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STOVE BUILDER INTERNATIONAL INC.
TEST REPORT

SCOPE OF WORK
EPA EMISSIONS TESTING/SERIES 3.5 STOVES/INSERTS/TESTING OF A REPRESENTATIVE UNIT TO COVER FOR THE SERIES WHICH CONTAINS SEVERAL UNITS

REPORT NUMBER
104981354MTL-001R1

TEST DATE(S)
02/20/22 - 02/21/22

ISSUE DATE **[REVISED DATE]**
03/21/22 08/24/22

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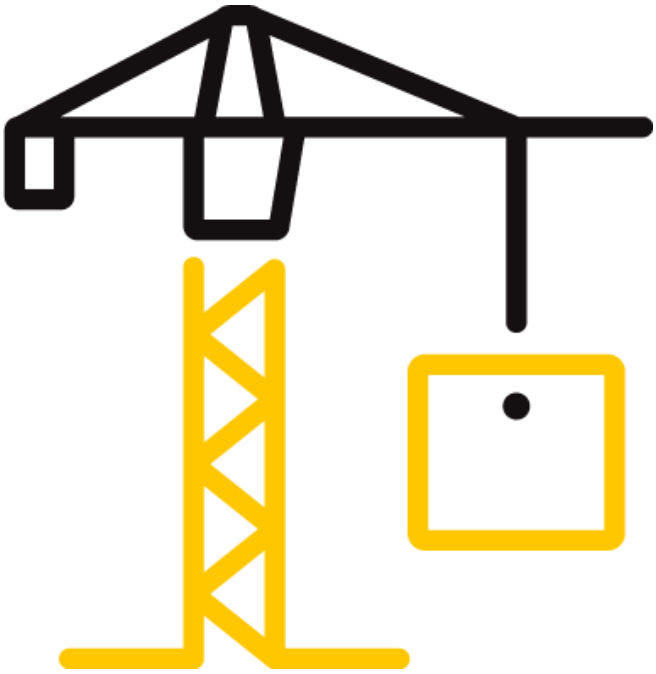

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Report No.: 104981354MTL-001R1
Date: 08/24/22

REPORT ISSUED TO

STOVE BUILDER INTERNATIONAL, INC.
250 de Copenhague,
Saint-Augustin-de-Desmaures, Qc, G3A 2H3

SECTION 1

SCOPE

Intertek Testing Services NA (Intertek) has conducted testing for Stove Builder International Inc., on model HES350 (3.5 Series) Wood Burning Room Heater to evaluate all applicable performance requirements included in "Determination of particulate matter emissions from wood heaters." HES350 is a representative model of the 3.5 Series. This series includes the following models: SOLUTION 3.5, OSBURN 3500, GATEWAY 3500, ESCAPE 2100, HT-3000, SOLUTION 3.5-I, FW3500, OSBURN 3500-I, HES350, HEI350, BLUE RIDGE 500, ESCAPE 2100-I, CW3500, BLUE RIDGE 500-I. See PEV #104981354MTL-002 for more details.

The test was conducted to determine if the unit is in accordance with U.S EPA requirements under EPA 40 CFR Part 60 "Standards of Performance for New Residential Wood Heaters, New Residential Hydronic Heaters and Forced-Air Furnaces". This evaluation was conducted on February 20 to February 21, 2022. The following test methods were applicable:

- ASTM E2515-11- Standard Test Method for Determination of Particulate Matter Emissions Collected by a Dilution Tunnel.
- ASTM E3053-17 - Standard Test Method for Determining Particulate Matter Emissions from Wood Heaters using Cordwood Test Fuel. It is based on the ALT-125 send by EPA on February 28th, 2018.
- ALT-125 - Broadly Applicable Alternative Test Method, Steffan Johnson, OAQPS, February 28, 2018
- CSA B415.1-10 - Performance Testing of Solid-Fuel-Burning Heating Appliances

Testing was performed by the undersigned at client's facility.

This report does not constitute certification of this product nor an opinion or endorsement by this laboratory.

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SECTION 2
SUMMARY OF TEST RESULTS

The appliance tests resulted in the following performance:

Particulate Emissions: 1.6 g/hr
Carbon Monoxide Emissions: 1.2 g/min
Heating Efficiency: 71% (Higher Heating Value Basis)

For INTERTEK B&C:

COMPLETED BY:	Brian Ziegler	**REVIEWED BY:**	Ken Slater
TITLE:	Technical Team Leader - Hearth	**TITLE:**	Associate Engineer - Hearth
SIGNATURE:		**SIGNATURE:**	 Ken Slater
DATE:	08/24/22	**DATE:**	08/24/22

aaa:bbb

SECTION 3
TEST METHOD(S)

The representative specimen was evaluated in accordance with the following:

ASTM E2515-11- Standard Test Method for Determination of Particulate Matter Emissions Collected by a Dilution Tunnel

ASTM E3053-17 - Standard Test Method for Determining Particulate Matter Emissions from Wood Heaters using Cordwood Test Fuel. It is based on the ALT-125 send by EPA on February 28th, 2018.

CSA B415.1-10 - Performance Testing of Solid-Fuel-Burning Heating Appliances

ALT-125 - Broadly Applicable Alternative Test Method, Steffan Johnson, OAQPS, February 28, 2018

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SECTION 4
MATERIAL SOURCE

A sample was submitted to Intertek directly from the client. The sample was not independently selected for testing. The test unit was handed to the Intertek representative at client's facility in St-Augustin-de-Desmaures, Quebec. The unit was inspected upon receipt and found to be in good condition. The unit was set up following the manufacturer's instructions without difficulty.
Following assembly, the unit was placed on the test stand. Prior to begin the emissions tests, the manufacturer operated the unit for a minimum of 50 hours at medium burn rates to break in the stove. The unit was found to be operating satisfactory during this break-in. The 50 plus hours of pre-burning were conducted from January 20, 2022 to February 17, 2022. The fuel used for the break-in process was beech cordwood. Table 1 shows the summary of the burn time in each test ran at medium burn rate; raw data is available on *Appendix F – Unit pre-burn documentation*.

Table 1 - Pre-burn time at medium burn rate summary

DATE	BURN CYCLE	DURATION (MIN)	FUEL ADDED (LBS)	MOISTURE (% DB)
2022-01-20	Preload	44	13.60	14.7
	Condition	99	30.90	19.2
	Load	439	36.09	19.5
2022-01-24	Preload	36	14.06	14.7
	Condition	134	28.89	19.0
	Load	519	36.14	19.0
2022-01-25	Preload	46	13.82	14.8
	Condition	167	29.83	19.0
	Load	549	35.56	19.1
2022-01-26	Preload	39	13.49	14.6
	Condition	195	29.40	19.5
	Load	509	35.20	19.2
2022-02-17	Preload	41	14.00	14.8
	Condition	135	28.86	19.2
	Load	500	33.22	19.1
	Total	3452	Minutes	
		57.53	Hours	

Following the pre-burn break-in process the unit was allowed to cool and ash and residue was removed from the firebox. The unit's chimney system and laboratory dilution tunnels were cleaned using standard wire brush chimney cleaning equipment. On February 18, 2022, the unit was set-up for testing.

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SECTION 5
EQUIPMENT

Equipment	INV Number	Calibration Due	MU
Floor scale	SBI-014	March 09, 2022	± 0.020 kg
DGM system 1	SBI-046	April 12, 2022	±2% F.S.
DGM System 2	SBI-047	April 07, 2022	±2% F.S.
Reference DGM	SBI-103	November 16, 2022	±2% F.S.
5 kg weight	SBI-190	October 02, 2023	±0.2 g
Temperature acquisition	SBI-197	October 21, 2022	±0.5°F
Pitot tube type S	SBI-203	March 24, 2022	±2.3e-004 inH_2O
Analytical scale	SBI-206	March 09, 2022	±0.08 mg
Table scale	SBI-222	March 09, 2022	±0.5 g
100 mg weight	SBI-237	October 09, 2023	±0.0025 mg
10 g weight	SBI-238	October 09, 2023	±0.012 mg
Hot wire anemometer	SBI-241	March 24, 2022	±0.15 m/s
Magnesense (tunnel)	SBI-247	February 25, 2022	±0.00015" H2O
Magnesense (draft)	SBI-252	February 25, 2022	±0.00015" H2O
DGM system 3	SBI-290	April 06, 2022	±2% F.S.
Pressure transmitter	SBI-326	November 23, 2022	±9.5e-003 psi
Pressure transmitter	SBI-327	November 23, 2022	±9.5e-003 psi
Vacuum transmitter	SBI-305	July 09, 2022	±1.9e-003 in.HG
Vacuum transmitter	SBI-301	August 11, 2022	±1.9e-003 in.HG
Relative humidity temperature meter	SBI-212	September 23, 2022	±6.0 e-001%
Relative humidity temperature meter	SBI-213	May 07, 2022	±6.0 e-001%
200 g weight	SBI-312	October 09, 2023	±0.06 mg
Barometer	SBI-331	October 01, 2022	±0.62mb/hPa
Moisture Content Standard	SBI-153	October 21, 2022	±0.2%
Multimeter	SBI-194	November 23, 2022	±1% Ω
Thermometer Calibrator	SBI-096	June 08, 2022	±0.5°F

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SECTION 6
LIST OF OFFICIAL OBSERVERS

NAME	COMPANY
Claude Paré	Stove Builder International inc.
Guillaume Thibodeau Fortin	Stove Builder International inc.
Claude Pelland	Intertek B&C

SECTION 7
TEST PROCEDURE

From February 20 to February 21, 2022, the unit was tested for EPA emissions. For wood stoves, wood insert or wood fireplace the test was conducted in accordance with ASTM E3053-17 and ASTM E2515-11. The fuel used for the test run was beech cordwood.

The applicable EPA regulatory limits are:

Step 2 – 2020 – 2.0 grams per hour with crib, 2.5 grams per hour with cordwood.

MANUFACTURER LOADING PROCEDURE

Stove lighting: 14.1 lbs
Split the start-up fuel log into 8 pieces. Crisscross the 8 pieces on the brick, leaving some space between each wood pieces. Crisscross the kindling on the top of the start-up fuel. The kindling is made of between 14-16 small pieces that are 10% of moisture content. Place crumbled newspaper on top kindling (5 full sheets). Light up the paper and let the door ajar at 90° until the flue temperature reaches 150°F, then close the door.

Pre-load (high burn): 29 lbs
When there is coal bed of 3.1 lb left, break ashes and level coal bed, then add pre-load in an East-West configuration. Put 3 pieces on the coal bed, without air space between them. Leave 1 inch of air space between the rear firebrick and the first piece. The 3 other pieces should be added on top of the first 3, in an East-West configuration. Let the door open at 90° for 1 minutes. Close the door and let burn until the weight is down to target.

When the flue gas temperature gets to 550°F, stir the coal bed. Let the door ajar by one inch for one minute. There should be approximately 5.7 to 6.1 lb of coal bed.

Loading (low fire): 34 lbs
For the loading, put 3 pieces on the coal bed in an East-West orientation. There should be air space between all pieces and with the rear brick. The 3 other pieces should be added on top of

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the first 3, slightly angled (170° from horizontal, top view). The distance between the logs shall be approximately 1 inch. Let the door open at 90° for 5 minutes and then close the door with the primary air control open. Close the primary air control using a 1/2-inch diameter rod as spacer at 7 min, then close using a 3/8-inch diameter rod at 14 minutes. Close the air control completely at 16 minutes or when 15% of the load weight has been consumed, whichever comes first.

Loading (medium fire): 34 lbs
For the loading, put 3 pieces on the coal bed in an East-West orientation. There should be air space between all pieces and with the rear brick. The 3 other pieces should be added on top of the first 3, slightly angled (170° from horizontal, top view). The distance between the logs shall be approximately 1 inch. Let the door open at 90° for 5 minutes and then close the door with the primary air control open. Close the primary air control using a 1/2-inch diameter rod as spacer at 8 min, then close using a 9/32-inch diameter rod as spacer at 16 minutes or when 15% of the load weight has been consumed, whichever comes first.

TEST SET-UP DESCRIPTON

A 6” flue is connected to a standard 6” diameter vertical single wall pipe and insulated chimney system was installed to 15’ above floor level. The single wall pipe extended to 8 feet above the floor and insulated chimney extended the remaining height.

AIR SUPPLY SYSTEM

Combustion air enters on the bottom of the heater, which is directed to the firebox. All gases exit through the 6” flue located on top of the heater.

TEST FUEL PROPERTIES
The species of fuel used was beech. The fuel was split cordwood of nominal length of 16 inches ± 1 inch. The fuel was dried in air to average moisture content between 18% and 28% on a dry basis. Cordwood fuel was loaded from side to side into the firebox per manufacturer’s instructions.

SAMPLING LOCATIONS

Particulate samples are collected from the dilution tunnel at point 20 feet from the tunnel entrance. The collection hood is 40 inches in diameter. The mixing section started with a 10-inch diameter elbow, followed by a strait 10-inch diameter section. A 10 to 8-inch diameter reducer is installed upstream of the 8-inch diameter elbow (see Figure 1). The sampling section is a continuous 13-foot section of 8-inch diameter pipe straight over its entire length. Tunnel velocity pressure is determined by a type “S” Pitot tube located 100 inches from the beginning of the sampling section. The dry bulb thermocouple is located on the pitot tube. Tunnel samplers are located 48 inches downstream of the Pitot tube and 36 inches upstream from the end of this section (See Figure 2).

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The dilution tunnel is fully compliant with ASTM E2515-11.

Stack gas samples are collected from the steel chimney section 8 feet ± 6 inches above the scale platform.

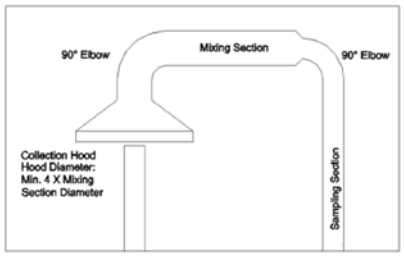

Figure 1 - Mixing Section with different diameter

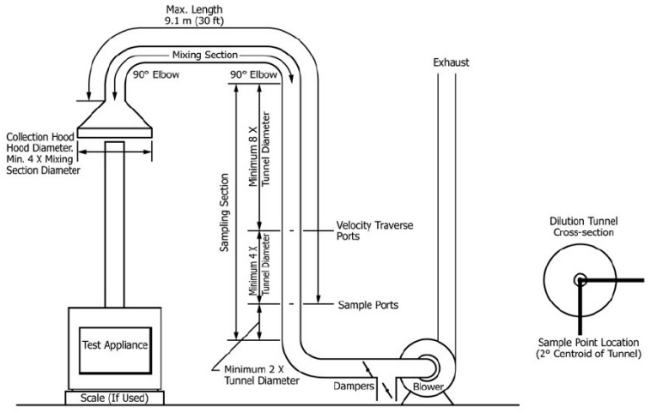

Figure 2 - Dilution tunnel

SAMPLING METHODS

PARTICULATE SAMPLING

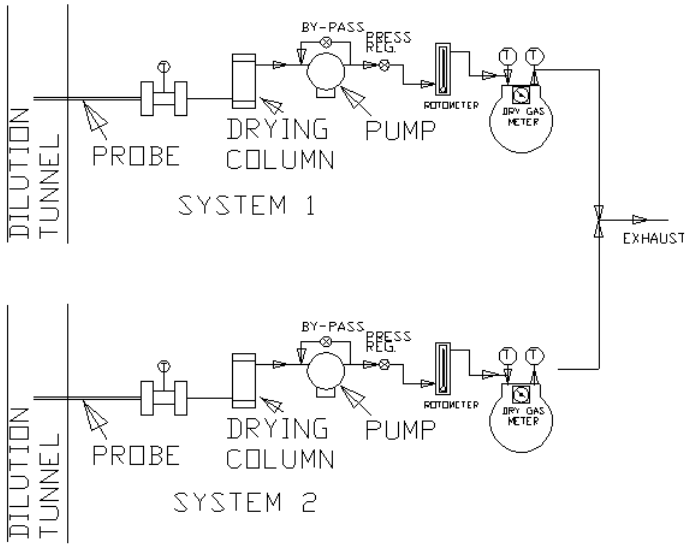

Figure 3 - Stack gas sample train

Particulates were sampled in strict accordance with ASTM E2515-2011. Schematic is presented on Figure 3. This method uses three identical sampling systems with PALL TX-40 47-mm diameter filters. The dryers used in the sample systems are filled with “Drierite” before each test run. In

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order to measure first-hour emissions rates, a third filter set is installed between the two others. The third filter set is stopped individually after 60 minutes of sampling.

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 E.

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 every 6 months using a Spirometer designed by the EPA Emissions Measurement Branch. The process involves sampling the train operation for 1 cubic foot of volume. With readings made to .001 ft3, the resolution is .1%, giving an accuracy higher than the ±2% required by the standard.

STACK SAMPLE ROTAMETER

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

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 three-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.

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TEST METHOD PROCEDURES

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 5 inches of mercury. Vacuum is monitored during each test and the highest vacuum reached is then used for the post-test vacuum value. If leakage limits are not met, the test run is rejected. During, these tests the vacuum was typically less than 1 inches of mercury. Thus, leakage rates reported are expected to be much higher than actual leakage during the tests.

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.

PM SAMPLING AND PROPORTIONALITY

Proportionality was calculated in accordance with ASTM E2515-11. The data and results are included in Appendix B. Negative sample probe catch are treated as zero when determining total particulate catch weight. The test run is treated as invalid if the negative value is greater than 5 % of the total particulate catch weight (excluding the probe). For the room air sample probe assembly, negative particulate catch weights are treated as zero when determining total room air particulate weight.

DEVIATIONS FROM STANDARD METHOD:

The following deviations were requested by EPA on ALT-125:

Changes to ASTM E3053-17 are:

1. Coal bed conditions prior to loading test fuel: The coal bed should be a level plane without valleys or ridges for all test runs in the high fire, low and medium burn rate categories.

Changes to ASTM E2515-11 must be as followed:

1. The filter temperature must be maintained between 80 and 90 Degrees F during testing.
2. Filters must be weighed in pairs to reduce weighing error propagation.
3. Sample filters must be Pall TX-40 or equivalent Teflon coated glass fiber, and of 47 mm,90mm, 100mm of 110mm in diameter.

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4. Only one point is allowed outside the +/- 10% proportionality range per test run.

SECTION 8
TEST CALCULATIONS

Weight of test fuel load, dry basis ASTM E3053

$$M_{Fldb} = \Sigma((M_{FLnwb})(100)/(100+MC_{FLn}))$$

where:

M_{FLdb}	= weight of test fuel load, dry basis, lb (kg);
M_{FLnwb}	= weight of each test fuel piece, *n*, in test fuel load per 8.4.1, wet basis, lb (kg);
MC_{FLn}	= average fuel moisture of test fuel piece, *n*, in test fuel load, % dry basis; and
n	= individual test fuel pieces that comprise the test fuel load, as applicable.

Weighted Average Determination ASTM E3053

$$Vi_{WA} = 0.4(Vi_{LAve)}) + 0.4(Vi_{MAve}) + 0.2(Vi_{HAve})$$

where:

Vi_{WA}	= Weighted average for variable *i*;
Vi	= Test result variable (Particulate Matter: g/h, g/kg, lb/MMBtu; % Overall Efficiency: HHV, LHV; Carbon Monoxide: g/h, etc.)
Vi_{LAve}	= Arithmetic average for variable *Vi* for all test runs (except per 8.6.13 or 8.9) that are included in the low fire burn rate category
Vi_{MAve}	= Arithmetic average for variable *Vi* for all test runs (except per 8.6.13 or 8.9) that are included in the medium fire burn rate category;
Vi_{HAve}	= Arithmetic average for variable *Vi* for all test runs (except per 8.9) that are included in the high fire burn rate category.

NOMENCLATURE FOR ASTM E2515:

A	= Cross-sectional area of tunnel m2 (ft2).
B_{ws}	= Water vapor in the gas stream, proportion by volume (assumed to be 0.02 (2.0 %)).
C_p	= Pitot tube coefficient, dimensionless (assigned a value of 0.99).
c_r	= Concentration of particulate matter room air, dry basis, corrected to standard conditions, g/dscm (gr/ dscf) (mg/dscf).
c_s	= Concentration of particulate matter in tunnel gas, dry basis, corrected to standard conditions, g/dscm (gr/dscf) (mg/dscf).
E_T	= Total particulate emissions, g.
F_p	= Adjustment factor for center of tunnel pitot tube placement.

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$F_p = V_{strav}/V_{scent}$

K_P = Pitot Tube Constant, 34.97 $\frac{m}{\sec}\left[\frac{\left(\frac{g}{g}\blacksquare mole\right)(mm\ Hg)}{(K)(mm\ water)}\right]^{\frac{1}{2}}$

or

= Pitot Tube Constant, 85.49 $\frac{ft}{\sec}\left[\frac{\left(\frac{lb}{lb}-mole\right)(in\ Hg)}{(R)(in\ water)}\right]^{\frac{1}{2}}$

L_a = Maximum acceptable leakage rate for either a pretest or post-test leak- check, equal to 0.0003 m3/min (0.010 cfm) or 4 % of the average sampling rate, whichever is less.

L_p = Leakage rate observed during the post-test leak-check, m3/min (cfm).

m_p = mass of particulate from probe, mg.

m_f = mass of particulate from filters, mg.

m_g = mass of particulate from filter gaskets, mg.

m_r = mass of particulate from the filter, filter gasket, and probe assembly from the room air blank filter holder assembly, mg.

m_n = Total amount of particulate matter collected, mg.

M_s = the dilution tunnel dry gas molecular weight (may be assumed to be 29 g/g mole (lb/lb mole).

P_{bar} = Barometric pressure at the sampling site, mm Hg (in. Hg).

P_g = Static Pressure in the tunnel (in. water).

P_R = Percent of proportional sampling rate.

P_s = Absolute average gas static pressure in dilution tunnel, mm Hg (in. Hg).

P_{std} = Standard absolute pressure, 760 mm Hg (29.92 in. Hg).

Q_{std} = Average gas flow rate in dilution tunnel.

$Q_{std} = 60\ (1 - B_{ws})\ V_s\ A\ [T_{std}\ P_s/T_s\ P_{std}]$

dscm/min (dscf/min).

T_m = Absolute average dry gas meter temperature, K (R).

T_{mi} = Absolute average dry gas meter temperature during each 10-min interval, *i*, of the test run.

$T_{mi} = (T_{mi(b)} + T_{mi(e)})/2$

where:

$T_{mi(b)}$ = Absolute dry gas meter temperature at the beginning of each 10-min test interval, i, of the test run, K (R), and

$T_{mi(e)}$ = Absolute dry gas meter temperature at the end of each 10-min test interval, i, of the test run, K (R).

Ts = Absolute average gas temperature in the dilution tunnel, K (R).

Tsi = Absolute average gas temperature in the dilution tunnel during each 10-min interval, i, of the test run, K (R).

$T_{si} = (T_{si(b)} + T_{m=si(e)})/2$

where:

$T_{si(b)}$ = Absolute gas temperature in the dilution tunnel at the beginning of each 10-min test interval, i, of the test run, K (R), and

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$T_{si(e)}$ = Absolute gas temperature in the dilution tunnel at the end of each 10-min test interval, i, of the test run, K (R).

V_m = Volume of gas sample as measured by dry gas meter, dcm (dcf).

V_{mc} = Volume of gas sampled corrected for the post test leak rate, dcm (dcf).

V_{mi} = Volume of gas sample as measured by dry gas meter during each 10-min interval, i, of the test run, dcm.

$V_{m(std)}$ = Volume of gas sample measured by the dry gas meter, corrected to standard conditions.

$$V_{m(std)} = K_1 V_m Y [(P_{bar} + (\Delta H/13.6))/T_m]$$

where:

K_1 = 0.3855 K/mm Hg for SI units and = 17.64 R/in. Hg for inch-pound units.

$$V_{m(std)} = K_1 V_{mc} Y [(P_{bar} + (\Delta H/13.6))/T_m]$$

where:

V_{mc} = Vm– (Lp– La)u

V_{mr} = Volume of room air sample as measured by dry gas meter, dcm (dcf), and

$V_{mr(std)}$ = Volume of room air sample measured by the dry gas meter, corrected to standard conditions.

$$V_{m(std)} = K_1 V_{mr} Y [(P_{bar} + (\Delta H/13.6))/T_m]$$

Where:

K_1 = 0.3855 K/mm Hg for SI units and = 17.64 R/in. Hg for inch-pound units, and

V_s = Average gas velocity in the dilution tunnel.

$$V_s = F_p K_p C_p (\sqrt{\Delta P_{avg}})(\sqrt{(T_s/P_s M_s)})$$

V_{si} = Average gas velocity in dilution tunnel during each 10-min interval, i, of the test run.

$$V_{si} = F_p K_p C_p (\sqrt{\Delta P_i})(\sqrt{(T_{si}/P_s M_s)})$$

V_{scent} = Average gas velocity at the center of the dilution tunnel calculated after the Pitot tube traverse.

V_{strav} = Average gas velocity calculated after the multipoint Pitot traverse.

Y = Dry gas meter calibration factor.

ΔH = Average pressure at the outlet of the dry gas meter or the average differential pressure across the orifice meter, if used, mm water (in. water).

ΔP_{avg} = Average velocity pressure in the dilution tunnel, mm water (in. water).

ΔP_i = Velocity pressure in the dilution tunnel as measured with the Pitot tube during each 10-min interval, i, of the test run.

$$\Delta P_i = (\Delta P_{i(b)} + \Delta P_{i(e)})/2$$

where:

$\Delta P_{i(b)}$ = Velocity pressure in the dilution tunnel as measured with the Pitot tube at the beginning of each 10-min interval, i, of the test run, mm water (in. water), and

$\Delta P_{i(e)}$ = Velocity pressure in the dilution tunnel as measured with the Pitot tube at the end of each 10-min interval, i, of the test run, mm water (in. water).

θ = Total sampling time, min.

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10 = ten min, length of first sampling period.
13.6 = Specific gravity of mercury.
100 = Conversion to percent.

TOTAL PARTICULATE WEIGHT – ASTM E2515

$$M_n = m_p + m_f + m_g$$

PARTICULATE CONCENTRATION – ASTM E2515

$$C_s = K_2(m_n/V_{m(std)})\ g/dscm\ (g/dscf)$$

where:
K_2 = 0.001 g/mg

TOTAL PARTICULATE EMISSIONS (g) – ASTM E2515

$$E_T = (C_s - C_r)Q_{std}\theta$$

PROPORTIONAL RATE VARIATION (%) – ASTM E2515

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

MEASUREMENT OF UNCERTAINTY – ASTM E2515

$$MU_{weighing} = \sqrt{0.1^2} \bullet X$$

GENERAL FORMULA – ASTM E2515

$$uY = \sqrt{((\delta Y/\delta x_1) \times u_1)^2 + \ldots + ((\delta Y/\delta x_n) \times u_n)^2}$$

Where:
$\delta Y/\delta x_i$ = Partial derivative of the combining formula with respect to individual measurement xi,
u_i = is the uncertainty associated with that measurement.

TOTAL PARTICULATE EMISSIONS – ASTM E2515

$$E_T = (c_s - c_r)\ Q_{std}\ \theta$$

where:
c_s = sample filter catch/(sample flow rate x test duration), g/dscf,
c_r = room background filter catch/(sample flow x sampling time), g/dscf,
Q_{std} = average dilution tunnel flow rate, dscf/min, and
θ = sampling time, minutes.

MU OF c_s

$$c_s = F_c/(Q_{sample} \times \theta) = 0.025/(0.25 \times 180) = 0.0005555$$
$$\delta c_s/\delta F_c = 1/Q_{sample} \bullet \Theta = 1/0.25 \bullet 180 = 0.0222$$

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$\delta c_s/\delta Q_{sample} = -F_c/Q^2_{sample} \bullet \Theta = -0.025/0.25^2 \bullet 180 = -0.00222$
$\delta c_s/\delta \Theta = -F_c/Q_{sample} \bullet \Theta^2 = -0.025/0.25 \bullet 180^2 = -0.000003$
$MUc_s = \sqrt{(0.00027 \bullet 0.0222)^2 + (0.0025 \bullet - 0.00222)^2}$
$\sqrt{} + (0.1 \bullet - 0.000003)^2 = 0.0000091g$
Thus, c_s would be 0.555 mg/dscf ± 0.0081 mg/dscf at 95% confidence level.

MU OF c_r

$c_r = BG_c/(QBG \times \theta) = 0.002/(0.15 \times 180) = 0.000074$
$\delta c_r/\delta BG_c = 1/Q_{BG} \bullet \Theta = 1/0.15 \bullet 180 = 0.03704$
$\delta c_r/\delta Q_{BG} = -BG_c/Q^2_{BG} \bullet \Theta = -0.002/0.15^2 \bullet 180 = -0.0004938$
$\delta c_r/\delta \Theta = -BG_c/Q_{BG} \bullet \Theta^2 = -0.002/0.15 \bullet 180^2 = -0.0000004$
$MUc_r = \sqrt{(0.00027 \bullet 0.03704)^2 + (0.0015 \bullet - 0.0004938)^2}$
$\sqrt{} + (0.1 \bullet - 0.0000004)^2 = 0.00001g$
Thus, c_r would be 0.074 mg/dscf ± 0.01 mg/dscf at 95% confidence level.

E_T AND MU_{ET}

$E_T = (c_s - c_r)\, Q_{sd}\, \theta = (0.000555 - 0.000074) \times 150 \times 180 = 13.00g$
$\delta E_T/\delta c_s = Q_{std} \bullet \Theta = 150 \bullet 180 = 27{,}000$
$\delta E_T/\delta c_r = Q_{std} \bullet \Theta = 150 \bullet 180 = 27{,}000$
$\delta E_T/\delta Q_{std} = c_s \bullet \Theta - c_r \bullet \Theta = 0.000555 \bullet 180 - 0.000074 \bullet 180 = 0.08667$
$\delta E_T/\delta \Theta = c_s \bullet Q_{std} - c_r \bullet Q_{std} = 0.000555 \bullet 180 - 0.000074 \bullet 180 = 0.07222$
$MU_{ET} = \sqrt{(27{,}000 \bullet 0.0000081)^2 + (27{,}000 \bullet 0.00001)^2\, (0.08667 \bullet 3)^2}$
$\sqrt{} + (0.07222 \bullet 0.1)^2 = 0.436$
Thus the result in this example would be:
ET = 13.00g ± 0.44 g at a 95% confidence level.

EFFICIENCY – CSA B415.1

The change in enthalpy of the circulating air shall be calculated using the moisture content and temperature rise of the circulating air, as follows:

$$\Delta h = \Delta t\,(1.006 + 1.84x)$$

Where:
Δh = change in enthalpy, kJ/kg
Δt = temperature rise, °C
1.006 = specific heat of air, kJ/kg °C
1.84 = specific heat of water vapor, kJ/kg °C
x = humidity ratio, kg/kg

The equivalent duct diameter shall be calculated as follows:

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$$ED = 2HW/H+W$$

Where:
ED = equivalent duct diameter
H = duct height, m
W = duct width, m

The air flow velocity shall be calculated as follows:

$$V = F_p \times C_p \times 34.97 \times \sqrt{T}/28.56(P_{baro} + P_s)$$

where
V = velocity, m/s
F_P = Pitot tube calibration factor determined from vane anemometer measurements
C_P = Pitot factor
= 0.99 for a standard Pitot tube or as determined by calibration for a Type S Pitot tube
34.97 = Pitot tube constant
Note: The Pitot tube constant is determined on the basis of the following units: $m/s[g/g\ mole\ (mm\ Hg)/(K)(mm\ H_2O)]^{0.5}$
ΔP = velocity pressure, mm H2O
T = temperature, K
28.56 = molecular weight of air
P_{Baro} = barometric pressure, mm Hg
P_s = duct static pressure, mm Hg

The mass flow rate shall be calculated as follows:

$$m = 3600VAp$$

where:
m = mass flow rate, kg/h
V = air flow velocity, m/s
3600 = number of seconds per hour
A = duct cross-sectional area, m2
p = density of air at standard temperature and pressure (use 1.204 kg/m3)

The rate of heat release into the circulating air shall be calculated using the air flow and change in enthalpy, as follows:

$$\Delta e = \Delta h \times m$$

Where:
Δe = rate of heat release into the circulating air, kJ/h
Δh = change in enthalpy of the circulating air, kJ/kg

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m = mass air flow rate, kg/h

The heat output over any time interval shall be calculated as the sum of the heat released over each measurement time interval, as follows:

$$E_t = \sum(\Delta e \times i) \text{ for } i = t_1 \text{ to } t_2$$

Where:
Et = delivered heat output over any time interval $t_2 – t_1$, kJ
i = time interval for each measurement, h

The average heat output rate over any time interval shall be calculated as follows:

$$e_t = E_t / t$$

where
e_t = average heat output, kJ/h
t = time interval over which the average output is desired, h

The total heat output during the burn shall be calculated as the sum of all the heat outputs over each time interval, as follows:

$$E_d = \sum(E_t) \text{ for } t = t_0 \text{ to } t_{final}$$

Where:
E_d = heat output over a burn, kJ/h (Btu/h)
E_t = heat output during each time interval, kJ/h (Btu/h)

The efficiency shall be calculated as the total heat output divided by the total energy input, expressed as a percentage as follows:

$$\text{Efficiency, \%} = 100 \times E_d / I$$

Where:
E_d = total heat output of the appliance over the test period, kJ/kg
I = input energy (fuel calorific value as-fired times weight of fuel charge), kJ/kg (Btu/lb)

SECTION 9
TEST SPECIMEN DESCRIPTION

The model HES350, being representative of the 3.5 series which includes: SOLUTION 3.5, OSBURN 3500, GATEWAY 3500, ESCAPE 2100, HT-3000, SOLUTION 3.5-I, FW3500, OSBURN 3500-I, HEI350, BLUE RIDGE 500, ESCAPE 2100-I, CW3500, BLUE RIDGE 500-I. Wood Fuel Room Heaters are constructed of sheet steel. The outer dimensions are 30 7/16-inches deep, 34 11/16-inches high, and 28 3/4-inches wide. The unit has a door located on the front with a viewing glass.

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Proprietary drawings and manufacturing methods are on file at Intertek located at 1829, 32nd Avenue Montreal (Lachine), QC Canada H8T 3J1 and in the EPA filing system.

FIREBOX CALCULATION

The model from the 3.5 Series (HES350) has a usable firebox volume (UFV) of 2.88 ft³. Schematic of the firebox dimensions is presented on Figure 4. Volume presented on Figure 4 comes from Solid Edge Cad Software. Fuel cannot be stacked any higher due to the secondary air tubes being at the top of the combustion chamber. Note that handwritten fuel load calculator sheets (appendix A – Run notes) show an erroneous volume of 2.84 ft³. This is a typo. All Excel spreadsheet uses 2.88 ft³ to calculate the test load.

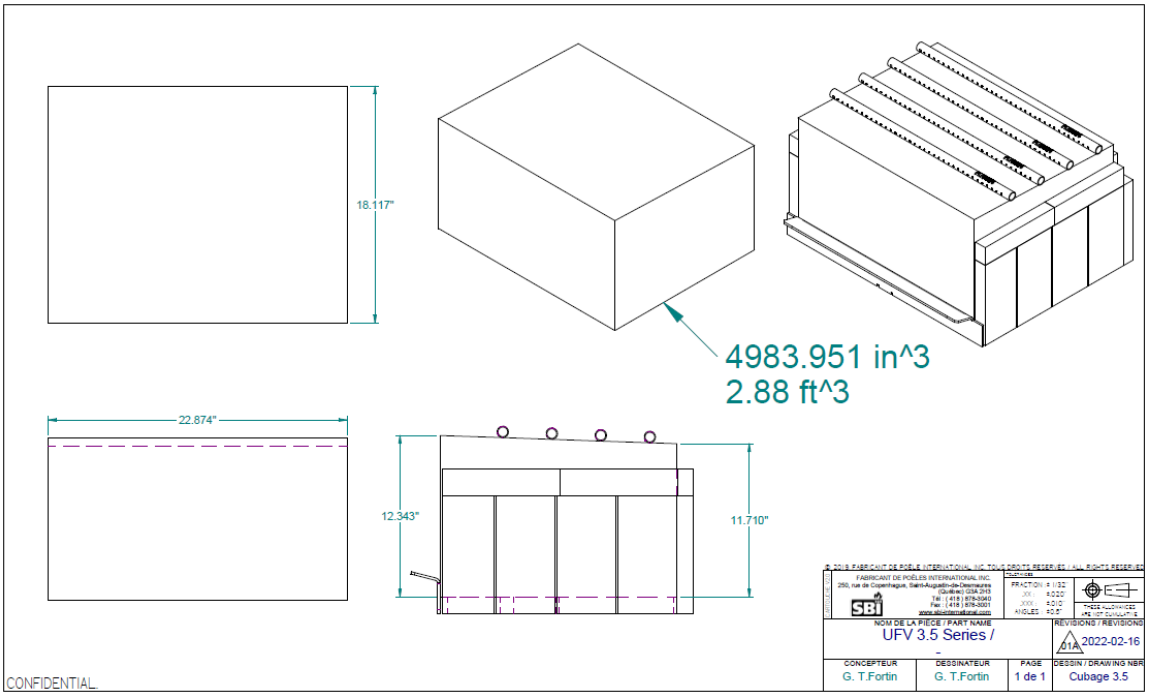

Figure 4 - Schematic of firebox volume

$$UFV = 18.117 \times 22.874 \times \frac{12.343 + 11.710}{2} = 4983.88\ in^3$$

$$UFV = \frac{4983.88}{12^3} = 2.88\ ft^3$$

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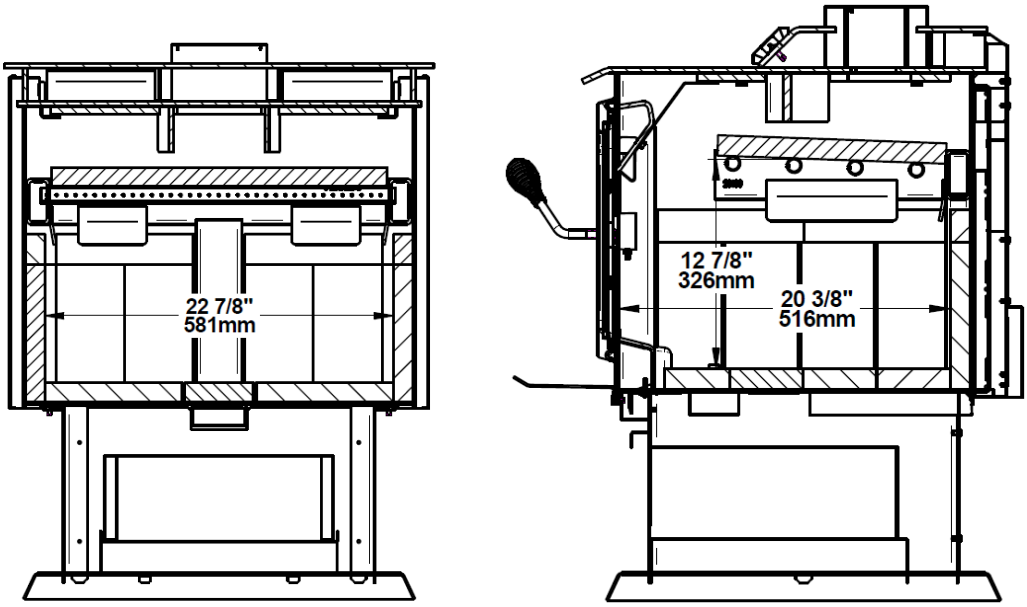
In their user's manual, SBI presents another volume called the "Overall Firebox Volume". This volume is for marketing purposes only. The overall firebox calculation is not intended to be used for testing, as it includes areas of the firebox that the test fuel load is not permitted to be placed into. This area is a buffer zone to allow an easier fuel insertion, to prevent ash spillage and to allow the air wash to work properly. The calculation presents an approximation of the volume a consumer could easily confirm using a measuring tape.



The calculation for the overall firebox volume would be the following: middle width x middle height x full depth. This is because it has a tapered firebox.

$$22.875 \times 12.875 \times 20.375 = 6000.76\ in^2$$

$$\frac{6000.76}{12^3} = 3.5\ ft^3$$

SECTION 10

TEST RESULTS

GENERAL DISCUSSION:

All runs have been found appropriate and all runs below have been validated and found compliant. All burn rate categories were achieved. All data were used in the calculation of the weighted average. No anomalies were observed.

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Test fuel pieces have been positioned in East-West orientation as per the manufacturer's written instructions. All test fuel pieces were split to meet individual and total load weight range for the firebox. Test fuel pieces were split in order to preserve the bark. In the area without bark, splitting was done to represent the random shape of the wood as it can be found in a standard cord of wood. No test fuel pieces were voluntary squared.

Filters were not altered by the gasket in all runs. No negative weight was found on probes or filters. No attempt was made to collect ambient background particulate matter during the testing. The contribution of room air particulate matter could not be subtracted from dilution tunnel particulate matter; thus, considered zero. This results in a sample that is potentially biased high when the compliance determination is made.

DESCRIPTION OF TEST RUNS:

RUN #1 High (February 20, 2022) - Air control was set fully opened; total burn time was 171 minutes with a category High burn rate 4.21 kg/hr. Burn time without the cold start was 135 minutes. Kindling and start-up fuel were ignited together in a cold chamber (average surface temperature was 68.9°F and ambient temperature was 65.8°F). Door was closed 1.1 minute after ignition. High fire load was inserted at 35 minutes. Door was closed at 36 minutes. At 36 minutes and 15 seconds, the fan was turned ON at high speed. The air control was always fully opened. The test run ended when 89.1% of the test full load was consumed. The allowable range is 90% ± 1.0%.

RUN #1 Medium (February 20, 2022) - Air control set to reach the medium burn rate, burn time was 461 minutes with a burn rate of 1.70 kg/hr. Load time was 1 minute and 25 seconds. The door was left open for 2 minutes and 35 seconds after the loading time (4 minutes run time), then closed. At 8 minutes, the air control was closed on a 1/2-inch rod as spacer. At 16 minutes and 26 seconds (maximum time allowed), the air control was closed on a 9/32-inch rod as spacer as final position to reach a medium burn rate. The fan was turned ON at low speed at 40 minutes. Test ended at 7 hours and 45 minutes from the beginning of the test, all fuel was consumed.

RUN #2-High (February 21, 2022) – Air control was set fully opened; total burn time was 160 minutes with a category High burn rate 4.77 kg/hr. Burn time without the cold start was 121 minutes. Kindling and start-up fuel were ignited together in a cold chamber (average surface temperature was 68.7°F and ambient temperature was 66.6°F). Door was closed 1 minute after ignition. High fire load was inserted at 37 minutes and 40 seconds. Door closed immediately after loading at 38 minutes and 40 seconds. At 39 minutes, the fan was turned ON at the high speed. The air control was always fully opened. The test run ended when 89.0% of the test full load was consumed. The allowable range is 90% ± 1.0%.

RUN #2-Low (February 21, 2022) – Air control set to reach the minimum achievable burn rate (fully closed), burn time was 575 minutes with a burn rate of 1.36 kg/hr. Load time was 1 minutes and 25 seconds. The door was left open for 2 minutes and 41 seconds after the loading time (4 minutes and 7 seconds run time), then closed. At 7 minutes, the air control was closed on a 1/2-

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inch rod as spacer. At 11 minutes and 36 seconds, the air control was closed on a 3/8-inch rod as spacer. At 15 minutes the air control was set to fully closed position because 15% of the test fuel load was consumed. The fan was turned on at low speed at 60 minutes. Test ended at 9 hours and 35 minutes from the beginning of the test, all fuel was consumed.

RESULT TABLES:

Table 2 to Table 9 present the results of the evaluation. On section 14, Table 10 to Table 13 present the results as per the adjunct summary sheet of ASTM E3053-17.

Table 2 - EMISSIONS

RUN #	TEST DATE	BURN RATES (KG/HR)(DRY)	PARTICULATE EMISSION RATE (G/HR)	1ST HOUR EMISSIONS (G)	CO EMISSIONS (G/HR)	CO EMISSIONS (G/MIN)	HEATING EFFICIENCY (% HHV)
1H	2022-02-20	4.21	3.1	**6.6**	47	**0.8**	68%
1M	2022-02-20	1.70	1.0	**6.2**	56	**0.9**	72%
2H	2022-02-21	4.77	3.8	**9.3**	54	**0.9**	68%
2L	2022-02-21	1.36	1.3	**9.6**	102	**1.7**	71%

Table 3 - FUEL DATA SUMMARY

#	KINDLING WEIGHT (LBS)	KINDLING MC (%DB)	SU FUEL Weight (lbs)	SU FUEL MC (%DB)	HIGH WEIGHT (LBS)	HIGH MC (%DB)	LOW/MED Weight (lbs)	LOW/MED MC (%DB)
1	5.780	10	8.220	22.8	29.34	21.8	34.6	20.5
2	5.635	10	8.581	21.6	29.46	20.5	34.62	21.0

Table 4 - 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
1H	65.8	88.1	30.4	30.4	17.7	16.9	0	0
1M	85.0	82.4	30.3	29.9	16.9	16.9	0	0
2H	66.6	86.4	30.2	30.2	18.7	20.1	0	0
2L	86.4	72.6	30.2	30.6	20.1	18.6	0	0

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Table 5 - DILUTION TUNNEL FLOW RATE MEASUREMENTS AND SAMPLING DAT

RUN #	BURN TIME (MIN)	TUNNEL VELOCITY (FT/SEC)	VOLUMETRIC FLOW RATE (DSCF/MIN)	TUNNEL AVE. TEMP. (°R)	SAMPLE VOLUME (DSCF)		PARTICULATE CATCH (MG)	
					1	2	1	2
1H	171	15.30	278.36	605	20.678	20.880	3.7	4.0
1M	461	15.29	293.36	568	57.168	57.806	3.2	3.3
2H	160	15.97	284.89	613	19.248	19.409	4.2	4.3
2L	575	15.73	310.26	558	73.475	74.281	5.4	5.2

Table 6 - DILUTION TUNNEL DUAL TRAIN PRECISION

RUN #	SAMPLE RATIOS		TOTAL EMISSIONS (G)		DEVIATION %	DEVIATION G/KG
	TRAIN 1	TRAIN 2	TRAIN 1	TRAIN 2		
1H	2302	2280	8.517	9.119	3.4%	0.044
1M	2366	2340	7.570	7.720	1.0%	0.012
2H	2368	2349	9.946	10.099	0.8%	0.011
2L	2428	2402	13.112	12.489	2.4%	0.048

Table 7 - GENERAL SUMMARY OF RESULTS

RUN #	BURN RATE (KG/HR)(DRY)	CHANGE IN SURFACE TEMP (°F)	INITIAL DRAFT (IN/H_2O)	BURN RATE RUN TIME (MIN)	AVERAGE DRAFT (IN/H_2O)
1H	4.21	382	0.001	135	0.091
1M	1.70	167	0.073	461	0.066
2H	4.77	408	0.000	121	0.091
2L	1.36	203	0.070	575	0.055

Table 8 - CSA B415.1 RESULTS

RUN #	CO EMISSIONS (G/MIN)	HEATING EFFICIENCY (% HHV)	HEATING EFFICIENCY (% LHV)	HEAT OUTPUT (BTU/HR)
1H	0.8	68%	72%	50,800
1M	0.9	72%	77%	21,700
2H	0.9	68%	73%	57,800
2L	1.7	71%	76%	17,200

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Table 9 - WEIGHTED AVERAGE CALCULATION

RUN #	BURN RATE CAT.	(E) AVERAGE EMISSION RATE G/HR	(CO) AVERAGE EMISSION RATE G/HR	HEAT OUTPUT (BTU/HR)	EFF HHV %	EFF LHV %	(K) WEIGHTING FACTOR	(KxE) G/HR	(KxCO) G/HR	(KxCO) G/MIN	(Kx HHV)	(Kx LHV)
1H	H	3.1	47	50,800	68%	72%	10%	0.31	4.7	0.08	7%	7%
1M	M	1.0	56	21,700	72%	77%	40%	0.40	22.2	0.37	29%	31%
2H	H	3.8	54	57,800	68%	73%	10%	0.38	5.4	0.09	7%	7%
2L	L	1.3	102	17,200	71%	76%	40%	0.53	40.8	0.68	28%	30%
						Totals:	**100%**	**1.6**	**73**	**1.2**	**71%**	**76%**

SECTION 11
CONCLUSION

This test demonstrates that this unit is an affected facility under the definition given in the regulation. The emission rate of 1.6 g/hr meets the EPA requirements for the Step 2 limits. Model Series 3.5 – HES350 therefore qualifies as mentioned above.

Model HES350 is a representative for similar models: SOLUTION 3.5, OSBURN 3500, GATEWAY 3500, ESCAPE 2100, HT-3000, SOLUTION 3.5-I, FW3500, OSBURN 3500-I, HEI350, BLUE RIDGE 500, ESCAPE 2100-I, CW3500, BLUE RIDGE 500-I stoves and inserts. All models have the same internal design, electrical components, and controls. The only differences are external cosmetic designs.

LIST OF APPENDICES

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SECTION 12
PHOTOGRAPHS

Figure 5 - Isometric view of unit

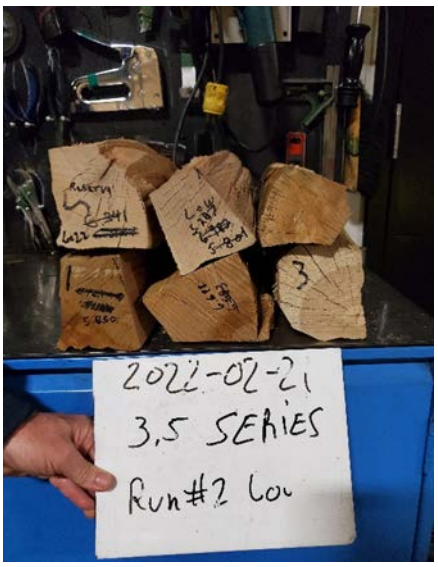

Figure 6 - Typical load

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SECTION 13
REVISION LOG

REVISION #	DATE	PAGES	REVISION
0	03/21/22	N/A	Original Report Issue
		3	Report originally created by Claude Pelland, who is no longer with Intertek. Report revised by Brian Ziegler and reviewed by Ken Slater.
1	08/24/22	19	Added “overall firebox volume” to report.

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SECTION 14
REPORT TABLES AS PER ASTM E3053-17

Table 10 - Section 1 - Model Identification

SECTION 1 – Model Identification	
Model Name(s)/Number(s)	3.5 Series
Manufacturer	Stove builder international inc.
Address 1	250 Rue Copenhague
Address 2	Saint-Augustin-de-Desmaures
Appliance Category(s) (Free-standing, Insert, etc.)	Insert and Fireplace
Usable Firebox Volume - ft^3	2.88
Catalytic/Non-Cat	Non-Cat
Convection Air Fan (No, Standard, Optional)	Optional
SECTION 1B – Laboratory Information	
Testing Laboratory	Intertek testing services
Address 1	1829 32nd Avenue
Address 2	Lachine, QC H8T 3J1
ISO/Accreditation Info	ISO 17025
Dates Tested	02/20/2022 - 02//2022
Test Methods/Standards	CAS B415.1-10, ASTM E2515, ASTM E3053
Dilution Tunnel Inside Diameter - in.	8.00
Filter Diameter - mm	47
Filter Material	Pall TX40

Table 11 - Section 2 - Test Conditions Summary

SECTION 2 – Test Conditions Summary				
Model Name(s)/Number(s)	3.5 Series			
Usable Firebox Volume - ft3	2.88			
Convection Air Fan (No, Standard, Optional)	Optional			
Test Run #	1	1	2	2
Date Tested	2022-02-20	2022-02-20	2022-02-21	2022-02-21
Test Run Category (L, M, H)	H	M	H	L
Average Barometric Pressure - in Hg	30.39	30.11	30.20	30.40
Max. Observed Ambient Temp - °F	89	89	90	90
Min. Observed Ambient Temp - °F	66	80	67	73
Max. Observed Filter Temp - °F	87&87	87&88	87&88	88&87

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Test Run Air Settings				
Primary (measured up from minimum)	Max - 1-1/4''	9/32''	Max - 1-1/4''	Min
Secondary (measured up from minimum)	fixed	fixed	fixed	fixed
Convection Air Fan Setting	Max	Low	Max	Low
Test Fuel Load				
Cordwood Fuel Species	Beech	Beech	Beech	Beech
Specific Gravity (from Table 1)	0.67	0.67	0.67	0.67
Higher Heating Value - Btu/lb (from Annex A1)	8088	8088	8088	8088
Nom. Test Fuel Load Piece Length - in.	16	16	16	16
Number of Test Fuel Pieces	6	6	6	6
Test Fuel Weight				
Kindling - As Fired lb	3.95	na	5.64	na
Kindling Wt. - As % of Test Fuel Load	13%	na	19.1%	na
Kindling Moisture - % DB	10%	na	10%	na
Kindling - kg DB	1.63	na	2.32	na
SU Fuel - As Fired lb	8.22	na	8.58	na
SU Fuel Wt. - As % of Test Fuel Load	28%	na	29.1%	na
SU Fuel Moisture - % DB	22.8%	na	21.6%	na
SU Fuel - kg DB	3.04	na	3.20	na
Test Fuel Load - As Fired lb	29.34	34.6	29.46	34.62
Ave. Test Fuel Load MC % DB	21.8%	20.5%	20.5%	21.0%
Test Fuel Load - kg DB	10.93	13.03	11.09	12.97
Test Fuel Loading Density - lb/ft3	10.19	12.01	10.23	12.02
Residual SU Fuel Wt. - As Fired lb	3.00	na	3.08	na
Residual SU Fuel Wt. - As % of Test Fuel Load	10%	na	10.5%	na
Test Run Duration - minutes	171	461	160	575
Test Run Duration - h	2.85	7.68	2.67	9.58
Test Fuel Load Wt. at End of Test - As Fired lb	3.20	0.00	3.23	0.00
Total Total Fuel Burned - kg DB	12.78	13.03	13.75	12.97
% Test Fuel Load Wt. at End of Test	10.9%	0.0%	11.0%	0.0%

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TEST REPORT FOR STOVE BUILDER INTERNATIONAL INC.
Report No.: 104981354MTL-001R1
Date: 08/24/22

Table 12 - Section 3 - Test Run Results Summary

SECTION 3 – Test Run Results Summary				
Model Name(s)/Number(s)	3.5 Series			
Usable Firebox Volume - ft^3	2.88			
Convection Air Fan (No, Standard, Optional)	Optional			
Test Run #	1	1	2	2
Date Tested	2-20-22	2-20-22	2-21-22	2-21-22
Test Run Category	H	M	H	L
Burn Rate - kg/h DB	4.21	1.70	4.77	1.35
Burn Rate - As % of Low to High Midpoint	na	55%	na	na
Burn Duration - h	2.85	7.68	2.67	9.58
Heat Output - Btu/h	50800	21700	57800	17200
Dilution Tunnel Flow Rate - dscfm				
Average	278.36	293.36	284.89	310.26
Maximum Observed	326.08	305.78	327.91	323.77
Minimum Observed	263.91	272.69	273.60	280.18
Dilution Tunnel Temperature - °F				
Average	145	108	153	98
Maximum Observed	174	148	177	148
Minimum Observed	69	84	69	81
Sample Dryer Exit Max. Temp (or Max. DGM Temp) - °F				
Train 1	65	66	67	67
Train 2	65	66	67	67
Average Sample Flow Rates - dscfm				
Train 1	0.121	0.124	0.120	0.128
Train 2	0.122	0.125	0.121	0.129
Sample Vacuum - in. Hg				
Train 1				
Start	0.39	0.43	0.41	0.44
End	0.57	0.55	0.67	0.61
Maximum Observed	0.58	0.57	0.68	0.61
Train 2				
Start	0.42	0.40	0.49	0.48
End	0.65	0.52	0.66	0.71
Maximum Observed	0.65	0.61	0.75	0.72
Proportional Rate Variation (10-minute basis)				
# of Occurences > 5%, Total Both Trains	4	2	0	2

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# of Occurences > 10%, Total Both Trains	0	0	0	0
Highest PR Variation - %, Either Train	107.0%	107.0%	104.5%	107.4%
Total Sample Volume - dscm (m^3)				
Train 1	0.586	1.619	0.544	2.079
Train 2	0.591	1.632	0.548	2.102
Average Dilution Ratio				
Train 1	2300.5	2365.8	2374.1	2429.6
Train 2	2281.6	2346.9	2354.5	2403.3
Total PM Catch - mg				
Train 1	3.7	3.2	4.2	5.4
Train 2	4.0	3.3	4.3	5.2
Total Catch PM Weight Excluding Probe - mg				
Train 1 - Immediately Post-Test	3.3	2.3	3.9	4.5
Train 1 - Final Dry Weight	3.2	2.5	3.9	4.5
Train 2 - Immediately Post-Test	3.5	2.4	3.9	4.3
Train 2 - Final Dry Weight	3.5	2.5	3.9	4.3
Final Dry Probe PM Catch - mg				
Train 1	0.5	0.7	0.3	0.9
Train 2	0.5	0.8	0.4	0.9
Probe PM Catch as % of Total PM Catch	.			
Train 1	13.5%	21.9%	7.1%	16.7%
Train 2	12.5%	24.2%	9.3%	17.3%
Total PM Emissions - g				
Train 1	8.512	7.571	9.971	13.120
Train 2	9.127	7.745	10.124	12.497
Average	8.819	7.658	10.048	12.808
PM Emission Train Precision - %	3.5%	1.1%	0.8%	2.4%
PM Emission Train Precision - g/kg	0.05	0.01	0.01	0.05
PM Concentration - mg/m^3				
Train 1	6.31	1.98	7.72	2.60
Train 2	6.77	2.02	7.84	2.47
PM Emission Rate - g/h	3.09	1.00	3.77	1.34
PM Emission Rate - g/Mj (from CSA B415.1-10/15)	0.07	0.04	0.08	0.07
PM Emission Rate - lb/MMBtu (from CSA B415.1-10/15)	0.16	0.10	0.19	0.17
First Hour Emissions				
Sampling Duration (minutes)	60.00	60.00	60.00	60.00
Average Sample Flow Rate - dscfm	0.1198	0.1224	0.1166	0.1222
Total Sample Volume - dscm (m^3)	0.204	0.208	0.198	0.208

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Report No.: 104981354MTL-001R1
Date: 08/24/22

Average Dilution Tunnel Flow Rate - dscfm	280.80	279.65	284.96	293.01
Average Dilution Ratio	2343.9	2284.7	2443.9	2397.8
Total PM Catch - mg	2.8	2.7	3.8	4.0
PM Concentration - mg/m^3	13.75	12.98	19.18	19.26
Total PM Emissions - g	6.56	6.17	9.29	9.59
PM Emission Rate - g/h	6.56	6.17	9.29	9.59
Total CO Emissions - g (CSA B415.1-10/15)	106.0	427.0	110.0	977.0
CO Emissions Rate - g/h (CSA B415.1-10/15)	47.2	55.6	54.2	101.9
Test Duration w/o Cold Start (High Fire Only) - h	2.25	na	2.02	na
Overall Efficiency - CSA B415.1-10/15				
% HHV Basis	67.6	71.8	68.0	71.0
% LHV Basis	72.4	76.8	72.8	76.0

Table 13 - Section 4 - Weighted Average Summary

SECTION 4 - Weighted Average Summary				
Model Name(s)/Number(s)	3.5 Series			
Usable Firebox Volume - ft3	2.88			
Convection Air Fan (No, Standard, Optional)	Optional			
Average for Each Test Run Category	L	M	H	
Burn Rate - kg/h DB	1.35	1.70	4.49	
PM Emission Rate - g/h	1.34	1.00	3.43	
CO Emissions Rate - g/h	101.9	55.6	50.7	
Overall Efficiency - CSA B415.1-10				
% HHV Basis	71	72	68	
% LHV Basis	76	77	73	
Heat Output - Btu/h	17200	21700	57800	Min & Max taken
Category Weighting	40%	40%	20%	
ASTM E3053 Weighted Averages				
PM Emission Rate - g/h	1.6			
CO Emissions Rate - g/h	73			
CO Emissions Rate - g/min	1.2			
Overall Efficiency - CSA B415.1-10				
% HHV Basis	71			
% LHV Basis	76			
Heat Output Range - Btu/h	17200	to	57800	

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STOVE BUILDER INTERNATIONAL PRODUCT EVALUATION

PRODUCT EVALUATED
SOLUTION 3.5, OSBURN 3500, GATEWAY 3500, ESCAPE 2100, HT-3000, SOLUTION 3.5-I, FW3500, OSBURN 3500-I, HES350, HEI350, BLUE RIDGE 500, ESCAPE 2100-I, CW3500, BLUE RIDGE 500-I

EVALUATION PROPERTY
U.S. ENVIRONMENTAL PROTECTION AGENCY 40 CFR PART 60

REPORT NUMBER
104981345MTL-002

ORIGINAL ISSUE DATE
03/21/22

LAST REVISED DATE
ORIGINAL

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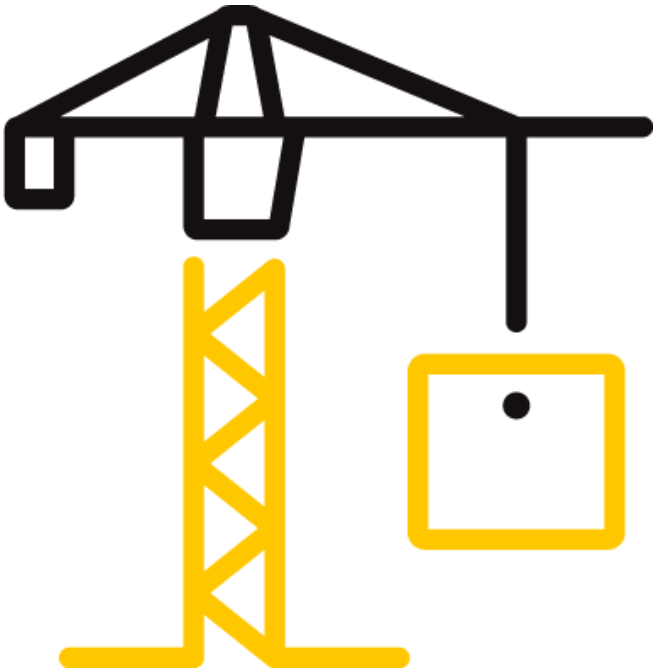

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PRODUCT EVALUATION FOR STOVE BUILDER INTERNATIONAL
Report No.: 104981354MTL-002
Date: 03/21/22

PRODUCT EVALUATION RENDERED TO:	
Company Name:	Stove Builder International
Address:	250 rue de Copenhague
	St-Augustin-de-Desmaures, QC
	G3A 2H3, Canada
Contact Person:	Guillaume Thibodeau-Fortin
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Table of Contents

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PRODUCT EVALUATION FOR STOVE BUILDER INTERNATIONAL
Report No.: 104981354MTL-002
Date: 03/21/22

1 Introduction

Intertek Testing Services NA Ltd./Inc. (Intertek) is conducting a product evaluation for Stove Builder International, on SOLUTION 3.5, OSBURN 3500, GATEWAY 3500, ESCAPE 2100, HT-3000, SOLUTION 3.5-I, FW3500, OSBURN 3500-I, HES350, HEI350, BLUE RIDGE 500, ESCAPE 2100-I, CW3500, BLUE RIDGE 500-I to evaluate if the differences with the tested HES350 will increase particulate matter emission rate limit. The evaluation is being conducted to determine if items listed in *U.S. Environmental Protection Agency 40 CFR Part 60 Standards of Performance for New Residential Wood Heaters; Final Rule, SECTION 60.533(k)* will show equivalency with the previously tested HES350.

2 Product and Assembly Description

2.1. Product Description:

The models from the 3.5 Series (HES350) wood fuel room heater are constructed of sheet steel. The outer dimensions are 24 1/16-inches deep from the face plate to the rear, 34 11/16-inches high, and 28 3/4-inches wide. The units have a door located on the front with a viewing glass.

Construction drawings are in appendix and named VB00020-V01.

This PEV refers to a product described in Intertek Test Report 104981354MTL-001. Consult that document for additional information and specific test conditions. Most of these models were already certify to US EPA, the series was retested per manufacturer's request.

2.2. Product Traceability:

The test specimen identification is as provided by the client and Intertek accepts no responsibility for any inaccuracies therein.

2.3. Product Certification:

Stove Builder International is an Intertek testing client and an Intertek Listing and Follow-up Service client. Models SOLUTION 3.5, OSBURN 3500, GATEWAY 3500, ESCAPE 2100, HT-3000, SOLUTION 3.5-I, FW3500, OSBURN 3500-I, BLUE RIDGE 500 and BLUE RIDGE 500-I are already listed within Intertek. The test done for emission is a re-test. Models CW3500, ESCAPE 2100-I, HES350, HEI350, Blue Ridge 500 and Blue Ridge 500-I are in the process of listing within Intertek. Currently, Intertek does not have any Listings for those models contained in Intertek's Directory of Listed Building Products.

Authorities Having Jurisdiction (AHJ) should be consulted in all cases as to the particular requirements covering the installation and use of Intertek certified products, equipment, systems, devices and materials. The AHJ should be consulted before construction. Fire resistance assemblies and products are developed by the design submitter and have been investigated by Intertek for compliance with specific requirements. The published information (product and design listings) cannot always address every construction nuance encountered in the field. When field issues arise, it is recommended the first contact for assistance be the technical service staff provided by the product manufacturer noted for the design. Users of fire resistance assemblies are advised to consult the test standard referenced for each Intertek certified product. The test standard includes specifics concerning alternate materials and alternate methods of construction. Only products which bear Intertek's Mark are considered as certified. The appearance of a company's name or product in Intertek Directory of Listed Building Products does not in itself assure that products so identified have been manufactured under Intertek's Follow-Up Service. Only those products bearing the Intertek Mark should be considered to be Listed and covered under Intertek's Follow-Up Service. Always verify the Mark on the product before using it.

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PRODUCT EVALUATION FOR STOVE BUILDER INTERNATIONAL
Report No.: 104981354MTL-002
Date: 03/21/22

3 Reference Documents

As part of this evaluation, Intertek has directly or indirectly used the following referenced documents:

- *U.S. Environmental Protection Agency 40 CFR Part 60 Standards of Performance for New Residential Wood Heaters; Final Rule, SECTION 60.533(k)*
- SBI drawing numbers: CB00024-V01, CB00028-V01, DB03129-V01, DB03131-V01, DB03132-V01, DB07300-V01, EB00053-V01, EB00062-V01, ESW0012-V01, ESW0014-V01, OB03500-V01, OB03510-V01, SF00615-V01, VB00020-V01, VB00021-V01.
- Intertek Testing Report No.: 104981354MTL-001

4 Evaluation Method

This PEV represents the results of an evaluation on wood room heaters models listed in object when compared to the tested HES350. This investigation was authorized by SBI in February 2022. Drawings CB00024-V01, CB00028-V01, DB03129-V01, DB03131-V01, DB03132-V01, DB07300-V01, EB00053-V01, EB00062-V01, ESW0012-V01, ESW0014-V01, OB03500-V01, OB03510-V01, SF00615-V01, VB00020-V01 and VB00021-V01 were received on March 9 , 2022 at the Intertek Lachine facility. Drawings can be found in appendix.

The models listed in subject are wood stove and inserts manufactured based on the construction of the tested HES350. The combustion room and air intake of all the mentioned units are identical.

Some variations were noted during the investigation. The variations are esthetical only and they are as follows:

- The loading doors differ by shape;
- The side decorative panels differ by shape;
- Some models have legs, others have pedestals;
- Some models are inserts, others are free-standing stoves;

Design drawings were evaluated to determine similarities between the above-mentioned models. Drawings show internal fire box size to be the same at 17 7/8” from the internal channel to the rear vertical tube (18 1/8” from internal channel to the rear brick), 12 3/16" high (from brick to higher tube) and 22 7/8" wide ± ¼”. All combustion channels respect the ± 5% of area change. All appliances share a 6" flue collar and have the same primary air entrance area. Differences noted during this evaluation were on the door shape and decorative side panels as well as the typical look of the façade of all unit' inspired by their typical branding look.

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5 Conclusion

Intertek has conducted this product evaluation for Stove Builder International, on SOLUTION 3.5, OSBURN 3500, GATEWAY 3500, ESCAPE 2100, HT-3000, SOLUTION 3.5-I, FW3500, OSBURN 3500-I, HES350, HEI350, BLUE RIDGE 500, ESCAPE 2100-I, CW3500 and BLUE RIDGE 500-I to evaluate if the differences with the tested HES350 will increase particulate matter emission rate limit. The evaluation was conducted to determine if items listed in *U.S. Environmental Protection Agency 40 CFR Part 60 Standards of Performance for New Residential Wood Heaters; Final Rule, SECTION 60.533(k)* will show equivalency with the tested HES350.

Based on the information contained and referenced herein, it is Intertek's professional judgment based on sound engineering principles that the following is true:

- Changes made are only aesthetical and do not increase particulate matter emission rate.

INTERTEK TESTING SERVICES NA LTD.

Reported by: _____

Claude Pelland P.Eng.
Staff Engineer
Intertek Lachine

Reviewed by: _____

Brian Ziegler
Project Team Leader
Building Products Division

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6 APPENDIX

Drawings CB00024-V01
Drawings CB00028-V01
Drawings DB03129-V01
Drawings DB03131-V01
Drawings DB03132-V01
Drawings DB07300-V01
Drawings EB00053-V01
Drawings EB00062-V01
Drawings ESW0012-V01
Drawings ESW0014-V01
Drawings OB03500-V01
Drawings OB03510-V01
Drawings SF00615-V01
Drawings VB00020-V01
Drawings VB00021-V01

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7 LAST PAGE & REVISION SUMMARY

DATE	SUMMARY	REPORTER	REVIEWER
03/21/2022	Original	Claude Pelland	Brian Ziegler

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WOOD HEATER EMISSION TEST - PRE-TEST CHECK LIST REQUIREMENTS

Date: 20/Feb/2021	Project : G1049 8/354	Project Engineer:	
Manufacturer SBI	Model: 3-5 Series		C. Pelland

APPLICABLE STANDARD & ARTICLE #	REQUIREMENTS	Conformance (OK, NC or NA)	Comment
ASTM E2515-11 9.2.4 Smoke Capture and velocity head, static pressure and temp	100% of the chimney effluent collected.	o.k	
ASTM E2515-11 9.3.1 Velocity measurement (at center)	Record velocity head, static pressure and temp (prior to ignition). Velocity head constant (less than 5% change for 1 min.)	o k	
ASTM E2515-11 9.3.2 Velocity Traverse measurement	Record velocity head, static pressure and temp (prior to ignition) at different point specified in the	o k	
ASTM E2515-11 9.4.1 Pretest preparation: filter check &	filters without irregularities. Label the filter with ink	o k	
ASTM E2515-11 9.4.2 & 3 Pretest preparation: Probe cleaning	With acetone. Identification of the probe.	o. k	
ASTM E2515-11 9.4.4 Pretest preparation: Desicate filters, gasket & probe	Dessicate and weight component at interval not less then 6 hr until constant reading (difference not more than 0.2 mg between 2 consecutive readings)	o. k	
ASTM E2515-11 9.6.1 Leak check of metering system (from pump to DGM outlet)	Maintain 5 to 7 in. w.c. stable durning 1 minute. Check prior initial use and at least semi-annually thereafter.	o k	
ASTM E2515-11 9.6.4.1 PRE-test leak check (Sampling trains)	Less then 0.01 cfm OR 4% of avg sampling rate (0.001 x .04 = .004) @ 15 in Hg OR at the highest sampling vacuum level (which is 5 in. Hg)	o. k	
ASTM E2515-11 9.6.4.2 PRE-test leak check (traverse-pitot tube)	Velocity pressure: Hold positive pressure of 3.0" w.c. during 15 sec. Static pressure side: Hold negative pressure of 3.0" w.c. during 15 sec.	o. k	
ASTM E2515-11 9.7.2 Test facility air velocity	less than 50 ft/min (before starting fire)	o. k	
ASTM E2515-11 9.8 Probe inlet location	2" centroidal area, more than 1in apart. Block off the opening aroud the probe to prevent air leak	o. k	
ASTM E2515-11 9.8.2 tunnel gas static pressure	at the beginning and at the end of each test run	o. k	

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ARTICLE E3053-18	REQUIREMENTS		
ASTM E3053-18 8.1.4 Pre-conditioning (pre-burn)	50hr minimum a medium fire (intermiment operation)	O.K	
ASTM E3053-18 8.1.5 &.6 Pre-conditioning (pre-burn) Recording	Record time, fuel weight, fuel moisture content, flue gas temperature	O.K	
ASTM E3053-18 8.2.4 Surface temperature	Install heater surface temperature sensor	O.K	
ASTM E3053-18 8.2.6 Flue gas temperature	Install flue gas temperature sensor	O.K	
ASTM E3053-18 8.3 Firebox volume	Firebox volume calculation	O.K	
ASTM E3053-18 8.4.1.1 Test fuel load weight	Calculate the load weight: (firebox (ft3)) * (applicable load density)	O.K	
ASTM E3053-18 8.4.1.2 to 9 Test fuel load weight	Use ASTM 3053 Excel file to respect fuel load and sub-load restriction	O.K	
ASTM E3053-18 8.4.2.4 Kindling moisture	Stored 48hr at 70F & 50% RH = 10%	O.K	
ASTM E3053-18 8.4.2.7 Fuel temperature	allowable test facility temperature (90F max), at least 24 hr storage	O.K	
ASTM E3053-18 8.4.2.8 test fuel length	plus or minus 1 in of the nominal	O.K	

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Date: 24 feb 2022 Page____ of ____

Manufacturer: SM Model: 3.5"

Project #: Q108981354 Run: 1 Engineer: em Reviewer: C. Pelland

Pre-Test Scale Audit

Scale Type	Audit Weight	Measured Weight
Platform	10Kg lbs, Class F	22.05 lbs lbs
Wood	5 Kg lbs, Class F	11.025 lbs lbs
Analytical	200.0000 mg, Class S	200.0000 mg

LIMITS OF WEIGHT RANGES

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

Fabricant de poêles international inc.
Stove Builder International Inc.

2022-02-18

Loading procedure for 3.5 Series – ALT-125

Fuel length: 16 inches ± 1 inch.
Specie: Beech

Low burn rate

Stove lighting: 14.1 lbs

Split the start-up fuel log into 8 pieces. Crisscross the 8 pieces on the brick, leaving some space between each wood pieces. Crisscross the kindling on the top of the start-up fuel. The kindling is made of between 14-16 small pieces that are 10% of moisture content. Place crumbled newspaper on top kindling (5 full sheets). Light up the paper and let the door ajar at 90° until the flue temperature reaches 150°F, then close the door.

Pre-load (high burn): 29 lbs

When there is coal bed of 3.1 lb left, break ashes and level coal bed, then add pre-load in an East-West configuration. Put 3 pieces on the coal bed, without air space between them. Leave 1 inch of air space between the rear firebrick and the first piece. The 3 other pieces should be added on top of the first 3, in an East-West configuration. Let the door open at 90° for 1 minutes. Close the door and let burn until the weight is down to target.

When the flue gas temperature gets to 550°F, stir the coal bed. Let the door ajar by one inch for one minute. There should be approximately 5.7 to 6.1 lb of coal bed.

Loading: 34 lbs

For the loading, put 3 pieces on the coal bed in an East-West orientation. There should be air space between all pieces and with the rear brick. The 3 other pieces should be added on top of the first 3, slightly angled (170° from horizontal, top view). The distance between the logs shall be approximately 1 inch. Let the door open at 90° for 5 minutes and then close the door with the primary air control open. Close the primary air control using a 1/2-inch diameter rod as spacer at 7 min, then close using a 3/8-inch diameter rod at 14 minutes. Close the air control completely at 16 minutes or when 15% of the load weight has been consumed, whichever comes first.

Medium burn rate

Stove lighting: 14.1 lbs

Use the same method than for low burn rate.

Pre-load (high burn): 29 lbs

Use the same method than for low burn rate.

Guillaume Thibodeau-Fortin

Loading: 34 lbs

For the loading, put 3 pieces on the coal bed in an East-West orientation. There should be air space between all pieces and with the rear brick. The 3 other pieces should be added on top of the first 3, slightly angled (170° from horizontal, top view). The distance between the logs shall be approximately 1 inch. Let the door open at 90° for 5 minutes and then close the door with the primary air control open. Close the primary air control using a 1/2-inch diameter rod as spacer at 8 min, then close using a 9/32 inch diameter rod as spacer at 16 minutes or when 15% of the load weight has been consumed, whichever comes first.

High burn rate

Note: For this test run, according to ASTM E3053-17, the sampling starts as soon as the kindling is ignited (cold start).

Stove lighting: 14.1 lbs

Use the same method than for low burn rate.

High burn: 29 lbs

When there is coal bed of 3.1 lb left, break ashes and level coal bed, then add pre-load in an East-West configuration. Put 3 pieces on the coal bed, without air space between them. Leave 1 inch of air space between the rear firebrick and the first piece. The 3 other pieces should be added on top of the first 3, in an East-West configuration. Let the door open at 90° for 1 minutes. Close the door and let burn until the 90% of the test fuel load has been consumed.

Fuel load ata - HIGH

Date: 2 Feb 2022

Run #: #1

Rev dat 11-01-2021

Doc rev Rev 3

November 20 Adjunct to ASTM E XXXX Wood Heater Cordwood Test Method
Cordwood Fuel Load Calculators - 10 lb/ft³ Nominal Load Density
Core 45-65% of Total Load Weight, Remainder 35-55% of Total Load Weight
Values to be input manually

For All Usable Firebox Volumes - High Fire Test Only

					Mid-Point
Nominal Required Load Density (wet basis)	10	lb/ft³			
Usable Firebox Volume	2.84	ft³			
Total Nom. Load Wt. Target	28.4	lb			
Total Load Wt. Allowable Range	27.00	to	29.80	lb	
Core Target Wt. Allowable Range	12.8	to	18.50	lb	
Remainder Load Wt. Allowable Range	9.90	to	15.60	lb	
Core Load Pc. Wt. Allowable Range	4.30	to	7.10	lb	5.70
Remainder Load Pc. Wt. Allowable Range	2.80	to	15.60	lb	9.20

	Pc. #		
Core Load Piece Wt. Actual	1	5.142	lb
	2	5.158	lb
	3	4.964	lb
Core Load Total. Wt. Actual			lb
	Pc. #		
Remainder Load Piece Wt.	1	5.979	lb
(1 to 3 Pcs.)	2	3.262	lb
	3	4.832	lb
Remainder Load Piece Weight Ratio - Small/Large			≤ 67%
Remainder Load Tot. Wt. Act			lb
Total Load Wt. Actual			lb
Core % of Total Wt.			45-65%
Remainder % of Total Wt.			35-55%
Actual Load % of Nominal Target			95-105%
Actual Fuel Load Density			lb/ft³

Kindling and Start-up Fuel

Maximim Kindling Wt. (20% of Tot. Load Wt.)	0.00	lb
Actual Kindling Wt.	5.783	lb
Maximum Start-up Fuel Wt. (30% of Tot. Load Wt.)	0.00	lb
Actual Start-up Fuel Wt.	8.221	lb

Cal. Block #: SBI-153

12%: 12.0 %

22%: 22.0 %

Wood moisture meter #: SBI-152

Room temp. (°F): 63.5 °F

Room RH (%): 18.4 %

Ambiant hygrometer # : SBI-213

Fuel Piece Moisture Reading (%-dry basis)

1	2	3	min/maj > 40%	Lenght [in]	Squared
25.3	17.8	16.9	38%	16"	No
27.0	15.4	23.5	31%	16"	No
20.5	24.9	17.9	66%	15 3/4"	No
27.8	25.7	22.0	50%	15 1/2"	No
28.5	16.9	22.7	70%	16"	No
24.5	20.0	14.2	75%	16"	No

Kindling Moisture (%-dry basis)

10	10	10

Start-up Fuel Moisture Readings (%-dry basis)

24.8	19.3	18.1	1st
25.6	23.2	25.6	2nd

Signature: C. Pelland

Fuel load data - LOW

Date: 20 Feb 2022

Run #: 1

Rev date: 11-01-2021

Doc rev: Rev 3

November 20, 2015 Adjunct to ASTM E XXXX Wood Heater Cordwood Test Method
Cordwood Fuel Load Calculators - 12 lb/ft³ Nominal Load Density
Core 45-65% of Total Load Weight, Remainder 35-55% of Total Load Weight
Values to be input manually

For Usable Firebox Volumes up to 3.0 ft³ - Low and Medium Fire

Nominal Required Load Density (wet basis)	12	lb/ft³			
Usable Firebox Volume	2.84	ft³			
Total Nom. Load Wt. Target	34.08	lb			
Total Load Wt. Allowable Range	32.38	to	35.78	lb	
Core Target Wt. Allowable Range	15.336	to	22.15	lb	
Remainder Load Wt. Allowable Range	11.93	to	18.74	lb	
					Mid-Point
Core Load Fuel Pc. Wt. Allowable Range	5.11	to	8.52	lb	6.82
Remainder Load Pc. Wt. Allowable Range	3.41	to	10.22	lb	6.82

	Pc. #		
Core Load Piece Wt. Actual	1	6.215	lb
	2	6.399	lb
	3	6.164	lb
Core Load Total. Wt. Actual		0.00	lb
	Pc. #		
Remainder Load Piece Wt.	1	6.846	lb
(2 or 3 Pcs.)	2	4.799	lb
	3	4.179	lb

Remainder Load Piece Weight Ratio - Small/Large				≤ 67%
Remainder Load Tot. Wt. Act			lb	
Total Load Wt. Actual			lb	
Core % of Total Wt.				45-65%
Remainder % of Total Wt.				35-55%
Actual Load % of Nominal Target				95-105%
Actual Fuel Load Density			lb/ft³	
Allowable Charcoal Bed Wt. Range (lb)	0.1	to	-0.1	Mid-Point
Actual Charcoal Bed Wt.			lb	Out of Range 0.0
Actual Fuel Load Ending Wt.			lb	Valid Test ≥ 90%
Total Wt. of Fuel Burned During Test Run lb.		0.0	lb	

Cal. Block #: SBI-153

12%: 12.0%

22%: 12.0%

Wood moisture meter #: SBI-152

Room temp. (°F): 64.3

Room RH (%): 16.7 RH

Ambiant hygrometer #: SBI-213

Fuel Piece Moisture Reading (%-dry basis)

1	2	3	min/maj > 40%	Lenght [in]	Squared
23.2	16.8	19.2	63%	16"	No
26.3	19.3	18.1	73%	15 3/4"	No
20.9	20.2	16.8	47%	16"	No
21.0	24.5	17.7	72%	16"	No
19.5	24.5	16.9	80%	16"	No
22.3	21.2	20.8	64%	16 1/4"	No

Signature: C Pelland

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Total Quality. Assured.

Date: 20 feb 2022 Page 1 of ____

Manufacturer: SRi Model: 3.5 Screen

Project #: G104881354 Run: #1 Engineer: C. Pelland Reviewer: ____

COMMENTS

High

Photo (winding + the load) Done

T: 0 START-up TIME: 05:49

T: 1:06 door closed flue = 150°F 14.0 lbs load Strike open Fan = off

T: 35:00 3 lbs door open for stirring... AND load is inserted

Time to load = 1 minute ~

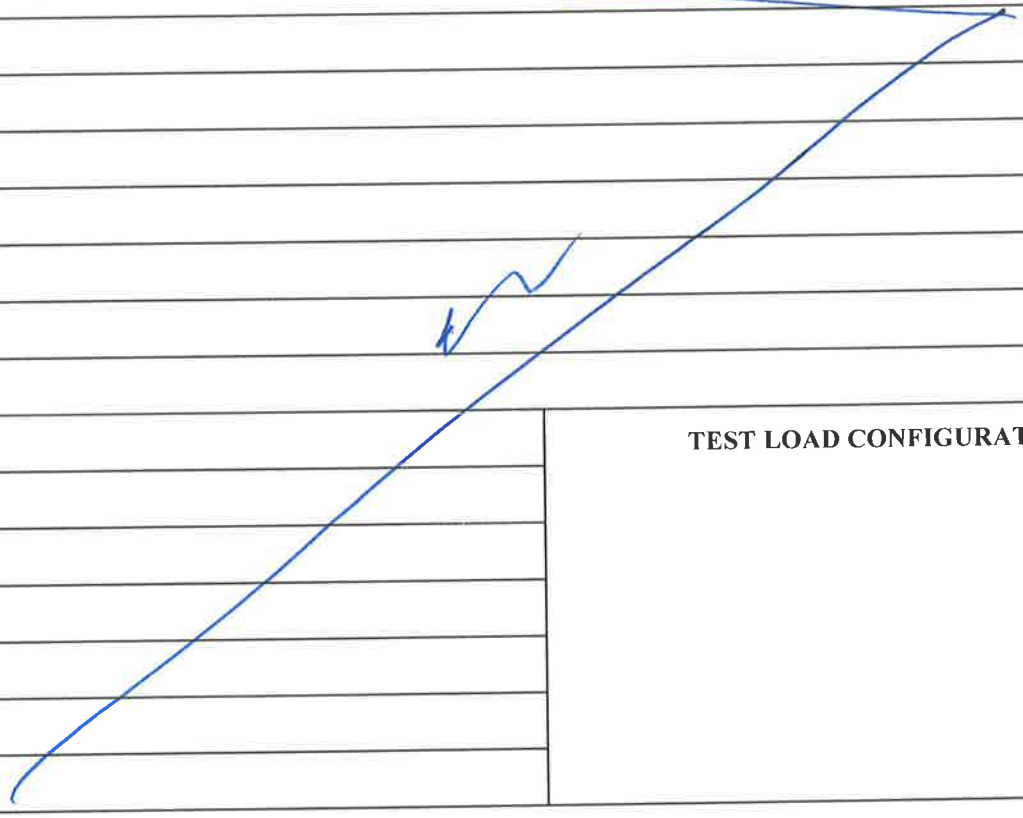
T: 36:15 fan on at high. load = 32 lbs. flue: 740°F

T: 38:00 Pic of load Taken.

T: 2:51:04 Test ends. flue 475°F 623 lbs weight

fan off in light of low burn Rate

TEST LOAD CONFIGURATION



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Total Quality. Assured.

Date: 2-Feb 2022 Page 1 of ____

Manufacturer: SBi Model: 3.5 Series

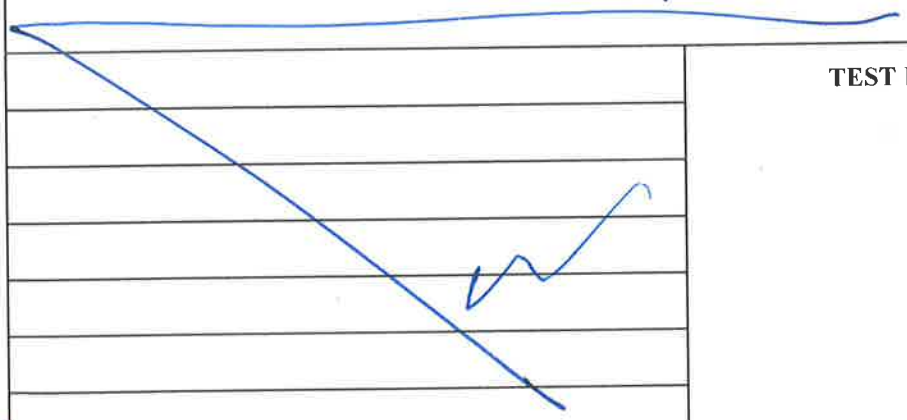
Project #: G104981354 Run: #1 Engineer: [signature] Reviewer: ____

C. Pelland

COMMENTS

Medium

~~T:0~~	11:49 h Raking 1 minute ~~clock time:~~	5.99 lbs
T:0	Loading !	Clock Time 11:50
T: 1:25	Loading complete (Max Allowed 1:25 min) 1:25 min ok	
T: 4:00	Door closed flue: 880 °F Load 39 lbs. ~~Air~~ intake full open	
T: Time	flue is at 795 °F ±	
T: 7:30	flue starts to increase slowly	
T: Time	Drill Bit: ~~3/8~~" 9/32" 1/2" ~~#9~~ 800 °F	
T: 14:00	weight: 36 lbs flue: 625 °F	
T: 16:26	drill bit: ~~11/32~~ in 9/32" flue 632 °F	(changed coal to medium)
T: 23:55	flue 553 °F	
T: 26:00	CO: 660 O2: 11.3 flue: 543	
T: 33:00	CO: 5040 O2 10:90 flue 533	32.50 lbs
T: 40:00	fan ON ~~@~~ low	
42:00	CO: 1904 O2 9:30 flue: 558	30.69 lbs
T: 7:41:02	Test over flue: 249.5 °F weight: 5.8~~4~~ lbs	
	T°:	C



TEST LOAD CONFIGURATION

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Date: 20/Feb/2022 Page ____ of ____

Manufacturer: SBi Model: 3.5 Series

Project #: G104981354 Run: #1 Engineer: [signature] Reviewer: D. Pellon

Pre/Post Checks

Moisture Meter Calibration Check:

Time:	X:	Y:	12:	22:

	Pre-Test	Post-Test
Facility Conditions:		
Air Velocity	Ø ok fpm	Ø OK fpm
Smoke Capture Check	OK Ø No leak	Ø ok
Wood Heater Conditions:		
Date Wood Heater Stack Cleaned	18.2.~~2020~~ 2022	2022 ✓
Date Dilution Tunnel Cleaned	18.2.~~2020~~	2022 ✓
Induced Draft Check	0.0015	✓
Pitot Leak Check:		
Total Pressure	✓ o.k.	✓ o.k
Static Pressure	✓ o.k.	✓ o.k
Temperature System:		
Ambient (65°-90°F)	65.6 °F	
Wood Heater Surface for cold-start (±10°F)	69.2 °F	
Proportional Checks:		
CO Analyzer Drift Check	o.k	
CO_2 Analyzer Check	o.k	
O_2 Analyzer Check	o.k	
Thermocouple check	o.k	

Sampling Train ID Numbers (HIGH):	Train 1 A	Train 2 B	Train 3 (first-hour) C
Probe	61	5	1
Filter Front	19	23	27
Filter Back	20	24	28

Sampling Train ID Numbers (LOW OR MEDIUM):	Train 1 D	Train 2 E	Train 3 (first-hour) F
Probe	3	6	2
Filter Front	33	41	29
Filter Back	34	42	30

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Date: 2022-02-18 Page____ of ____

Manufacturer: SBI Model: 3.5 Series

Project #: G104981354 Run: 1 Engineer: [signature] Reviewer: ________

C. Pelland

CONTINUOUS ANALYZERS

Pre-Test (Adjust and Record)

	ZERO		SPAN		CAL. (Record Only)	
CO	0.0	0.00	2.09%	1.98%	4252ppm	4252 ppm
CO_2	0.00	0.00	10.01%	10.15%	18.0%	18.0%
O_2	0.00	0.00	7.84%	7.99%	18.0%	18.0%
	Actual	Should Be	Actual	Should Be	Actual	Should Be

Post Test (Record Only)

	Zero	Span	Cal.	Zero Drift	Span Drift	Cal. Drift	OK?	Not OK*
CO	0 ppm	2.03%	4458ppm	0.0%	2.5%	4.84%	✓	
CO_2	0.00%	9.73%	17.66%	0.0%	2.9%	1.9%	✓	
O_2	0.00%	7.88%	17.96%	0.0%	1.4%	0.2%	✓	

- Greater than 5% of the range used.

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Date: 20 Feb 2022 Page ____ of ____

Manufacturer: SAi Model: 3.8 Series

Project #: 6104871354 Run: #1 Tech: CM (Pollard) Reviewer: ____

PRETEST DILUTION TUNNEL TRAVERSE RUN

Barometric pressure (P_{bar}) 30.3 (inches Hg.) Static pressure (P_q) 65.2 ~~(inches w.c.)~~ °F
0.172 w.c.
Inside diameter: Port A 8in. Port B 8in.
Tunnel cross sectional area: 0.349 Ft^2
Pitot tube type: S-Type

Traverse Point	Position (inches)	Velocity Head Δ_p (inches H_2O)	Tunnel Temperature (°F)
A- Centroid	4.00	0.099	64.1
B - Centroid	4.00	0.096	64.8
A-1	0.54	0.089	64.4
A-2	2.00	0.099	64.4
A-3	6.00	0.084	64.4
A-4	7.46	0.077	63.8
B-1	0.54	0.082	64.9
B-2	2.00	0.093	65.0
B-3	6.00	0.092	65.1
B-4	7.46	0.072	64.6
		AVERAGE	/

$$v_s = K_p C_p (\sqrt{\Delta p})_{avg} \sqrt{\frac{(T_s)_{avg}}{P_s M_s}}$$

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

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

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Date: 20 Feb 2022 Page 1 of ____

Manufacturer: SBi Model: 3.5 Series Project #: G104981354

Category #: A1 Run: #1 Engineer: C. Rolland Reviewer: ____

RAW DRY GAS METER READINGS

	Start (HIGH)	End (HIGH)	Start (L/M)	End (L/M)
System 1 (ft^3) Equipment #: SBi-047	507.350	527.379	527.379	583.323
System 2 (ft^3) Equipment #: SBi-046	327.206	347.490	347.490	404.232
System 3 (ft^3) Equipment #: SBi-290	348.945	356.115	356.134	363.542

AMBIENT CONDITIONS

	Start (HIGH)	End (HIGH)	Start (L/M)	End (L/M)
	Date 20-Feb-2022 Time 8:43	Date 20 Feb 2022 Time 11:45	Date 20 Feb 2022 Time 11:50	Date 20 Feb 2022 Time 19:33
Barometer. (inches Hg) Equipment #: ENV Canada	102.7 kPa	102.6 kPa	102.6 kPa	101.3 kPa
Indoor Dry Bulb (EF)°F Equipment #: SBi-212	64.1 °F	65.6 °F	65.6 °F 65.8 °F	65.3 °F
Indoor Humidity (%) Equipment #: SBi 212	17.6%	16.9%	16.9%	16.9%

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Date: 20 feb 2022 Page ____ of ____

Manufacturer: SM Model: 3.5" Fuel

Project #: G104978354 Run: #1 Engineer: Reviewer:

Pelland c

SAMPLING EQUIPMENT CHECK OUT

Leakage Checks Tunnel Samplers (HIGH)

	Train 1 (A)		Train 2 (B)		Train 3 (C)	
Unplugged Flow Rate = cfm	Pre-Test	Post-Test	Pre-Test	Post-Test	Pre-Test	Post-Test
Vacuum (inches Hg.)	5.07	5.11	5.10	5.09	5.00	5.00
Initial 1minute DGM (ft^3)	506.173	583.413	327.064	404.274	348.899	356.134
Final 1minute DGM (ft^3)	506.175	583.413	327.065	404.274	348.900	356.134
Change © (ft^3)	0.002	∅	0.001	∅	0.001	∅
Allowable leakage .04 x Sample rate or .02cfm	0.005	0.005	0.005	0.005	0.005	0.005
Check OK	ok	ok	ok	ok	ok	ok

Leakage Checks Tunnel Samplers (LOW OR MEDIUM)

	Train 1 (D)		Train 2 (E)		Train 3 (F)	
Unplugged Flow Rate = cfm	Pre-Test	Post-Test	Pre-Test	Post-Test	Pre-Test	Post-Test
Vacuum (inches Hg.)	5.03	5.12	4.99	5.03	5.00	5.00
Initial 1minute DGM (ft^3)	507.249	583.375	327.109	404.250	348.899	363.564
Final 1minute DGM (ft^3)	507.250	583.375	327.109	404.250	348.899	363.564
Change © (ft^3)	0.002	∅	∅	∅	∅	∅
Allowable leakage .04 x Sample rate or .02cfm	0.005	0.005	0.005	0.005	0.005	0.005
Check OK	ok	ok	ok	ok	ok	ok

Leakage Checks Flue Gas Sampler

Plugged Probe	Pre Test	Post Test
Check OK	✓	✓

Fuel load ata - HIGH

Date: 21 Feb. 2022

Run #: #2

Rev dat 11-01-2021

Doc rev Rev 3

November 20 Adjunct to ASTM E XXXX Wood Heater Cordwood Test Method
Cordwood Fuel Load Calculators - 10 lb/ft³ Nominal Load Density
Core 45-65% of Total Load Weight, Remainder 35-55% of Total Load Weight
Values to be input manually

For All Usable Firebox Volumes - High Fire Test Only

						Mid-Point
Nominal Required Load Density (wet basis)	10	lb/ft³				
Usable Firebox Volume	2.84	ft³				
Total Nom. Load Wt. Target	28.4	lb				
Total Load Wt. Allowable Range	27.00	to	29.80	lb		
Core Target Wt. Allowable Range	12.8	to	18.50	lb		
Remainder Load Wt. Allowable Range	9.90	to	15.60	lb		
Core Load Pc. Wt. Allowable Range	4.30	to	7.10	lb		5.70
Remainder Load Pc. Wt. Allowable Range	2.80	to	15.60	lb		9.20

	Pc. #		
Core Load Piece Wt. Actual	1	5.114	lb
	2	4.729	lb
	3	4.572	lb
Core Load Total Wt. Actual			lb
	Pc. #		
Remainder Load Piece Wt.	1	5.728	lb
(1 to 3 Pcs.)	2	3.771	lb
	3	5.545	lb
Remainder Load Piece Weight Ratio - Small/Large			≤ 67%
Remainder Load Tot. Wt. Act			lb
Total Load Wt. Actual			lb
Core % of Total Wt.			45-65%
Remainder % of Total Wt.			35-55%
Actual Load % of Nominal Target			95-105%
Actual Fuel Load Density			lb/ft³

Kindling and Start-up Fuel

Maximim Kindling Wt. (20% of Tot. Load Wt.)	0.00	lb
Actual Kindling Wt.	5.635	lb
Maximum Start-up Fuel Wt. (30% of Tot. Load Wt.)	0.00	lb
Actual Start-up Fuel Wt.	8.581	lb

Cal. Block #: SBI-153

12%: 12.07

22%: 22.05

Wood moisture meter #: SBi-152

Room temp. (°F): 64.5 °F

Room RH (%): 19.7%

Ambiant hygrometer # : SBi-213

Fuel Piece Moisture Reading (%-dry basis)

1	2	3	min/maj > 40%	Lenght [in]	Squared
23.4	19.1	19.9	66%	16 1/4"	No
21.6	22.0	19.3	85%	16 1/4"	No
25.6	11.0	17.9	86%	16 1/4"	No
23.3	20.2	15.5	53%	16 1/4"	No
28.1	20.3	19.9	70%	16"	No
21.0	22.4	20.0	47%	15 3/4"	No

Kindling Moisture (%-dry basis)

10	10	10

Start-up Fuel Moisture Readings (%-dry basis)

22.6	18.7	17.7	1st
25.4	25.9	19.1	2nd

Signature: e. Pelland

Fuel load data - LOW

Date: 22 F.6 2022

Run #: #2

Rev date: 11-01-2021

Doc rev: Rev 3

November 20, 2015 Adjunct to ASTM E XXXX Wood Heater Cordwood Test Method
Cordwood Fuel Load Calculators - 12 lb/ft³ Nominal Load Density
Core 45-65% of Total Load Weight, Remainder 35-55% of Total Load Weight
Values to be input manually

For Usable Firebox Volumes up to 3.0 ft³ - Low and Medium Fire

Nominal Required Load Density (wet basis)	12	lb/ft³			
Usable Firebox Volume	2.84	ft³			
Total Nom. Load Wt. Target	34.08	lb			
Total Load Wt. Allowable Range	32.38	to	35.78	lb	
Core Target Wt. Allowable Range	15.336	to	22.15	lb	
Remainder Load Wt. Allowable Range	11.93	to	18.74	lb	
					Mid-Point
Core Load Fuel Pc. Wt. Allowable Range	5.11	to	8.52	lb	6.82
Remainder Load Pc. Wt. Allowable Range	3.41	to	10.22	lb	6.82

	Pc. #		
Core Load Piece Wt. Actual	1	6.674	lb
	2	6.021	lb
	3	5.843	lb
Core Load Total. Wt. Actual		0.00	lb
Remainder Load Piece Wt. (2 or 3 Pcs.)	1	6.798	lb
	2	5.199	lb
	3	4.086	lb

Remainder Load Piece Weight Ratio - Small/Large				≤ 67%
Remainder Load Tot. Wt. Act			lb	
Total Load Wt. Actual			lb	
Core % of Total Wt.				45-65%
Remainder % of Total Wt.				35-55%
Actual Load % of Nominal Target				95-105%
Actual Fuel Load Density			lb/ft³	
Allowable Charcoal Bed Wt. Range (lb)	0.1	to	-0.1	Mid-Point
Actual Charcoal Bed Wt.			lb	Out of Range 0.0
Actual Fuel Load Ending Wt.			lb	Valid Test ≥ 90%
Total Wt. of Fuel Burned During Test Run lb.		0.0	lb	

Cal. Block #: SBI-153

12%: 12.0%

22%: 22.0%

Wood moisture meter #: SBI-152

Room temp. (°F): 65.2°F

Room RH (%): 19.5 %

Ambiant hygrometer #: SBI-213

Fuel Piece Moisture Reading (%-dry basis)

1	2	3	min/maj > 40%	Lenght [in]	Squared
25.0	19.9	25.5	55%	16"	No
23.4	22.8	15.3	56%	16"	No
23.4	25.2	20.1	67%	16"	No
24.5	19.1	16.5	83%	15 3/4"	No
22.8	21.4	16.5	64%	16 1/4"	No
20.3	19.2	15.0	64%	16 1/4"	No

Signature: e. Pellon

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Total Quality. Assured.

Date: 21/Feb/2022 Page 1 of ____

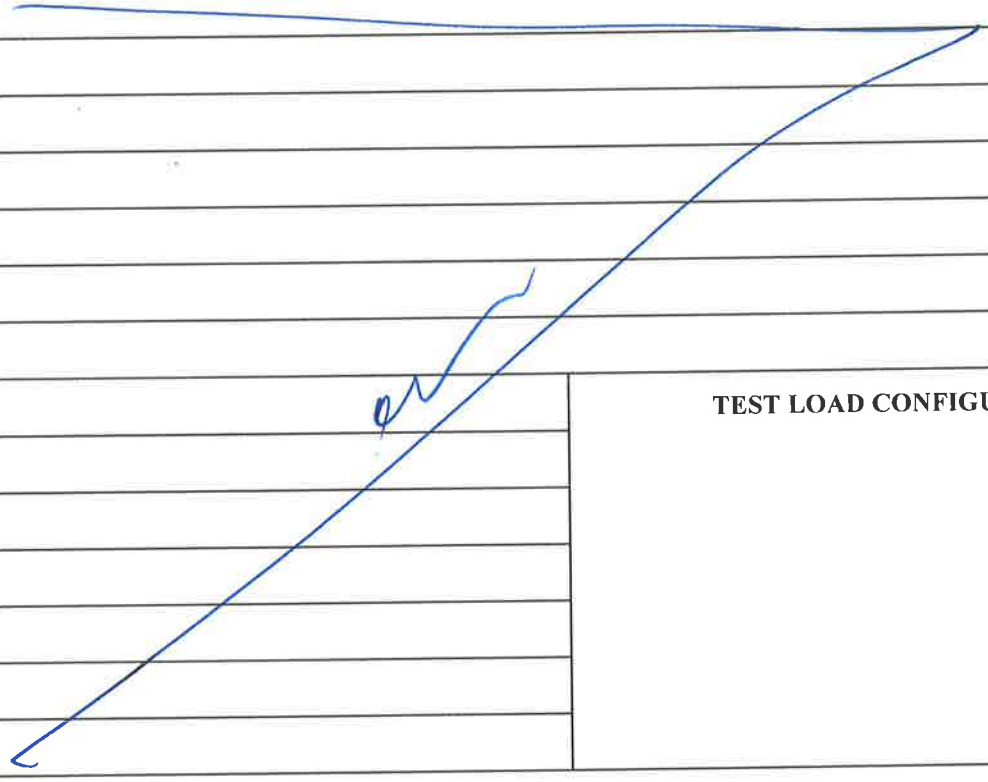
Manufacturer: SBi Model: 3.5 Series

Project #: G104951354 Run: # 2 Engineer: C. Pelland Reviewer: ____

COMMENTS

T=0 light up, clock = 09:00 A.M. load: 14.28 lbs.
T+ 1:00 flue 150°F door closed (Air Intake full opened)
T= 37:00 Raking weight = 3.05 Raking 3d Sec
T: 37:40 Loading (high)
T: 38:40 door closed (pic) 32.26 lbs
T= 39:00 fan on Max flue: 200°F 32.15 lbs
Air Intake unchanged full open
T= 1:00:00 1h Probe removed
T= 2:40:00 Test ended.

TEST LOAD CONFIGURATION



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Total Quality. Assured.

Date: 21 Feb 2022 Page____ of ____

Manufacturer: SIBI Model: 3.5 Series

Project #: C104981354 Run: #2 Engineer: C. Pelland Reviewer:

Low

COMMENTS

1/2

T≥0<0 : MIN Ranking (Pic)
door closed

T=0 : Loading (Low) clock (11:47)
T=01:30 Loading Complete Air intake full on @0.33 lbs
door opened. flue 412°F

T=4:07 flue: 500°F 36.11 lbs
T= 7:00 drill bit: 1/2" 37.92 lbs flue: 828°F
No/smoke CO=120 00

T: 11:36-12:10 @ 36.4 lbs drill bit: 3/8" inserted flue: 730°F
O2: 3.37% ↗ CO: 8000 ↗

T: 14:00 35.7 lbs flue > 700°F
T: 15:00 air intake shut. flue 708°F & 35.4 lbs
T: 25:30 ↗ 525°F. weight: 33.37 lbs. flue 527°F
T: 34:00 flue: 518 O2: 9.04% weight: 34.81 lbs
T=1:00 FAN low 60 MIN

ISO probe removed T: 09:34:00 clock time Test end 21:212	**TEST LOAD CONFIGURATION**

intertek
Total Quality. Assured.

Date: 21/feb/2022   Page____ of ____

Manufacturer: S, BC   Model: 3.5 Series

Project #: G104498/354   Run: #2   Engineer: C. Pelland   Reviewer:________

Pre/Post Checks

Moisture Meter Calibration Check:

Time:	X:	Y:	12:	22:

	Pre-Test	Post-Test
Facility Conditions:		
Air Velocity	∅ fpm	∅ fpm
Smoke Capture Check	∅	∅
Wood Heater Conditions:		
Date Wood Heater Stack Cleaned	18-2-2022	
Date Dilution Tunnel Cleaned	18-2-2022	
Induced Draft Check	910015	✓
Pitot Leak Check:		
Total Pressure	o.k	o.k
Static Pressure	o.k	o.k

Temperature System:	
Ambient (65°-90°F)	66.6 °F
Wood Heater Surface for cold-start (±10°F)	68.7 °F
Proportional Checks:	
CO Analyzer Drift Check	o.k
CO_2 Analyzer Check	o.k
O_2 Analyzer Check	o.k
Thermocouple check	o.k

Sampling Train ID Numbers (HIGH):	Train 1 A	Train 2 B	Train 3 (first-hour) C
Probe	25	26	12
Filter Front	51	59	21
Filter Back	52	60	22

Sampling Train ID Numbers (LOW OR MEDIUM):	Train 1 D	Train 2 E	Train 3 (first-hour) F
Probe	63	32	22
Filter Front	63	69	65
Filter Back	64	70	66

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Date: 2022-02-21 Page____ of____

Manufacturer: SBI Model:_____

Project #: G104981354 Run: 2 Engineer: C. Pelland Reviewer:_____

CONTINUOUS ANALYZERS

Pre-Test (Adjust and Record)

	ZERO		SPAN		CAL. (Record Only)	
CO	0 ppm	0.00 %	2.02 %	1.98 %	4252 ppm	4252 ppm
CO_2	0.00 %	0.00 %	9.70 %	10.1 %	17.66 %	18.0 %
O_2	0.00 %	0.00 %	7.97 %	7.99 %	17.96 %	18.0 %
	Actual	Should Be	Actual	Should Be	Actual	Should Be

Post Test (Record Only)

	Zero	Span	Cal.	Zero Drift	Span Drift	Cal. Drift	OK?	Not OK*
CO	0 ppm	2.07 %	4190 ppm	0.0 %	4.5 %	1.5 %	✓	
CO_2	0.00 %	9.65 %	17.42 %	0.0 %	4.7 %	3.3 %	✓	
O_2	0.00 %	7.89 %	17.93 %	0.0 %	1.3 %	0.4 %	✓	

- Greater than 5% of the range used.

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Date: 21 & 22 feb 2022 Page ____ of ____

Manufacturer: 5,13,1 Model: 3.8 Series

Project #: G104981351 Run: # 2 Engineer: ____ Reviewer: ____

C Rollins

SAMPLING EQUIPMENT CHECK OUT

Leakage Checks Tunnel Samplers (HIGH)

	Train 1 (A)		Train 2 (B)		Train 3 (C)	
Unplugged Flow Rate = cfm	Pre-Test	Post-Test	Pre-Test	Post-Test	Pre-Test	Post-Test
Vacuum (inches Hg.)	5.03	5.17	5.00	5.42	5.00	5.00
Initial 1minute DGM (ft^3)	583.539	674.050	404.292	495.835	363.565	370.645
Final 1minute DGM (ft^3)	583.539	674.050	404.292	495.835	363.565	370.645
Change © (ft^3)	∅	∅	∅	∅	∅	∅
Allowable leakage .04 x Sample rate or .02cfm	0.0005	0.005	0.005	0.005	0.005	0.005
Check OK	ok	ok	ok	ok	ok	ok

Leakage Checks Tunnel Samplers (LOW OR MEDIUM)

	Train 1 (D)		Train 2 (E)		Train 3 (F)	
Unplugged Flow Rate = cfm	Pre-Test	Post-Test	Pre-Test	Post-Test	Pre-Test	Post-Test
Vacuum (inches Hg.)	5.12	5.05	5.07	5.37	5.00	5.00
Initial 1minute DGM (ft^3)	584.712	674.050	404.305	495.834	363.586	378.012
Final 1minute DGM (ft^3)	584.712	674.050	404.305	495.835	363.587	378.012
Change © (ft^3)	∅	∅	∅	0.001	0.001	∅
Allowable leakage .04 x Sample rate or .02cfm	0.005	0.005	0.005	0.005	0.005	0.005
Check OK	ok	ok	ok	ok	ok	ok

Leakage Checks Flue Gas Sampler

Plugged Probe	Pre Test	Post Test
Check OK	✓	✓

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Date: 2022-02-21 | Page 1 of ____

Manufacturer: SBI | Model: 3.5 Series

Project #: G104981354 | Run: #2 | Tech: C. Pelland | Reviewer: ____

PRETEST DILUTION TUNNEL TRAVERSE RUN

Barometric pressure (P_{bar}) 30.3 (inches Hg.) Static pressure (P_q) 0.156 (inches w.c.)
Inside diameter: Port A 8in. Port B 8in.
Tunnel cross sectional area: 0.349 Ft^2
Pitot tube type: S-Type

Traverse Point	Position (inches)	Velocity Head Δ_p (inches H_2O)	Tunnel Temperature (°F)
A- Centroid	4.00	0.084	66.1
B - Centroid	4.00	.087	66.8
A-1	0.54	0.077	65.8
A-2	2.00	0.086	66.1
A-3	6.00	0.077	66.2
A-4	7.46	0.069	66.1
B-1	0.54	0.074	66.8
B-2	2.00	0.085	66.9
B-3	6.00	0.081	67.0
B-4	7.46	0.063	66.7
		AVERAGE	/

$$v_s = K_p C_p (\sqrt{\Delta p})_{avg} \sqrt{\frac{(T_s)_{avg}}{P_s M_s}}$$

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

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

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Total Quality. Assured.

Date: 21 Feb 2022 Page 1 of ____

Manufacturer: SBi Model: F-8 Series Project #: 610495/135-4

Category #: ____ Run: #2 Engineer: C. Rolland Reviewer: ____

RAW DRY GAS METER READINGS

	Start (HIGH)	End (HIGH)	Start (L/M)	End (L/M)
System 1 (ft^3) Equipment #: SBi 047	583.899	602.695	602.695	674.034
System 2 (ft^3) Equipment #: SBi-046	404.480	423.486	423.486	495.833
System 3 (ft^3) Equipment #: SBi-290	363.608	370.636	370.668	378.008

AMBIENT CONDITIONS

	Start (HIGH)	End (HIGH)	Start (L/M)	End (L/M)
	Date 21/2/22 Time 8:56	Date 21/2/22 Time 11:44	Date 21/2/22 Time 11:44	Date 21/2/22 Time 21:27
Barometer. (inches Hg) Equipment #: ENV CANADA	102.1 kpa	102.4 kpa	102.4 kpa	103.5 kpa
Indoor Dry Bulb (EF)°F Equipment #: SBi-212	64.8°F	66.6°F	66.6°F	64.5°F
Indoor Humidity (%) Equipment #: SBi-212	18.7%	20.1%	20.1%	18.6%

Ambiant	Flue	Dilution Tunn	Firebox Top	Firebox Back	Firebox Right	Firebox Left	Firebox Botto	DGM Inlet 1	DGM Outlet 1	Probe Temp	DGM inlet 2	DGM outlet 2	Probe Temp	Probe Temp 3	DGM inlet 3	Manomètre Draft	Manomètre Tunn	Transmetteur V	Transmetteur	Transmetteur p	Transmetteur Va	Massflow 1	Massflow 2	Balance	Date	Weight for BR	time for BR	10 min	minutes
65.81246845	68.0546276	68.8484625	68.4957762	70.1711357	68.2360183	68.6137617	68.8805599	64.0163534	64.0535345	82.1082704	64.08236	64.3196339	84.5799576	82.08715229	65.12400858	0.001184526	0.086429218	-0.196742949	-0.3588651	-0.159249153	-0.32744946	-0.0273894	0.17188103	14.0913126	08:49:35			1	0
65.99175942	146.597598	82.0447173	76.8869118	70.3650582	68.3371407	68.7123649	68.8695224	64.4276194	64.0900975	81.6289235	64.3816726	64.3403197	85.1321709	82.06624995	65.24698734	0.029525292	0.083137775	0.198130321	-0.3041839	-0.184353012	0.089549577	3.51712129	3.49332115	13.9963415	08:50:35				1
66.36438289	209.853193	75.4708973	91.4798914	71.4772799	68.7026906	69.1391199	68.7414602	64.4480002	64.0369557	81.6685991	64.3987122	64.3444106	85.3433322	82.6383477	65.31955244	0.04962822	0.083502577	0.179931085	-0.3077945	-0.210830714	0.136478626	3.47843623	3.52518416	13.8491151	08:51:35				2
66.69469403	341.499214	84.0339451	120.829245	73.4428643	69.9611042	70.4751641	68.6312115	64.5112966	64.0492969	82.0783971	64.4728698	64.332523	85.7490338	83.70298819	65.40620526	0.075712653	0.081366533	0.185347583	-0.3048084	-0.187350488	0.137555533	3.45916009	3.45730459	13.6467402	08:52:35				3
67.40714437	460.167776	91.6930009	174.94152	77.198712	72.3493926	73.1894216	68.6077353	64.590524	64.1034753	82.5506804	64.5546046	64.3917071	86.4414478	85.18881838	65.50878101	0.086914403	0.08165919	0.203387004	-0.3052739	-0.166754196	0.094924277	3.40561634	3.41782292	13.4045426	08:53:35				4
67.81679084	524.563917	98.6112802	234.857881	83.0528352	76.0024055	77.6200879	68.554849	64.674116	64.145311	83.0222083	64.6239976	64.4331198	87.2572769	86.7852062	65.56645509	0.092909415	0.080808233	0.215823067	-0.3095771	-0.157761769	0.043962973	3.47766584	3.50806674	13.1182772	08:54:35				5
68.11809139	549.777663	102.61467	292.574362	90.9708979	80.9477497	84.0642804	68.5592268	64.7382245	64.1476089	83.4871461	64.7089897	64.464238	87.7959057	88.03699005	65.60047998	0.094280127	0.076854528	0.229832693	-0.3051604	-0.159816857	0.143259698	3.50939936	3.50240356	12.8569879	08:55:35				6
68.23697154	609.440787	109.502462	348.321572	100.180778	86.9944501	92.4854148	68.6047092	64.7917213	64.208221	83.7242662	64.7674988	64.4663663	87.6287368	88.18521507	65.5834032	0.097278649	0.077360304	0.243230104	-0.3573891	-0.156467405	0.192386817	3.50638664	3.50451803	12.553196	08:56:35				7
68.53826334	648.450898	114.106885	404.708937	110.554031	94.1837098	103.139739	68.7421241	64.7878046	64.2084807	84.0745047	64.7310065	64.4799919	87.2544761	87.90229915	65.53147715	0.100398409	0.077328046	0.25643082	-0.3086234	-0.160566226	0.067824576	3.47482195	3.46579364	12.2405406	08:57:35				8
68.93025787	673.235028	118.632128	457.63542	121.625463	102.2246	114.71621	69.0057039	64.7649676	64.1852201	84.5519298	64.6743396	64.4701001	86.7135532	87.55852112	65.46731536	0.103595168	0.076693959	0.258378104	-0.3042747	-0.158465722	0.096431455	3.545629	3.48053595	11.906052	08:58:35				9
69.41917778	696.548711	122.450156	507.205604	133.337149	111.312457	125.858705	69.3858384	64.7361786	64.185248	85.1006557	64.6434612	64.4697103	86.2740158	87.28312879	65.43853542	0.103869484	0.075681767	0.281556191	-0.3551296	-0.161599447	0.111554868	3.50015467	3.50047922	11.5754973	08:59:35			1	10
69.92653418	706.591511	124.132258	548.983105	146.20878	121.606633	136.775833	69.982363	64.7059373	64.1675317	85.5783492	64.5831469	64.469539	85.8907965	86.88359164	65.44963693	0.102553592	0.07506433	0.28020391	-0.357514	-0.15628574	0.167133595	3.48692036	3.4762316	11.2407095	09:00:35				11
70.65402825	700.140806	124.043119	577.47888	159.697051	132.506571	146.553123	70.7581488	64.6810495	64.1743864	85.9475809	64.5440569	64.4271055	85.4462499	86.49752877	65.40346419	0.103264129	0.078154112	0.280398147	-0.304059	-0.160691121	0.219717635	3.50930592	3.51385287	10.9396386	09:01:35				12
70.9535384	708.125418	125.926118	602.174576	173.543309	143.464492	157.080786	71.7496027	64.6339286	64.1711183	86.377792	64.4952625	64.3841564	84.8278463	86.13112531	65.34675544	0.104564482	0.076925842	0.287621783	-0.3078399	-0.160134771	0.224848925	3.51506254	3.5032936	10.6160748	09:02:35				13
71.00644853	712.924885	127.432002	625.308157	188.992237	153.821036	167.834104	73.045065	64.6038812	64.161952	86.7504407	64.4501764	64.3658014	84.3820783	85.71170075	65.31671747	0.105119974	0.075777698	0.286849754	-0.3067613	-0.166549823	0.190882098	3.49865323	3.4923934	10.3074147	09:03:35				14

Time	Flue	Room	Tunnel	DGM 1	DGM 1	Filter 1	DGM 2	DGM 2	Filter 2	DGM 3	Filter 3	Meter #1	Meter #2	Draft	Tunnel	CO	CO2	O2	scale
10.0	Temp 1	Temp 2	Dry Bulb 3	In 13	Out 14	15	In 16	Out 17	18	In 19	20	21	22	23	24	% 25	% 25	% 27	Lbs 28
0.0	68.05463	65.81247	68.84846	64.01635	64.05353	82.10827	64.08236	64.31963	84.57996	82.09	65.12	507.350	327.206	0.001185	0.086429				14.09
10.0	696.5487	69.41918	122.4502	64.73618	64.18525	85.10066	64.64346	64.46971	86.27402	87.28	65.44	508.545	328.422	0.103869	0.075682				11.58
20.0	787.8373	73.79185	143.2043	64.56315	64.11495	85.79993	64.35597	64.31212	83.62651	84.08	65.30	509.736	329.622	0.108546	0.069754				8.18
30.0	826.4636	78.78199	153.0848	64.54268	64.09907	83.34596	64.31128	64.23442	87.37881	85.08	65.60	510.910	330.816	0.108533	0.071734				4.43
40.0	843.0773	79.97266	173.9525	64.6318	64.07708	83.04773	64.3791	64.25546	85.23794	85.42	65.56	512.097	332.015	0.10854	0.067866				30.53
50.0	775.7036	83.15167	164.2041	64.68031	64.14231	84.01643	64.41717	64.28142	86.95159	87.26	65.64	513.270	333.205	0.104819	0.069384				27.26
60.0	716.8073	84.48134	158.1578	64.73795	64.20665	83.06146	64.4389	64.31484	85.96008	86.41	65.70	514.436	334.392	0.100334	0.070926				24.61
70.0	706.9607	84.09161	156.4823	64.77208	64.24789	84.44152	64.48389	64.32266	84.6239			515.614	335.572	0.099262	0.072349				22.10
80.0	744.2608	86.62671	160.6033	64.94528	64.33216	86.72874	64.68427	64.4817	85.25763			516.778	336.760	0.100674	0.069127				19.39
90.0	773.8384	88.18686	164.6317	64.99718	64.38241	83.58814	64.66016	64.53194	84.33689			517.961	337.952	0.103344	0.070851				16.67
100.0	778.39	89.37219	160.7645	65.03049	64.45917	83.47467	64.78703	64.56735	84.6937			519.108	339.117	0.105417	0.069867				13.97
110.0	753.3671	87.33189	162.2961	65.09535	64.5633	85.092	64.90869	64.65894	86.0096			520.271	340.292	0.098422	0.068357				11.89
120.0	712.6055	86.49241	155.0815	65.25466	64.64288	82.14219	64.95109	64.73978	84.31069			521.429	341.459	0.09604	0.071102				10.14
130.0	655.5359	87.99281	149.2054	65.30111	64.71023	83.38037	65.05726	64.85514	84.04937			522.580	342.632	0.091469	0.070417				8.69
140.0	603.9958	87.67509	143.0556	65.43698	64.82358	84.10538	65.21819	64.9735	83.71031			523.747	343.807	0.086867	0.069664				7.82
150.0	562.7273	86.86328	136.7252	65.4934	64.8867	84.2225	65.21826	65.0149	83.04332			524.907	344.985	0.082565	0.074514				7.17
160.0	512.4544	85.49509	129.162	65.5317	64.96676	83.52201	65.26783	65.07116	82.41443			526.075	346.168	0.076674	0.074205				6.66
170.0	478.6484	86.88619	123.8117	65.70234	65.09193	83.59513	65.63178	65.28275	84.76405			527.250	347.358	0.075202	0.074306				6.24
171.0	474.8438	88.11499	122.9846	65.69607	65.09902	83.52851	65.62718	65.30111	84.91951			527.379	347.490	0.072964	0.074711				6.21

Intertek Testing Services

Manufacturer:	**SBI**
Model:	**3.5 Series**
Date:	**2-20-22**
Run:	**1-High**
Project #:	**G104981354**
Test Duration (min):	**171**
Test Duration (high only):	**135**

RESULTS

Average emission rate:(gr/hr) **3.094**

Burn Rate (Dry kg/hr): 4.210

PRESSURE FACTOR: 1.01588

BAROMETRIC PRESSURE

Average:	30.395
Start:	30.41
End:	30.38

TEMPERATURE FACTORS

DGM #1:	1.00621
DGM #2:	1.00626

DRY GAS METER VALUES

VOLUMES SAMPLED

		avg sample flow dscfm	DGM #1 Final:	527.379
DGM #1:	20.67798	0.12092386	Initial:	507.350
DGM #2:	20.88023	0.12210662		
			DGM #2 Final:	347.490
TOTAL TUNNEL VOLUME (scf):	47600		Initial:	327.206

SAMPLE RATIOS

TEMPERATURES (DEG. RANKIN)

Sample Train 1:	2301.982	DGM #1:	524.743
Sample Train 2:	2279.684	DGM #2:	524.713

TOTAL EMISSIONS

CALIBRATION FACTORS

Sample Train 1 (g):	**8.517**	DGM #1:	1.0100
Sample Train 2 (g):	**9.119**	DGM #2:	1.0070

EMISSION RATES

TUNNEL FLOW RATE: 278.365

Sample Train 1 (g/hr):	**2.99**
Sample Train 2 (g/hr):	**3.20**

PARTICULATE CATCH (mg)

Total Sample Train 1:	3.7
Total Sample Train 2:	4
Filter and seal Sample Train 1:	3.2
Filter and seal Sample Train 2:	3.5
Probe Sample Train 1:	0.5
Probe Sample Train 2:	0.5

MAX Allowed	7.50%
DEVIATION:	3.41%

	Room Temp		Bar Pressure		Relative Humidity		Air Velocity	
	Before	After	Before	After	Before	After	Before	After
	66	88	30.41	30.38	17.7	16.9	0	0

Average Dilution Tunnel Measurements						Sample Data	
Burn	Velocity	Flow Rate	Temp	Total Sample		Particulate Catch	
Time	(Ft/sec)	(dscf/min)	(R)	1	2	1	2
171	15.30	278.36	604.67	20.68	20.88	3.70	4.00

Dilution Tunnel Dual Train Precision				
Sample Ratios		Total Emissions (g)		
Train 1	Train 2	Train 1	Train 2	Deviation (%)
2301.98	2279.68	8.52	9.12	3.41%

Burn			Initial		Run	Average
Rate		Surface	Draft		Time	Draft
4.210		0.000	0.001		171.000	0.091

Run	Date	Burn Rate	Emission
1-High	2022-02-20	4.210	3.094

E&E Boiler Tunnel Traverse Worksheet

Static Pressure: **0.172**

Barometer: 30.41

	TUNNEL VELOCITY	TUNNEL TEMP	SQUARE ROOT
A CENTER	0.099	64.700	0.3146
B CENTER	0.096	64.800	0.3098
A1	0.089	64.400	0.2983
A2	0.099	64.400	0.3146
A3	0.084	64.400	0.2898
A4	0.077	63.800	0.2775
B1	0.082	64.900	0.2864
B2	0.093	65.000	0.3050
B3	0.092	65.100	0.3033
B4	0.072	64.600	0.2683
AVERAGE	0.172	68.2	0.2968

PITOT CONSTANT= 0.9505

E&E FUEL LOAD DATA SHEET

			Test Load Weight: Lower	Ideal	Upper	
Firebox Volume:	2.88	cu. ft	32.83	34.56	36.29	
Load Volume:	2.8800	cu. ft	Loading Density:	10.186	lbs./ft3	
Number of Spacers:			Load Density:	10.186	lbs./ft3	

Piece Size: Thick	x Wide	x Length	Weight lbs	Meter Moisture Content Dry Uncorrected %			
2	4	16	5.14	25.30	17.80	16.90	84.00
2	4	16	5.16	27.00	15.40	23.50	84.00
2	4	15.75	4.96	20.50	24.90	17.90	82.69
2	4	15.5	5.98	27.80	25.70	22.00	81.38
2	4	16	3.26	28.50	16.90	22.70	84.00
2	4	16	4.83	24.50	20.00	14.20	84.00
							0.00
							0.00
							0.00

Test Load Weight 29.337 lbs. **Dry Weight** 10.930 kg.

Average Moisture Content: %

Dry: 21.75 21.750 Wet: 17.864

Pre-test moisture content: %

#DIV/0! #DIV/0! Wet: #DIV/0!

Coal Bed Range: 5.9 lbs. to 7.3 lbs. 20% to 25% of test load

For All Usable Firebox Volumes - High Fire Test Only

Nominal Required Load Density (wet basis)	10	lb/ft³				
Usable Firebox Volume	2.88	ft³				
Total Nom. Load Wt. Target	28.80	lb				
Total Load Wt. Allowable Range	27.40	to	30.20	lb		
Core Target Wt. Allowable Range	13.00	to	18.70	lb		
Remainder Load Wt. Allowable Range	10.10	to	15.80	lb		
						Mid-Point
Core Load Pc. Wt. Allowable Range	4.30	to	7.20	lb		5.75
Remainder Load Pc. Wt. Allowable Range	2.90	to	15.80	lb		9.35
	Pc. #					
Core Load Piece Wt. Actual	1	5.142	**3.5**	In Range		
	2	5.158	**3.5**	In Range		
	3	4.964	**3.5**	In Range		
Core Load Total. Wt. Actual		15.26		In Range		
	Pc. #					
Remainder Load Piece Wt.	1	5.979	**5.2**	In Range		
(1 to 3 Pcs.)	2	3.262	**3.2**	In Range		
	3	4.832		In Range		
Remainder Load Piece Weight Ratio - Small/Large		55%		In Range	≤ 67%	
Remainder Load Tot. Wt. Act		14.07	lb	In Range		
Total Load Wt. Actual		29.34	lb	In Range		
Core % of Total Wt.		52%		In Range	45-65%	
Remainder % of Total Wt.		48%		In Range	35-55%	
Actual Load % of Nominal Target		102%		In Range	95-105%	
Actual Fuel Load Density		10.2	lb/ft³			
Kindling and Start-up Fuel						
Maximim Kindling Wt. (20% of Tot. Load Wt.)		5.87	lb			
Actual Kindling Wt.		5.78	lb	In Range	19.7%	
Maximum Start-up Fuel Wt. (30% of Tot. Load Wt.)		8.80	lb			
Actual Start-up Fuel Wt.		8.22	lb	In Range	28.0%	
Allowable Residual Start-up Fuel Wt. Range	2.9	to	5.9	lb		Mid-Point
Actual Residual Start-up Fuel Wt.		3.00	lb	In Range		4.4
Total Wt. All Fuel Added (wet basis)		43.34	lb			
High Fire Test Run End Point Range	Low		High			Mid-Point
Based on Fuel Load Wt. (w/tares)	2.6	to	3.2	lb		2.9
Actual Fuel Load Ending Wt.		3.2	lb	In Range		

Fuel Piece Moisture Reading (%-dry basis)

1	2	3	Ave.		Pc. Wt. Dry Basis			
25.3	17.8	16.9	20.0	In Range	4.29	lb	1.94	kg
27	15.4	23.5	22.0	In Range	4.23	lb	1.92	kg
20.5	24.9	17.9	21.1	In Range	4.10	lb	1.86	kg
27.8	25.7	22	25.2	In Range	4.78	lb	2.17	kg
28.5	16.9	22.7	22.7	In Range	2.66	lb	1.21	kg
24.5	20	14.2	19.6		4.04	lb	1.83	kg

Total Load Ave. MC (%-dry basis)	21.8	In Range				
Total Load Ave. MC % (wet basis)	17.9					
Total Test Load Weight (dry basis) →			24.09	lb	10.93	kg
Kindling Moisture (%-dry basis)						
10 10 10	10.0	In Range	5.26	lb	2.38	kg
Start-up Fuel Moisture Readings (%-dry basis)						
24.8 19.3 18.1	22.8	In Range	6.70	lb	3.04	kg
25.6 23.2 25.6						
Total Wt. All Fuel Added (dry basis) →			36.04	lb	16.35	kg
Total Wt. All Fuel Burned (dry basis) →			29.8	lb	13.5	kg

								6" Tunnel	0.1963	ft^2							**(ASTM E2515 Formula)**			
		Manufacturer:		SBI				12" Tunnel	0.7854	ft^2										
		Model:		3.5 Series							Tunnel area (ft2):		0.349			Manufacturer:		SBI		
		Date:		2-20-22							Wood moisture (% wet):		17.86			Model:		3.5 Series		
		Run:		1-High							Load Weight (lbs wet):		29.337			Date:		2-20-22		
		Project #:		G104981354							Burn Rate (Dry kg/hr):		4.210			Run:		1-High		
		Test Duration:		171							End of test weight (Dry lb)		3.211	10.9%						
		Total Gas Volume (DGM 1):		20.670							Final Temperature (DGM #1) Degrees Rankin:					524.743				
		Total Gas Volume (DGM 2):		20.872							Final Temperature (DGM #2) Degrees Rankin:					524.713				
		Average Barometric Pressure:		30.395							Final Tunnel Temperature Degrees Rankin:					604.669				
		Molecular Weight:		28.78							Final Tunnel Velocity (feet per second):					15.2977641				
		Pitot Correction:		0.950461585							Standardized Tunnel Flow (dscfm):					278.364553				
		Calibration Factor (DGM #1):		1.0100																
		Calibration Factor (DGM #2):		1.0070																
			(1) VS:	0.07343984									Average Inlet +	Average Inlet +						
			(2) VS:	0.072726247				Filter	Filter				Outlet	Outlet	Average	Average	#1	#2		Average
								Face	Face	Delta-P	Tunnel		Temp.	Temp.	101.3	101.3	dDGM	dDGM		0.3
Elapsed	DGM 1	DGM 1	DGM 1	DGM 2	DGM 2	DGM 2	Tunnel	Velocity	Velocity	(in. H2O)	Velocity		Meter 1	Meter 2	Proportional Rates		Vol.Std.	Vol.Std.		SQRT
Time	Reading	Inlet T	Outlet T	Reading	Inlet T	Outlet T	Dry Bulb	DGM 1	DGM 2	Tunnel	Ft/Sec		Deg. R	Deg. R	PR1	PR2	(ft3)	(ft3)	Time	Delta-P
0.00	507.35	64.02	64.05	327.21	64.08235999	64.31963	68.84846			0.086	15.673		524.0	524.2					0	0.29398847
10.00	508.55	64.74	64.19	328.42	64.64346122	64.46971	122.4502	10.64	10.79	0.076	15.391		524.5	524.6	97.74	98.16	1.234	1.252	10	0.27510319
20.00	509.74	64.56	64.11	329.62	64.35597498	64.31212	143.2043	10.60	10.65	0.070	15.037		524.3	524.3	103.31	102.77	1.230	1.236	20	0.26411063
30.00	510.91	64.54	64.10	330.82	64.3112812	64.23442	153.0848	10.45	10.60	0.072	15.374		524.3	524.3	101.25	101.68	1.213	1.230	30	0.26783135
40.00	512.10	64.63	64.08	332.02	64.37910066	64.25546	173.9525	10.57	10.64	0.068	15.206		524.4	524.3	107.01	106.73	1.226	1.235	40	0.26051138
50.00	513.27	64.68	64.14	333.21	64.41717324	64.28142	164.2041	10.44	10.56	0.069	15.256		524.4	524.3	103.75	103.95	1.211	1.225	50	0.2634078
60.00	514.44	64.74	64.21	334.39	64.43890025	64.31484	158.1578	10.38	10.54	0.071	15.350		524.5	524.4	101.49	102.04	1.204	1.222	60	0.26631944
70.00	515.61	64.77	64.25	335.57	64.48389434	64.32266	156.4823	10.48	10.47	0.072	15.482		524.5	524.4	101.37	100.29	1.216	1.215	70	0.26897712
80.00	516.78	64.95	64.33	336.76	64.68426779	64.4817	160.6033	10.36	10.54	0.069	15.184		524.6	524.6	102.76	103.57	1.201	1.223	80	0.26292083
90.00	517.96	65.00	64.38	337.95	64.66016158	64.53194	164.6317	10.53	10.58	0.071	15.422		524.7	524.6	103.47	102.98	1.221	1.227	90	0.26617779
100.00	519.11	65.03	64.46	339.12	64.78702885	64.56735	160.7645	10.20	10.33	0.070	15.267		524.7	524.7	100.69	101.00	1.184	1.199	100	0.2643241
110.00	520.27	65.10	64.56	340.29	64.90868674	64.65894	162.2961	10.34	10.42	0.068	15.120		524.8	524.8	103.32	103.07	1.200	1.209	110	0.26145122
120.00	521.43	65.25	64.64	341.46	64.95109183	64.73978	155.0815	10.30	10.35	0.071	15.331		524.9	524.8	100.23	99.77	1.195	1.201	120	0.266649
130.00	522.58	65.30	64.71	342.63	65.05726076	64.85514	149.2054	10.23	10.40	0.070	15.184		525.0	525.0	99.61	100.25	1.187	1.206	130	0.26536111
140.00	523.75	65.44	64.82	343.81	65.21819298	64.9735	143.0556	10.37	10.42	0.070	15.026		525.1	525.1	100.98	100.39	1.203	1.208	140	0.26394027
150.00	524.91	65.49	64.89	344.99	65.21825551	65.0149	136.7252	10.31	10.44	0.075	15.458		525.2	525.1	96.52	96.80	1.196	1.211	150	0.27297331
160.00	526.08	65.53	64.97	346.17	65.2678297	65.07116	129.162	10.38	10.48	0.074	15.328		525.2	525.2	96.74	96.77	1.204	1.216	160	0.27240618
170.00	527.25	65.70	65.09	347.36	65.63178451	65.28275	123.8117	10.44	10.54	0.074	15.269		525.4	525.5	96.76	96.73	1.211	1.223	170	0.27259194
171.00	527.38	65.70	65.10	347.49	65.62718398	65.30111	122.9846	11.46	11.69	0.075	15.299		525.4	525.5	105.87	106.93	0.133	0.136	171	0.27333294

Time	Flue	Room	Tunnel	DGM 1	DGM 1	Filter 1	DGM 2	DGM 2	Filter 2	DGM 3	Filter 3	Meter #1	Meter #2	Draft	Tunnel	CO	CO2	O2	scale
10.0	Temp 1	Temp 2	Dry Bulb 3	In 13	Out 14	15	In 16	Out 17	18	In 19	20	21	22	23	24	% 25	% 25	% 27	Lbs 28
0.0	68.05463	65.81247	68.84846	65.30	65.30	82.60						348.945		0.001185	0.086429				14.09
10.0	696.5487	69.41918	122.4502	65.50	65.50	87.50						350.152		0.103869	0.075682				11.58
20.0	787.8373	73.79185	143.2043	65.30	65.30	84.10						351.329		0.108546	0.069754				8.18
30.0	826.4636	78.78199	153.0848	65.60	65.60	85.10						352.512		0.108533	0.071734				4.43
40.0	843.0773	79.97266	173.9525	65.60	65.60	85.20						353.715		0.10854	0.067866				30.53
50.0	775.7036	83.15167	164.2041	65.60	65.60	87.10						354.915		0.104819	0.069384				27.26
60.0	716.8073	84.48134	158.1578	65.70	65.70	86.80						356.115		0.100334	0.070926				24.61

Intertek Testing Services

Manufacturer:	**SBI**
Model:	**3.5 Series**
Date:	**2-20-22**
Run:	**1-High**
Project #:	**G104981354**
Test Duration (min):	**60**
Test Duration (high only):	**135**

RESULTS

Average emission rate:(gr/hr) **#DIV/0!**

Burn Rate (Dry kg/hr): 4.210

PRESSURE FACTOR: 1.01588

BAROMETRIC PRESSURE

Average:	30.395
Start:	30.41
End:	30.38

TEMPERATURE FACTORS

DGM #1:	1.00473
DGM #2:	1.14783

DRY GAS METER VALUES

VOLUMES SAMPLED

		avg sample flow dscfm	DGM #1 Final:	356.115
DGM #1:	7.19387	0.11989785	Initial:	348.945
DGM #2:	0.00000	0		
			DGM #2 Final:	0.000
TOTAL TUNNEL VOLUME (scf):	16848		Initial:	0.000

SAMPLE RATIOS

TEMPERATURES (DEG. RANKIN)

Sample Train 1:	2342.012	DGM #1:	525.514
Sample Train 2:	#DIV/0!	DGM #2:	460.000

TOTAL EMISSIONS

CALIBRATION FACTORS

Sample Train 1 (g):	**6.558**	DGM #1:	0.9830
Sample Train 2 (g):	**#DIV/0!**	DGM #2:	0.0000

EMISSION RATES

TUNNEL FLOW RATE: 280.802

Sample Train 1 (g/hr):	**6.56**
Sample Train 2 (g/hr):	**#DIV/0!**

PARTICULATE CATCH (mg)

Total Sample Train 1:	2.8
Total Sample Train 2:	0
Filter and seal Sample Train 1:	2.7
Filter and seal Sample Train 2:	
Probe Sample Train 1:	0.1
Probe Sample Train 2:	

MAX Allowed	7.50%
DEVIATION:	#DIV/0!

								6" Tunnel	0.1963	ft^2						**(ASTM E2515 Formula)**				
		Manufacturer:		SBI				12" Tunnel	0.7854	ft^2										
		Model:		3.5 Series							Tunnel area (ft2):		0.349			Manufacturer:		SBI		
		Date:		2-20-22							Wood moisture (% wet):		17.86			Model:		3.5 Series		
		Run:		1-High							Load Weight (lbs wet):		29.337			Date:		2-20-22		
		Project #:		G104981354							Burn Rate (Dry kg/hr):		4.210			Run:		1-High		
		Test Duration:		60							End of test weight (Dry lb)		3.211	10.9%						
		Total Gas Volume (DGM 1):		7.190							Final Temperature (DGM #1) Degrees Rankin:					525.514				
		Total Gas Volume (DGM 2):		0.000							Final Temperature (DGM #2) Degrees Rankin:					460.000				
		Average Barometric Pressure:		30.395							Final Tunnel Temperature Degrees Rankin:					600.557				
		Molecular Weight:		28.78							Final Tunnel Velocity (feet per second):					15.3268033				
		Pitot Correction:		0.950461585							Standardized Tunnel Flow (dscfm):					280.802202				
		Calibration Factor (DGM #1):		0.9830																
		Calibration Factor (DGM #2):											Average	Average						
				(1) VS:	0.212955781								Inlet +	Inlet +						
				(2) VS:	#DIV/0!			Filter	Filter				Outlet	Outlet	Average	Average	#1	#2		Average
								Face	Face	Delta-P	Tunnel		Temp.	Temp.	102.3	#DIV/0!	dDGM	dDGM		0.3
Elapsed	**DGM 1**	**DGM 1**	**DGM 1**	**DGM 2**	**DGM 2**	**DGM 2**	**Tunnel**	**Velocity**	**Velocity**	**(in. H2O)**	**Velocity**		**Meter 1**	**Meter 2**	**Proportional Rates**		**Vol.Std.**	**Vol.Std.**		**SQRT**
Time	**Reading**	**Inlet T**	**Outlet T**	**Reading**	**Inlet T**	**Outlet T**	**Dry Bulb**	**DGM 1**	**DGM 2**	**Tunnel**	**Ft/Sec**		**Deg. R**	**Deg. R**	**PR1**	**PR2**	**(ft3)**	**(ft3)**	**Time**	**Delta-P**
0.00	348.95	65.30	65.30	0.00	0	0	68.84846			0.086	15.673		525.3	460.0					0	0.29398847
10.00	350.15	65.50	65.50	0.00	0	0	122.4502	10.44	0.00	0.076	15.391		525.5	460.0	97.51	#DIV/0!	1.211	0.000	10	0.27510319
20.00	351.33	65.30	65.30	0.00	0	0	143.2043	10.18	0.00	0.070	15.037		525.3	460.0	100.87	#DIV/0!	1.181	0.000	20	0.26411063
30.00	352.51	65.60	65.60	0.00	0	0	153.0848	10.23	0.00	0.072	15.374		525.6	460.0	100.68	#DIV/0!	1.186	0.000	30	0.26783135
40.00	353.72	65.60	65.60	0.00	0	0	173.9525	10.40	0.00	0.068	15.206		525.6	460.0	107.03	#DIV/0!	1.206	0.000	40	0.26051138
50.00	354.92	65.60	65.60	0.00	0	0	164.2041	10.37	0.00	0.069	15.256		525.6	460.0	104.78	#DIV/0!	1.203	0.000	50	0.2634078
60.00	356.12	65.70	65.70	0.00	0	0	158.1578	10.37	0.00	0.071	15.350		525.7	460.0	103.09	#DIV/0!	1.203	0.000	60	0.26631944

Ambiant	Flue	Dilution Tunn	Firebox Too	Firebox Back	Firebox Richt	Firebox Left	Firebox Botto	DGM Inlet 1	DGM Outlet	Probe Temp	DGM inlet 2	DGM outlet 2	Probe Temp	Probe Temp	DGM inlet 3	Manomètre D	Manomètre Tu	Trans Vacuu	Trans Pressi	Trans Pression	Trans Vacuu	Masaflow 1	Massflow 2	Balance	Date	Run time	Weight for BR	weight loss for 30 n	weight loss %	
84.959919	456.199442	145.550227	423.043885	503.543257	393.055109	404.528973	502.386634	65.093898	65.0872168	81.9102854	65.1732351	65.2617553	84.9425536	83.2863285	66.9075055	0.07323868	0.072926205	-0.2687015	-0.3633727	-0.212953926	-0.374558	-0.0135174	0.17335625	5.85195792		11:50:26	0	34.60			
88.4353738	713.610425	148.39516	690.32456	469.871562	397.958252	409.83411	504.723137	65.7491814	65.2051792	83.7822316	65.6581757	65.5212426	84.8815681	87.5210169	66.7712772	0.1003486	0.070207384	0.16277679	-0.3241898	-0.217370661	0.02375007	3.51468554	3.48655811	36.9096849		12:00:26	10	31.08230158			
89.2432695	580.6141992	131.320174	673.819646	447.829705	400.104715	410.571278	478.397532	65.7031336	65.1390773	85.1208289	65.4793652	65.3816682	85.5085808	84.7822047	66.6092483	0.09030982	0.070819393	0.1403314	-0.3627255	-0.200998085	0.02231911	3.50048906	3.49667317	34.8836737		12:10:26	20	29.05629041			
87.2508196	525.387116	124.660794	621.100848	430.101641	381.35943	393.046378	449.001915	65.6071023	65.1595237	83.8267716	65.4751761	65.3511751	82.349685	84.6903921	66.547475	0.08627433	0.074757704	0.1531756	-0.307522	-0.213612462	0.09954416	3.50858799	3.50717998	33.3409963		12:20:26	30	27.51361296	7.088387043	20.5%	
87.7328652	541.526843	125.931808	612.123458	415.145344	373.467622	374.908863	418.286063	65.5342269	65.1041717	84.1595439	65.4131518	65.2766213	85.9170845	85.0531945	66.5000865	0.0862744	0.073501266	0.14541105	-0.3032756	-0.223797067	0.05780295	3.49642894	3.50206918	31.7464117		12:30:26	40	25.91902843	5.163273151	14.9%	
87.1636486	565.656598	129.061292	612.699613	403.032709	377.108979	365.926345	392.236797	65.5072887	65.0505034	84.2825858	65.3749391	65.2542729	81.9558712	84.9421731	66.4372709	0.08925161	0.072135717	0.13632127	-0.3044337	-0.214384539	0.11134588	3.51062214	3.50439674	30.1023911		12:40:26	50	24.2750078	4.781282606	13.8%	
86.7591829	574.186072	129.997557	619.910078	398.524174	391.940419	360.57699	370.516712	65.5263761	65.0303422	85.3079362	65.3560334	65.2466399	87.886109	85.6464668	66.5510788	0.09062499	0.070035832	0.13582216	-0.3644741	-0.195445943	0.07782408	3.51327753	3.5097993	28.337157		12:50:27	60	22.50977367	5.003839284	14.5%	
87.9571632	587.40251	130.262141	636.866495	404.397109	405.160026	369.168953	354.693714	65.4704823	64.9381052	85.34023	65.2813463	65.2166272	83.6409085	84.1785295	66.5507122	0.08913653	0.070654833	0.15508355	-0.325223	-0.210524154	0.08401014	3.50251338	3.49578476	26.4867251		13:00:27	70	20.65934178	5.259686649	15.2%	
88.4187873	615.102418	132.977302	671.704269	417.092418	416.960813	385.103821	343.243837	65.4213807	64.9370164	85.5958416	65.231823	65.1733658	84.3103937	84.1781281	66.641845	0.09151879	0.071398925	0.17030531	-0.3326599	-0.206096065	0.09048142	3.48512387	3.49465704	24.469725		13:10:27	80	18.64234171	5.632666089	16.3%	
85.6968218	641.946865	135.838322	702.906655	437.183863	431.21148	403.206651	335.225924	65.3968814	64.9367329	86.3179077	65.3192223	65.2052339	86.7587017	84.1785029	66.7550589	0.09391228	0.071812929	0.1811506	-0.3570031	-0.214168812	0.02154708	3.41772785	3.43745476	22.3497058		13:20:27	90	16.52232246	5.98745121	17.3%	
85.8448812	655.303631	137.479272	732.31754	459.355728	450.359753	420.712647	328.673294	65.3982394	64.9138702	86.6749516	65.2809148	65.1610786	83.6123459	84.1780639	66.7013373	0.09625454	0.072980265	0.19867861	-0.3057054	-0.208151152	0.15387633	3.39182963	3.39216402	20.201682		13:30:27	100	14.37429871	6.285043063	18.2%	
86.1270231	614.796776	134.593689	725.457221	480.00231	466.990087	432.058782	327.920547	65.3801873	64.8837035	86.8016667	65.2591038	65.1267396	81.9966897	84.178.02845	66.692893	0.0904876	0.071631778	0.2290705	-0.3103492	-0.217041383	0.08369305	3.40306422	3.40288719	18.2723097		13:40:27	110	12.44492642	6.197415289	17.9%	
85.8934466	575.495072	130.752053	672.99926	487.413292	473.438914	430.613656	331.170899	65.3976205	64.9140863	86.7986739	65.2706924	65.1283073	83.9842985	84.1778.94086	66.8404993	0.08610243	0.073716527	0.23688668	-0.3077718	-0.207231472	0.16511255	3.43886605	3.43720397	16.748638		13:50:27	120	10.92125466	5.601067802	16.2%	
85.6784945	545.553575	127.000015	639.295765	488.264927	467.612063	422.916699	336.48125	65.4384891	64.8910705	86.1045615	65.2518556	65.1487204	84.0349068	84.1777.99996	66.6430874	0.08512222	0.075306813	0.22880004	-0.3553227	-0.161656217	0.15946002	3.43344873	3.44929582	15.483514		14:00:27	130	9.656130726	4.718167989	13.6%	
84.478991	528.253674	124.256052	612.289202	480.237509	456.036452	415.151345	342.883711	65.4734234	64.9397941	85.839541	65.2876279	65.146079	83.6016206	84.177.6767	66.7113843	0.08290525	0.074338934	0.25681929	-0.3289699	-0.158170516	0.162794	3.45837822	3.44369	14.4248546		14:10:27	140	8.597471332	3.84745509	11.1%	
86.4163507	504.692964	121.083632	583.972658	477.481408	447.498884	413.414253	352.286998	65.4746517	64.9435284	85.9564681	65.2976246	65.1844702	87.4534666	84177.6896	66.7797908	0.07957545	0.075256946	0.24930799	-0.3326826	-0.183013231	0.17138959	3.49263108	3.49162629	13.5401436		14:20:27	150	7.712760282	3.209494378	9.3%	
88.3024518	478.092319	118.137887	543.06874	474.593671	439.68368	412.56919	361.409483	65.446483	64.9070009	85.1035646	65.2786395	65.1316617	83.3891347	84177.63905	66.693639	0.07652169	0.073685319	0.26520589	-0.3568214	-0.16124747	0.11078284	3.49180168	3.5133349	12.8308233		14:30:27	160	7.003440008	2.652690718	7.7%	
87.6311465	446.303153	114.907655	495.643656	472.234205	428.084822	409.518647	371.0941	65.5056823	64.9536865	85.4366731	65.3420184	65.1896166	83.6811704	84177.67206	66.9188675	0.07209611	0.075820494	0.26017049	-0.3052626	-0.183013231	0.14470295	3.49851555	3.48697281	12.2952998		14:40:27	170	6.467916457	2.129554875	6.2%	
88.0725465	428.169983	112.572559	463.489297	468.166335	416.272294	405.1004	378.304857	65.4723684	64.9362333	85.8331242	65.3145476	65.1993063	84.1933929	84177.74586	66.988212	0.06904784	0.075747295	0.24945059	-0.3028328	-0.199658305	0.1263857	3.50035137	3.49127552	11.8076715		14:50:27	180	5.980288221	1.732472061	5.0%	
86.9946355	420.358114	110.043676	444.334443	464.496221	405.934556	401.576663	383.405986	65.4182625	64.9288863	85.4344461	65.2829849	65.1802686	84.4169058	84177.71544	67.0497112	0.06861413	0.075787906	0.26076303	-0.3061936	-0.214077979	0.12222559	3.49582902	3.47548416	11.3681517		15:00:27	190	5.540768387	1.46267162	4.2%	
86.6391539	406.857734	108.542091	427.88881	453.103247	398.548225	398.741284	388.195461	65.4701934	64.973312	85.4544457	65.2914958	65.222184	84.4716558	84177.49161	67.1650159	0.06761769	0.0776725	0.26432076	-0.3624871	-0.218585547	0.18134237	3.48240292	3.48457149	11.0001265		15:10:27	200	5.172743212	1.295173245	3.7%	
87.8715657	392.783411	106.584764	412.273664	437.65136	390.657142	390.870037	390.875485	65.449461	64.9592565	84.9039235	65.3425772	65.2260847	84.0685286	84177.44819	67.1739193	0.06600351	0.079234721	0.25759378	-0.3128698	-0.215962756	0.18128091	3.49192953	3.48566314	10.6469928		15:20:27	210	4.819609512	1.160678709	3.4%	
88.9956587	386.669227	105.843952	401.426558	426.234157	382.328139	383.248522	392.156855	65.4318136	64.9132083	84.7421384	65.2606287	65.208018	83.9223925	84177.38405	67.1767275	0.06501115	0.074171779	0.27353348	-0.3024127	-0.170319376	0.19007073	3.5273478	3.5421688	10.3204785		15:30:27	220	4.493095249	1.047673139	3.0%	
88.7096582	376.697561	104.637595	390.13184	417.973417	374.271533	376.422838	392.123689	65.4342578	64.9524019	84.5303512	65.2751816	65.1695421	83.7125825	84177.38717	67.127022	0.06480351	0.076678461	0.26364216	-0.3464438	-0.224048857	0.14291302	3.52767891	3.51890794	10.0155352		15:40:28	230	4.188151907	0.984591304	2.8%	
85.7163934	361.988588	103.960008	371.299963	410.556136	365.891489	368.646717	391.194996	65.3819991	64.9055609	84.3677493	65.2596631	65.1544405	83.3409478	84177.42021	67.1457258	0.06114622	0.077574016	0.274217	-0.3329665	-0.163756721	0.21113188	3.52044708	3.51424298	9.7503653		15:50:28	240	3.922982003	0.896627509	2.6%	
84.4956302	348.584773	101.995457	353.661751	400.556921	355.513322	358.896816	387.852148	65.35119	64.8981314	83.8818084	65.20881	65.1303093	83.199092	84177.39691	67.1049288	0.06045968	0.075525305	0.26739659	-0.3589219	-0.215077138	0.20570555	3.51944229	3.51268908	9.57217162		16:00:28	250	3.744788319	0.74830693	2.2%	
86.3355714	335.47623	99.8821209	339.336676	389.938727	346.675317	351.711879	381.787665	65.3303922	64.8648011	83.5811074	65.1738141	65.1420795	82.885866	84177.31615	67.1525665	0.05804365	0.077662281	0.26025409	-0.3343858	-0.164381195	0.15756437	3.55662755	3.54770741	9.35436021		16:10:28	260	3.526976915	0.661174992	1.9%	
86.5548052	326.479232	98.8383921	328.715618	380.957229	338.490342	344.336305	375.965195	65.3239866	64.8475361	83.2772429	65.1724187	65.123564	82.8310876	84177.22606	67.1924731	0.05722767	0.076520373	0.27555207	-0.3648487	-0.19075671	0.2136127	3.54955143	3.54762382	9.11696533		16:20:28	270	3.285582031	0.633399971	1.8%	
86.2839798	320.028443	97.8769966	318.751259	373.561126	331.14416	337.579501	368.675884	65.3546633	64.851492	85.8331571	65.2068554	65.1250141	85.7918298	84177.13016	67.0804474	0.05672314	0.076748384	0.26535095	-0.3091229	-0.158704158	0.20746106	3.55236253	3.53616959	8.91232022		16:30:28	280	3.084936922	0.659851397	1.9%	
83.8196639	310.850935	97.0712586	308.084914	366.481713	324.137769	330.163799	359.379932	65.2809547	64.7819433	86.0387327	65.1172745	65.0625725	86.693993	84177.00432	66.9417107	0.05466878	0.078785472	0.25547685	-0.3066932	-0.1565923	0.19232781	3.54424721	3.52823129	8.73387657		16:40:28	290	2.906493271	0.620483644	1.8%	
83.4940863	302.385823	95.8145017	296.984327	357.888428	317.508002	322.383223	350.469336	65.2956063	64.8024448	82.514423	65.1502999	65.0776431	86.4478179	84176.9429	66.8820849	0.05206418	0.078110671	0.25903457	-0.3464665	-0.154514504	0.20692752	3.55457208	3.54507825	8.55172439		16:50:28	300	2.724341093	0.565240938	1.6%	
83.2220892	295.52154	94.6534429	288.661169	351.19586	310.726126	315.933964	343.051255	65.3384849	64.8035707	82.9198587	65.1581065	65.1092516	86.0696361	84176.99443	66.7747262	0.05178086	0.076291841	0.27224021	-0.2998353	-0.156932922	0.12729295	3.54027397	3.54113943	8.36880592		17:00:28	310	2.541422623	0.543514299	1.6%	
82.4544702	288.87674	93.8648978	280.604768	345.654995	305.088131	308.858839	336.39664	65.3411944	64.8121276	85.508193	65.155388	65.0877423	85.7206376	84177.04014	66.6973197	0.05059545	0.077289928	0.25878871	-0.3219303	-0.203847958	0.1416763	3.52841816	3.55447537	8.19716465		17:10:28	320	2.369781352	0.536711919	1.6%	
81.940096	279.326776	92.7096792	272.778886	340.484006	300.827592	301.96902	330.553413	65.3410806	64.8433354	86.0474118	65.1339785	65.1218692	85.8366569	84177.10222	66.736429	0.04963621	0.077558335	0.28011786	-0.3417091	-0.155956472	0.12576119	3.60764868	3.5832437	8.01386099		17:20:28	330	2.186477687	0.537863406	1.6%	
81.3627905	273.724615	91.95356	265.699009	335.620172	296.260852	294.64634	324.859115	65.3056489	64.7957846	84.7437195	65.1156638	65.0897745	85.6862789	84177.0287	66.6271618	0.04855153	0.079980553	0.28703661	-0.3029123	-0.19020036	0.15649975	3.60106266	3.58895606	7.84969824		17:30:28	340	2.022314937	0.519107686	1.5%	
81.6750575	269.338927	90.6183575	259.663796	332.358622	292.820989	288.679945	319.8962	65.2467314	64.7781995	83.7356944	65.0755323	65.0872244	85.8060881	84176.91049	66.6442256	0.04810626	0.077637353	0.28222004	-0.3630775	-0.163370682	0.15203723	3.61528701	3.59615807	7.67285683		17:40:28	350	1.845473534	0.524307819	1.5%	
81.318578	264.77597	90.204589	255.225698	329.79865	289.510523	283.633521	315.408993	65.2372852	64.7491226	83.2335218	65.050635	65.0531404	85.5516496	84176.83798	66.5546659	0.04767463	0.078065302	0.28065877	-0.309509	-0.192720965	0.21359303	3.60068074	3.58573846	7.50108853		17:50:28	360	1.673705231	0.512772457	1.5%	
81.0450375	259.931664	89.4308048	249.47469	329.121083	286.003228	279.388911	311.525946	65.1561628	64.7155942	82.9089319	65.031309	64.9995724	85.3659392	84176.77222	66.5228339	0.04745174	0.078526805	0.28550485	-0.3062049	-0.158136454	0.19193934	3.63014898	3.63585643	7.32614032		18:00:28	370	1.49875702	0.523557918	1.5%	
80.9893544	257.34838	88.8724638	244.403586	331.813503	283.534203	275.78941	307.390315	65.1856431	64.6699046	82.7452678	64.9622405	64.9547238	85.3947104	84176.67885	66.4855275	0.04674119	0.07800711	0.30039715	-0.3577638	-0.161020389	0.22927211	3.64493556	3.65302629	7.16205133		18:10:28	380	1.33466803	0.510805503	1.5%	
80.9733053	255.132276	88.3522029	240.475827	333.342785	281.048108	272.967666	304.091982	65.1636229	64.6320085	82.6704525	64.9460645	64.9001282	85.2790741	84176.63862	66.4576778	0.04626355	0.079565805	0.28852166	-0.3329097	-0.161270178	0.11991442	3.64912681	3.62721986	7.00731766		18:20:28	390	1.179934363	0.493770867	1.4%	
80.6234505	253.304231	87.8480709	238.137128	334.508244	278.803951	270.66653	300.925269	65.0975133	64.6460743	82.5457143	64.9430069	64.9016642	85.009392	84176.53884	66.4174809	0.04562274	0.076943757	0.28216103	-0.3579682	-0.214180166	0.21596321	3.65152485	3.63892979	6.8247598		18:30:28	400	0.997376501	0.501380518	1.4%	
80.4089004	252.989472	87.6516739	237.056017	335.927054	276.789792	268.5232	298.365927	65.0588008	64.5910652	82.7577828	64.8930163	64.8441556	84.3168611	84176.45737	66.3128522	0.04537721	0.078738737	0.29426763	-0.3045813	-0.213260486	0.22518085	3.63731689	3.63262407	6.67727927		18:40:28	410	0.849895975	0.484772055	1.4%	
81.4137362	250.436803	84.6961606	233.857054	336.185509	275.847045	267.995669	297.087058	65.0171106	64.5502017	82.3910664	64.8722038	64.816243	84.0886083	4176.341	66.2966438	0.04523973	0.078045831	0.2935251	-0.3302529	-0.214146104	0.17641024	3.63619901	3.65048728	6.48522676		18:50:28	420	0.657843465	0.522090898	1.5%	
82.1590834	249.653766	84.6017573	232.762897	335.112526	274.77966	267.556294	296.501878	65.0295177	64.5254385	82.1300984	64.839927	64.7751952	83.4000536	4176.27605	66.1800809	0.04539494	0.08081091	0.29754015	-0.3077832	-0.212284035	0.23397067	3.64062137	3.6424867	6.30236976		19:00:29	430	0.474986462	0.522390039	1.5%	
82.2982738	247.718512	84.5368997	231.567376	333.591469	273.06475	266.42571	296.231277	64.9673664	64.4920936	82.1218858	64.8103453	64.7502067	83.4737771	4176.2058	66.2035228	0.04598265	0.078870831	0.28887572	-0.3053307	-0.216609938	0.17100112	3.63597772	3.63444022	6.14159591		19:10:29	440	0.314212609	0.535683366	1.5%	
82.5155835	248.498433	84.2254231	231.298261	332.524747	271.900752	264.951299	296.148078	64.9598019	64.4782623	82.1094161	64.7831518	64.7313653	83.4526267	4176.11268	66.1688336	0.04597981	0.080898927	0.29231543	-0.3342041	-0.213794127	0.21396184	3.63249622	3.64622227	5.9910748		19:20:29	450	0.163691501	0.494151964	1.4%	
82.4937765	249.769562	84.3256506	232.401309	330.599957	271.33971	263.687	296.279593	65.0359389	64.4934347	82.0466098	64.8584595	64.7553063	83.4097269	4176.11618	66.1593698	0.04723561	0.078663393	0.28406406	-0.3595577	-0.214264383	0.21379465	3.63302238	3.64658124	5.83972593		19:30:29	460	0.012342633	0.46264383	1.3%	
82.3978068	249.619964	84.3857007	232.4177	330.228417	271.22996	263.564329	296.376548	65.0602387	64.4976917	81.9833322	64.8418351	64.7487044	83.408565	4176.122	66.1423376	0.04641586	0.080122956	0.28078416	-0.3066932	-0.189575886	0.14069282	3.64119998	3.65412615	5.8273833		19:31:29	461	0	0.314212609	0.9%	Loss on 21 min.	

Time	Flue	Room	Tunnel	DGM 1	DGM 1	Filter 1	DGM 2	DGM 2	Filter 2	DGM 3	Filter 3	Meter #1	Meter #2	Draft	Tunnel	CO	CO2	O2	scale
10.0	Temp 1	Temp 2	Dry Bulb 3	In 13	Out 14	15	In 16	Out 17	18	In 19	20	21	22	23	24	% 25	% 25	% 27	Lbs 28
0.0	456.1994	84.95992	145.5502	65.0939	65.08722	81.91029	65.17324	65.26176	84.94255	66.91	83.29	527.379	347.490	0.073239	0.072926				5.85
10.0	713.6104	88.43537	148.3952	65.74918	65.20518	83.78223	65.65818	65.52124	84.88157	66.77	87.52	528.578	348.717	0.100349	0.070207				36.91
20.0	580.6142	89.24327	131.3202	65.70313	65.13908	85.12083	65.47937	65.38167	85.50858	66.61	84.78	529.769	349.920	0.09031	0.070819				34.88
30.0	525.3871	87.25082	124.6608	65.6071	65.15952	83.82677	65.47518	65.35118	82.34968	66.55	84.69	530.968	351.130	0.086274	0.074758				33.34
40.0	541.5268	87.73287	125.9318	65.53423	65.10417	84.15954	65.41315	65.27662	85.91708	66.50	85.05	532.157	352.334	0.086274	0.073501				31.75
50.0	565.6566	87.16365	129.0613	65.50729	65.0505	84.28259	65.37494	65.25427	81.95587	66.44	84.94	533.348	353.542	0.089252	0.072136				30.10
60.0	574.1861	86.75918	129.9976	65.52638	65.03034	85.30794	65.35603	65.24664	87.88611	66.55	85.65	534.547	354.756	0.090625	0.070036				28.34
70.0	587.4025	87.95716	130.2621	65.47048	64.93811	85.34023	65.28135	65.21663	83.64091			535.746	355.968	0.089137	0.070655				26.49
80.0	615.1024	88.41879	132.9773	65.42138	64.93702	85.59584	65.23182	65.17337	84.31039			536.940	357.177	0.091519	0.071399				24.47
90.0	641.9469	85.69682	135.8383	65.39688	64.93673	86.31791	65.31922	65.20523	86.7587			538.100	358.350	0.093912	0.071813				22.35
100.0	655.3036	85.84488	137.4793	65.39824	64.91387	86.67495	65.28091	65.16108	83.61235			539.264	359.535	0.096255	0.07298				20.20
110.0	614.7968	86.12702	134.5937	65.38019	64.8837	86.80167	65.2591	65.12674	81.99669			540.440	360.730	0.090488	0.071632				18.27
120.0	575.4951	85.89345	130.7521	65.39762	64.91409	86.79867	65.27069	65.12831	83.9843			541.614	361.905	0.086102	0.073717				16.75
130.0	545.5536	85.67849	127	65.43849	64.89107	86.10456	65.25186	65.14872	84.03491			542.777	363.094	0.085122	0.075307				15.48
140.0	528.2537	84.47899	124.2561	65.47342	64.93979	85.83954	65.28763	65.14608	83.60162			543.966	364.294	0.082905	0.074339				14.42
150.0	504.693	86.41635	121.0836	65.47465	64.94353	85.95647	65.29762	65.18447	87.45347			545.158	365.508	0.079575	0.075257				13.54
160.0	478.0923	88.30245	118.1379	65.44648	64.907	85.10356	65.27864	65.13166	83.38913			546.349	366.724	0.076522	0.073685				12.83
170.0	446.3032	87.63115	114.9077	65.50568	64.95369	85.43667	65.34202	65.18962	83.68117			547.549	367.938	0.072096	0.07582				12.30
180.0	428.17	88.07255	112.5726	65.47237	64.93623	85.83312	65.31455	65.19931	84.19339			548.800	369.200	0.069048	0.075747				11.81
190.0	420.3581	86.99464	110.0437	65.41826	64.92889	85.43445	65.28298	65.18027	84.41691			549.990	370.405	0.068614	0.075788				11.37
200.0	406.8577	86.63915	108.5421	65.47019	64.97331	85.45445	65.2915	65.22218	84.47166			551.162	371.591	0.067618	0.077672				11.00
210.0	392.7834	87.87157	106.5848	65.44946	64.95926	84.90392	65.34258	65.22608	84.06853			552.348	372.791	0.066004	0.079235				10.65
220.0	386.6692	88.99566	105.844	65.43181	64.91321	84.74214	65.26063	65.20802	83.92239			553.546	374.008	0.065011	0.074172				10.32
230.0	376.6976	88.70966	104.6376	65.43426	64.9524	84.53035	65.27518	65.16954	83.71258			554.757	375.241	0.064804	0.076678				10.02
240.0	361.9886	85.71639	103.96	65.382	64.90556	84.36775	65.25966	65.15444	83.34095			555.964	376.465	0.061146	0.077574				9.75
250.0	348.5848	84.49563	101.9955	65.35119	64.89813	83.88181	65.20881	65.13031	83.19909			557.173	377.691	0.06046	0.075525				9.57
260.0	335.4762	86.33557	99.88212	65.33039	64.8648	83.58111	65.17381	65.14208	82.88587			558.390	378.927	0.058044	0.077662				9.35
270.0	326.4792	86.55481	98.83839	65.32399	64.84754	83.27724	65.17242	65.12356	82.83109			559.611	380.165	0.057228	0.07652				9.12
280.0	320.0284	86.28398	97.877	65.35466	64.85149	85.83316	65.20686	65.12501	85.79183			560.829	381.399	0.056723	0.076748				8.91
290.0	310.8509	83.81966	97.07126	65.28095	64.78194	86.03873	65.11727	65.06257	86.69399			562.047	382.632	0.054669	0.078785				8.73
300.0	302.3858	83.49409	95.8145	65.29561	64.80244	82.51442	65.1503	65.07764	86.44782			563.267	383.865	0.052064	0.078111				8.55
310.0	295.5215	83.22209	94.65344	65.33848	64.80357	82.91086	65.15811	65.10925	86.06964			564.502	385.118	0.051781	0.076292				8.37
320.0	288.8767	82.45447	93.8649	65.34119	64.81213	85.50819	65.15539	65.08774	85.72064			565.706	386.345	0.050595	0.07729				8.20
330.0	279.3268	81.9401	92.70968	65.34108	64.84334	86.04741	65.13398	65.12187	85.83666			566.944	387.602	0.049636	0.077558				8.01
340.0	273.7246	81.36279	91.95356	65.30565	64.79578	84.74372	65.11566	65.08977	85.68628			568.185	388.855	0.048552	0.078981				7.85
350.0	269.3389	81.67506	90.61836	65.24673	64.7782	83.73569	65.07553	65.08722	85.80609			569.427	390.107	0.048106	0.077637				7.67
360.0	264.776	81.31858	90.20459	65.23729	64.74912	83.23352	65.05063	65.05314	85.55165			570.663	391.364	0.047675	0.078065				7.50
370.0	259.9317	81.04504	89.4308	65.15616	64.71559	82.90893	65.03131	64.99957	85.36594			571.913	392.633	0.047452	0.078527				7.33
380.0	257.3484	80.98935	88.87246	65.18564	64.6699	82.74527	64.96224	64.95472	85.39471			573.175	393.907	0.046741	0.078007				7.16
390.0	255.1323	80.97331	88.3522	65.16362	64.63201	82.67045	64.94606	64.90013	85.27907			574.427	395.182	0.046264	0.079566				7.01
400.0	253.3042	80.62345	87.84807	65.09751	64.64607	82.54571	64.94301	64.90166	85.00939			575.675	396.454	0.045623	0.076944				6.82
410.0	252.9895	80.4089	87.65167	65.0588	64.59107	82.75778	64.89302	64.84416	84.31686			576.931	397.733	0.045377	0.078739				6.68
420.0	250.4368	81.41374	84.69616	65.01711	64.5502	82.39107	64.8722	64.81624	84.08861			578.185	399.003	0.04524	0.078046				6.49
430.0	249.6538	82.15908	84.60176	65.02952	64.52544	82.1301	64.83993	64.7752	83.40005			579.434	400.279	0.045395	0.080811				6.30
440.0	247.7185	82.29827	84.5369	64.96737	64.49209	82.12189	64.81035	64.75021	83.47378			580.684	401.546	0.045983	0.078871				6.14
450.0	248.4984	82.51558	84.22542	64.9598	64.47826	82.10942	64.78315	64.73137	83.45263			581.942	402.827	0.04598	0.080899				5.99
460.0	249.7696	82.49378	84.32565	65.03594	64.49343	82.04661	64.85846	64.75531	83.40973			583.195	404.102	0.047236	0.078663				5.84
461.0	249.62	82.39781	84.3857	65.06024	64.49769	81.98333	64.84184	64.7487	83.40857			583.323	404.232	0.046416	0.080123				5.83

Intertek Testing Services

Manufacturer:	**SBI**
Model:	**3.5 Series**
Date:	**2-20-22**
Run:	**1-MED**
Project #:	**G104981354**
Test Duration: (minutes)	**461**

RESULTS

Average emission rate:(gr/hr) 0.995

Burn Rate (Dry kg/hr): 1.70

PRESSURE FACTOR: 1.00618

BAROMETRIC PRESSURE

Average: 30.105
Start: 30.3
End: 29.91

TEMPERATURE FACTORS

DGM #1: 1.00554
DGM #2: 1.00545

DRY GAS METER VALUES

VOLUMES SAMPLED

		Avg sample flow rate (dscfm)			
DGM #1:	57.16783	0.124008309	DGM #1	Final:	583.323
				Initial:	527.379
DGM #2:	57.80564	0.125391847			
			DGM #2	Final:	404.232
TOTAL TUNNEL VOLUME (scf):	135238			Initial:	347.490

SAMPLE RATIOS

TEMPERATURES (DEG. RANKIN)

Sample Train 1:	2365.626	DGM #1:	525.090
Sample Train 2:	2339.525	DGM #2:	525.140

TOTAL EMISSIONS

CALIBRATION FACTORS

Sample Train 1 (g):	**7.570**	DGM #1:	1.0100
Sample Train 2 (g):	**7.720**	DGM #2:	1.0070

EMISSION RATES

TUNNEL FLOW RATE: 293.357

Sample Train 1 (g/hr):	**0.99**
Sample Train 2 (g/hr):	**1.00**

PARTICULATE CATCH (mg)

Total Sample Train 1:	3.2
Total Sample Train 2:	3.3
Filter and seal Sample Train 1:	2.5
Filter and seal Sample Train 2:	2.5
Probe Sample Train 1:	0.7
Probe Sample Train 2:	0.8

MAX Allowed	7.50%
DEVIATION:	0.98%

	Room Temp		Bar Pressure		Relative Humidity		Air Velocity	
	Before	After	Before	After	Before	After	Before	After
	85	0	30.30	29.91	16.9	16.9	0	0

Average Dilution Tunnel Measurements						Sample Data	
Burn	Velocity	Flow Rate	Temp	Total Sample		Particulate Catch	
Time	(Ft/sec)	(dscf/min)	(R)	1	2	1	2
461	15.29	293.36	568.10	57.17	57.81	3.20	3.30

Dilution Tunnel Dual Train Precision					
Sample Ratios		Total Emissions (g)			
Train 1	Train 2	Train 1	Train 2	Deviation (%)	
2365.63	2339.52	7.57	7.72	0.98%	

Burn				Initial		Run	Average
Rate		Surface		Draft		Time	Draft
1.695		0.000		0.073		461.000	0.066

Run	Date	Burn Rate	Emission
1-MED	2022-02-20	1.695	0.995

E&E Boiler Tunnel Traverse Worksheet

Static Pressure: **0.172**

Barometer: 30.3

	TUNNEL VELOCITY	TUNNEL TEMP	SQUARE ROOT
A CENTER	0.099	64.700	0.3146
B CENTER	0.096	64.800	0.3098
A1	0.089	64.400	0.2983
A2	0.099	64.400	0.3146
A3	0.084	64.400	0.2898
A4	0.077	63.800	0.2775
B1	0.082	64.900	0.2864
B2	0.093	65.000	0.3050
B3	0.092	65.100	0.3033
B4	0.072	64.600	0.2683
AVERAGE		64.61	0.2968

PITOT CONSTANT= 0.9505

E&E FUEL LOAD DATA SHEET

			Test Load Weight: Lower	Ideal	Upper	
Firebox Volume:	2.88	cu. ft	32.83	34.56	36.29	
Load Volume:	2.8800	cu. ft	Loading Density:	12.015	lbs./ft3	
Number of Spacers:			Load Density:	12.015	lbs./ft3	

Piece Size: Thick	x Wide	x Length	Weight lbs	Meter Moisture Content Dry Uncorrected %			
2	4	16	6.22	23.20	16.80	19.20	84.00
2	4	15.75	6.40	26.30	19.30	18.10	82.69
2	4	16	6.16	20.90	20.20	16.80	84.00
2	4	16	6.85	21.00	24.50	17.70	84.00
2	4	16	4.80	19.50	24.50	16.90	84.00
2	4	16.25	4.18	22.30	21.20	20.80	85.31
							0.00
							0.00
							0.00

Test Load Weigh 34.602 lbs. **Dry Weigh** 13.024 kg.

Average Moisture Content: %

Dry: 20.51 20.511 Wet: 17.020

Pre-test moisture content: %

#DIV/0! #DIV/0! Wet: #DIV/0!

Coal Bed Range: 7.0 lbs. to 8.6 lbs. 20% to 25% of test load

For Usable Firebox Volumes up to 3.0 ft^3 - Low and Medium Fire

Nominal Required Load Density (wet basis)	12	lb/ft^3				
Usable Firebox Volume	2.88	ft^3				
Total Nom. Load Wt. Target	34.56	lb				
Total Load Wt. Allowable Range	32.83	to	36.29	lb		
Core Target Wt. Allowable Range	15.552	to	22.46	lb		
Remainder Load Wt. Allowable Range	12.10	to	19.01	lb		
						Mid-Point
Core Load Fuel Pc. Wt. Allowable Range	5.18	to	8.64	lb		6.91
Remainder Load Pc. Wt. Allowable Range	3.46	to	10.37	lb		6.91
	Pc. #					Ordre
Core Load Piece Wt. Actual	1	6.215			In Range	
	2	6.399			In Range	
	3	6.164			In Range	
Core Load Total. Wt. Actual		18.78			In Range	
	Pc. #					
Remainder Load Piece Wt.	1	6.846			In Range	
(2 or 3 Pcs.)	2	4.799			In Range	
	3	4.179			In Range	
Remainder Load Piece Weight Ratio - Small/Large		61%			In Range	≤ 67%
Remainder Load Tot. Wt. Act		15.82	lb		In Range	
Total Load Wt. Actual		34.60	lb		In Range	
Core % of Total Wt.		54%			In Range	45-65%
Remainder % of Total Wt.		46%			In Range	35-55%
Actual Load % of Nominal Target		100%			In Range	95-105%
Actual Fuel Load Density		12.0	lb/ft^3			
Allowable Charcoal Bed Wt. Range (lb)	3.5	to	6.9			Mid-Point
Actual Charcoal Bed Wt.		5.9	lb		In Range	5.2
Actual Fuel Load Ending Wt.		0.0	lb		lb	≥ 90%
Total Wt. of Fuel Burned During Test Run lb.		34.6	lb			

Fuel Piece Moisture Reading (%-dry basis)

1	2	3	Ave.		Pc. Wt. Dry Basis			
23.2	16.8	19.2	19.7	In Range	5.19	lb	2.35	kg
26.3	19.3	18.1	21.2	In Range	5.28	lb	2.39	kg
20.9	20.2	16.8	19.3	In Range	5.17	lb	2.34	kg
21	24.5	17.7	21.1	In Range	5.65	lb	2.56	kg
19.5	24.5	16.9	20.3	In Range	3.99	lb	1.81	kg
22.3	21.2	20.8	21.4	In Range	3.44	lb	1.56	kg
Total Load Ave. MC % (dry basis)			20.5	In Range				
Total Load Ave. MC % (wet basis)			17.0					
Total Test Load Weight (dry basis) →					28.72	lb	13.03	kg
Total Fuel Weight Burned During Test Run (dry basis)					28.7	lb	13.03	kg

								6" Tunnel	0.1963	ft²							**(ASTM E2515 Formula)**			
		Manufacturer:		SBI				12" Tunnel	0.7854	ft²										
		Model:		3.5 Series							Tunnel area (ft2):		0.349		Manufacturer:		SBI			
		Date:		2-20-22							Wood moisture (% wet):		17.02		Model:		3.5 Series			
		Run:		1-MED							Load Weight (lbs wet):		34.602		Date:		2-20-22			
		Project #:		G104981354							Burn Rate (Dry kg/hr):		1.695		Run:		1-MED			
		Test Duration:		461							End of test weight (Dry lb)		0.000							
		Total Gas Volume (DGM 1):		57.145							Final Temperature (DGM #1) Degrees Rankin:				525.090					
		Total Gas Volume (DGM 2):		57.782							Final Temperature (DGM #2) Degrees Rankin:				525.140					
		Average Barometric Pressure:		30.105							Final Tunnel Temperature Degrees Rankin:				568.100					
		Molecular Weight:		28.78							Final Tunnel Velocity (feet per second):				15.2926151					
		Pitot Correction:		0.950461585							Standardized Tunnel Flow (dscfm):				293.357326					
		Calibration Factor (DGM #1):		1.0100																
		Calibration Factor (DGM #2):		1.0070									Average	Average						
			(1) VS:	0.028263932									Inlet +	Inlet +						
			(2) VS:	0.027952012				Filter	Filter				Outlet	Outlet	Average	Average	#1	#2		Average
								Face	Face	Delta-P	Tunnel		Temp.	Temp.	99.9	99.9	dDGM	dDGM		0.3
Elapsed	DGM 1	DGM 1	DGM 1	DGM 2	DGM 2	DGM 2	Tunnel	Velocity	Velocity	(in. H2O)	Velocity		Meter 1	Meter 2	Proportional Rates		Vol.Std.	Vol.Std.		SQRT
Time	Reading	Inlet T	Outlet T	Reading	Inlet T	Outlet T	Dry Bulb	DGM 1	DGM 2	Tunnel	Ft/Sec		Deg. R	Deg. R	PR1	PR2	(ft3)	(ft3)	Time	Delta-P
0.00	527.38	65.09	65.09	347.49	65.17323511	65.26176	145.5502			0.073	15.479		525.1	525.2					0	0.27004852
10.00	528.58	65.75	65.21	348.72	65.65817567	65.52124	148.3952	10.55	10.76	0.070	15.224		525.5	525.6	106.09	107.02	1.224	1.248	10	0.26496676
20.00	529.77	65.70	65.14	349.92	65.47936517	65.38167	131.3202	10.48	10.56	0.071	15.074		525.4	525.4	103.47	103.05	1.216	1.224	20	0.26611913
30.00	530.97	65.61	65.16	351.13	65.47517611	65.35118	124.6608	10.55	10.62	0.075	15.400		525.4	525.4	100.82	100.32	1.224	1.232	30	0.27341855
40.00	532.16	65.53	65.10	352.33	65.41315179	65.27662	125.9318	10.47	10.57	0.074	15.286		525.3	525.3	100.97	100.81	1.214	1.226	40	0.27111117
50.00	533.35	65.51	65.05	353.54	65.37493909	65.25427	129.0613	10.48	10.60	0.072	15.184		525.3	525.3	102.38	102.38	1.216	1.230	50	0.26858093
60.00	534.55	65.53	65.03	354.76	65.35603342	65.24664	129.9976	10.55	10.65	0.070	14.973		525.3	525.3	104.68	104.51	1.224	1.236	60	0.26464284
70.00	535.75	65.47	64.94	355.97	65.28134632	65.21663	130.2621	10.56	10.64	0.071	15.043		525.2	525.2	104.27	103.92	1.224	1.234	70	0.26580977
80.00	536.94	65.42	64.94	357.18	65.23182298	65.17337	132.9773	10.51	10.61	0.071	15.157		525.2	525.2	103.54	103.38	1.219	1.231	80	0.26720577
90.00	538.10	65.40	64.94	358.35	65.31922234	65.20523	135.8383	10.21	10.30	0.072	15.237		525.2	525.3	100.55	100.23	1.185	1.194	90	0.26797934
100.00	539.26	65.40	64.91	359.54	65.28091477	65.16108	137.4793	10.25	10.40	0.073	15.382		525.2	525.2	100.23	100.60	1.189	1.207	100	0.2701486
110.00	540.44	65.38	64.88	360.73	65.25910382	65.12674	134.5937	10.35	10.49	0.072	15.202		525.1	525.2	101.97	102.16	1.201	1.217	110	0.26764114
120.00	541.61	65.40	64.91	361.91	65.27069243	65.12831	130.7521	10.34	10.31	0.074	15.372		525.2	525.2	100.02	98.70	1.199	1.196	120	0.27150788
130.00	542.78	65.44	64.89	363.09	65.25185565	65.14872	127	10.24	10.44	0.075	15.487		525.2	525.2	97.71	98.50	1.188	1.211	130	0.27442087
140.00	543.97	65.47	64.94	364.29	65.2876279	65.14608	124.2561	10.47	10.53	0.074	15.351		525.2	525.2	100.29	99.81	1.214	1.222	140	0.27265167
150.00	545.16	65.47	64.94	365.51	65.29762458	65.18447	121.0836	10.49	10.66	0.075	15.404		525.2	525.2	99.66	100.08	1.217	1.236	150	0.27432999
160.00	546.35	65.45	64.91	366.72	65.27863949	65.13166	118.1379	10.49	10.67	0.074	15.203		525.2	525.2	100.39	101.06	1.216	1.238	160	0.2714504
170.00	547.55	65.51	64.95	367.94	65.34201844	65.18962	114.9077	10.56	10.65	0.076	15.379		525.2	525.3	99.41	99.17	1.225	1.236	170	0.27535521
180.00	548.80	65.47	64.94	369.20	65.31454758	65.19931	112.5726	11.01	11.08	0.076	15.340		525.2	525.3	103.49	102.93	1.278	1.285	180	0.27522226
190.00	549.99	65.42	64.93	370.41	65.28298486	65.18027	110.0437	10.48	10.58	0.076	15.311		525.2	525.2	98.21	98.05	1.215	1.227	190	0.27529603
200.00	551.16	65.47	64.97	371.59	65.2914958	65.22218	108.5421	10.32	10.41	0.078	15.479		525.2	525.3	95.40	95.19	1.197	1.207	200	0.27869786
210.00	552.35	65.45	64.96	372.79	65.34257717	65.22608	106.5848	10.44	10.53	0.079	15.607		525.2	525.3	95.43	95.18	1.211	1.222	210	0.28148663
220.00	553.55	65.43	64.91	374.01	65.26062865	65.20802	105.844	10.55	10.68	0.074	15.091		525.2	525.2	99.57	99.73	1.224	1.239	220	0.27234496
230.00	554.76	65.43	64.95	375.24	65.27518162	65.16954	104.6376	10.66	10.82	0.077	15.327		525.2	525.2	98.88	99.27	1.237	1.255	230	0.27690876
240.00	555.96	65.38	64.91	376.47	65.25966311	65.15444	103.96	10.63	10.74	0.078	15.407		525.1	525.2	97.94	97.92	1.233	1.246	240	0.27852112
250.00	557.17	65.35	64.90	377.69	65.20881002	65.13031	101.9955	10.65	10.76	0.076	15.176		525.1	525.2	99.26	99.24	1.235	1.248	250	0.27481868
260.00	558.39	65.33	64.86	378.93	65.17381406	65.14208	99.88212	10.72	10.85	0.078	15.360		525.1	525.2	98.36	98.49	1.243	1.259	260	0.27867953
270.00	559.61	65.32	64.85	380.17	65.17241869	65.12356	98.83839	10.75	10.87	0.077	15.232		525.1	525.1	99.33	99.29	1.247	1.261	270	0.27662316
280.00	560.83	65.35	64.85	381.40	65.2068554	65.12501	97.877	10.73	10.83	0.077	15.242		525.1	525.2	98.85	98.73	1.244	1.257	280	0.27703499
290.00	562.05	65.28	64.78	382.63	65.11727448	65.06257	97.07126	10.73	10.83	0.079	15.432		525.0	525.1	97.52	97.32	1.244	1.256	290	0.2806875
300.00	563.27	65.30	64.80	383.87	65.15029985	65.07764	95.8145	10.74	10.82	0.078	15.348		525.0	525.1	97.98	97.62	1.246	1.256	300	0.27948286
310.00	564.50	65.34	64.80	385.12	65.15810654	65.10925	94.65344	10.88	11.00	0.076	15.153		525.1	525.1	100.25	100.27	1.262	1.276	310	0.27620978
320.00	565.71	65.34	64.81	386.35	65.15538798	65.08774	93.8649	10.60	10.77	0.077	15.241		525.1	525.1	97.03	97.49	1.230	1.250	320	0.27801066
330.00	566.94	65.34	64.84	387.60	65.13397854	65.12187	92.70968	10.90	11.04	0.078	15.251		525.1	525.1	99.48	99.59	1.265	1.280	330	0.27849297
340.00	568.19	65.31	64.80	388.86	65.11566382	65.08977	91.95356	10.93	11.00	0.079	15.380		525.1	525.1	98.77	98.32	1.268	1.276	340	0.28103479
350.00	569.43	65.25	64.78	390.11	65.07553229	65.08722	90.61836	10.94	10.99	0.078	15.230		525.0	525.1	99.59	98.98	1.269	1.275	350	0.2786348
360.00	570.66	65.24	64.75	391.36	65.05063497	65.05314	90.20459	10.89	11.04	0.078	15.266		525.0	525.1	98.81	99.07	1.263	1.280	360	0.27940169
370.00	571.91	65.16	64.72	392.63	65.03130896	64.99957	89.4308	11.01	11.14	0.079	15.300		524.9	525.0	99.59	99.67	1.277	1.293	370	0.28022635
380.00	573.18	65.19	64.67	393.91	64.96224049	64.95472	88.87246	11.12	11.19	0.078	15.242		524.9	525.0	100.83	100.36	1.289	1.298	380	0.27929753
390.00	574.43	65.16	64.63	395.18	64.94606452	64.90013	88.3522	11.03	11.20	0.080	15.386		524.9	524.9	99.01	99.42	1.279	1.299	390	0.28207411
400.00	575.68	65.10	64.65	396.45	64.94300691	64.90166	87.84807	10.99	11.17	0.077	15.124		524.9	524.9	100.33	100.82	1.275	1.296	400	0.27738738
410.00	576.93	65.06	64.59	397.73	64.89301631	64.84416	87.65167	11.07	11.23	0.079	15.296		524.8	524.9	99.81	100.21	1.284	1.303	410	0.28060424
420.00	578.19	65.02	64.55	399.00	64.87220378	64.81624	84.69616	11.05	11.16	0.078	15.188		524.8	524.8	99.84	99.69	1.282	1.294	420	0.27936684
430.00	579.43	65.03	64.53	400.28	64.83992698	64.7752	84.60176	11.00	11.21	0.081	15.453		524.8	524.8	97.72	98.43	1.277	1.300	430	0.2842726
440.00	580.68	64.97	64.49	401.55	64.81034533	64.75021	84.5369	11.01	11.13	0.079	15.265		524.7	524.8	99.00	98.94	1.278	1.291	440	0.28083951
450.00	581.94	64.96	64.48	402.83	64.78315183	64.73137	84.22542	11.09	11.25	0.081	15.456		524.7	524.8	98.36	98.75	1.286	1.305	450	0.28442737
460.00	583.20	65.04	64.49	404.10	64.85845953	64.75531	84.32565	11.04	11.20	0.079	15.242		524.8	524.8	99.34	99.67	1.281	1.299	460	0.28046995
461.00	583.32	65.06	64.50	404.23	64.84183509	64.7487	84.3857	11.28	11.42	0.080	15.384		524.8	524.8	100.55	100.70	0.131	0.132	461	0.28305999

Time	Flue	Room	Tunnel	DGM 1	DGM 1	Filter 1	DGM 2	DGM 2	Filter 2	DGM 3	Filter 3	Meter #1	Meter #2	Draft	Tunnel	CO	CO2	O2	scale
10.0	Temp 1	Temp 2	Dry Bulb 3	In 13	Out 14	15	In 16	Out 17	18	In 19	20	21	22	23	24	% 25	% 25	% 27	Lbs 28
0.0	456.1994	84.95992	145.5502	66.90751	66.90751	83.28633						356.134		0.073239	0.072926				5.85
10.0	713.6104	88.43537	148.3952	66.77128	66.77128	87.52102						357.377		0.100349	0.070207				36.91
20.0	580.6142	89.24327	131.3202	66.60925	66.60925	84.7822						358.616		0.09031	0.070819				34.88
30.0	525.3871	87.25082	124.6608	66.54748	66.54748	84.69039						359.839		0.086274	0.074758				33.34
40.0	541.5268	87.73287	125.9318	66.50009	66.50009	85.05319						361.069		0.086274	0.073501				31.75
50.0	565.6566	87.16365	129.0613	66.43727	66.43727	84.94217						362.301		0.089252	0.072136				30.10
60.0	574.1861	86.75918	129.9976	66.55108	66.55108	85.64647						363.542		0.090625	0.070036				28.34

Intertek Testing Services

Manufacturer:	**SBI**
Model:	**3.5 Series**
Date:	**2-20-22**
Run:	**1-Med**
Project #:	**G104981354**
Test Duration: (minutes)	**60**

RESULTS

Average emission rate:(gr/hr) #DIV/0!

Burn Rate (Dry kg/hr): 10.370

PRESSURE FACTOR: 1.00618

BAROMETRIC PRESSURE

Average: 30.105
Start: 30.3
End: 29.91

TEMPERATURE FACTORS

DGM #1: 1.00262
DGM #2: 1.14783

DRY GAS METER VALUES

VOLUMES SAMPLED

Avg sample flow rate (dscfm) DGM #1 Final: 363.542

DGM #1: 7.34632 0.122438711 Initial: 356.134
DGM #2: 0.00000 0 DGM #2 Final: 0.000

TOTAL TUNNEL VOLUME (scf): 16779 Initial: 0.000

SAMPLE RATIOS

TEMPERATURES (DEG. RANKIN)

Sample Train 1: 2284.027 DGM #1: 526.618
Sample Train 2: #DIV/0! DGM #2: 460.000

TOTAL EMISSIONS

CALIBRATION FACTORS

Sample Train 1 (g): **6.167** DGM #1: 0.9830
Sample Train 2 (g): **#DIV/0!** DGM #2: 0.0000

EMISSION RATES

TUNNEL FLOW RATE: 279.653

Sample Train 1 (g/hr): **6.17**
Sample Train 2 (g/hr): **#DIV/0!**

PARTICULATE CATCH (mg)

Total Sample Train 1: 2.7
Total Sample Train 2: 0
Filter and seal Sample Train 1: 2
Filter and seal Sample Train 2:
Probe Sample Train 1: 0.7
Probe Sample Train 2:

MAX Allowed 7.50%

DEVIATION: #DIV/0!

								6" Tunnel	0.1963	ft^2						**(ASTM E2515 Formula)**				
		Manufacturer:		SBI				12" Tunnel	0.7854	ft^2										
		Model:		3.5 Series							Tunnel area (ft2):		0.349		Manufacturer:		SBI			
		Date:		2-20-22							Wood moisture (% wet):		17.02		Model:		3.5 Series			
		Run:		1-Med							Load Weight (lbs wet):		34.602		Date:		2-20-22			
		Project #:		G104981354							Burn Rate (Dry kg/hr):		10.370		Run:		1-Med			
		Test Duration:		60							End of test weight (Dry lb)		5.852							
		Total Gas Volume (DGM 1):		7.344							Final Temperature (DGM #1) Degrees Rankin:				526.618					
		Total Gas Volume (DGM 2):		0.000							Final Temperature (DGM #2) Degrees Rankin:				460.000					
		Average Barometric Pressure:		30.105							Final Tunnel Temperature Degrees Rankin:				593.560					
		Molecular Weight:		28.78							Final Tunnel Velocity (feet per second):				15.2315554					
		Pitot Correction:		0.950461585							Standardized Tunnel Flow (dscfm):				279.653274					
		Calibration Factor (DGM #1):		0.9830										Average	Average					
		Calibration Factor (DGM #2):												Inlet +	Inlet +					
			(1) VS:	0.209650253										Outlet	Outlet	Average	Average	#1	#2	Average
			(2) VS:	#DIV/0!				Filter	Filter					Temp.	Temp.	99.9	#DIV/0!	dDGM	dDGM	0.3
Elapsed	**DGM 1**	**DGM 1**	**DGM 1**	**DGM 2**	**DGM 2**	**DGM 2**	**Tunnel**	**Face Velocity**	**Face Velocity**	**Delta-P**	**Tunnel Velocity**			**Meter 1**	**Meter 2**	**Proportional Rates**		**Vol.Std.**	**Vol.Std.**	**SQRT**
Time	**Reading**	**Inlet T**	**Outlet T**	**Reading**	**Inlet T**	**Outlet T**	**Dry Bulb**	**DGM 1**	**DGM 2**	**(in. H2O)**	**Ft/Sec**			**Deg. R**	**Deg. R**	**PR1**	**PR2**	**(ft3)**	**(ft3)**	**Time**	**Delta-P**
0.00	356.13	66.91	66.91	0.00	0	0	145.5502			0.073	15.479			526.9	460.0					0	0.27004852
10.00	357.38	66.77	66.77	0.00	0	0	148.3952	10.62	0.00	0.070	15.224			526.8	460.0	103.14	#DIV/0!	1.232	0.000	10	0.26496676
20.00	358.62	66.61	66.61	0.00	0	0	131.3202	10.59	0.00	0.071	15.074			526.6	460.0	100.98	#DIV/0!	1.228	0.000	20	0.26611913
30.00	359.84	66.55	66.55	0.00	0	0	124.6608	10.45	0.00	0.075	15.400			526.5	460.0	96.49	#DIV/0!	1.212	0.000	30	0.27341855
40.00	361.07	66.50	66.50	0.00	0	0	125.9318	10.51	0.00	0.074	15.286			526.5	460.0	97.99	#DIV/0!	1.220	0.000	40	0.27111117
50.00	362.30	66.44	66.44	0.00	0	0	129.0613	10.53	0.00	0.072	15.184			526.4	460.0	99.37	#DIV/0!	1.222	0.000	50	0.26858093
60.00	363.54	66.55	66.55	0.00	0	0	129.9976	10.61	0.00	0.070	14.973			526.6	460.0	101.62	#DIV/0!	1.230	0.000	60	0.26464284

Ambiant	Flue	Dilution Tunne	Firebox Top	Firebox Back	Firebox Right	Firebox Left	Firebox Botto	DGM Inlet 1	DGM Outlet 1	Probe Temp 1	DGM inlet 2	DGM outlet 2	Probe Temp 2	Probe Temp	DGM inlet 3	Manomètre Draft	Manomètre Tun	Transmetteu	Transmetteur	Transmetteur p	Transmetteur V	Massflow 1	Massflow 2	Balance	Date	Weight for BR	time for BR	10 min	minutes
66.6053747	68.4448296	69.3764667	68.0733113	69.8106731	68.2092503	68.5765759	68.7191528	64.8754616	64.9381025	82.7643909	64.9105407	65.0855105	86.2895148	83.5585687	65.7860881	-0.000767462	0.087070336	-0.2072342	-0.30807836	-0.215565363	-0.333964994	-0.03055945	0.18569396	14.3189752	09:00:21			1	0
66.6634126	154.098079	86.4688573	78.8362852	69.8565411	68.2351385	68.5728595	68.6854212	65.1723998	64.9515015	83.2217708	65.0500524	65.1607082	87.8725687	84.3177088	65.8904819	0.031215741	0.085490499	0.19937688	-0.32993496	-0.210251656	0.156428451	3.5252071	3.5388971	14.2178984	09:01:21				1
66.7842466	197.904106	76.7905641	94.0349879	70.3467109	68.5055639	68.8274014	68.6277178	65.2402877	64.9438118	82.4036826	65.0887141	65.1864238	85.1375266	83.6147039	65.8953182	0.043645887	0.085933832	0.19593963	-0.36138574	-0.212136432	0.048523846	3.53717929	3.59240643	14.0588702	09:02:21				2
66.8095418	290.542814	81.433659	115.670179	71.2619383	69.1577858	69.4682723	68.520416	65.2284392	64.9586881	81.6813492	65.0643375	65.129061	83.2777247	82.7144262	65.8438176	0.06165441	0.082961636	0.20455488	-0.35537944	-0.208628023	0.130236008	3.52190098	3.51687706	13.9639852	09:03:21				3
67.0576446	374.441706	87.7176954	151.895506	72.8791659	70.3801495	70.7650038	68.4577322	65.2399848	64.9405858	81.7611381	65.0616864	65.1272451	82.5213728	82.1876687	65.8332362	0.072291408	0.08045554	0.22273199	-0.3081919	-0.212488409	0.167944963	3.51061395	3.50807166	13.7905122	09:04:21				4
67.196887	481.525475	97.1253438	202.913039	75.6101681	72.1600243	73.0088682	68.3905075	65.2490726	64.9221131	82.3010207	65.0503136	65.0962469	82.6818964	82.3001926	65.8239545	0.086178582	0.082961239	0.24592975	-0.3044337	-0.215792444	0.14755995	3.49949247	3.48512223	13.5511831	09:05:21				5
67.3615594	564.144555	106.792819	273.024424	79.7703087	74.8383846	76.9042433	68.3395351	65.2660868	64.9082271	83.1474336	65.0744281	65.1090865	83.7163963	83.0675583	65.8347028	0.09423483	0.079748719	0.25459909	-0.33279618	-0.213782773	0.053293708	3.41644114	3.41813927	13.2430885	09:06:21				6
67.6221015	631.929182	116.309017	343.317883	85.4994061	78.6537716	82.5731785	68.3285385	65.2955758	64.9289512	84.1547442	65.0951506	65.0959858	84.9991971	84.0393368	65.8896472	0.097307227	0.077388526	0.2926744	-0.33403378	-0.212386222	0.133665883	3.5221321	3.54262775	12.8937453	09:07:21				7
67.907184	670.967298	123.112608	405.401326	93.4480888	83.9406957	90.5905434	68.3350205	65.3166805	64.9254209	85.1672763	65.1200153	65.0903679	86.2885366	85.1867067	65.9115811	0.100596744	0.07815132	0.30178139	-0.30744253	-0.211704978	0.250770912	3.49673709	3.49812543	12.5265848	09:08:21				8
68.1595605	711.817384	130.089903	466.169729	103.84649	90.7538653	101.20823	68.4589363	65.3643628	64.9267582	86.3043206	65.168537	65.1038146	87.63425	86.4617304	65.9646771	0.102882311	0.077026613	0.3330412	-0.33417003	-0.212147787	0.153072336	3.4739483	3.45970264	12.1514048	09:09:21				9
68.517889	746.850387	134.786038	524.242469	116.309077	98.7723453	113.250127	68.6613037	65.3398958	64.920661	86.8964605	65.1465731	65.0709932	88.2610587	87.2607245	66.0124279	0.102717603	0.075950583	0.34906695	-0.35868347	-0.214929535	0.217347456	3.46153354	3.427679	11.7692217	09:10:21			1	10
68.9496833	765.654756	138.547619	574.031757	130.533141	107.501128	125.573716	69.0422181	65.3414778	64.8938462	86.8980255	65.1489904	65.0817621	88.1305411	87.5022026	65.9952264	0.105612565	0.075200752	0.34786465	-0.3078967	-0.209275206	0.216201706	3.4182114	3.38501906	11.3946113	09:11:21				11
69.2854813	760.269776	139.726239	615.501513	144.250469	116.970808	137.665921	69.7397071	65.3296447	64.9329587	86.5120689	65.1542764	65.0924766	86.7533162	86.450926	65.9658657	0.105560465	0.077900255	0.37953014	-0.33100224	-0.20842365	0.287351327	3.52729371	3.52936065	11.0351137	09:12:21				12
69.7454757	769.897306	142.188533	648.791461	157.21692	127.341099	148.985619	70.6548779	65.3458633	64.9266296	85.8897424	65.1496182	65.0832251	84.5217843	84.8931197	65.9516088	0.10533293	0.074561804	0.368557	-0.33021881	-0.213351318	0.248061433	3.54103124	3.53431082	10.6735344	09:13:21				13
70.1717512	777.701428	144.327966	673.553245	169.232431	138.173616	160.092717	71.9027885	65.3379913	64.9187563	85.5802485	65.0974836	65.0740995	84.0486801	84.6376364	65.9103458	0.105604009	0.076024107	0.37761482	-0.35704849	-0.211886643	0.265923829	3.52230257	3.50998616	10.3047675	09:14:21				14
70.7798765	782.302093	145.66789	694.662176	180.220357	149.115135	171.977258	73.531706	65.3300521	64.8857591	85.2028402	65.0653242	65.0344233	83.8463849	84.6401114	65.8506479	0.105017406	0.074915376	0.38662592	-0.30597786	-0.212738198	0.18058018	3.50123322	3.49313429	9.94186051	09:15:21				15
71.0905836	796.7035	148.641274	714.351019	191.084763	160.638995	183.248946	75.7460458	65.3004535	64.8745296	84.9544126	65.0332165	65.0127549	83.8075422	84.6930879	65.7876611	0.103856674	0.074796885	0.37262613	-0.35359685	-0.184125931	0.186498251	3.48928562	3.4916394	9.57377387	09:16:21				16
71.7755225	787.445871	149.016434	728.683443	202.038705	172.826438	194.57624	78.5562211	65.304279	64.8929722	84.5273275	64.9911081	64.9927784	83.5908132	84.5571031	65.7480716	0.106145224	0.074232298	0.38040052	-0.3055464	-0.211670915	0.309216473	3.53453866	3.51435936	9.21187083	09:17:21				17
72.2031891	802.982983	152.452028	742.37406	213.30061	185.31908	205.743656	82.0648877	65.2856975	64.8819043	84.1763942	65.0042608	64.9808758	83.4941973	84.5920461	65.7290763	0.10562894	0.074039284	0.37731978	-0.31216583	-0.194787407	0.312043969	3.5117138	3.51530185	8.82770844	09:18:21				18
72.4504731	796.560712	151.894174	751.621663	224.845947	198.124312	216.824785	86.178221	65.2761837	64.8590251	83.8513426	64.9947458	64.9521513	83.2911104	84.5776609	65.7429417	0.105329439	0.075127199	0.38423116	-0.30487651	-0.202405991	0.252558381	3.509242	3.50993699	8.44860686	09:19:21				19
72.8761234	809.688673	154.195433	757.408867	236.412275	211.057169	227.582791	90.9821279	65.2632365	64.8661211	83.7081936	64.9809619	64.9371143	83.2803477	84.699235	65.7166387	0.107946609	0.074057045	0.37783364	-0.35743452	-0.216746187	0.32072315	3.5064145	3.5095436	8.07543482	09:20:21			1	20
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73.7850428	833.163193	158.757714	781.748704	259.667381	237.622844	248.142589	102.321471	65.2975519	64.8549229	83.1881394	64.9760282	64.9434557	83.2154529	84.7067549	65.7200557	0.107996398	0.07423253	0.392008	-0.35641266	-0.211080504	0.199389172	3.49659449	3.49016419	7.31871097	09:22:21				22
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74.562562	839.638997	160.154839	807.747594	283.097928	264.452273	266.962455	115.675306	65.2625061	64.8035829	82.7167397	64.9238557	64.8933705	83.1476093	84.8833441	65.6916959	0.105543287	0.072809	0.38665297	-0.360432	-0.215962756	0.205179391	3.47774944	3.4744679	6.56870754	09:24:21				24
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75.5525342	837.980998	160.567785	828.743061	307.254511	290.557635	284.567052	131.309123	65.2663097	64.8190807	82.361586	64.9447815	64.9155494	83.2022823	85.0099086	65.7113621	0.106954314	0.074304276	0.38395087	-0.32376969	-0.21332861	0.204026264	3.50062674	3.49274418	5.86133373	09:26:21				26
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76.1827219	818.037652	159.116742	835.027513	331.333922	315.255991	300.919131	149.051549	65.269234	64.8295228	82.1326189	64.9330903	64.8959235	82.9452714	85.0496008	65.7238874	0.104713069	0.073570037	0.39263251	-0.35145093	-0.209252498	0.307170842	3.49140337	3.50419021	5.24532901	09:28:21				28
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77.2337698	803.242926	157.557248	830.389178	368.098071	348.779683	324.366532	177.546628	65.2718198	64.8128985	82.7474983	64.9264892	64.8634304	84.1936685	85.3006216	65.848783	0.104940474	0.073915105	0.39035822	-0.34571712	-0.210069991	0.318230037	3.49400467	3.48307004	4.40286648	09:31:21				31
77.7851263	790.826079	156.923998	827.086455	379.945491	359.032825	331.721729	187.530306	65.2915912	64.8268272	83.3295545	64.9425052	64.8903047	85.2503337	85.4528867	65.8785675	0.102672855	0.074532212	0.37929656	-0.35827473	-0.211591437	0.210172994	3.4525249	3.44555533	4.14937126	09:32:21				32
77.710827	783.077141	155.922657	823.592814	391.856874	369.046257	338.78373	197.505252	65.2786363	64.8355859	83.9145854	64.9662969	64.8886229	86.3926043	85.6826851	65.9637091	0.103626278	0.073793085	0.379717	-0.33392024	-0.210353843	0.233274861	3.43574023	3.43132934	3.88979898	09:33:21				33
78.040816	773.558033	154.142657	814.765983	404.103174	378.608988	345.633763	207.582969	65.2924874	64.8268884	84.5826431	64.9609407	64.8661444	87.585057	86.047667	66.0067743	0.09918829	0.073533677	0.37564295	-0.35876295	-0.210944255	0.305083412	3.451884	3.43185877	3.64068433	09:34:21				34
76.5352794	761.883855	151.580619	803.080386	416.979821	387.454181	351.774955	217.599867	65.3013415	64.7998288	85.1934299	64.9618618	64.8775059	88.6525694	86.4092869	66.0076949	0.100502256	0.075219084	0.38015465	-0.33574824	-0.214452664	0.204562259	3.43926927	3.45891094	3.42192223	09:35:21				35
77.4127274	744.217155	146.67167	789.670029	430.536877	395.687497	358.357419	227.497553	65.3219703	64.8016691	85.7028482	64.9753946	64.8876983	88.8120157	86.3962342	66.0195518	0.097840763	0.076218935	0.37701736	-0.29988072	-0.209911034	0.216917185	3.44618803	3.43779897	3.24265082	09:36:21				36
74.4612298	724.2543	143.847383	776.09157	443.855981	403.203052	364.866271	238.056392	65.3640652	64.8258162	85.8788304	65.0116499	64.8734245	86.8332183	85.8470092	66.0474423	0.095204956	0.077068669	0.37134515	-0.3069316	-0.208968646	0.197026369	3.45985016	3.44750753	3.07917241	09:37:21				37
74.7411968	667.67556	245.324738	752.624058	457.865996	410.928546	371.124855	248.779922	65.3492483	64.8343825	87.0490304	64.9905668	64.8799026	86.3418355	86.7231421	66.0610126	0.084847578	0.068252105	0.39086963	-0.31803589	-0.210864776	0.342856293	3.42620542	3.45884865	56.2499959	09:38:21	25.75	0		38
75.1050196	677.194772	186.126608	725.631238	472.848837	415.443865	375.807861	260.573074	65.3322906	64.8207619	88.6241473	65.0036729	64.895515	87.9542789	88.7161687	66.0624256	0.098551096	0.073135787	0.40835584	-0.36062502	-0.210717173	0.281172635	3.42759212	3.4539116	32.2649375	09:39:21	25.72	1		39
76.2036561	744.881031	166.66681	705.764937	480.377863	418.334814	380.540086	270.960737	65.4213806	64.8351196	87.1269895	65.0485129	64.9182243	85.0977252	87.5250675	66.1051574	0.100982488	0.072991844	0.40889184	-0.35874024	-0.194560325	0.255353913	3.43223741	3.46708855	31.9865972	09:40:21	25.68	2	1	40
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76.4118474	848.980193	169.159131	735.668034	479.799786	422.814141	388.128965	288.010915	65.4657513	64.8870189	84.4412008	65.0569796	64.9220978	81.3662963	85.8807118	66.090664	0.10853754	0.070976208	0.40066751	-0.34659138	-0.210342489	0.251837984	3.45565891	3.45496556	31.20577	09:42:21	24.90	4		42
77.0861826	867.987448	172.311172	756.583128	477.132567	424.91378	392.352247	296.534214	65.5175233	64.8790866	84.4523695	65.1212881	64.9559258	82.8056518	86.3798647	66.1194657	0.106479762	0.071724373	0.39997908	-0.33351149	-0.216155775	0.305339116	3.44715348	3.68262074	30.7934925	09:43:21	24.48	5		43
77.6894522	878.835131	172.857889	772.185658	474.496005	427.443256	396.77019	302.931658	65.4763303	64.9113816	84.4161129	65.1335365	64.9326793	84.6096571	86.7187549	66.1417258	0.108479736	0.073134051	0.40236647	-0.30592109	-0.21628067	0.343731588	3.43405848	3.69362093	30.3842678	09:44:21	24.07	6		44
79.1213224	882.890417	174.84105	791.113581	472.79526	430.249668	401.67898	309.438855	65.47688	64.9282179	84.5407264	65.1641507	64.9490979	86.0512375	87.0935087	66.188186	0.107663671	0.071748777	0.4076379	-0.33185379	-0.213510276	0.338560959	3.44996294	3.44560286	29.9567218	09:45:21	23.65	7		45
79.3805329	884.449542	175.821591	805.851785	472.181763	433.363707	406.380372	315.00275	65.4840036	64.9052759	84.3869055	65.1620891	64.9503769	86.0715111	87.0456266	66.2362087	0.108422129	0.073830613	0.40070193	-0.36129491	-0.209979158	0.320064221	3.43624344	3.42963448	29.5414037	09:46:21	23.23	8		46
79.3976337	881.178873	176.054942	815.158061	472.61237	436.396478	410.207595	319.693778	65.5116586	64.9241683	84.0503181	65.1872427	64.95173	84.3812146	86.5797991	66.2772095	0.107002283	0.074988466	0.40390807	-0.35861535	-0.211001025	0.331462716	3.44281143	3.41650834	29.1135708	09:47:21	22.80	9		47
79.020942	881.176375	176.126112	822.742604	473.79611	439.940747	415.085417	324.054241	65.4885551	64.8939595	83.7742492	65.2175827	64.9620286	82.9491194	86.1227087	66.3033612	0.105689096	0.074852471	0.39904478	-0.36032981	-0.209559058	0.30523831	3.44454071	3.43373721	28.7535077	09:48:21	22.44	10		48
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81.1632367	872.588085	177.275201	833.411196	478.528818	446.809785	424.460954	330.766193	65.5349833	64.9462464	83.6589044	65.2243499	64.9955225	83.2769825	86.3607859	66.2784068	0.105693407	0.074262409	0.41482712	-0.30504682	-0.210444675	0.249143258	3.46163845	3.42425486	27.9913952	09:50:22	21.68	12	1	50
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81.7946425	865.106854	177.305153	837.76362	485.730143	452.892243	433.030991	336.211744	65.5188448	64.9372029	83.4488543	65.2295041	64.9914903	83.7757183	87.1056984	66.2393193	0.107495833	0.075223797	0.40613073	-0.33079787	-0.211920705	0.254825294	3.39342614	3.40288719	27.2592665	09:52:22	20.95	14		52
82.5067829	863.085401	177.399777	837.288295	490.132473	455.708266	437.241727	337.791902	65.5609521	64.9885081	83.1189787	65.2924937	65.0169041	83.782693	85.7658348	66.2926813	0.103565508	0.071473754	0.40700602	-0.34375286	-0.214725161	0.314015839	3.40708827	3.39932209	26.8953719	09:53:22	20.59	15		53
82.5421998	856.802746	177.124823	836.360432	494.76099	458.369885	441.183497	339.370518	65.5895707	64.9912436	83.0136697	65.268924	65.0066944	83.7671996	85.0931179	66.3000059	0.106640356	0.073122788	0.4070429	-0.35676463	-0.211409772	0.325812642	3.39775344	3.40053832	26.5359112	09:54:21	20.23	16		54
82.955253	848.840396	176.32022	835.744267	499.632023	460.827896	445.121037	340.946578	65.62124	65.0321082	83.1112849	65.2805561	65.060086	84.1030508	85.3249795	66.3249876	0.10625966	0.07393063	0.39445932	-0.31019022	-0.214146104	0.330602174	3.39243119	3.39680111	26.1765611	09:55:22	19.87	17		55
83.9475314	844.239268	176.075699	833.756225	504.632353	463.165792	448.893888	341.780836	65.6158306	64.9924552	83.0264591	65.2609496	65.0396424	84.1746276	85.5308488	66.2319365	0.103947154	0.072795285	0.40624383	-0.30776045	-0.212794969	0.266309843	3.42429092	3.41727709	25.8432445	09:56:22	19.53	18		56
83.8111656	848.003883	176.972641	832.645512	509.553174	465.289042	452.230985	342.760288	65.6168201	65.0377091	82.9516988	65.3024403	65.0519068	84.3580099	85.604574	66.2558804	0.106373448	0.070447594	0.40835338	-0.30828274	-0.209297914	0.322586839	3.42461711	3.41022393	25.5018633	09:57:22	19.19	19		57
84.1442171	845.304524	175.851501	832.40097	514.236673	467.506697	455.534876	343.548189	65.6210405	65.0273152	82.8830362	65.2949703	65.0410954	84.425469	85.795976	66.2275457	0.105513119	0.072933465	0.42447011	-0.32173731	-0.199317682	0.260337681	3.40672931	3.40088254	25.1640678	09:58:22	18.85	20		58
85.2720884	840.877452	175.705479	831.496586	518.535212	469.445565	458.739143	343.928949	65.5886993	65.0091634	82.8948456	65.2576139	65.0392294	84.4314788	85.9755493	66.2185857	0.105314424	0.073016061	0.40718796	-0.3714341	-0.212613304	0.241216436	3.40395754	3.40225449	24.8227112	09:59:22	18.51	21		59
85.1184416	841.111841	175.623032	831.359036	523.132753	471.465302	461.393488	344.63278	65.5930163	65.0243387	83.0957213	65.2552509	65.0644264	84.5288071	86.1484156	66.2475255	0.104438433	0.072783784	0.40543	-0.36084075	-0.215996818	0.332015922	3.39934176	3.38549768	24.4961559	10:00:22	18.19	22	1	60
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85.3519412	835.397245	174.794727	831.302948	532.753207	474.764548	466.172419	345.415656	65.6129837	65.0681131	83.641459	65.2819019	65.0605968	84.9517535	78.9268103	66.2215779	0.102580867	0.073808393	0.41687275	-0.33466961	-0.211239461	0.340451693	3.39937454	3.41788357	23.8504256	10:02:22	17.54	24		62
85.8226619	828.103554	174.790647	831.026341	537.799162	476.008456	468.250984	345.719069	65.6392305	65.0688944	83.9297644	65.3240188	65.0897731	85.2716917	78.1534805	66.2661811	0.102522432	0.069986507	0.42624037	-0.35547027	-0.214373185	0.316184405	3.40151196	3.46116474	23.5359139	10:03:22	17.23	25		63
86.0774028	827.193432	174.527377	828.626925	542.925308	477.28855	470.051413	346.109079	65.6344058	65.0828593	84.1967544	65.2870434	65.0786836	85.3446302	4175.76701	66.2617751	0.102583359	0.07412001	0.42773525	-0.3060914	-0.21787024	0.349236599	3.39608153	3.43448466	23.2228774	10:04:22	16.91	26		64
86.0456502	823.306403	172.946824	826.001799	548.434086	478.21539	471.562538	346.672795	65.6482483	65.1042214	84.5016368	65.3205119	65.1271876	85.5286385	4175.84803	66.2802045	0.102128935	0.07247796	0.42604367	-0.32404219	-0.211477896	0.277469845	3.4070686	3.41557076	22.9026942	10:05:22	16.59	27		65
84.7870684	821.238707	173.223639	822.177708	554.174087	478.63218	472.196494	346.325539	65.6763171	65.1289566	84.7415833	65.3811515	65.1423186	85.709355	4175.89191	66.3036745	0.104109878	0.073851192	0.41452224	-0.35732098	-0.21444131	0.323245768	3.40289047	3.40722268	22.5920385	10:06:22	16.28	28		66
84.7053563	819.356367	172.468563	819.149118	560.181251	479.141807	473.516958	346.694585	65.6894219	65.0852754	85.0481287	65.3529236	65.1575513	85.9235919	4175.96098	66.2858921	0.102885933	0.072584597	0.41816602	-0.35812712	-0.215020367	0.289448591	3.40579664	3.40128412	22.3116575	10:07:22	16.00	29		67
85.0268298	819.047066	173.044345	814.455309	566.518039	479.592841	474.393966	346.532562	65.6896239	65.1251466	85.3600366	65.3840222	65.1660676	86.1560237	4176.0455	66.3182296	0.100176553	0.071138931	0.42257446	-0.36222594	-0.210115407	0.267563776	3.40484267	3.40830123	22.0061569	10:08:22	15.70	30		68
85.2799179	815.97519	170.306353	811.13766	572.99959	480.454031	476.135144	345.729925	65.6679937	65.1118623	85.5990275	65.3790898	65.1473553	86.0412281	4176.0861	66.3254022	0.102525883	0.074808794	0.41329289	-0.3093046	-0.211262169	0.333201011	3.40524917	3.40720465	21.7316644	10:09:22	15.42	31		69
86.4893924	816.193015	171.637369	808.506442	579.634175	481.303705	477.683523	346.024885	65.668697	65.1179941	85.9472938	65.3898137	65.1555748	85.9981221	4176.14409	66.3081596	0.101329049	0.074350757	0.41533607	-0.30746524	-0.212159141	0.317519475	3.40710794	3.39999905	21.421943	10:10:22	15.11	32	1	70
87.3833073	815.045704	171.405087	806.424958	586.49836	482.144802	479.4172	345.673749	65.68677	65.1089298	86.1660081	65.394946	65.1648833	86.0515492	4176.22442	66.3304008	0.101866617	0.074820723	0.41885937	-0.30542151	-0.209831555	0.292113813	3.40435257	3.39182308	21.108886	10:11:22	14.80	33		71
88.1500479	813.555106	172.060482	803.132704	593.268421	483.080476	481.047459	345.856585	65.7144047	65.1578672	86.5197528	65.4113114	65.1996228	86.09006	4176.29253	66.3601141	0.10290798	0.074390672	0.41895772	-0.30939544	-0.207731052	0.344348719	3.40209057	3.39013969	20.7764791	10:12:22	14.47	34		72
88.1059505	810.648821	171.547412	801.752688	599.833152	483.969782	482.564552	345.93462	65.7295028	65.1566843	86.7449585	65.4468694	65.1838255	86.1008725	4176.34849	66.3860583	0.102359421	0.071919193	0.40999579	-0.33362503	-0.212284035	0.32916138	3.39946961	3.39994168	20.4826818	10:13:22	14.17	35		73
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88.9472764	809.198264	172.131709	798.186663	612.197187	486.061782	485.574576	346.105085	65.7494038	65.1523721	87.1991463	65.4463153	65.2195983	86.0366886	4176.49061	66.4551972	0.098814274	0.072867192	0.416322	-0.36121543	-0.209695306	0.285404044	3.39115923	3.39612743	19.8785648	10:15:22	13.57	37		75
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89.2725987	804.027938	171.397672	792.8027	623.639566	488.096703	488.745356	346.514434	65.7771857	65.1780737	87.568535	65.4523909	65.2269272	85.9550966	4176.56872	66.5063395	0.101155859	0.075432318	0.42110662	-0.35301779	-0.212170495	0.303632784	3.41467252	3.40096613	19.2881141	10:17:22	12.98	39		77
89.207351	803.028068	172.451675	790.54401	629.304722	489.242822	490.222902	346.747433	65.8017457	65.1796748	87.5903498	65.4452242	65.2418896	86.0951121	4176.62117	66.497507	0.100932888	0.071652809	0.42239497	-0.33574824	-0.214452664	0.323555563	3.41786882	3.41440534	18.9936243	10:18:22	12.68	40		78
89.5230537	802.035829	171.956389	788.437417	634.61318	490.332062	491.760174	347.14665	65.81274	65.1810684	87.4067458	65.4695804	65.2775216	86.0382276	4176.68698	66.5151747	0.102567123	0.072209225	0.424566	-0.35930795	-0.211625499	0.313138086	3.4103485	3.41128608	18.6997123	10:19:22	12.39	41		79
89.7919382	800.415282	171.273663	787.232925	639.601734	491.457456	493.075126	347.371319	65.8060357	65.1927346	87.1874442	65.4478449	65.269563	85.9010072	4176.72172	66.5013784	0.100065437	0.074662968	0.4192208	-0.33250098	-0.214270999	0.293547231	3.40327075	3.4070391	18.4155162	10:20:22	12.11	42	1	80
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89.7641521	796.693869	171.625938	782.07555	648.828256	493.209406	495.96457	348.216733	65.840109	65.1984239	86.6937213	65.4656412	65.2848555	85.6661096	4176.83145	66.4966317	0.10162578	0.073555251	0.41277165	-0.35896732	-0.213873606	0.346507451	3.39537998	3.39360809	17.8190704	10:22:22	11.51	44		82
88.2443403	797.861926	172.877914	780.094085	653.404277	493.795737	496.327454	348.605083	65.837737	65.2332131	86.438551	65.4803863	65.3050297	85.6922789	4176.8843	66.5092834	0.101158842	0.071864044	0.40491859	-0.30405902	-0.209922388	0.346787742	3.37950175	3.40681126	17.5564043	10:23:22	11.25	45		83
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87.4513959	797.190695	170.846002	777.433028	664.672237	495.721169	499.840484	349.733416	65.8457724	65.2579523	85.7250324	65.5218225	65.3076391	85.9461309	4177.05198	66.5936816	0.100929831	0.073026925	0.41646461	-0.35604933	-0.206482103	0.260915474	3.39047407	3.40276589	16.8082121	10:26:22	10.50	48		86
86.6198119	795.374013	170.936026	776.920331	668.003357	496.520429	501.053827	350.316435	65.8756244	65.2807141	85.4685731	65.5470866	65.3516942	86.0017173	4177.12279	66.6293654	0.099309315	0.073646268	0.41278149	-0.34139122	-0.231903876	0.273243354	3.39182308	3.39901885	16.5401901	10:27:22	10.23	49		87
87.2966055	794.209258	170.531905	774.759795	671.179744	497.158995	502.381316	350.871848	65.8475025	65.2692863	85.2005519	65.5135331	65.3323338	86.0011514	4177.16052	66.6250384	0.098598762	0.073896282	0.39564441	-0.34517212	-0.214384539	0.273592488	3.39071011	3.39275082	16.2594648	10:28:22	9.95	50		88
87.9171716	788.175596	169.686116	773.626749	674.253577	498.042363	503.282037	351.54233	65.8533496	65.2329633	85.0190609	65.486399	65.3156357	86.0168572	4177.20341	66.6237896	0.100828541	0.072758651	0.40304753	-0.33011662	-0.215883277	0.314333011	3.38774329	3.37765773	16.0222544	10:29:22	9.71	51		89
86.917867	787.29793	170.110996	771.663017	677.38576	498.796599	504.424855	352.248867	65.8829583	65.3085091	84.8193276	65.5101676	65.3364835	85.9362475	4177.26646	66.6763381	0.098849171	0.073463737	0.41570487	-0.30587567	-0.212704136	0.292949768	3.38320618	3.38487317	15.7470653	10:30:22	9.44	52	1	90
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87.4222127	792.956014	169.531125	771.391273	683.912304	500.018341	507.214133	353.791343	65.8976688	65.2944137	84.4563491	65.5403277	65.3365842	85.7169008	4177.34919	66.6822806	0.098813209	0.074452918	0.41134315	-0.33663386	-0.210194886	0.276235582	3.403692	3.39873528	15.2172049	10:32:22	8.91	54		92
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87.4196802	793.727582	169.598734	775.333028	691.577139	501.477141	510.169706	355.61351	65.8917693	65.2738989	84.2093777	65.5469519	65.3486369	85.5602009	4177.39925	66.6551022	0.101429986	0.075681358	0.4199707	-0.32790258	-0.210887484	0.296522248	3.40119725	3.39587172	14.6950935	10:34:22	8.39	56		94
87.0339891	795.629747	168.499643	776.391848	695.251269	502.252137	511.666005	355.77374	65.943548	65.3453156	84.1233611	65.5803696	65.3737071	85.4787922	4177.48829	66.6947621	0.097790918	0.073137135	0.42071568	-0.32734623	-0.212897155	0.268259586	3.40678012	3.39217713	14.4258709	10:35:22	8.12	57		95
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87.7562358	796.397672	170.049872	780.389691	702.792056	503.780781	514.927793	358.297018	65.9502609	65.3511954	83.7175704	65.5979381	65.4029677	85.5267738	4177.57332	66.7139908	0.098702691	0.072679369	0.41616956	-0.36232813	-0.214316415	0.277757512	3.39583566	3.38371103	13.9091932	10:37:22	7.60	59		97
87.8923757	799.234258	169.45652	782.332737	706.531319	504.706933	516.667215	359.465079	65.9693648	65.3352324	83.5114261	65.6178799	65.4254163	85.5163444	4177.63706	66.72516	0.098226467	0.0744779	0.41433292	-0.35970534	-0.213657878	0.30266406	3.40001216	3.39778786	13.6601359	10:38:22	7.35	60		98
87.020786	800.660533	168.711502	782.149516	710.144878	505.42974	517.982299	360.02513	65.9823803	65.3499218	83.4068137	65.6442565	65.4158895	85.4060552	4177.65663	66.7227324	0.10247493	0.076038631	0.43218056	-0.35742317	-0.209661244	0.302110854	3.40182667	3.40448206	13.3932572	10:39:22	7.08	61		99
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89.8122292	806.047994	170.449284	793.03064	723.351161	510.801776	526.727151	365.13385	66.0164987	65.3949053	82.9854146	65.6717007	65.4583667	85.0438083	4177.79884	66.756422	0.099906056	0.073532688	0.42290638	-0.30646608	-0.213760065	0.287651288	3.39802718	3.37950503	12.2983977	10:43:22	5.99	65		103
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88.7825477	789.12587	168.271152	800.799523	722.098466	520.924256	536.288733	377.824795	66.076561	65.4374491	82.7461304	65.7346945	65.5259589	85.2434477	4178.05933	66.8331539	0.098975007	0.076356816	0.43911653	-0.31032647	-0.209615828	0.348358846	3.39963352	3.399268	10.6188039	10:50:22	4.31	72	1	110
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89.554807	775.294469	166.351631	791.937337	718.756572	523.89008	536.534152	382.017188	66.1445711	65.5342857	82.6993317	65.7885221	65.5601699	84.9354191	4178.15882	66.8932131	0.098048638	0.076255236	0.44145229	-0.30407037	-0.214270999	0.291710588	3.38519772	3.39361464	10.211075	10:52:22	3.90	74		112
89.2102025	770.200847	166.17345	787.303216	716.657397	525.151753	536.564918	384.14623	66.1506606	65.4773353	82.7426263	65.7712358	65.5771155	84.8227841	4178.19976	66.8671735	0.096740704	0.074009006	0.44158014	-0.33221713	-0.216882436	0.320710857	3.37918212	3.39526361	10.0258289	10:53:22	3.72	75		113
89.040808	766.587963	165.407172	783.513877	714.48687	526.542302	535.731836	386.059865	66.1858863	65.5234266	82.9406451	65.7822561	65.5802046	84.9271455	4178.2365	66.8998844	0.096850493	0.074937473	0.44104415	-0.30579619	-0.212624658	0.362218491	3.3773381	3.38991021	9.84148032	10:54:22	3.53	76		114
89.2700762	762.135576	164.821055	780.569949	712.356718	527.881991	534.794508	388.373289	66.1569789	65.5141328	83.2840412	65.7775552	65.5763383	84.9799605	4178.263	66.9056167	0.09685137	0.076047337	0.44889721	-0.30690889	-0.187498091	0.391110578	3.38547637	3.37012922	9.66235643	10:55:22	3.35	77		115
89.5248003	755.64317	163.664925	776.296337	710.19223	529.107451	533.599508	390.428076	66.1693004	65.5122631	83.6268719	65.8007323	65.6020223	85.0459142	4178.3144	66.9379608	0.096528355	0.076873761	0.44114495	-0.33867759	-0.214350477	0.395012521	3.41402506	3.39468827	9.48923175	10:56:22	3.18	78		116
89.5791616	747.475793	162.939039	772.020765	708.272962	530.157433	532.284945	392.845099	66.1900843	65.5067511	83.9341786	65.792299	65.5915009	85.1467072	4178.31181	66.950393	0.094248926	0.077601446	0.45349496	-0.35565193	-0.197251241	0.3714853	3.41532981	3.40400507	9.3468653	10:57:22	3.04	79		117
89.5813263	743.821551	161.88037	766.821756	706.192701	531.026187	530.579943	395.113263	66.1953692	65.5416795	84.185541	65.8117777	65.6364472	85.2197414	4178.35362	66.9861329	0.09505677	0.074886258	0.45843939	-0.3522003	-0.214543496	0.371967204	3.40766853	3.39288687	9.17487981	10:58:22	2.86	80		118
89.0947299	737.900434	162.129099	761.217165	704.220461	531.486854	528.944769	397.160575	66.2081013	65.5581727	84.4959453	65.824512	65.6546096	85.2402071	4178.38398	67.0151316	0.093178756	0.076576984	0.45224103	-0.3584791	-0.209933742	0.387220927	3.40692928	3.38921195	9.02703048	10:59:22	2.72	81		119
89.086636	733.871865	160.244484	754.722949	701.977906	531.66914	526.949625	399.080532	66.2257853	65.5929786	84.7574506	65.845956	65.648085	85.2172101	4178.41098	67.0545037	0.092031244	0.077475769	0.45684616	-0.35422132	-0.212760907	0.30886488	3.40180373	3.39326059	8.89212617	11:00:22	2.58	82	1	120
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88.9549412	729.474229	157.159774	742.967394	697.335826	531.68759	522.36244	403.29496	66.2384234	65.6365133	85.2284882	65.9258012	65.6866091	85.2876035	4178.49133	67.0729778	0.09601952	0.078200679	0.47375212	-0.36180584	-0.208105736	0.312995482	3.39674702	3.39288195	8.61701495	11:02:22	2.31	84		122
89.0919727	728.184105	155.442437	737.436445	694.798296	531.731243	520.167756	405.470039	66.2597656	65.6073474	85.3124632	65.9200145	65.6762298	85.2128355	4178.50439	67.0780412	0.094240009	0.076199373	0.45940074	-0.35919441	-0.210081345	0.384066426	3.42800191	3.39864513	8.4983339	11:03:22	2.19	85		123
88.8540487	724.7916	154.17711	733.339293	692.48659	531.51665	518.006382	407.471426	66.2707567	65.6542441	85.4547999	65.9305898	65.6964078	85.1563369	4178.52813	67.0919485	0.091789341	0.078195153	0.45768703	-0.36052283	-0.205800859	0.359966329	3.43250951	3.42474988	8.37688272	11:04:22	2.07	86		124
88.6819481	716.921305	152.719964	728.253831	690.157531	531.296988	515.716997	409.694212	66.2728094	65.6233173	85.583314	65.9184507	65.6976262	85.1116538	4178.57501	67.0848222	0.093584399	0.076942574	0.44521409	-0.360977	-0.21812003	0.400923216	3.41994723	3.41679519	8.26696281	11:05:22	1.96	87		125
88.7298039	708.76123	150.704149	722.306327	687.969776	531.120533	513.41701	411.73072	66.2611125	65.6441797	85.7374663	65.9334666	65.7297591	85.1070951	4178.62517	67.1106771	0.0926008	0.078628902	0.44742199	-0.33231931	-0.208276047	0.317674373	3.40952074	3.40924537	8.17265969	11:06:22	1.86	88		126
88.4894196	696.555915	151.969121	715.081449	685.738727	531.121138	511.229387	413.694969	66.2721654	65.6226731	85.7926328	65.9566261	65.7287086	85.0535488	4178.65874	67.089602	0.091892573	0.076148679	0.45474398	-0.36222594	-0.210614987	0.398393223	3.41438731	3.41316944	8.06897256	11:07:22	1.76	89		127
88.1019859	686.706604	151.673729	706.170102	683.633398	530.587402	508.987323	416.241089	66.2718722	65.65369	85.8882205	65.9642636	65.7217361	85.0921211	4178.69783	67.1247701	0.089950338	0.077711086	0.4395886	-0.35771838	-0.215020367	0.328200032	3.41299077	3.42157653	7.97425146	11:08:22	1.66	90		128
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88.2754907	666.079176	149.702949	686.385366	678.190419	528.481258	504.406462	421.106902	66.3183463	65.7076914	86.0945717	66.0124138	65.7807451	84.8905039	4178.76287	67.1653856	0.088233008	0.076531281	0.4493324	-0.36170366	-0.210490092	0.38364599	3.42572844	3.4384202	7.82185765	11:10:22	1.51	92	1	130
88.205592	656.492614	148.575562	674.246271	674.896832	527.04769	502.298341	423.35933	66.2948287	65.7217384	86.1638451	66.0030846	65.7588915	84.8816759	4178.79981	67.1869325	0.087962347	0.077625333	0.44911357	-0.35201863	-0.224455603	0.318679978	3.44786158	3.45221674	7.74905579	11:11:22	1.44	93		131
88.1865603	649.398622	147.316154	662.111166	671.000918	525.209417	499.629818	425.792085	66.3047994	65.7033249	86.2373476	66.0097175	65.7747089	84.8435907	4178.83048	67.2006538	0.086975821	0.075580478	0.45255574	-0.35939878	-0.214100687	0.362616799	3.45655223	3.43613362	7.68786715	11:12:22	1.38	94		132
87.888992	641.410773	147.006366	650.722035	666.932354	522.724654	496.923131	428.095895	66.3152864	65.7280081	86.2766523	66.0181189	65.7906252	84.8655581	4178.86943	67.2236516	0.084524268	0.077017061	0.454058	-0.30754472	-0.212420284	0.328942557	3.44285732	3.44991705	7.61712239	11:13:22	1.31	95		133
87.9748408	634.774766	146.267591	639.643033	662.624399	520.265384	494.346551	430.166501	66.3248689	65.7221474	86.3253898	66.0297896	65.8219166	84.840733	4178.93091	67.235733	0.086460422	0.076207982	0.44463876	-0.30527391	-0.214918181	0.339443629	3.45654896	3.44688138	7.56859191	11:14:22	1.26	96		134
87.7573668	629.291294	145.040497	629.613443	658.162977	517.671585	491.614667	432.205181	66.340397	65.7326703	86.2986198	66.044485	65.8290996	84.8040183	4178.97641	67.2157955	0.082631149	0.077508452	0.45025687	-0.33210358	-0.213567046	0.400372469	3.45271012	3.442777	7.50448562	11:15:22	1.19	97		135
87.9995278	624.33198	144.512008	619.76902	653.641612	514.91975	488.789375	434.914306	66.3310471	65.7429381	86.3067163	66.0388903	65.8176604	84.7509235	4178.99308	67.2364855	0.082945575	0.076974877	0.44881853	-0.29797324	-0.20903677	0.334966352	3.4461995	3.44914829	7.44367398	11:16:22	1.13	98		136
88.2050828	617.361148	143.870189	610.406559	649.147897	512.088962	486.01092	437.422374	66.3197718	65.7362517	86.2897694	66.0317876	65.8260019	84.7443004	4179.03839	67.2727715	0.084459211	0.075191444	0.44995199	-0.30199258	-0.205494299	0.325239767	3.45192826	3.47769371	7.38907873	11:17:22	1.08	99		137
88.1734062	613.362226	142.484664	601.574603	644.531546	509.228152	483.325505	439.370052	66.3482576	65.7593183	86.2828512	66.0669554	65.8473978	84.7369631	4179.08635	67.2874788	0.082700033	0.075885829	0.45297372	-0.3101448	-0.210785298	0.412779028	3.45844215	3.48614341	7.33084052	11:18:22	1.02	100		138
88.0750084	610.766714	142.191749	593.174623	639.788781	506.374985	480.606349	440.877404	66.333908	65.734946	86.252531	66.0417517	65.8443156	84.7103398	4179.09575	67.2869015	0.082460368	0.079009749	0.44109332	-0.29544128	-0.186260497	0.329466258	3.45395094	3.48908237	7.28143311	11:19:22	0.97	101		139
88.0193285	605.552282	141.338039	585.908485	635.421421	503.566433	477.756068	443.162607	66.352735	65.7483513	86.2257207	66.0367899	65.8456148	84.6839212	4179.09827	67.2765195	0.083005558	0.078372892	0.43892721	-0.30564859	-0.225046015	0.397994915	3.44392767	3.48101294	7.22085094	11:20:22	0.91	102	1	140
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87.3680956	601.544165	140.073122	573.286611	627.060114	497.993955	472.6213	446.676708	66.4135172	65.7745025	86.2454069	66.080468	65.8897141	84.5311801	4179.16517	67.3130813	0.080778582	0.080001648	0.46723905	-0.3225321	-0.211035087	0.355641491	3.51221538	3.51283988	7.10713235	11:22:22	0.80	104		142
88.0369622	600.081476	139.74589	567.891375	623.186205	495.463691	469.964878	447.14669	66.4223112	65.7741154	86.2470896	66.1059587	65.9097806	84.4253378	4179.17575	67.3302147	0.082724243	0.079223887	0.45917946	-0.35809306	-0.216905144	0.41130873	3.49923676	3.50173315	7.04744351	11:23:22	0.74	105		143
87.7420485	600.217784	139.706946	564.229351	619.267136	492.870854	467.456771	449.702404	66.4446856	65.8131939	86.2469304	66.1128932	65.9004364	84.3465975	4179.20376	67.338814	0.082710409	0.078175455	0.46577367	-0.34996354	-0.221526252	0.329345782	3.49858275	3.49915481	6.99449559	11:24:22	0.68	106		144
87.5307969	596.912735	139.152295	561.378131	615.483671	490.300561	465.433779	451.148307	66.4323087	65.8237724	86.1582361	66.123053	65.9110146	84.3591466	4179.22509	67.354808	0.082497076	0.078574661	0.46838726	-0.3375876	-0.220527094	0.398196527	3.50283793	3.5063473	6.94022406	11:25:22	0.63	107		145
87.4326727	595.458516	138.72852	557.96618	611.745602	487.860002	462.921285	452.562642	66.3999075	65.7754995	86.0236773	66.0960732	65.8957201	84.3295165	4179.20271	67.3341007	0.0821331	0.078151839	0.4680037	-0.3621124	-0.211909351	0.418554495	3.51292676	3.50769794	6.8741959	11:26:22	0.56	108		146
87.2838597	594.41826	138.416765	555.131214	608.038153	485.634351	460.836655	453.336016	66.4181124	65.7820212	85.9817851	66.1084374	65.9348	84.3152983	4179.25502	67.3635607	0.083583671	0.079421613	0.47470118	-0.36132897	-0.208843751	0.338811746	3.5075832	3.50380993	6.83018122	11:27:22	0.52	109		147
87.4230942	593.043247	138.150886	551.625059	604.521952	483.183979	458.593365	454.094555	66.4307073	65.8384505	85.9025165	66.1519198	65.9290314	84.2235517	4179.26893	67.3723958	0.080671694	0.077430916	0.46017277	-0.35838827	-0.20873021	0.394803533	3.50583261	3.51057461	6.76786158	11:28:22	0.46	110		148
87.4689691	579.095046	137.045297	547.715266	601.069352	480.949433	456.661984	455.838836	66.4340872	65.8167853	85.8132926	66.1598913	65.9386733	84.1838848	4179.30057	67.4003854	0.08104217	0.077239389	0.44937174	-0.33543033	-0.204529203	0.333006774	3.50873387	3.49846309	6.72718252	11:29:22	0.42	111		149
86.8312313	572.527969	136.287054	542.786153	597.488213	478.562569	454.376613	457.552877	66.4640399	65.877636	85.7313695	66.2036207	65.9623716	84.0452212	4179.32144	67.3873601	0.080810324	0.079551346	0.46048748	-0.30730629	-0.213589754	0.388295376	3.50926167	3.51733437	6.67320604	11:30:22	0.36	112	1	150
87.0973963	567.165351	135.686664	537.413203	594.289943	476.360372	452.622864	457.972575	66.4704799	65.8632064	85.6935249	66.2355204	65.9788308	83.8844803	4179.35416	67.4238309	0.08044647	0.078524287	0.46669568	-0.30854388	-0.209967804	0.361030943	3.51516089	3.50588834	6.62738422	11:31:22	0.32	113		151
86.9795456	562.332711	134.822108	531.395723	590.799729	474.021654	450.697487	459.425521	66.4644921	65.8668178	85.6160924	66.2433047	65.9920423	83.715542	4179.36683	67.4328624	0.079407255	0.078880799	0.45341383	-0.33114984	-0.213953084	0.32401288	3.52117977	3.50421315	6.59614245	11:32:22	0.29	114		152
86.7366338	551.581584	133.834837	524.648968	587.449002	471.630923	448.768925	460.746362	66.5020087	65.8772122	85.2341092	66.269974	66.0061927	83.4763505	4179.39427	67.4457521	0.078683949	0.078671288	0.46586464	-0.30132269	-0.214679745	0.39065572	3.52119616	3.51701966	6.56005705	11:33:22	0.25	115		153
87.0240988	542.621099	132.669214	517.05894	583.867058	469.029665	446.924372	461.841124	66.5574982	65.909342	84.7474646	66.325052	66.02079	83.2988184	4179.43877	67.4803616	0.077104453	0.078397286	0.44402408	-0.32852705	-0.209752077	0.317084287	3.51620337	3.508329	6.52665982	11:34:22	0.22	116		154
86.2162764	539.913227	131.609892	509.289939	580.004785	466.672374	445.187806	462.399994	66.5877416	65.9166365	84.3154992	66.3377705	66.0451973	82.9865554	4179.46668	67.4893193	0.077323235	0.075382755	0.45593153	-0.37985882	-0.229144836	0.383073114	3.53469601	3.45673418	6.49368876	11:35:22	0.18	117		155
86.7444595	534.082175	130.99901	501.343412	575.840801	464.269933	443.08719	461.981512	66.5983815	65.9160094	83.8036007	66.3571757	66.0641877	82.7148178	4179.47194	67.5037089	0.075677657	0.076593557	0.45567828	-0.33902957	-0.207492616	0.397205674	3.52375648	3.45609328	6.45707884	11:36:22	0.15	118		156
86.6469207	526.699058	130.38614	493.406613	571.455807	461.904842	441.353167	462.219177	66.6304603	65.9823256	83.3968283	66.405951	66.1196476	82.4850117	4179.53821	67.6279533	0.07514644	0.076163355	0.46366411	-0.31678694	-0.204222643	0.299453008	3.5239417	3.45411321	6.41407632	11:37:22	0.10	119		157
86.5267339	520.368058	129.728663	485.949379	566.884734	459.365345	439.237424	462.490036	66.6747186	65.9798481	82.9023013	66.4481273	66.1313611	82.227101	4179.56821	67.6375732	0.075625828	0.079425821	0.47457824	-0.35712796	-0.216167129	0.390471318	3.54232288	3.44784519	6.3744627	11:38:22	0.06	120		158
86.4333739	514.567002	129.222993	478.693712	562.309549	456.862527	437.254422	462.753819	66.6972583	66.0082385	82.5405201	66.5028022	66.1526542	81.8858981	4179.56256	67.6721983	0.073274007	0.07992149	0.45995886	-0.33174025	-0.212874447	0.329176133	3.53059983	3.54180819	6.33968451	11:39:22	0.03	121		159
86.1563739	511.267002	128.528993	471.165812	557.750549	454.342527	435.044422	462.943819	66.5272583	66.0215152	82.0005201	66.5020125	66.1420542	81.4358981	4179.56256	67.6721983	0.073274007	0.07992149	0.46586464	-0.33543033	-0.216905144	0.325239767	3.52729371	3.54262775	6.310000000	11:40:22	0.00	122	1	160

Time	Flue	Room	Tunnel	DGM 1	DGM 1	Filter 1	DGM 2	DGM 2	Filter 2	DGM 3	Filter 3	Meter #1	Meter #2	Draft	Tunnel	CO	CO2	O2	scale
10.0	Temp 1	Temp 2	Dry Bulb 3	In 13	Out 14	15	In 16	Out 17	18	In 19	20	21	22	23	24	% 25	% 25	% 27	Lbs 28
0.0	68.44483	66.60537	69.37647	64.87546	64.9381	82.76439	64.91054	65.08551	86.28951	65.79	83.56	583.899	404.480	-0.00077	0.08707				14.32
10.0	746.8504	68.51789	134.786	65.3399	64.92066	86.89646	65.14657	65.07099	88.26106	66.01	87.26	585.100	405.696	0.102718	0.075951				11.77
20.0	809.6887	72.87612	154.1954	65.26324	64.86612	83.70819	64.98096	64.93711	83.28035	65.72	84.70	586.299	406.900	0.107947	0.074057				8.08
30.0	804.0019	77.01859	157.8226	65.29047	64.80232	82.18846	64.93638	64.88835	83.28665	65.77	85.25	587.487	408.103	0.10346	0.07335				4.67
40.0	744.881	76.20366	166.6668	65.42138	64.83512	87.12699	65.04851	64.91822	85.09773	66.11	87.53	588.661	409.297	0.100982	0.072992				31.99
50.0	872.5881	81.16324	177.2752	65.53498	64.94625	83.6589	65.22435	64.99552	83.27698	66.28	86.36	589.845	410.498	0.105693	0.074262				27.99
60.0	841.1118	85.11844	175.623	65.59302	65.02434	83.09572	65.25525	65.06443	84.52881	66.25	86.15	590.999	411.664	0.104438	0.072784				24.50
70.0	816.193	86.48939	171.6374	65.6687	65.11799	85.94729	65.38981	65.15557	85.99812	66.31		592.166	412.844	0.101329	0.074351				21.42
80.0	800.4153	89.79194	171.2737	65.80604	65.19273	87.18744	65.44784	65.26956	85.90101	66.50		593.325	414.014	0.100065	0.074663				18.42
90.0	787.2979	86.91787	170.111	65.88296	65.30851	84.81933	65.51017	65.33648	85.93625	66.68		594.483	415.187	0.098849	0.073464				15.75
100.0	803.3305	84.95733	164.5465	66.02019	65.36603	83.33257	65.64825	65.43408	85.27773	66.73		595.642	416.359	0.101551	0.074735				13.18
110.0	789.1259	88.78255	168.2712	66.07656	65.43745	82.74613	65.73469	65.52596	85.24345	66.83		596.795	417.524	0.098975	0.076357				10.62
120.0	733.8719	89.08664	160.2445	66.22579	65.59298	84.75745	65.84596	65.64809	85.21721	67.05		597.962	418.694	0.092031	0.077476				8.89
130.0	666.0792	88.27549	149.7029	66.31835	65.70769	86.09457	66.01241	65.78075	84.8905	67.17		599.122	419.870	0.088233	0.076531				7.82
140.0	605.5523	88.01933	141.338	66.35274	65.74835	86.22572	66.03679	65.84561	84.68392	67.28		600.302	421.068	0.083006	0.078373				7.22
150.0	572.528	86.83123	136.2871	66.46404	65.87764	85.73137	66.20362	65.96237	84.04522	67.39		601.496	422.280	0.08081	0.079551				6.67
160.0	514.567	86.43337	129.223	66.69726	66.00824	82.54052	66.5028	66.15265	81.8859	67.67		602.695	423.486	0.073274	0.079921				6.31

Intertek Testing Services

Manufacturer:	**SBI**
Model:	**3.5 Series**
Date:	**2-21-22**
Run:	**2-High**
Project #:	**G104981354**
Test Duration (min):	**160**
Test Duration (high only):	**121**

RESULTS

Average emission rate:(gr/hr) 3.758

Burn Rate (Dry kg/hr): 4.768

PRESSURE FACTOR:	1.00919

BAROMETRIC PRESSURE

Average:	30.195
Start:	30.15
End:	30.24

TEMPERATURE FACTORS

DGM #1:	1.00467
DGM #2:	1.00488

DRY GAS METER VALUES

VOLUMES SAMPLED		avg sample flow dscfm	DGM #1	Final: 602.695
DGM #1:	19.24795	0.12029969		Initial: 583.899
DGM #2:	19.40912	0.12130697		
			DGM #2	Final: 423.486
TOTAL TUNNEL VOLUME (scf):	45583			Initial: 404.480

SAMPLE RATIOS

Sample Train 1:	2368.211
Sample Train 2:	2348.546

TEMPERATURES (DEG. RANKIN)

DGM #1:	525.545
DGM #2:	525.438

TOTAL EMISSIONS

Sample Train 1 (g):	**9.946**
Sample Train 2 (g):	**10.099**

CALIBRATION FACTORS

DGM #1:	1.0100
DGM #2:	1.0070

EMISSION RATES

Sample Train 1 (g/hr):	**3.73**
Sample Train 2 (g/hr):	**3.79**
MAX Allowed	7.50%
DEVIATION:	0.76%

TUNNEL FLOW RATE: 284.895

PARTICULATE CATCH (mg)

Total Sample Train 1:	4.2
Total Sample Train 2:	4.3
Filter and seal Sample Train 1:	3.9
Filter and seal Sample Train 2:	3.9
Probe Sample Train 1:	0.3
Probe Sample Train 2:	0.4

	Room Temp		Bar Pressure		Relative Humidity		Air Velocity	
	Before	After	Before	After	Before	After	Before	After
	67	86	30.15	30.24	18.7	20.1	0	0

Average Dilution Tunnel Measurements						Sample Data	
Burn	Velocity	Flow Rate	Temp	Total Sample		Particulate Catch	
Time	(Ft/sec)	(dscf/min)	(R)	1	2	1	2
160	15.97	284.89	612.85	19.25	19.41	4.20	4.30

Dilution Tunnel Dual Train Precision				
Sample Ratios		Total Emissions (g)		
Train 1	Train 2	Train 1	Train 2	Deviation (%)
2368.21	2348.55	9.95	10.10	0.76%

Burn			Initial		Run	Average
Rate		Surface	Draft		Time	Draft
4.768		0.000	-0.001		160.000	0.091

Run	Date	Burn Rate	Emission
2-High	2022-02-21	4.768	3.758

E&E Boiler Tunnel Traverse Worksheet

Static Pressure: **0.156**

Barometer: 30.15

	TUNNEL VELOCITY	TUNNEL TEMP	SQUARE ROOT
A CENTER	0.084	66.100	0.2898
B CENTER	0.087	66.800	0.2950
A1	0.077	65.800	0.2775
A2	0.086	66.100	0.2933
A3	0.077	66.200	0.2775
A4	0.069	66.100	0.2627
B1	0.074	66.800	0.2720
B2	0.085	66.900	0.2915
B3	0.081	67.000	0.2846
B4	0.063	66.700	0.2510
AVERAGE	0.156	68.4	0.2795

PITOT CONSTANT= 0.9559

E&E FUEL LOAD DATA SHEET

			Test Load Weight: Lower	Ideal	Upper	
Firebox Volume:	2.88	cu. ft	32.83	34.56	36.29	
Load Volume:	2.8800	cu. ft	Loading Density:	10.229	lbs./ft3	
Number of Spacers:			Load Density:	10.229	lbs./ft3	

Piece Size: Thick	x Wide	x Length	Weight lbs	Meter Moisture Content Dry Uncorrected %			
2	4	16.25	5.11	23.40	19.10	19.90	85.31
2	4	16.25	4.73	21.60	22.00	19.30	85.31
2	4	16.25	4.57	25.60	11.00	17.90	85.31
2	4	16.25	5.73	23.30	20.20	15.50	85.31
2	4	16	3.77	28.10	20.30	19.90	84.00
2	4	15.75	5.55	21.00	22.40	20.00	82.69
							0.00
							0.00
							0.00

Test Load Weigh 29.459 lbs. **Dry Weigh** 11.081 kg.

Average Moisture Content: %

Dry: 20.58 20.583 Wet: 17.070

Pre-test moisture content: %

#DIV/0! #DIV/0! Wet: #DIV/0!

Coal Bed Range: 5.9 lbs. to 7.3 lbs. 20% to 25% of test load

For All Usable Firebox Volumes - High Fire Test Only

Nominal Required Load Density (wet basis)	10	lb/ft³				
Usable Firebox Volume	2.88	ft³				
Total Nom. Load Wt. Target	28.80	lb				
Total Load Wt. Allowable Range	27.40	to	30.20	lb		
Core Target Wt. Allowable Range	13.00	to	18.70	lb		
Remainder Load Wt. Allowable Range	10.10	to	15.80	lb		
						Mid-Point
Core Load Pc. Wt. Allowable Range	4.30	to	7.20	lb		5.75
Remainder Load Pc. Wt. Allowable Range	2.90	to	15.80	lb		9.35
	Pc. #					
Core Load Piece Wt. Actual	1	5.114			In Range	
	2	4.729			In Range	
	3	4.572			In Range	
Core Load Total. Wt. Actual		14.42			In Range	
	Pc. #					
Remainder Load Piece Wt.	1	5.728			In Range	
(1 to 3 Pcs.)	2	3.771			In Range	
	3	5.545			In Range	
Remainder Load Piece Weight Ratio - Small/Large		66%			In Range	≤ 67%
Remainder Load Tot. Wt. Act		15.04	lb		In Range	
Total Load Wt. Actual		29.46	lb		In Range	
Core % of Total Wt.		49%			In Range	45-65%
Remainder % of Total Wt.		51%			In Range	35-55%
Actual Load % of Nominal Target		102%			In Range	95-105%
Actual Fuel Load Density		10.2	lb/ft³			
Kindling and Start-up Fuel						
Maximim Kindling Wt. (20% of Tot. Load Wt.)		5.89	lb			
Actual Kindling Wt.		5.635	lb		In Range	19.1%
Maximum Start-up Fuel Wt. (30% of Tot. Load Wt.)		8.84	lb			
Actual Start-up Fuel Wt.		8.581	lb		In Range	29.1%
Allowable Residual Start-up Fuel Wt. Range	2.9	to	5.9	lb		Mid-Point
Actual Residual Start-up Fuel Wt.		3.08	lb		In Range	4.4
Total Wt. All Fuel Added (wet basis)		43.68	lb			
High Fire Test Run End Point Range	Low		High			Mid-Point
Based on Fuel Load Wt. (w/tares)	2.7	to	3.2	lb		2.9
Actual Fuel Load Ending Wt.		3.23	lb		In Range	

Fuel Piece Moisture Reading (%-dry basis)

1	2	3	Ave.		Pc. Wt. Dry Basis			
23.4	19.1	19.9	20.8	In Range	4.23	lb	1.92	kg
21.6	22	19.3	21.0	In Range	3.91	lb	1.77	kg
25.6	11	17.9	18.2	In Range	3.87	lb	1.75	kg
23.3	20.2	15.5	19.7	In Range	4.79	lb	2.17	kg
28.1	20.3	19.9	22.8	In Range	3.07	lb	1.39	kg
21	22.4	20	21.1		4.58	lb	2.08	kg

Total Load Ave. MC (%-dry basis)	20.5	In Range				
Total Load Ave. MC % (wet basis)	17.0					
Total Test Load Weight (dry basis) →			24.45	lb	11.09	kg

Kindling Moisture (%-dry basis)

10	10	10	10.0	In Range	5.12	lb	2.32	kg

Start-up Fuel Moisture Readings (%-dry basis)

22.6	18.7	17.7	21.6	In Range	7.06	lb	3.20	kg
25.4	25.9	19.1						

Total Wt. All Fuel Added (dry basis) →	36.63	lb	16.61	kg
Total Wt. All Fuel Burned (dry basis) →	30.3	lb	13.8	kg

								6" Tunnel	0.1963	ft^2							**(ASTM E2515 Formula)**			
		Manufacturer:		SBI				12" Tunnel	0.7854	ft^2										
		Model:		3.5 Series							Tunnel area (ft2):		0.349			Manufacturer:		SBI		
		Date:		2-21-22							Wood moisture (% wet):		17.07			Model:		3.5 Series		
		Run:		2-High							Load Weight (lbs wet):		29.459			Date:		2-21-22		
		Project #:		G104981354							Burn Rate (Dry kg/hr):		4.768			Run:		2-High		
		Test Duration:		160							End of test weight (Dry lb)		3.231	11.0%						
		Total Gas Volume (DGM 1):		19.239							Final Temperature (DGM #1) Degrees Rankin:					525.545				
		Total Gas Volume (DGM 2):		19.400							Final Temperature (DGM #2) Degrees Rankin:					525.438				
		Average Barometric Pressure:		30.195							Final Tunnel Temperature Degrees Rankin:					612.846				
		Molecular Weight:		28.78							Final Tunnel Velocity (feet per second):					15.9734876				
		Pitot Correction:		0.955865132							Standardized Tunnel Flow (dscfm):					284.894989				
		Calibration Factor (DGM #1):		1.0100																
		Calibration Factor (DGM #2):		1.0070									Average	Average						
			(1) VS:	0.081287038									Inlet +	Inlet +						
			(2) VS:	0.080610207				Filter	Filter				Outlet	Outlet	Average	Average	#1	#2		Average
								Face	Face	Delta-P	Tunnel		Temp.	Temp.	100.7	100.8	dDGM	dDGM		0.3
Elapsed	DGM 1	DGM 1	DGM 1	DGM 2	DGM 2	DGM 2	Tunnel	Velocity	Velocity	(in. H2O)	Velocity		Meter 1	Meter 2	Proportional Rates		Vol.Std.	Vol.Std.		SQRT
Time	Reading	Inlet T	Outlet T	Reading	Inlet T	Outlet T	Dry Bulb	DGM 1	DGM 2	Tunnel	Ft/Sec		Deg. R	Deg. R	PR1	PR2	(ft3)	(ft3)	Time	Delta-P
0.00	583.90	64.88	64.94	404.48	64.9105407	65.08551	69.37647			0.087	15.881		524.9	525.0					0	0.29507683
10.00	585.10	65.34	64.92	405.70	65.14657314	65.07099	134.786	10.61	10.71	0.076	15.722		525.1	525.1	100.93	101.03	1.230	1.242	10	0.27559133
20.00	586.30	65.26	64.87	406.90	64.98096191	64.93711	154.1954	10.59	10.60	0.074	15.776		525.1	525.0	103.72	103.00	1.228	1.230	20	0.27213424
30.00	587.49	65.29	64.80	408.10	64.93637519	64.88835	157.8226	10.49	10.60	0.073	15.747		525.0	524.9	103.57	103.73	1.217	1.229	30	0.27083169
40.00	588.66	65.42	64.84	409.30	65.04851292	64.91822	166.6668	10.37	10.52	0.073	15.820		525.1	525.0	103.30	103.92	1.203	1.220	40	0.27017003
50.00	589.85	65.53	64.95	410.50	65.2243499	64.99552	177.2752	10.45	10.58	0.074	16.092		525.2	525.1	104.11	104.45	1.213	1.227	50	0.2725113
60.00	591.00	65.59	65.02	411.66	65.2552509	65.06443	175.623	10.19	10.27	0.073	15.910		525.3	525.2	102.34	102.28	1.182	1.191	60	0.2697847
70.00	592.17	65.67	65.12	412.84	65.38981366	65.15557	171.6374	10.30	10.39	0.074	16.030		525.4	525.3	102.04	102.05	1.195	1.205	70	0.27267335
80.00	593.33	65.81	65.19	414.01	65.44784492	65.26956	171.2737	10.23	10.30	0.075	16.059		525.5	525.4	101.06	100.91	1.186	1.195	80	0.27324525
90.00	594.48	65.88	65.31	415.19	65.51016761	65.33648	170.111	10.22	10.32	0.073	15.915		525.6	525.4	101.66	101.87	1.185	1.197	90	0.27104195
100.00	595.64	66.02	65.37	416.36	65.64825451	65.43408	164.5465	10.22	10.31	0.075	15.981		525.7	525.5	100.40	100.42	1.186	1.196	100	0.27337731
110.00	596.80	66.08	65.44	417.52	65.73469451	65.52596	168.2712	10.17	10.25	0.076	16.202		525.8	525.6	99.08	99.02	1.180	1.189	110	0.27632737
120.00	597.96	66.23	65.59	418.69	65.84595598	65.64809	160.2445	10.29	10.29	0.077	16.215		525.9	525.7	98.86	98.04	1.194	1.194	120	0.2783447
130.00	599.12	66.32	65.71	419.87	66.01241382	65.78075	149.7029	10.23	10.34	0.077	15.979		526.0	525.9	97.99	98.25	1.186	1.199	130	0.27664288
140.00	600.30	66.35	65.75	421.07	66.03678985	65.84561	141.338	10.40	10.53	0.078	16.058		526.1	525.9	97.81	98.21	1.207	1.222	140	0.27995159
150.00	601.50	66.46	65.88	422.28	66.20362067	65.96237	136.2871	10.52	10.65	0.080	16.111		526.2	526.1	97.78	98.15	1.221	1.236	150	0.28204848
160.00	602.70	66.70	66.01	423.49	66.50280216	66.15265	129.223	10.56	10.59	0.080	16.052		526.4	526.3	97.31	96.77	1.225	1.229	160	0.28270389

Time	Flue	Room	Tunnel	DGM 1	DGM 1	Filter 1	DGM 2	DGM 2	Filter 2	DGM 3	Filter 3	Meter #1	Meter #2	Draft	Tunnel	CO	CO2	O2	scale
10.0	Temp 1	Temp 2	Dry Bulb 3	In 13	Out 14	15	In 16	Out 17	18	In 19	20	21	22	23	24	% 25	% 25	% 27	Lbs 28
0.0	68.44483	66.60537	69.37647	65.78609	65.78609	83.55857						363.608		-0.00077	0.08707				14.32
10.0	746.8504	68.51789	134.786	66.01243	66.01243	87.26072						364.816		0.102718	0.075951				11.77
20.0	809.6887	72.87612	154.1954	65.71664	65.71664	84.69923						366.030		0.107947	0.074057				8.08
30.0	804.0019	77.01859	157.8226	65.76766	65.76766	85.25419						367.246		0.10346	0.07335				4.67
40.0	744.881	76.20366	166.6668	66.10516	66.10516	87.52507						368.369		0.100982	0.072992				31.99
50.0	872.5881	81.16324	177.2752	66.27841	66.27841	86.36079						369.493		0.105693	0.074262				27.99
60.0	841.1118	85.11844	175.623	66.24753	66.24753	86.14842						370.636		0.104438	0.072784				24.50

Intertek Testing Services

Manufacturer:	**SBI**
Model:	**3.5 Series**
Date:	**2-21-22**
Run:	**2-High**
Project #:	**G104981354**
Test Duration (min):	**60**
Test Duration (high only):	**121**

RESULTS

Average emission rate:(gr/hr) **#DIV/0!**

Burn Rate (Dry kg/hr): 4.775

PRESSURE FACTOR: 1.00919

BAROMETRIC PRESSURE

Average:	30.195
Start:	30.15
End:	30.24

TEMPERATURE FACTORS

DGM #1:	1.00383
DGM #2:	1.14783

DRY GAS METER VALUES

VOLUMES SAMPLED

		avg sample flow dscfm			
DGM #1:	6.99869	0.11664491	DGM #1	Final:	370.636
				Initial:	363.608
DGM #2:	0.00000	0			
			DGM #2	Final:	0.000
				Initial:	0.000

TOTAL TUNNEL VOLUME (scf): 17097

SAMPLE RATIOS

TEMPERATURES (DEG. RANKIN)

Sample Train 1:	2442.947	DGM #1:	525.988
Sample Train 2:	#DIV/0!	DGM #2:	460.000

TOTAL EMISSIONS

CALIBRATION FACTORS

Sample Train 1 (g):	**9.283**	DGM #1:	0.9830
Sample Train 2 (g):	**#DIV/0!**	DGM #2:	0.0000

EMISSION RATES

TUNNEL FLOW RATE: 284.957

Sample Train 1 (g/hr):	**9.28**
Sample Train 2 (g/hr):	**#DIV/0!**

PARTICULATE CATCH (mg)

Total Sample Train 1:	3.8
Total Sample Train 2:	0
Filter and seal Sample Train 1:	3.3
Filter and seal Sample Train 2:	
Probe Sample Train 1:	0.5
Probe Sample Train 2:	

MAX Allowed	7.50%
DEVIATION:	#DIV/0!

								6" Tunnel	0.1963	ft^2						**(ASTM E2515 Formula)**				
		Manufacturer:		SBI				12" Tunnel	0.7854	ft^2										
		Model:		3.5 Series							Tunnel area (ft2):		0.349			Manufacturer:		SBI		
		Date:		2-21-22							Wood moisture (% wet):		17.07			Model:		3.5 Series		
		Run:		2-High							Load Weight (lbs wet):		29.459			Date:		2-21-22		
		Project #:		G104981354							Burn Rate (Dry kg/hr):		4.775			Run:		2-High		
		Test Duration:		60							End of test weight (Dry lb)		3.200	10.9%						
		Total Gas Volume (DGM 1):		6.996							Final Temperature (DGM #1) Degrees Rankin:					525.988				
		Total Gas Volume (DGM 2):		0.000							Final Temperature (DGM #2) Degrees Rankin:					460.000				
		Average Barometric Pressure:		30.195							Final Tunnel Temperature Degrees Rankin:					607.964				
		Molecular Weight:		28.78							Final Tunnel Velocity (feet per second):					15.8497032				
		Pitot Correction:		0.955865132							Standardized Tunnel Flow (dscfm):					284.957362				
		Calibration Factor (DGM #1):		0.9830																
		Calibration Factor (DGM #2):											Average	Average						
				(1) VS:	0.223600918								Inlet +	Inlet +						
				(2) VS:	#DIV/0!			Filter	Filter				Outlet	Outlet	Average	Average	#1	#2		Average
								Face	Face	Delta-P	Tunnel		Temp.	Temp.	102.1	#DIV/0!	dDGM	dDGM		0.3
Elapsed	DGM 1	DGM 1	DGM 1	DGM 2	DGM 2	DGM 2	Tunnel	Velocity	Velocity	(in. H2O)	Velocity		Meter 1	Meter 2	Proportional Rates		Vol.Std.	Vol.Std.		SQRT
Time	Reading	Inlet T	Outlet T	Reading	Inlet T	Outlet T	Dry Bulb	DGM 1	DGM 2	Tunnel	Ft/Sec		Deg. R	Deg. R	PR1	PR2	(ft3)	(ft3)	Time	Delta-P
0.00	363.61	65.79	65.79	0.00	0	0	69.37647			0.087	15.881		525.8	460.0					0	0.29507683
10.00	364.82	66.01	66.01	0.00	0	0	134.786	10.37	0.00	0.076	15.722		526.0	460.0	101.66	#DIV/0!	1.202	0.000	10	0.27559133
20.00	366.03	65.72	65.72	0.00	0	0	154.1954	10.42	0.00	0.074	15.776		525.7	460.0	105.26	#DIV/0!	1.209	0.000	20	0.27213424
30.00	367.25	65.77	65.77	0.00	0	0	157.8226	10.44	0.00	0.073	15.747		525.8	460.0	106.23	#DIV/0!	1.211	0.000	30	0.27083169
40.00	368.37	66.11	66.11	0.00	0	0	166.6668	9.63	0.00	0.073	15.820		526.1	460.0	98.92	#DIV/0!	1.118	0.000	40	0.27017003
50.00	369.49	66.28	66.28	0.00	0	0	177.2752	9.64	0.00	0.074	16.092		526.3	460.0	98.92	#DIV/0!	1.118	0.000	50	0.2725113
60.00	370.64	66.25	66.25	0.00	0	0	175.623	9.80	0.00	0.073	15.910		526.2	460.0	101.49	#DIV/0!	1.137	0.000	60	0.2697847

Ambiant	Flue	Dilution Tunn	Firebox Top	Firebox Back	Firebox Right	Firebox Left	Firebox Bottor	DGM Inlet 1	DGM Outlet 1	Probe Temp 1	DGM inlet 2	DGM outlet 2	Probe Temp 2	Probe Temp 3	DGM inlet 3	Manomètre D	Manomètre Ti	Trans Vacuun	Trans Pressio	Trans Vacuun	Massflow 1	Massflow 2	Balance	Date	RUN TIME	Weight for BR	weight loss for 30 m	weight loss %
86.4032637	465.870773	139.472345	453.120677	533.386592	438.334316	419.63791	464.804322	66.1134705	66.0295754	84.9368603	66.1067924	66.1589644	86.4933271	83.4105665	68.0292404	0.07015675	0.0766322	-0.279205	-0.3408576	-0.1959909	-0.378964	-0.0211754	0.17993407	5.97135199	11:47:18	0	34.62		
89.1138364	736.429459	148.045137	696.645784	487.509764	420.282908	412.792982	464.416294	66.7584434	66.1762917	83.4956059	66.6478674	66.4509029	85.0032264	85.1400732	68.0974272	0.10026112	0.07252358	0.15679725	-0.3375422	-0.2176886	0.10063336	3.5269872	3.50685051	36.9381033	11:57:18	10	30.96941894		
89.6993812	575.55845	130.880797	713.490826	464.91526	421.214691	423.0248	451.323531	66.7983034	66.2512202	84.4385895	66.6297278	66.4348484	84.6019435	84.2698446	67.9020663	0.08959002	0.07403894	0.17781415	-0.3069997	-0.2183244	0.03303409	3.53516644	3.50494584	34.350699	12:07:18	20	28.38201468		
86.3747593	527.969161	126.377455	651.473723	443.522596	403.152488	412.220846	430.415996	66.8032946	66.2457788	87.681519	66.6397268	66.4440136	85.8380004	86.6800532	68.072195	0.08430749	0.08051307	0.16397418	-0.3348853	-0.2144072	0.06925553	3.50836834	3.50697181	32.6591969	12:17:18	30	26.69051262	7.930487376	22.9%
89.1602709	519.514328	117.681295	638.3787	426.455253	380.822725	406.221789	402.800067	66.8083279	66.2971393	83.2409316	66.6856535	66.4953694	82.2847386	84.202022	67.8265918	0.08587634	0.07803406	0.15217983	-0.3620443	-0.2091617	0.02563834	3.51375452	3.51211047	30.992458	12:27:18	40	25.02377369	5.945645255	17.2%
87.5569341	537.760655	121.278927	655.517595	408.763788	364.066077	401.478969	380.933933	66.7771138	66.2609096	85.471915	66.6531858	66.4620642	87.0518978	84.005206	67.9901496	0.08648482	0.07832421	0.16108521	-0.3635544	-0.2118526	0.01453489	3.50994682	3.5057523	29.3733111	12:37:18	50	23.40462683	4.977387859	14.4%
85.4518572	546.826488	124.974418	658.375854	405.872678	357.814982	401.715286	361.627411	66.8369785	66.2682029	83.5167997	66.6437866	66.4893877	82.2456801	82.3744449	67.700082	0.08543635	0.07883259	0.14070512	-0.3565376	-0.2085031	0.10272571	3.51342177	3.51208425	27.6378395	12:47:18	60	21.66915516	5.021357463	14.5%
83.9282182	549.129008	125.202235	636.392817	411.406841	360.077236	408.74743	345.749359	66.8801285	66.3071906	84.533754	66.6873577	66.5191909	84.7789742	4180.88481	67.9655007	0.08300812	0.07668509	0.16123765	-0.3617264	-0.2174274	0.03443554	3.51272023	3.49910235	25.9070393	12:57:18	70	19.93835501	5.085418676	14.7%
83.8921514	546.424882	124.605613	635.260514	420.406702	367.588847	415.815894	332.065268	66.867952	66.3300677	85.1448089	66.6989645	66.550829	85.932208	4180.94053	69.0735886	0.08490478	0.08028067	0.15053743	-0.3105876	-0.215713	0.03123433	3.50273138	3.50550315	23.9843588	13:07:18	80	18.01567446	5.388952368	15.6%
81.2302776	543.978649	118.583276	639.915764	427.61147	373.555138	422.017937	319.56998	66.8863278	66.3250771	83.5024319	66.6872985	66.5349892	84.9372788	4180.90251	70.0024654	0.08262567	0.08113739	0.14945068	-0.3590468	-0.2124203	0.01639612	3.50361159	3.49076083	22.2768875	13:17:19	90	16.30820319	5.360951967	15.5%
80.5265654	541.097568	117.340493	641.438857	431.941352	381.487624	424.625139	308.169913	66.8878406	66.3570558	82.2746227	66.7134302	66.5594536	83.9532392	4180.91678	70.587583	0.08310681	0.07890536	0.16935379	-0.3603185	-0.2150998	0.02215929	3.50107095	3.48570576	20.5961709	13:27:19	100	14.62748659	5.310868416	15.3%
80.3747492	531.765386	115.524917	647.713024	434.164108	389.124436	427.489394	300.357939	66.9202513	66.3961517	86.7037277	66.7892381	66.6023014	82.6421247	4180.96672	70.007176	0.08214389	0.07809158	0.16849571	-0.3591036	-0.2164056	0.13681547	3.54620761	3.7146493	18.988625	13:37:19	110	13.01994066	4.995733797	14.4%
79.5283504	520.688582	114.205009	662.419222	435.022285	389.954405	434.141715	295.189843	66.9049157	66.3712138	83.8133799	66.7939298	66.6120008	82.9712976	4180.94182	69.6943708	0.0826434	0.07686515	0.16996355	-0.3631683	-0.210456	0.03915623	3.54165083	3.52909839	17.5440329	13:47:19	120	11.57534862	4.732854574	13.7%
79.2486485	479.080723	109.768246	614.905515	431.807324	390.362393	430.281361	292.441845	66.8183288	66.3593099	82.3000451	66.7202738	66.5859103	83.2073979	4180.79727	69.5116366	0.07564123	0.07925393	0.16197772	-0.3084985	-0.2101835	0.11796468	3.53360599	3.52982781	16.4183988	13:57:19	130	10.44971446	4.17777213	12.1%
81.6085347	463.467341	112.807842	593.251986	420.500324	391.219895	416.331614	295.619492	66.8375787	66.3414211	82.3162486	66.7178268	66.5676061	83.2595972	4180.82979	69.2608121	0.07565715	0.0804314	0.16895303	-0.3243828	-0.2060052	0.09705105	3.57343024	3.548109	15.307734	14:07:19	140	9.339049643	3.680891018	10.6%
81.3012795	445.991633	111.64753	567.677937	409.669383	391.882942	404.200705	299.346374	66.8067993	66.3477779	82.5212801	66.7421248	66.5689548	82.6951475	4180.6486	69.1667165	0.07340134	0.07817544	0.17439411	-0.3101221	-0.2086507	0.11516177	3.57444159	3.54549863	14.4485277	14:17:19	150	8.479843422	3.095505199	8.9%
80.8252212	409.207196	108.70606	508.089389	400.274875	389.546515	393.939	304.342574	66.8042734	66.3285579	82.3482027	66.7124767	66.5580827	82.5055262	4180.52873	68.9908016	0.06830405	0.08338262	0.18742518	-0.3611927	-0.2156448	0.14545531	3.60290012	3.59719104	13.8162014	14:27:19	160	7.847517079	2.602197385	7.5%
81.2951164	394.050939	106.989643	475.856392	390.995001	383.53048	383.638657	309.454082	66.8498265	66.3403169	85.5067465	66.7597007	66.5677539	84.1405808	4180.4382	68.8754115	0.06500937	0.08146907	0.20788641	-0.3066023	-0.2121478	0.16223588	3.56994218	3.56290049	13.2936188	14:37:19	170	7.324934442	2.0141152	5.8%
82.3653374	356.881758	103.724146	423.790132	376.028078	374.58772	373.441349	314.382714	66.8540864	66.329971	84.8949918	66.7960894	66.6108223	85.7597803	4180.41165	68.7366844	0.05819363	0.08083897	0.20049804	-0.3175022	-0.2141802	0.08988642	3.63810203	3.63196022	12.8780138	14:47:19	180	6.909329483	1.570513938	4.5%
80.7640407	332.868034	101.266115	384.02489	363.094314	363.62664	363.218481	317.339632	66.8081748	66.3161839	82.8070337	66.7368241	66.5828491	85.5973377	4180.46586	68.6966493	0.05463803	0.08061123	0.20716601	-0.3545279	-0.2334934	0.13605573	3.62372033	3.61566565	12.4873523	14:57:19	190	6.518667952	1.328849127	3.8%
79.4697183	317.090914	98.9050306	353.652605	355.110363	353.385891	352.203333	321.685338	66.7833298	66.3234688	82.4768802	66.7244964	66.5838738	84.8368649	4180.3626	68.6268019	0.05327914	0.08321773	0.20921165	-0.3424244	-0.2057895	0.13110393	3.65923203	3.64272437	12.2431181	15:07:19	200	6.274433808	1.050500634	3.0%
78.4236011	301.419159	96.7849495	334.634907	348.747847	343.855643	341.837865	323.771589	66.731081	66.2966672	82.0892474	66.670577	66.5124243	83.7241725	4180.20861	68.5983612	0.05208534	0.0781021	0.20545722	-0.3516326	-0.227067	0.15770943	3.67406286	3.65610785	12.0467793	15:17:19	210	6.078094979	0.831234505	2.4%
78.1602908	292.199389	95.6699726	320.336821	343.716657	335.933162	332.730142	323.698159	66.7170467	66.2258701	85.0076873	66.633592	66.4971367	82.551873	4180.06885	68.4984551	0.04974002	0.08216137	0.19927115	-0.3054442	-0.2141575	0.12167238	3.6798162	3.68589736	11.7978245	15:27:19	220	5.829140146	0.689527806	2.0%
80.4194261	282.894314	93.127327	306.510319	338.960473	328.815231	325.510316	323.821835	66.6785795	66.2011674	85.8074639	66.5984617	66.4519886	82.0288641	4179.9505	68.3549512	0.04897404	0.08284302	0.20663002	-0.3579568	-0.2132151	0.16151548	3.67509879	3.69788594	11.5562539	15:37:19	230	5.587569585	0.686864223	2.0%
78.8230791	278.080884	93.5911694	298.908903	334.795272	322.025882	319.951413	324.747483	66.5604106	66.0854771	85.8598722	66.4815403	66.3659423	85.421763	4179.92445	68.2806555	0.04794827	0.08394146	0.21774822	-0.3116776	-0.1999308	0.16256043	3.70595865	3.70232798	11.3423272	15:47:19	240	5.373642914	0.704452065	2.0%
78.9948073	274.773913	93.0692152	293.926201	331.542895	317.496358	314.500938	324.271237	66.7603	66.1760619	84.4588215	66.5792028	66.370547	86.7052339	4179.79252	68.176843	0.04567021	0.08328463	0.21916197	-0.3581271	-0.2128744	0.19473979	3.70527185	3.7341582	11.1415177	15:57:19	250	5.172833364	0.656306783	1.9%
80.5033491	271.007197	92.4271203	290.245835	328.380827	314.581356	310.923459	324.730207	66.6587589	66.1588045	82.8769505	66.5673734	66.3570471	83.8783534	4179.69591	68.2434143	0.04766566	0.08201379	0.21945947	-0.3590127	-0.2110464	0.09865903	3.70991222	3.6989022	10.8839042	16:07:19	260	4.915219838	0.672349746	1.9%
79.6780095	267.548839	91.731355	285.880754	325.984323	311.418995	307.400749	325.550213	66.6032191	66.1399814	82.4016797	66.525185	66.3620138	82.0700251	4179.60193	68.2558821	0.04643064	0.08306383	0.23845041	-0.3059097	-0.2088097	0.11630752	3.72854747	3.73053737	10.697691	16:17:19	270	4.729006721	0.644636193	1.9%
80.0365268	263.024022	90.9223668	280.780443	322.755453	308.085151	304.484609	325.748362	66.5609908	66.0964921	84.0312919	66.454578	66.3494119	86.2174724	4179.54349	68.1982579	0.04559675	0.08142683	0.22599713	-0.3080329	-0.2147592	0.15277238	3.72475944	3.69966604	10.4853789	16:27:19	280	4.516694591	0.656138772	1.9%
80.5267209	257.07318	89.720402	275.337344	319.879163	305.119372	301.196486	326.220416	66.5667042	66.0938589	85.3039861	66.4932591	66.3046277	86.242549	4179.52948	68.1877047	0.04385501	0.08345045	0.24012232	-0.3590695	-0.211001	0.21916197	3.71647201	3.72666247	10.2746608	16:37:19	290	4.305976513	0.609243325	1.8%
79.5686235	253.958831	90.0629635	270.465605	317.597317	301.946096	297.590604	325.234968	66.5523823	66.0716037	86.346535	66.5073138	66.3170142	83.7919206	4179.44828	68.1675558	0.04243114	0.08041516	0.23103991	-0.3586835	-0.2147933	0.16468965	3.70604224	3.69413562	10.1326468	16:47:20	300	4.163962478	0.565044243	1.6%
76.5708732	251.561457	89.6021471	265.086319	316.429078	298.581647	292.936683	323.872497	66.5576396	66.0731056	86.1344076	66.4499746	66.3247761	82.7567774	4179.46819	68.1031716	0.04311926	0.08325031	0.25114955	-0.3065456	-0.2117958	0.21813178	3.73937227	3.72215815	10.0403516	16:57:20	310	4.071667288	0.445027303	1.3%
76.3719656	249.545401	88.6739241	261.77024	315.143959	295.494017	289.230443	321.649883	66.5443018	66.0409822	84.109475	66.4954773	66.3118542	82.9107716	4179.38242	68.2036815	0.04385014	0.07980314	0.21367663	-0.309157	-0.2155994	0.13604098	3.73448931	3.68491552	9.88325759	17:07:20	320	3.914573277	0.391403236	1.1%
75.9990516	247.478263	88.3207307	259.414792	314.542067	293.213862	287.221118	319.77658	66.4805238	66.0114166	82.7469275	66.4275247	66.2985688	82.8094314	4179.23038	68.1099288	0.04184794	0.08255519	0.22758299	-0.3588311	-0.2092411	0.13809645	3.73073406	3.69418971	9.6934302	17:17:20	330	3.724745883	0.439216595	1.3%
76.2542522	246.038805	87.9593145	257.550403	314.073488	291.325028	286.097364	318.505051	66.4026549	66.0157603	82.5831685	66.3726073	66.2440655	82.4155011	4179.05183	68.0671471	0.04229534	0.08106685	0.24771476	-0.3352487	-0.2129766	0.15621209	3.73108812	3.73523347	9.47577041	17:27:20	340	3.507086099	0.564581189	1.6%
76.0224072	242.888976	87.6896585	255.11953	313.76998	289.559316	283.644112	317.189291	66.3241212	65.9288645	84.6518472	66.2393995	66.1605177	82.3595341	4178.838	68.0036863	0.04264968	0.08164746	0.25163637	-0.3602163	-0.2100813	0.14957608	3.71402316	3.72316785	9.32238083	17:37:20	350	3.353696516	0.560876761	1.6%
75.9254476	240.943406	87.2625364	252.370723	313.309055	287.805531	281.674902	315.661224	66.3243649	65.9170031	85.4731734	66.2897253	66.2066718	86.0096222	4178.64909	67.9993426	0.0418309	0.08270441	0.23649083	-0.3047516	-0.2063004	0.23452388	3.69783677	3.70817475	9.15540698	17:47:20	360	3.186722662	0.538023221	1.6%
75.8514523	239.964981	87.0171719	250.183039	313.616583	286.094162	279.844753	313.735112	66.3727235	65.8752087	86.744565	66.3197219	66.1924291	82.0674008	4178.54216	67.8837732	0.04233139	0.0793545	0.23989612	-0.3741818	-0.1961045	0.22756332	3.70700441	3.71141366	8.97648388	17:57:20	370	3.007799566	0.499286532	1.4%
75.8244513	239.869329	86.7139989	248.810613	314.237642	284.566848	278.185664	311.410512	66.3385035	65.8939942	86.1004803	66.3284874	66.2087077	82.6532458	4178.48146	67.898788	0.04101249	0.08143852	0.26002543	-0.3096793	-0.2278505	0.25133641	3.73599075	3.71746205	8.79398749	18:07:20	380	2.825303172	0.528393345	1.5%
75.8599696	239.842554	86.3919779	247.595949	315.484359	283.470472	276.940321	309.814455	66.2740238	65.8587216	84.3213955	66.2126725	66.1392156	85.039679	4178.34509	67.8552069	0.04237554	0.08383409	0.26132116	-0.34289	-0.2194598	0.20147168	3.71837688	3.72926213	8.62469017	18:17:20	390	2.656005854	0.530716808	1.5%
75.4753928	238.684048	86.3090702	246.494345	317.581581	282.320098	275.66973	308.441894	66.1756651	65.7737027	84.0646709	66.085929	66.0496162	84.8066205	4178.12847	67.7911188	0.04099232	0.08253562	0.28044486	-0.3491006	-0.2292811	0.19132958	3.7111137	3.72106813	8.44949609	18:27:20	400	2.480811774	0.526987793	1.5%
75.292251	237.389921	86.0798506	245.084351	319.448086	281.312514	274.102448	307.556955	66.1695066	65.7821536	83.1789337	66.0685008	66.0054742	84.9274575	4177.97815	67.7628606	0.04221666	0.08445936	0.27926715	-0.3591263	-0.2171436	0.2006849	3.72068129	3.70350323	8.28194854	18:37:20	410	2.313264225	0.512038947	1.5%
75.4158836	236.948639	85.8143555	244.076233	320.530914	279.921586	272.628544	306.263474	66.0912626	65.6926246	83.3604107	66.0232279	65.9664612	84.4864591	4177.79894	67.7322203	0.04145652	0.08359596	0.29445203	-0.3602163	-0.2110805	0.27795667	3.74052457	3.73957224	8.10953278	18:47:20	420	2.140848466	0.515157388	1.5%
74.9555393	235.341315	85.5739106	243.162845	321.481742	278.291103	271.007777	305.115209	65.994106	65.5633045	82.8357269	65.9402604	65.9051974	84.0932164	4177.7271	67.6209557	0.04068959	0.08334208	0.27439402	-0.3614312	-0.2153383	0.21068686	3.74303572	3.72708373	7.95343454	18:57:20	430	1.984750225	0.496061548	1.4%
75.0285253	233.671324	85.3850111	241.289911	322.587542	276.274899	269.478755	303.759557	66.041529	65.5919503	83.0491389	65.9855976	65.8186295	84.0057759	4177.75188	67.6220467	0.04139768	0.08558323	0.29212119	-0.3646671	-0.2078673	0.28163487	3.74012954	3.72596748	7.80042605	19:07:20	440	1.83174174	0.481522485	1.4%

Time	Flue	Room	Tunnel	DGM 1	DGM 1	Filter 1	DGM 2	DGM 2	Filter 2	DGM 3	Filter 3	Meter #1	Meter #2	Draft	Tunnel	CO	CO2	O2	scale
10.0	Temp 1	Temp 2	Dry Bulb 3	In 13	Out 14	15	In 16	Out 17	18	In 19	20	21	22	23	24	% 25	% 25	% 27	Lbs 28
0.0	465.8708	86.40326	139.4723	66.11347	66.02958	84.93686	66.10679	66.15896	86.49333	83.41	68.03	602.695	423.486	0.070157	0.076632				5.97
10.0	736.4295	89.11384	148.0451	66.75844	66.17629	83.49561	66.64787	66.4509	85.00323	85.14	68.10	603.900	424.704	0.100261	0.072524				36.94
20.0	575.5585	89.69938	130.8808	66.7983	66.25122	84.43859	66.62973	66.43485	84.60194	84.27	67.90	605.097	425.908	0.08959	0.074039				34.35
30.0	527.9692	86.37476	126.3775	66.80329	66.24578	87.68152	66.63973	66.44401	85.838	86.68	68.07	606.295	427.121	0.084307	0.080513				32.66
40.0	519.5143	89.16027	117.6813	66.80833	66.29714	83.24093	66.68565	66.49537	82.28474	84.20	67.83	607.488	428.332	0.085876	0.078034				30.99
50.0	537.7607	87.55693	121.2789	66.77711	66.26091	85.47191	66.65319	66.46206	87.0519	84.01	67.99	608.683	429.540	0.086485	0.078324				29.37
60.0	546.8265	85.45186	124.9744	66.83698	66.2682	83.5168	66.64379	66.48939	82.24568	82.37	67.70	609.879	430.752	0.085436	0.078833				27.64
70.0	549.129	83.92822	125.2022	66.88013	66.30719	84.53375	66.68736	66.51919	84.77897			611.079	431.963	0.083008	0.076685				25.91
80.0	546.4249	83.89215	124.6056	66.86795	66.33007	85.14481	66.69896	66.55083	85.93221			612.268	433.170	0.084905	0.080281				23.98
90.0	543.9786	81.23028	118.5833	66.88633	66.32508	83.50243	66.6873	66.53499	84.93728			613.455	434.377	0.082626	0.081137				22.28
100.0	541.0976	80.52657	117.3405	66.88784	66.35706	82.27462	66.71343	66.55945	83.95324			614.648	435.578	0.083107	0.078905				20.60
110.0	531.7654	80.37475	115.5249	66.92025	66.39615	86.70373	66.78924	66.6023	82.64212			615.853	436.807	0.082144	0.078092				18.99
120.0	520.6886	79.52835	114.205	66.90492	66.37121	83.81338	66.79393	66.612	82.9713			617.058	438.038	0.082643	0.076865				17.54
130.0	479.0807	79.24865	109.7682	66.81833	66.35931	82.30005	66.72027	66.58591	83.2074			618.259	439.254	0.075641	0.079254				16.42
140.0	463.4673	81.60853	112.8078	66.83758	66.34142	82.31625	66.71783	66.56761	83.2596			619.470	440.479	0.075657	0.080431				15.31
150.0	445.9916	81.30128	111.6475	66.8068	66.34778	82.52128	66.74212	66.56895	82.69515			620.688	441.713	0.073401	0.078175				14.45
160.0	409.2072	80.82522	108.7061	66.80427	66.32856	82.3482	66.71248	66.55808	82.50553			621.910	442.950	0.068304	0.083383				13.82
170.0	394.0509	81.29512	106.9896	66.84983	66.34032	85.50675	66.7597	66.56775	84.14058			623.128	444.183	0.065009	0.081469				13.29
180.0	356.8818	82.36534	103.7241	66.85409	66.32997	84.89499	66.79609	66.61082	85.75978			624.360	445.431	0.058194	0.080839				12.88
190.0	332.868	80.76404	101.2661	66.80817	66.31618	82.80703	66.73682	66.58285	85.59734			625.592	446.681	0.054638	0.080611				12.49
200.0	317.0909	79.46972	98.90503	66.78333	66.32347	82.47688	66.7245	66.58387	84.83686			626.828	447.932	0.053279	0.083218				12.24
210.0	301.4192	78.4236	96.78495	66.73108	66.29667	82.08925	66.67058	66.51242	83.72417			628.071	449.192	0.052085	0.078102				12.05
220.0	292.1994	78.16029	95.66997	66.71705	66.22587	85.00769	66.63359	66.49714	82.55187			629.314	450.456	0.04974	0.082161				11.80
230.0	282.8943	80.41943	93.12733	66.67858	66.20117	85.80746	66.59846	66.45199	82.02886			630.560	451.734	0.048974	0.082843				11.56
240.0	278.0809	78.82308	93.59117	66.56041	66.08548	85.85987	66.48154	66.36594	85.42176			631.818	453.005	0.047948	0.083941				11.34
250.0	274.7739	78.99481	93.06922	66.7603	66.17606	84.45882	66.5792	66.37055	86.70523			633.072	454.276	0.04567	0.083285				11.14
260.0	271.0072	80.50335	92.42712	66.65876	66.1588	82.87695	66.56737	66.35705	83.87835			634.324	455.545	0.047666	0.082014				10.88
270.0	267.5488	79.67801	91.73135	66.60322	66.13998	82.40168	66.52518	66.36201	82.07003			635.585	456.834	0.046431	0.083064				10.70
280.0	263.024	80.03653	90.92237	66.56099	66.09649	84.03129	66.45458	66.34941	86.21747			636.851	458.108	0.045597	0.081427				10.49
290.0	257.0732	80.52672	89.7204	66.5667	66.09386	85.30399	66.49326	66.30463	86.24255			638.103	459.390	0.043855	0.08345				10.27
300.0	253.9588	79.56862	90.06296	66.55238	66.0716	86.34653	66.50731	66.31701	83.79192			639.358	460.662	0.042431	0.080415				10.13
310.0	251.5615	76.57087	89.60215	66.55764	66.07311	86.13441	66.44997	66.32478	82.75678			640.627	461.947	0.043119	0.08325				10.04
320.0	249.5454	76.37197	88.67392	66.5443	66.04098	84.10948	66.49548	66.31185	82.91077			641.883	463.216	0.04385	0.079803				9.88
330.0	247.4783	75.99905	88.32073	66.48052	66.01142	82.74693	66.42752	66.29857	82.80943			643.150	464.500	0.041848	0.082555				9.69
340.0	246.0388	76.25425	87.95931	66.40265	66.01576	82.58317	66.37261	66.24407	82.4155			644.410	465.761	0.042295	0.081067				9.48
350.0	242.889	76.02241	87.68966	66.32412	65.92886	84.65185	66.2394	66.16052	82.35953			645.663	467.046	0.04265	0.081647				9.32
360.0	240.9434	75.92545	87.26254	66.32436	65.917	85.47317	66.28973	66.20667	86.00962			646.921	468.320	0.041831	0.082704				9.16
370.0	239.965	75.85145	87.01717	66.37272	65.87521	86.74456	66.31972	66.19243	82.0674			648.175	469.594	0.042331	0.079354				8.98
380.0	239.8693	75.82445	86.714	66.3385	65.89399	86.10048	66.32849	66.20871	82.65325			649.432	470.872	0.041012	0.081439				8.79
390.0	239.8426	75.85997	86.39198	66.27402	65.85872	84.3214	66.21267	66.13922	85.03968			650.686	472.152	0.042376	0.083834				8.62
400.0	238.684	75.47539	86.30907	66.17567	65.7737	84.06467	66.08593	66.04962	84.80662			651.952	473.428	0.040992	0.082536				8.45
410.0	237.3899	75.29225	86.07985	66.16951	65.78215	83.17893	66.0685	66.00547	84.92746			653.203	474.701	0.042217	0.084459				8.28
420.0	236.9486	75.41588	85.81436	66.09126	65.69262	83.36041	66.02323	65.96646	84.48646			654.461	475.982	0.041457	0.083596				8.11
430.0	235.3413	74.95554	85.57391	65.99411	65.5633	82.83573	65.94026	65.9052	84.09322			655.732	477.267	0.04069	0.083342				7.95
440.0	233.6713	75.02853	85.36501	66.04153	65.59195	83.04914	65.9856	65.81863	84.00578			656.986	478.540	0.041398	0.085583				7.80
450.0	232.1463	74.63161	85.04422	66.05532	65.60073	83.11247	65.98436	65.75394	84.10962			658.250	479.822	0.041493	0.082761				7.65
460.0	230.3406	74.88323	84.82276	65.86597	65.44641	82.8614	65.80586	65.66935	84.01959			659.517	481.093	0.041215	0.084452				7.49
470.0	228.1351	74.50767	84.43341	65.78226	65.36269	83.05571	65.68917	65.59524	83.67228			660.771	482.361	0.040358	0.083879				7.33
480.0	226.3274	74.36391	84.23413	65.6713	65.30682	83.23623	65.61118	65.54856	83.5834			662.043	483.634	0.040338	0.084174				7.20
490.0	223.4877	73.95873	83.80702	65.57632	65.18928	82.80351	65.46109	65.44022	83.65022			663.312	484.899	0.039913	0.083384				7.06
500.0	221.9807	73.60563	83.51446	65.45353	65.1003	82.91812	65.40677	65.34623	83.33819			664.570	486.192	0.040258	0.086392				6.92
510.0	219.1622	73.63632	83.10098	65.34782	65.00166	82.52148	65.27809	65.24176	83.37204			665.839	487.480	0.039218	0.08582				6.78
520.0	216.8766	73.58184	82.84353	65.25804	64.87387	82.96356	65.16284	65.14113	83.39355			667.096	488.764	0.037563	0.084684				6.64
530.0	215.2439	73.33307	82.56366	65.21499	64.84418	82.17199	65.09807	65.05757	83.27267			668.355	490.057	0.037224	0.086328				6.51
540.0	212.9036	73.15351	82.0918	65.18172	64.70441	82.01643	65.10071	64.97252	83.32164			669.623	491.335	0.036128	0.084205				6.37
550.0	210.7128	73.11298	81.87256	65.08258	64.64784	85.45638	65.00909	64.92974	82.59052			670.880	492.622	0.037894	0.086306				6.25
560.0	208.7016	72.8192	81.6124	65.02614	64.63441	87.02391	64.96726	64.89877	82.27001			672.140	493.904	0.037969	0.085836				6.13
570.0	206.3806	72.6857	81.24172	64.93433	64.55386	83.1613	64.9172	64.84078	83.21427			673.402	495.182	0.036118	0.083484				6.02
575.0	205.9508	72.61134	81.12998	64.88224	64.51972	82.04162	64.8672	64.80247	83.49205			674.034	495.833	0.0359	0.084913				5.97

Intertek Testing Services

Manufacturer:	**SBI**
Model:	**3.5 Series**
Date:	**2-21-22**
Run:	**2-Low**
Project #:	**G104981354**
Test Duration: (minutes)	**575**

RESULTS

Average emission rate:(gr/hr) 1.336

Burn Rate (Dry kg/hr): 1.356

PRESSURE FACTOR: 1.01604

BAROMETRIC PRESSURE

Average:	30.4
Start:	30.24
End:	30.56

TEMPERATURE FACTORS

DGM #1:	1.00364
DGM #2:	1.00349

DRY GAS METER VALUES

VOLUMES SAMPLED

		Avg sample flow rate (dscfm)			
DGM #1:	73.47451	0.127781755	DGM #1	Final:	674.034
				Initial:	602.695
DGM #2:	74.28056	0.129183587			
			DGM #2	Final:	495.833
TOTAL TUNNEL VOLUME (scf):	178401			Initial:	423.486

SAMPLE RATIOS

TEMPERATURES (DEG. RANKIN)

Sample Train 1:	2428.065	DGM #1:	526.087
Sample Train 2:	2401.717	DGM #2:	526.164

TOTAL EMISSIONS

CALIBRATION FACTORS

Sample Train 1 (g):	**13.112**	DGM #1:	1.0100
Sample Train 2 (g):	**12.489**	DGM #2:	1.0070

EMISSION RATES

TUNNEL FLOW RATE: 310.262

Sample Train 1 (g/hr):	**1.37**
Sample Train 2 (g/hr):	**1.30**

PARTICULATE CATCH (mg)

Total Sample Train 1:	5.4
Total Sample Train 2:	5.2
Filter and seal Sample Train 1:	4.5
Filter and seal Sample Train 2:	4.3
Probe Sample Train 1:	0.9
Probe Sample Train 2:	0.9

MAX Allowed	7.50%
DEVIATION:	2.43%

	Room Temp		Bar Pressure		Relative Humidity		Air Velocity	
	Before	After	Before	After	Before	After	Before	After
	86	0	30.24	30.56	20.1	18.6	0	0

Average Dilution Tunnel Measurements						Sample Data	
Burn	Velocity	Flow Rate	Temp	Total Sample		Particulate Catch	
Time	(Ft/sec)	(dscf/min)	(R)	1	2	1	2
575	15.73	310.26	558.07	73.47	74.28	5.40	5.20

Dilution Tunnel Dual Train Precision				
Sample Ratios		Total Emissions (g)		
Train 1	Train 2	Train 1	Train 2	Deviation (%)
2428.07	2401.72	13.11	12.49	2.43%

Burn			Initial		Run	Average
Rate		Surface	Draft		Time	Draft
1.356		0.000	0.070		575.000	0.055

Run	Date	Burn Rate	Emission
2-Low	2022-02-21	1.356	1.336

E&E Boiler Tunnel Traverse Worksheet

Static Pressure: **0.156**

Barometer: 30.24

	TUNNEL VELOCITY	TUNNEL TEMP	SQUARE ROOT
A CENTER	0.084	66.100	0.2898
B CENTER	0.087	66.800	0.2950
A1	0.077	65.800	0.2775
A2	0.086	66.100	0.2933
A3	0.077	66.200	0.2775
A4	0.069	66.100	0.2627
B1	0.074	66.800	0.2720
B2	0.085	66.900	0.2915
B3	0.081	67.000	0.2846
B4	0.063	66.700	0.2510
AVERAGE		66.45	0.2795

PITOT CONSTANT= 0.9559

E&E FUEL LOAD DATA SHEET

			Test Load Weight: Lower	Ideal	Upper	
Firebox Volume:	2.88	cu. ft	32.83	34.56	36.29	
Load Volume:	2.8800	cu. ft	Loading Density:	12.021	lbs./ft3	
Number of Spacers:			Load Density:	12.021	lbs./ft3	

Piece Size: Thick	x Wide	x Length	Weight lbs	Meter Moisture Content Dry Uncorrected %			
2	4	16.25	6.67	25.00	19.90	25.50	85.31
2	4	16.25	6.02	23.40	22.80	15.30	85.31
2	4	16.25	5.84	23.40	25.20	20.10	85.31
2	4	16.25	6.80	24.50	19.10	16.50	85.31
2	4	16	5.20	22.80	21.40	16.50	84.00
2	4	15.75	4.09	20.30	19.20	15.00	82.69
							0.00
							0.00
							0.00

Test Load Weight 34.621 lbs. **Dry Weight** 12.991 kg.

Average Moisture Content: %

Dry: 20.88 20.883 Wet: 17.276

Pre-test moisture content: %

#DIV/0! #DIV/0! Wet: #DIV/0!

Coal Bed Range: 7.0 lbs. to 8.6 lbs. 20% to 25% of test load

For Usable Firebox Volumes up to 3.0 ft^3 - Low and Medium Fire

Nominal Required Load Density (wet basis)	12	lb/ft^3				
Usable Firebox Volume	2.88	ft^3				
Total Nom. Load Wt. Target	34.56	lb				
Total Load Wt. Allowable Range	32.83	to	36.29	lb		
Core Target Wt. Allowable Range	15.552	to	22.46	lb		
Remainder Load Wt. Allowable Range	12.10	to	19.01	lb		
						Mid-Point
Core Load Fuel Pc. Wt. Allowable Range	5.18	to	8.64	lb		6.91
Remainder Load Pc. Wt. Allowable Range	3.46	to	10.37	lb		6.91
	Pc. #					Ordre
Core Load Piece Wt. Actual	1	6.674			In Range	
	2	6.021			In Range	
	3	5.843			In Range	
Core Load Total. Wt. Actual		18.54			In Range	
	Pc. #					
Remainder Load Piece Wt.	1	6.798			In Range	
(2 or 3 Pcs.)	2	5.199			In Range	
	3	4.086			In Range	
Remainder Load Piece Weight Ratio - Small/Large		60%			In Range	≤ 67%
Remainder Load Tot. Wt. Act		16.08	lb		In Range	
Total Load Wt. Actual		34.62	lb		In Range	
Core % of Total Wt.		54%			In Range	45-65%
Remainder % of Total Wt.		46%			In Range	35-55%
Actual Load % of Nominal Target		100%			In Range	95-105%
Actual Fuel Load Density		12.0	lb/ft^3			
Allowable Charcoal Bed Wt. Range (lb)	3.5	to	6.9			Mid-Point
Actual Charcoal Bed Wt.		6.0	lb		In Range	5.2
Actual Fuel Load Ending Wt.		0.0	lb		lb	≥ 90%
Total Wt. of Fuel Burned During Test Run lb.		34.6	lb			

Fuel Piece Moisture Reading (%-dry basis)

1	2	3	Ave.		Pc. Wt. Dry Basis			
25	19.9	25.5	23.5	In Range	5.41	lb	2.45	kg
23.4	22.8	15.3	20.5	In Range	5.00	lb	2.27	kg
23.4	25.2	20.1	22.9	In Range	4.75	lb	2.16	kg
24.5	19.1	16.5	20.0	In Range	5.66	lb	2.57	kg
22.8	21.4	16.5	20.2	In Range	4.32	lb	1.96	kg
20.3	19.2	15	18.2	In Range	3.46	lb	1.57	kg
Total Load Ave. MC % (dry basis)			21.0	In Range				
Total Load Ave. MC % (wet basis)			17.4					
Total Test Load Weight (dry basis) →					28.60	lb	12.97	kg
Total Fuel Weight Burned During Test Run (dry basis)					28.6	lb	12.97	kg

								6" Tunnel	0.1963	ft^2						**(ASTM E2515 Formula)**				
		Manufacturer:		SBI				12" Tunnel	0.7854	ft^2										
		Model:		3.5 Series							Tunnel area (ft2):		0.349			Manufacturer:		SBI		
		Date:		2-21-22							Wood moisture (% wet):		17.28			Model:		3.5 Series		
		Run:		2-Low							Load Weight (lbs wet):		34.621			Date:		2-21-22		
		Project #:		G104981354							Burn Rate (Dry kg/hr):		1.356			Run:		2-Low		
		Test Duration:		575							End of test weight (Dry lb)		0.000							
		Total Gas Volume (DGM 1):		73.445							Final Temperature (DGM #1) Degrees Rankin:					526.087				
		Total Gas Volume (DGM 2):		74.250							Final Temperature (DGM #2) Degrees Rankin:					526.164				
		Average Barometric Pressure:		30.4							Final Tunnel Temperature Degrees Rankin:					558.071				
		Molecular Weight:		28.78							Final Tunnel Velocity (feet per second):					15.7341613				
		Pitot Correction:		0.955865132							Standardized Tunnel Flow (dscfm):					310.262426				
		Calibration Factor (DGM #1):		1.0100																
		Calibration Factor (DGM #2):		1.0070									Average Inlet +	Average Inlet +						
			(1) VS:	0.023032749																
			(2) VS:	0.022782802				Filter	Filter				Outlet	Outlet	Average	Average	#1	#2		Average
								Face	Face				Temp.	Temp.	99.8	99.8	dDGM	dDGM		0.3
Elapsed	DGM 1	DGM 1	DGM 1	DGM 2	DGM 2	DGM 2	Tunnel	Velocity	Velocity	Delta-P	Tunnel		Meter 1	Meter 2	Proportional Rates		Vol.Std.	Vol.Std.		SQRT
Time	Reading	Inlet T	Outlet T	Reading	Inlet T	Outlet T	Dry Bulb	DGM 1	DGM 2	(in. H2O)	Velocity		Deg. R	Deg. R	PR1	PR2	(ft3)	(ft3)	Time	Delta-P
0.00	602.70	66.11	66.03	423.49	66.10679236	66.159	139.472			0.077	15.801		526.1	526.1					0	0.2768252
10.00	603.90	66.76	66.18	424.70	66.64786735	66.4509	148.045	10.69	10.77	0.073	15.481		526.5	526.5	107.35	107.00	1.240	1.249	10	0.269302
20.00	605.10	66.80	66.25	425.91	66.62972783	66.4348	130.881	10.61	10.64	0.074	15.420		526.5	526.5	104.02	103.20	1.231	1.235	20	0.272101
30.00	606.30	66.80	66.25	427.12	66.6397268	66.444	126.377	10.62	10.72	0.081	16.018		526.5	526.5	99.45	99.32	1.232	1.244	30	0.2837482
40.00	607.49	66.81	66.30	428.33	66.68565355	66.4954	117.681	10.58	10.71	0.078	15.652		526.6	526.6	99.84	99.95	1.227	1.242	40	0.2793458
50.00	608.68	66.78	66.26	429.54	66.65318579	66.4621	121.279	10.60	10.68	0.078	15.730		526.5	526.6	100.15	99.84	1.229	1.239	50	0.2798646
60.00	609.88	66.84	66.27	430.75	66.6437866	66.4894	124.974	10.61	10.72	0.079	15.831		526.6	526.6	100.21	100.16	1.230	1.243	60	0.2807714
70.00	611.08	66.88	66.31	431.96	66.6873577	66.5192	125.202	10.64	10.71	0.077	15.617		526.6	526.6	101.95	101.47	1.234	1.242	70	0.2769207
80.00	612.27	66.87	66.33	433.17	66.69896455	66.5508	124.606	10.54	10.67	0.080	15.971		526.6	526.6	98.67	98.79	1.223	1.238	80	0.2833384
90.00	613.46	66.89	66.33	434.38	66.68729848	66.535	118.583	10.52	10.67	0.081	15.973		526.6	526.6	97.48	97.76	1.221	1.238	90	0.2848463
100.00	614.65	66.89	66.36	435.58	66.71343022	66.5595	117.34	10.58	10.62	0.079	15.735		526.6	526.6	99.23	98.53	1.227	1.231	100	0.280901
110.00	615.85	66.92	66.40	436.81	66.78923815	66.6023	115.525	10.68	10.86	0.078	15.629		526.7	526.7	100.58	101.17	1.239	1.260	110	0.2794487
120.00	617.06	66.90	66.37	438.04	66.79392976	66.612	114.205	10.68	10.88	0.077	15.488		526.6	526.7	101.27	102.02	1.239	1.262	120	0.2772456
130.00	618.26	66.82	66.36	439.25	66.72027378	66.5859	109.768	10.65	10.75	0.079	15.666		526.6	526.7	99.03	98.88	1.235	1.247	130	0.2815207
140.00	619.47	66.84	66.34	440.48	66.71782681	66.5676	112.808	10.74	10.83	0.080	15.824		526.6	526.6	99.39	99.15	1.246	1.256	140	0.2836043
150.00	620.69	66.81	66.35	441.71	66.74212484	66.569	111.648	10.80	10.91	0.078	15.584		526.6	526.7	101.30	101.20	1.253	1.265	150	0.2795987
160.00	621.91	66.80	66.33	442.95	66.71247668	66.5581	108.706	10.84	10.93	0.083	16.054		526.6	526.6	98.16	97.98	1.257	1.268	160	0.2887605
170.00	623.13	66.85	66.34	444.18	66.75970075	66.5678	106.99	10.80	10.90	0.081	15.844		526.6	526.7	98.82	98.64	1.253	1.264	170	0.2854279
180.00	624.36	66.85	66.33	445.43	66.79608938	66.6108	103.724	10.92	11.03	0.081	15.737		526.6	526.7	100.05	99.93	1.267	1.280	180	0.2843219
190.00	625.59	66.81	66.32	446.68	66.73682415	66.5828	101.266	10.92	11.05	0.081	15.681		526.6	526.7	99.99	100.03	1.267	1.282	190	0.2839212
200.00	626.83	66.78	66.32	447.93	66.72449637	66.5839	98.905	10.96	11.06	0.083	15.899		526.6	526.7	98.52	98.32	1.271	1.283	200	0.2884748
210.00	628.07	66.73	66.30	449.19	66.67057702	66.5124	96.7849	11.02	11.14	0.078	15.373		526.5	526.6	102.10	102.05	1.279	1.292	210	0.2794675
220.00	629.31	66.72	66.23	450.46	66.63359197	66.4971	95.67	11.02	11.17	0.082	15.752		526.5	526.6	99.46	99.72	1.279	1.296	220	0.2866381
230.00	630.56	66.68	66.20	451.73	66.59846166	66.452	93.1273	11.05	11.30	0.083	15.781		526.4	526.5	99.07	100.20	1.282	1.311	230	0.2878246
240.00	631.82	66.56	66.09	453.01	66.48154033	66.3659	93.5912	11.16	11.24	0.084	15.892		526.3	526.4	99.46	99.07	1.295	1.304	240	0.2897265
250.00	633.07	66.76	66.18	454.28	66.5792028	66.3705	93.0692	11.12	11.24	0.083	15.822		526.5	526.5	99.43	99.40	1.290	1.304	250	0.2885908
260.00	634.32	66.66	66.16	455.55	66.56737342	66.357	92.4271	11.10	11.22	0.082	15.692		526.4	526.5	100.00	99.95	1.288	1.302	260	0.2863805
270.00	635.59	66.60	66.14	456.83	66.52518499	66.362	91.7314	11.19	11.40	0.083	15.782		526.4	526.4	100.03	100.83	1.298	1.322	270	0.288208
280.00	636.85	66.56	66.10	458.11	66.45457796	66.3494	90.9224	11.23	11.27	0.081	15.614		526.3	526.4	101.37	100.59	1.303	1.307	280	0.2853539
290.00	638.10	66.57	66.09	459.39	66.49325914	66.3046	89.7204	11.11	11.34	0.083	15.790		526.3	526.4	98.92	99.88	1.288	1.315	290	0.2888779
300.00	639.36	66.55	66.07	460.66	66.50731381	66.317	90.063	11.13	11.25	0.080	15.505		526.3	526.4	101.05	100.98	1.291	1.305	300	0.2835757
310.00	640.63	66.56	66.07	461.95	66.44997462	66.3248	89.6021	11.26	11.36	0.083	15.769		526.3	526.4	100.38	100.19	1.306	1.318	310	0.2885313
320.00	641.88	66.54	66.04	463.22	66.49547733	66.3119	88.6739	11.14	11.23	0.080	15.426		526.3	526.4	101.40	101.05	1.293	1.302	320	0.2824945
330.00	643.15	66.48	66.01	464.50	66.42752469	66.2986	88.3207	11.24	11.36	0.083	15.685		526.2	526.4	100.55	100.47	1.304	1.317	330	0.2873242
340.00	644.41	66.40	66.02	465.76	66.37260727	66.2441	87.9593	11.18	11.15	0.081	15.538		526.2	526.3	100.89	99.56	1.297	1.294	340	0.2847224
350.00	645.66	66.32	65.93	467.05	66.23939947	66.1605	87.6897	11.12	11.37	0.082	15.589		526.1	526.2	99.98	101.11	1.290	1.319	350	0.2857402
360.00	646.92	66.32	65.92	468.32	66.28972535	66.2067	87.2625	11.16	11.27	0.083	15.684		526.1	526.2	99.70	99.54	1.295	1.307	360	0.2875837
370.00	648.18	66.37	65.88	469.59	66.31972186	66.1924	87.0172	11.13	11.27	0.079	15.359		526.1	526.3	101.43	101.59	1.291	1.307	370	0.2816993
380.00	649.43	66.34	65.89	470.87	66.3284874	66.2087	86.714	11.16	11.30	0.081	15.556		526.1	526.3	100.34	100.57	1.294	1.311	380	0.2853743
390.00	650.69	66.27	65.86	472.15	66.21267248	66.1392	86.392	11.13	11.32	0.084	15.778		526.1	526.2	98.65	99.28	1.291	1.314	390	0.2895412
400.00	651.95	66.18	65.77	473.43	66.08592904	66.0496	86.3091	11.24	11.29	0.083	15.654		526.0	526.1	100.40	99.78	1.304	1.310	400	0.2872901
410.00	653.20	66.17	65.78	474.70	66.0685008	66.0055	86.0799	11.11	11.27	0.084	15.832		526.0	526.0	98.06	98.40	1.288	1.307	410	0.2906189
420.00	654.46	66.09	65.69	475.98	66.02322791	65.9665	85.8144	11.17	11.34	0.084	15.747		525.9	526.0	99.12	99.52	1.296	1.315	420	0.2891297
430.00	655.73	65.99	65.56	477.27	65.94026036	65.9052	85.5739	11.29	11.37	0.083	15.720		525.8	525.9	100.32	99.98	1.309	1.319	430	0.2886903
440.00	656.99	66.04	65.59	478.54	65.98559755	65.8186	85.365	11.14	11.27	0.086	15.927		525.8	525.9	97.64	97.73	1.292	1.307	440	0.2925461
450.00	658.25	66.06	65.60	479.82	65.98435792	65.7539	85.0442	11.22	11.35	0.083	15.657		525.8	525.9	100.05	100.07	1.302	1.316	450	0.2876816
460.00	659.52	65.87	65.45	481.09	65.80585508	65.6693	84.8228	11.25	11.25	0.084	15.813		525.7	525.7	99.32	98.24	1.305	1.306	460	0.2906068
470.00	660.77	65.78	65.36	482.36	65.68917165	65.5952	84.4334	11.14	11.23	0.084	15.754		525.6	525.6	98.63	98.35	1.292	1.303	470	0.289619
480.00	662.04	65.67	65.31	483.63	65.61118313	65.5486	84.2341	11.30	11.28	0.084	15.779		525.5	525.6	99.89	98.57	1.311	1.308	480	0.2901284
490.00	663.31	65.58	65.19	484.90	65.46109118	65.4402	83.807	11.28	11.21	0.083	15.698		525.4	525.5	100.12	98.42	1.308	1.300	490	0.2887632
500.00	664.57	65.45	65.10	486.19	65.40677082	65.3462	83.5145	11.18	11.46	0.086	15.975		525.3	525.4	97.53	98.83	1.297	1.329	500	0.293926
510.00	665.84	65.35	65.00	487.48	65.27809017	65.2418	83.101	11.28	11.42	0.086	15.916		525.2	525.3	98.71	98.79	1.309	1.324	510	0.2929498
520.00	667.10	65.26	64.87	488.76	65.16284091	65.1411	82.8435	11.18	11.38	0.085	15.806		525.1	525.2	98.44	99.15	1.297	1.320	520	0.2910047
530.00	668.36	65.21	64.84	490.06	65.09807228	65.0576	82.5637	11.20	11.46	0.086	15.955		525.0	525.1	97.65	98.90	1.299	1.330	530	0.2938165
540.00	669.62	65.18	64.70	491.34	65.10071417	64.9725	82.0918	11.28	11.33	0.084	15.751		524.9	525.0	99.57	98.95	1.308	1.314	540	0.2901813
550.00	670.88	65.08	64.65	492.62	65.00908662	64.9297	81.8726	11.18	11.41	0.086	15.943		524.9	525.0	97.50	98.43	1.297	1.324	550	0.293779
560.00	672.14	65.03	64.63	493.90	64.96725908	64.8988	81.6124	11.21	11.37	0.086	15.895		524.8	524.9	97.99	98.30	1.300	1.319	560	0.2929776
570.00	673.40	64.93	64.55	495.18	64.91720485	64.8408	81.2417	11.23	11.33	0.083	15.671		524.7	524.9	99.52	99.35	1.303	1.315	570	0.2889367
575.00	674.03	64.88	64.52	495.83	64.86720368	64.8025	81.13	11.25	11.55	0.085	15.803		524.7	524.8	98.84	100.37	0.652	0.670	575	0.291399

Time	Flue	Room	Tunnel	DGM 1	DGM 1	Filter 1	DGM 2	DGM 2	Filter 2	DGM 3	Filter 3	Meter #1	Meter #2	Draft	Tunnel	CO	CO2	O2	scale
10.0	Temp 1	Temp 2	Dry Bulb 3	In 13	Out 14	15	In 16	Out 17	18	In 19	20	21	22	23	24	% 25	% 25	% 27	Lbs 28
0.0	465.8708	86.40326	139.4723	68.02924	68.02924	83.41057						370.668		0.070157	0.076632				5.97
10.0	736.4295	89.11384	148.0451	68.09743	68.09743	85.14007						371.843		0.100261	0.072524				36.94
20.0	575.5585	89.69938	130.8808	67.90207	67.90207	84.26984						373.061		0.08959	0.074039				34.35
30.0	527.9692	86.37476	126.3775	68.0722	68.0722	86.68005						374.291		0.084307	0.080513				32.66
40.0	519.5143	89.16027	117.6813	67.82659	67.82659	84.20202						375.527		0.085876	0.078034				30.99
50.0	537.7607	87.55693	121.2789	67.99015	67.99015	84.00521						376.767		0.086485	0.078324				29.37
60.0	546.8265	85.45186	124.9744	67.70008	67.70008	82.37444						378.008		0.085436	0.078833				27.64

Intertek Testing Services

Manufacturer:	**SBI**
Model:	**3.5 Series**
Date:	**2-21-22**
Run:	**2-Low**
Project #:	**G104981354**
Test Duration: (minutes)	**60**

RESULTS

Average emission rate:(gr/hr) #DIV/0!

Burn Rate (Dry kg/hr): 10.282

PRESSURE FACTOR: 1.01604

BAROMETRIC PRESSURE

Average: 30.4
Start: 30.24
End: 30.56

TEMPERATURE FACTORS

DGM #1: 1.00010
DGM #2: 1.14783

DRY GAS METER VALUES

VOLUMES SAMPLED		Avg sample flow rate (dscfm)			
DGM #1:	7.33173	0.122195508	DGM #1	Final:	378.008
DGM #2:	0.00000	0		Initial:	370.668
			DGM #2	Final:	0.000
TOTAL TUNNEL VOLUME (scf):	17581			Initial:	0.000

SAMPLE RATIOS

TEMPERATURES (DEG. RANKIN)

Sample Train 1: 2397.910
Sample Train 2: #DIV/0!

DGM #1: 527.945
DGM #2: 460.000

TOTAL EMISSIONS

CALIBRATION FACTORS

Sample Train 1 (g): **9.592**
Sample Train 2 (g): **#DIV/0!**

DGM #1: 0.9830
DGM #2: 0.0000

EMISSION RATES

TUNNEL FLOW RATE: 293.014

Sample Train 1 (g/hr): **9.59**
Sample Train 2 (g/hr): **#DIV/0!**

PARTICULATE CATCH (mg)

Total Sample Train 1:	4
Total Sample Train 2:	0
Filter and seal Sample Train 1:	3.4
Filter and seal Sample Train 2:	
Probe Sample Train 1:	0.6
Probe Sample Train 2:	

MAX Allowed 7.50%

DEVIATION: #DIV/0!

								6" Tunnel	0.1963	ft^2							**(ASTM E2515 Formula)**			
		Manufacturer:		SBI				12" Tunnel	0.7854	ft^2										
		Model:		3.5 Series							Tunnel area (ft2):		0.349		Manufacturer:		SBI			
		Date:		2-21-22							Wood moisture (% wet):		17.28		Model:		3.5 Series			
		Run:		2-Low							Load Weight (lbs wet):		34.621		Date:		2-21-22			
		Project #:		G104981354							Burn Rate (Dry kg/hr):		10.282		Run:		2-Low			
		Test Duration:		60							End of test weight (Dry lb)		5.971							
	Total Gas Volume (DGM 1):			7.329							Final Temperature (DGM #1) Degrees Rankin:				527.945					
	Total Gas Volume (DGM 2):			0.000							Final Temperature (DGM #2) Degrees Rankin:				460.000					
	Average Barometric Pressure:			30.4							Final Tunnel Temperature Degrees Rankin:				589.816					
		Molecular Weight:		28.78							Final Tunnel Velocity (feet per second):				15.7046967					
		Pitot Correction:		0.955865132							Standardized Tunnel Flow (dscfm):				293.013811					
	Calibration Factor (DGM #1):			0.9830																
	Calibration Factor (DGM #2):																			
			(1) VS:	0.217981124									Average Inlet +	Average Inlet +						
			(2) VS:	#DIV/0!				Filter	Filter				Outlet	Outlet	Average	Average	#1	#2		Average
								Face	Face	Delta-P	Tunnel		Temp.	Temp.	99.8	#DIV/0!	dDGM	dDGM		0.3
Elapsed	**DGM 1**	**DGM 1**	**DGM 1**	**DGM 2**	**DGM 2**	**DGM 2**	**Tunnel**	**Velocity**	**Velocity**	**(in. H2O)**	**Velocity**		**Meter 1**	**Meter 2**	**Proportional Rates**		**Vol.Std.**	**Vol.Std.**		**SQRT**
Time	**Reading**	**Inlet T**	**Outlet T**	**Reading**	**Inlet T**	**Outlet T**	**Dry Bulb**	**DGM 1**	**DGM 2**	**Tunnel**	**Ft/Sec**		**Deg. R**	**Deg. R**	**PR1**	**PR2**	**(ft3)**	**(ft3)**	**Time**	**Delta-P**
0.00	370.67	68.03	68.03	0.00	0	0	139.4723			0.077	15.801		528.0	460.0					0	0.27682521
10.00	371.84	68.10	68.10	0.00	0	0	148.0451	10.11	0.00	0.073	15.481		528.1	460.0	100.35	#DIV/0!	1.173	0.000	10	0.26930202
20.00	373.06	67.90	67.90	0.00	0	0	130.8808	10.48	0.00	0.074	15.420		527.9	460.0	101.56	#DIV/0!	1.216	0.000	20	0.27210097
30.00	374.29	68.07	68.07	0.00	0	0	126.3775	10.58	0.00	0.081	16.018		528.1	460.0	97.92	#DIV/0!	1.228	0.000	30	0.28374824
40.00	375.53	67.83	67.83	0.00	0	0	117.6813	10.64	0.00	0.078	15.652		527.8	460.0	99.29	#DIV/0!	1.234	0.000	40	0.27934578
50.00	376.77	67.99	67.99	0.00	0	0	121.2789	10.67	0.00	0.078	15.730		528.0	460.0	99.68	#DIV/0!	1.238	0.000	50	0.27986464
60.00	378.01	67.70	67.70	0.00	0	0	124.9744	10.69	0.00	0.079	15.831		527.7	460.0	99.86	#DIV/0!	1.240	0.000	60	0.28077141

Filters pre-weights

General information

Project:	G104981354
Project Engineer:	Claude Pelland
Scale ID:	SBI-206

		Date	2022-02-14		2022-02-16		2022-02-18		2022-02-20		2022-02-21	
		Pression barométrique	**101.80**		**103.0**		**100.5**		**102.6**		**101.9**	
Calibration Record		SBI-237	0.1000	0.0999		0.0998		0.0999		0.1000		0.1000
		SBI-238	10.0001	10.0001		10.0001		9.9999		10.0001		10.0000
		SBI-238	200.0000	200.0000		200.0000		200.0000		200.0000		200.0000
		Start Time	Temp. [°F]	17H30	67	12H00	67	12H40	69.9	6H07	66.9	6H10	68.1
		End Time	RH [%]	18H00	2.2	12H25	1.9	13H00	2.6	6H30	2	6H30	2
			Filter ID	**Weight (mg)**		**Weight (mg)**		**Weight (mg)**		**Weight (mg)**		**Weight (mg)**	
RUN 1	HIGH	A-front	19	181.2		181.1		181.1		181.0			
		A-front	20										
		B-front	23	180.9		181.0		181.0		181.0			
		B-rear	24										
		C-front	27	181.5		181.6		181.6		181.6			
		C-rear	28										
	MED	D-front	33	185.8		185.8		185.8		185.8			
		D-rear	34										
		E-front	41	182.9		182.9		182.8		182.9			
		E-rear	42										
		F-front	29	184.3		184.3		184.3		184.4			
		F-rear	30										
RUN 2	HIGH	A-front	51	180.2		180.1		180.2		180.2		180.2	
		A-front	52										
		B-front	59	183.4		183.3		183.4		183.4		183.4	
		B-rear	60										
		C-front	21	179.9		179.9		179.9		179.7		179.8	
		C-rear	22										
	LOW	D-front	63	185.7		185.7		185.8		185.8		185.8	
		D-rear	64										
		E-front	69	181.1		181.0		181.1		181.1		181.1	
		E-rear	70										
		F-front	65	182.3		182.1		182.1		182.2		182.1	
		F-rear	66										

Probes pre-weights

General information

Project:	G104981354
Project Engineer:	Claude Pelland
Scale ID:	SBI-206

	Date		2022-02-14		2022-02-15		2022-02-15		2022-02-16		2022-02-20		2022-02-21	
	Pression barométrique		**101.80**		**102.90**		**103.2**		**102.3**		**102.6**		**101.9**	
Calibration Record	SBI-237	0.1000	0.0999		0.0999		0.1000		0.0999		0.1000		0.1000	
	SBI-238	10.0001	10.0001		10.0000		10.0001		10.0001		10.0001		10.0000	
	SBI-238	200.0000	200.0000		200.0000		200.0000		200.0000		200.0000		200.0000	
	Start Time	Temp. [°F]	16H30	69.2	8H30	68.5	14H30	69.7	15H00	70	7H00	69.9	6H32	70.8
	End Time	RH [%]	17H15	1.5	9H22	3.5	14H52	0.1	16H00	0.1	7H45	0.6	7H15	0.4

		système	**Probe ID**	**Weight (g)**	**Weight (g)**	**Weight (g)**	**Weight (g)**	**Weight (g)**	**Weight (g)**
RUN 1	H	A	61	94.1150	94.1149	94.1149	94.1153	94.1151	
		B	5	80.6117	80.6117	80.6121	80.6123	80.6123	
		C	1	80.1690	80.1687	80.1688	80.1690	80.1689	
	M	D	3	79.8579	79.8575	79.8578	79.8580	79.8580	
		E	6	80.5626	80.5619	80.5619	80.5620	80.5620	
		F	2	79.7085	79.7081	79.7085	79.7086	79.7087	
RUN 2	H	A	25	80.3274	80.3270	80.3271	80.3274	80.3273	80.3272
		B	26	80.8062	80.8056	80.8061	80.8063	80.8063	80.8061
		C	12	81.0055	81.0052	81.0054	81.0058	81.0053	81.0055
	L	D	63	94.1926	94.1922	94.1929	94.1931	94.1928	94.1926
		E	32	80.6018	80.6015	80.6018	80.6020	80.6018	80.6019
		F	22	80.2966	80.2960	80.2965	80.2968	80.2966	80.2968

Filters weights

General information

Project:	G104981354
Project Engineer:	Claude Pelland
Scale ID:	SBI-206

	Date/Pressure [kPa]		2022-02-20/102.6		2022-02-20/102.6		2022-02-22/103.3					
Calibration Record	SBI-237	0.1000	0.1000		0.1000		0.1000					
	SBI-238	10.0001	10.0001		10.0001		10.0000					
	SBI-238	200.0000	200.0000		200.0000		200.0000					
	Start Time	Temp. [°F]	6h07	66.9	20h10	NA	9h20	67.1				
	End Time	RH [%]	6h30	2.0	20h50	NA	9h45	2.2				

Run	Sampling train		Filter ID	Pretest Weight (mg)	Post test Weight (mg)	Post test Weight (mg)	Post test Weight (mg)	Difference
1 H	A	front	19	181.0	184.3	184.2		**3.2**
		rear	20					
	B	front	23	181.0	184.5	184.5		**3.5**
		rear	24					
	C (1 hr)	front	27	181.6	184.1	184.3		**2.7**
		rear	28					

	Date/Pressure		2022-02-20/102.6		2022-02-20/102.6		2022-02-22/103.3					
Calibration Record	SBI-237	0.1000	0.1000		0.1000		0.1000					
	SBI-238	10.0001	10.0001		10.0001		10.0000					
	SBI-238	200.0000	200.0000		200.0000		200.0000					
	Start Time	Temp. [°F]	6h07	66.9	20h10	NA	9h20	67.1				
	End Time	RH [%]	6h30	2.0	20h50	NA	9h45	2.2				

Run	Sampling train		Filter ID	Pretest Weight (mg)	Post test Weight (mg)	Post test Weight (mg)	Post test Weight (mg)	Difference
1 M	D	front	33	185.8	188.1	188.3		**2.5**
		rear	34					
	E	front	41	182.9	185.3	185.4		**2.5**
		rear	42					
	F (1 hr)	front	29	184.4	186.5	186.4		**2.0**
		rear	30					

Filters weights

General information

Project:	G104981354
Project Engineer:	Claude Pelland
Scale ID:	SBI-206

	Date/Pressure		2022-02-21/101.9		2022-02-21/101.9		2022-02-23/100.5					
Calibration Record	SBI-237	0.1000	0.1000		0.1000		0.0999					
	SBI-238	10.0001	10.0000		10.0000		10.0000					
	SBI-238	200.0000	200.0000		200.0000		200.0000					
	Start Time	Temp. [°F]	6H10	68.1	21h39	NA	7h20	67.1				
	End Time	RH [%]	6H30	2.0	22h10	NA	7h30	2.1				

Run	**Sampling train**		**Filter ID**	**Pretest Weight (mg)**	**Post test Weight (mg)**	**Post test Weight (mg)**	**Post test Weight (mg)**	**Difference**
2 H	A	front	51	180.2	184.1	184.1		**3.9**
		rear	52					
	B	front	59	183.4	187.3	187.3		**3.9**
		rear	60					
	C (1 hr)	front	21	179.8	183.2	183.1		**3.3**
		rear	22					

	Date/Pressure		2022-02-21/101.9		2022-02-21/101.9		2022-02-22/103.3					
Calibration Record	SBI-237	0.1000	0.1000		0.1000		0.1000					
	SBI-238	10.0001	10.0000		10.0000		10.0000					
	SBI-238	200.0000	200.0000		200.0000		200.0000					
	Start Time	Temp. [°F]	6H10	68.1	21h39	NA	9h20	67.1				
	End Time	RH [%]	6H30	2	22h10	NA	9H45	2.2				

Run	**Sampling train**		**Filter ID**	**Pretest Weight (mg)**	**Post test Weight (mg)**	**Post test Weight (mg)**	**Post test Weight (mg)**	**Difference**
2 L	D	front	63	185.8	190.3	190.3		**4.5**
		rear	64					
	E	front	69	181.1	185.4	185.4		**4.3**
		rear	70					
	F(1 hr)	front	65	182.1	185.4	185.5		**3.4**
		rear	66					

Probes weights

General information

Project:	G104981354
Project Engineer:	Claude Pelland
Scale ID:	SBI-206

	Date/Pressure		2022-02-20/102.6		2022-02-20/102.6		2022-02-24/103.5		2022-02-25/103.2		2022-03-01/102.5		2022-03-04/102.9	
Calibration Record	SBI-237	0.1000	0.1000		0.1000		0.1000		0.0999		0.0999		0.1000	
	SBI-238	10.0001	10.0001		10.0001		10.0000		9.9999		10.0000		10.0000	
	SBI-238	200.0000	200.0000		200.0000		200.0000		200.0000		200.0001		200.0000	
	Start Time	Temp. [°F]	7H00	69.9	20H20	NA	11H15	69.2	7H15	69.8	9H15	69.6	7h40	70.8
	End Time	RH [%]	7H45	0.6	20H50	NA	11H50	0.6	7H30	0.9	9H30	0.9	8h10	0.8

Run	Sampling train	Probe ID	Pretest Weight (g)	Post test Weight (g)	Post test Weight (g)	Post test Weight (g)	Post test Weight (g)	Post test Weight (g)	Difference (mg)
1 H	A	61	94.1151	94.1164	94.1151	94.1151	94.1155	94.1156	**0.5**
	B	5	80.6123	80.6154	80.6126	80.6128	-	-	**0.5**
	C (1 hr)	1	80.1689	80.1706	80.1689	80.1690	-	-	**0.1**

	Date/Pressure		2022-02-20/102.6		2022-02-20/102.6		2022-02-24/103.5		2022-02-25/103.2		2022-03-01/102.5		2022-03-04/102.9	
Calibration Record	SBI-237	0.1000	0.1000		0.1000		0.1000		0.0999		0.0999		0.1000	
	SBI-238	10.0001	10.0001		10.0001		10.0000		9.9999		10.0000		10.0000	
	SBI-238	200.0000	200.0000		200.0000		200.0000		200.0000		200.0001		200.0000	
	Start Time	Temp. [°F]	7H00	69.9	20H20	NA	11H15	69.2	7H15	69.8	9H15	69.6	7h40	70.8
	End Time	RH [%]	7H45	0.6	20H50	NA	11H50	0.6	7H30	0.9	9H30	0.9	8h10	0.8

Run	Sampling train	Probe ID	Pretest Weight (g)	Post test Weight (g)	Post test Weight (g)	Post test Weight (g)	Post test Weight (g)	Post test Weight (g)	Difference (mg)
1 M	D	3	79.8580	79.8591	79.8581	79.8582	79.8585	79.8587	**0.7**
	E	6	80.5620	80.5637	80.5627	80.5628	-	-	**0.8**
	F(1 hr)	2	79.7087	79.7107	79.7094	79.7094	-	-	**0.7**

Probes weights

General information

Project:	G104981354
Project Engineer:	Claude Pelland
Scale ID:	SBI-206

	Date/Pressure		2022-02-21/101.9		2022-02-21/101.9		2022-02-24/103.5		2022-02-25/103.2	
Calibration Record	SBI-237	0.1000	0.1000		0.1000		0.1000		0.0999	
	SBI-238	10.0001	10.0000		10.0000		10.0000		9.9999	
	SBI-238	200.0000	200.0000		200.0000		200.0000		200.0000	
	Start Time	Temp. [°F]	6H32	70.8	21h39	NA	11H15	69.2	7H15	69.8
	End Time	RH [%]	7H15	0.4	21h54	NA	11H50	0.6	7H30	0.9

Run	Sampling train	Probe ID	Pretest Weight (g)	Post test Weight (g)	Post test Weight (g)	Post test Weight (g)	Difference (mg)
2 H	A	25	80.3272	80.3284	80.3275	80.3275	**0.3**
	B	26	80.8061	80.8071	80.8065	80.8065	**0.4**
	C (1 hr)	12	81.0055	81.0055	80.0059	81.0060	**0.5**

	Date/Pressure		2022-02-21/101.9		2022-02-09/101.3		2022-02-24/103.5		2022-02-25/103.2	
Calibration Record	SBI-237	0.1000	0.1000		0.1000		0.1000		0.0999	
	SBI-238	10.0001	10.0000		10.0000		10.0000		9.9999	
	SBI-238	200.0000	200.0000		200.0000		200.0000		200.0000	
	Start Time	Temp. [°F]	6H32	70.8	21h39	NA	11H15	69.2	7H15	69.8
	End Time	RH [%]	7H15	0.4	21h54	NA	11H50	0.6	7H30	0.9

Run	Sampling train	Probe ID	Pretest Weight (g)	Post test Weight (g)	Post test Weight (g)	Post test Weight (g)	Difference (mg)
2 L	D	63	94.1926	94.1938	94.1134	94.1935	**0.9**
	E	32	80.6019	80.6035	80.6028	80.6028	**0.9**
	F (1 hr)	22	80.2968	80.2995	80.2974	80.2974	**0.6**

ID Certificat de Calibration
CA0003-006-030921-ACC-USI

Mettler-Toledo Inc.
Service Division
1900 Polaris Parkway
Columbus, OH 43240
1-800-METTLER

METTLER TOLEDO

Accredited by the American Association for Laboratory Accreditation (A2LA)
CALIBRATION CERT #1902.01

ISO 17025 Registered
ANSI/NCSL Z540-1 Accredited

Certificat de Calibration de Précision

Accuracy Calibration Certificate

Client

Compagnie:	SBI Fabricant De Poeles		
Adresse:	250 Rue de Copenhague		
Ville:	Saint-Augustin-De-Desmaures	**Contact:**	Gabrielle Santerre
Zip/Code Postal:	G3A 2H3		
État/Province:	Quebec		

Weighing Device

Manufacturier:	Weigh-Tronix	**Type d'Instrument:**	Weighing Instrument
Modèle:	DSL 4848-05	**# Outil:**	SBI-014 FLOOR SCALE
No. Série:	B00927386KL	**Modèle Indicateur:**	N/D
Building:	N/D	**Terminal Serial No.:**	N/D
Floor:	N/D	**Terminal Asset No.:**	N/D
Room:	N/D		

Plage	Capacité Max	Lisibilité (d)
1	500 kg	0.02 kg

Procedure

Instruction de Calibration: EURAMET cg-18 v. 4.0 (11/2015)
Instruction de travail METTLER TOLEDO: 30260953

Ce certificat de calibration contient des mesures pour les calibrations Tel que Trouvé et Tel que Laissé.

The sensitivity/span of the weighing instrument was adjusted before As Left calibration with an external weight.

The calibration was agreed with the user below the maximum capacity of the balance.

	Temperature	
Tel que Trouvé	Start: 22.0 °C	End: 22.0 °C
Tel que Laissé	Start: 22.0 °C	End: 22.0 °C

Environmental conditions have been verified to ensure the accuracy of the calibration.

This certificate is issued in accordance with the conditions of accreditation granted by A2LA, which is based on ISO/IEC 17025. A2LA has assessed the measurement capability of the laboratory and its traceability to recognized national standards.

Date calibration Tel que Trouvé:	09-03-2021	**Authorized A2LA Signatory:**	Dany Careau
Date calibration Tel que Laissé:	09-03-2021		Dany Careau
Date d'Émission:	09-03-2021		

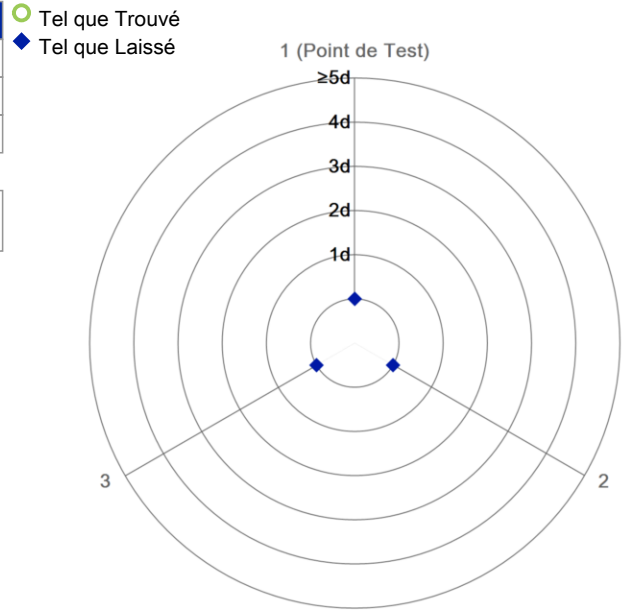
Résultats de Mesure

Répétabilité

Charge de Test: 100 kg

	Tel que Trouvé	Tel que Laissé
1	N/D	100.00 kg
2	N/D	100.00 kg
3	N/D	100.00 kg

Écart Type	**N/D**	**0.000 kg**



The "d" in the graph represents the readability of the range/interval in which the test was performed.

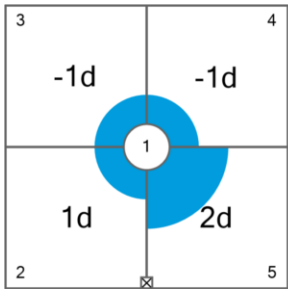
The results of this graph are based upon the absolute values of the differences from the mean value.

Excentricité

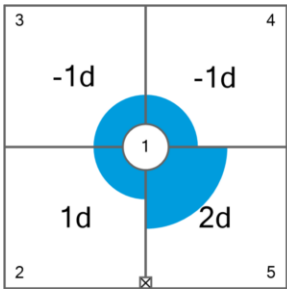
Charge de Test: 100 kg

Position	Tel que Trouvé	Tel que Laissé
1	100.06 kg	100.00 kg
2	100.08 kg	100.02 kg
3	100.04 kg	99.98 kg
4	100.04 kg	99.98 kg
5	100.10 kg	100.04 kg

Déviation Maximale	**0.04 kg**	**0.04 kg**



Tel que Trouvé



Tel que Laissé

The "d" in the graph represents the readability of the range/interval in which the test was performed.

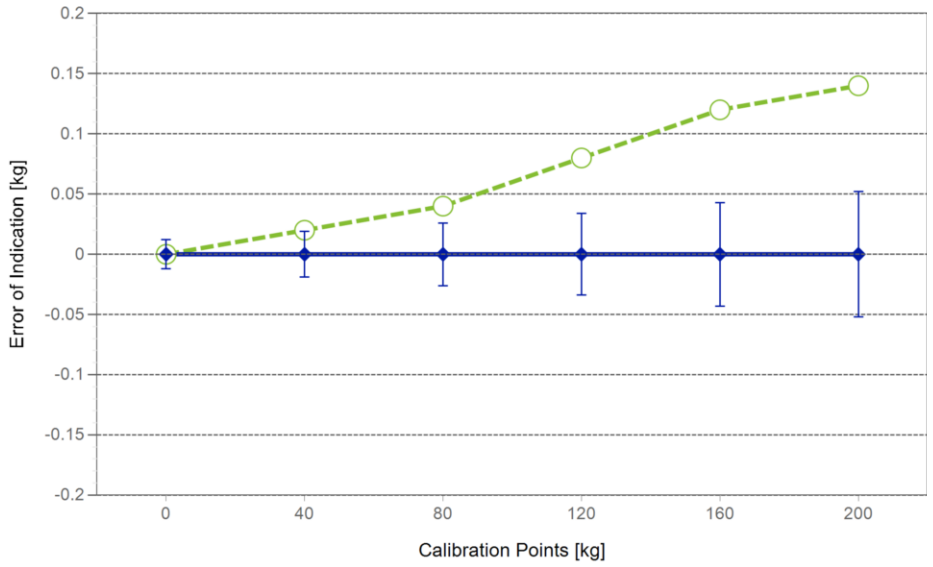
Erreur d'indication

Tel que Trouvé

	Reference Value	Indication	Erreur d'indication	Incertitude Élargie	k
1	0 kg	0.00 kg	0.00 kg	N/D	N/D
2	40 kg	40.02 kg	0.02 kg	N/D	N/D
3	80 kg	80.04 kg	0.04 kg	N/D	N/D
4	120 kg	120.08 kg	0.08 kg	N/D	N/D
5	160 kg	160.12 kg	0.12 kg	N/D	N/D
6	200 kg	200.14 kg	0.14 kg	N/D	N/D

Tel que Laissé

	Reference Value	Indication	Erreur d'indication	Incertitude Élargie	k
1	0 kg	0.00 kg	0.00 kg	0.012 kg	2
2	40 kg	40.00 kg	0.00 kg	0.019 kg	2
3	80 kg	80.00 kg	0.00 kg	0.026 kg	2
4	120 kg	120.00 kg	0.00 kg	0.034 kg	2
5	160 kg	160.00 kg	0.00 kg	0.043 kg	2
6	200 kg	200.00 kg	0.00 kg	0.052 kg	2



Tel que Trouvé

Tel que Laissé

For improved legibility of the graphics only increasing measurement points are shown and measurement points close to zero are not displayed.

The uncertainty stated is the expanded uncertainty at calibration obtained by multiplying the standard combined uncertainty by the coverage factor k – which can be larger than 2 according to EURAMET cg-18. The value of the measurand lies within the assigned range of values with a probability of approximately 95%. The user is responsible for maintaining environmental conditions and the settings of the weighing instrument when it was calibrated.

Test Equipment

Tous les poids utilisés pour le contrôle métrologique sont retraçables aux étalons Nationaux et Internationaux. Les poids ont été calibrés et certifiés par un laboratoire de calibration accrédité.

Jeu de Poids 1: OIML M1

Weight Set Number:	Kit 20kg "Q"	Date d'Émission:	03-06-2020
# Certificat:	1415506	Date de Calibration Due:	03-06-2021

Remarques

N/D

End of Accredited Section

The information below and any attachments to this calibration certificate are not part of the accredited calibration.

Incertitude de Mesure du dispositif de pesage en opération

Stated is the expanded uncertainty with k=2 in use. The formula shall be used for the estimation of the uncertainty under consideration of the errors of indication. The value R represents the net load indication in the unit of measure of the device.

Coefficient de température pour l'évaluation de l'incertitude de mesure en opération: $10.0 \cdot 10^{-6}$ / K

Plage d'opération sur le site pour l'évaluation de l'incertitude de mesure en opération: 10 K

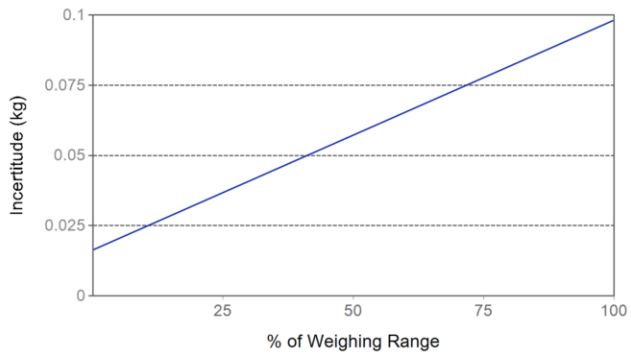
Linéarisation de l'Équation d'Incertitude

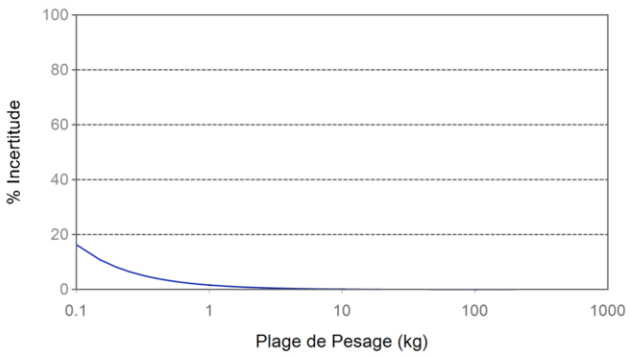
Plage			Tel que Trouvé	Tel que Laissé
	d	Max		
1	0.02 kg	200 kg	N/A	U_1 = 16 g + 0.409 g/kg · R

To optimize the stability of the linearization, besides of the zero load only increasing measurement points with a test load of 5% of the measurement range or larger are taken for the calculation of the linear equation.

Absolute and Relative Measurement Uncertainty in Use for Various Net Indications (Examples)

Indication Net	Tel que Trouvé		Tel que Laissé	
0.20 kg	N/A	N/A	0.016 kg	8.0%
2.00 kg	N/A	N/A	0.017 kg	0.84%
20.00 kg	N/A	N/A	0.024 kg	0.12%
100.00 kg	N/A	N/A	0.057 kg	0.057%
200.00 kg	N/A	N/A	0.098 kg	0.049%





Tel que Trouvé Tel que Laissé

METTLER TOLEDO Service

Handbook 44 Tolerance Assessment (Entretien)

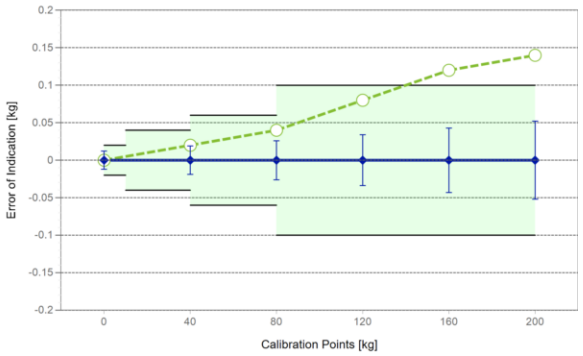
Assessment done without considering measurement uncertainty.
Les mesures du certificat de calibration joint ont été évaluées selon les tolérances définies par NIST HB44.

	Tel que Trouvé	Tel que Laissé
Global	✗	✓

✓ = Passed
✗ = Failed

Weighing Device

Range	Max. Capacity	Readability (d)	Verification Scale Interval (e)	Class
1	500 kg	0.02 kg	0.02 kg	III



Tolerances according to NIST Handbook 44

Test Load		Tolérance
From	To	
0.00 kg	0.00 kg	0.005 kg
0.02 kg	10.00 kg	0.02 kg
10.02 kg	40.00 kg	0.04 kg
40.02 kg	80.00 kg	0.06 kg
80.02 kg	200.00 kg	0.1 kg

○ Tel que Trouvé
◆ Tel que Laissé
— Tolérance

Eccentricity and Repeatability

Test	Test Load	Tolérance	As Found		As Left	
			Max. Error / Range	Result	Max. Error / Range	Result
Excentricité (Maximum Error)	100 kg	0.10 kg	0.1 kg	✓	0.04 kg	✓
Excentricité (Plage)	100 kg	0.1 kg	0.06 kg	✓	0.06 kg	✓
Répétabilité (Maximum Error)	100 kg	0.1 kg	N/D	N/D	0.00 kg	✓
Répétabilité (Plage)	100 kg	0.10 kg	N/D	N/D	0.00 kg	✓

Max. Error: Maximum of the absolute values of the individual errors.
Range: Difference between largest and smallest measurement value.

Error of Indication

	Reference Value	Tolérance	As Found		As Left	
			Error of Indication	Result	Error of Indication	Result
1	0 kg	0.02 kg	0.00 kg	✓	0.00 kg	✓
2	40 kg	0.04 kg	0.02 kg	✓	0.00 kg	✓
3	80 kg	0.06 kg	0.04 kg	✓	0.00 kg	✓
4	120 kg	0.10 kg	0.08 kg	✓	0.00 kg	✓
5	160 kg	0.10 kg	0.12 kg	✗	0.00 kg	✓
6	200 kg	0.10 kg	0.14 kg	✗	0.00 kg	✓

POLYCONTROLS
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CLAS 2009-02

#655

CERTIFICAT D'ÉTALONNAGE # 15508

Date d'étalonnage : 2021-11-16
Date d'émission du certificat : 2021-11-16

Stove Builder International
250, rue de Copenhague
Saint-Augustin-de-Desmaures, Québec, Canada
G3A 2H3

Étalonnage d'un
Débitmètre volumétrique American Meter Company DTM-200A S/N : 07J264834

CONFORMITÉ AU PROGRAMME DE QUALITÉ

Tous les étalonnages sont effectués conformément au manuel d'assurance qualité de Polycontrols qui est conforme à la norme ISO/IEC 17025: 2017, à la norme ISO 9001 – 2015 ainsi qu'à toutes autres exigences de qualité définies dans la description d'achat des clients. Les résultats ne sont valides que pour l'objet soumis à l'essai ou à l'étalonnage. Si applicable, la règle de décision est décrite au certificat.

TRAÇABILITÉ

La traçabilité des étalons de débit au National Institute of Standards and Technology, NIST, est maintenue par les laboratoires de Fluke Corporation de Phoenix, Arizona et est conforme aux normes ISO/IEC 17025, ANSI/NCSL Z540-1-1994, ISO-10012-1, MIL-STD 45662A.

Le Service d'évaluation des laboratoires d'étalonnage (CLAS) du Conseil national de recherches du Canada (CNRC) a évalué et certifié la capacité d'étalonnage du laboratoire et la traçabilité au Système international d'unités (SI) ou à des étalons acceptables selon le CLAS. Le présent certificat d'étalonnage est délivré conformément aux conditions de certification du CLAS et aux conditions d'accréditation du Conseil canadien des normes (CCN). Le CLAS et le CCN ne garantissent pas l'exactitude des étalonnages individuels effectués par les laboratoires accrédités.

APTITUDE EN MATIÈRE DE MESURE ET D'ÉTALONNAGE - CMC

Les rendements métrologiques d'étalonnage ont une incertitude de ±0.2% de la lecture pour les mesures entre 5 SCCM à 10 SLPM, ±0.3% de la lecture pour les mesures entre 10 SLPM à 30 SLPM, ±0.2% de la lecture pour les mesures entre 30 SLPM à 3000 SLPM, ±0.3% de la lecture pour les mesures supérieures à 3000 SLPM jusqu'à 6000 SLPM et ±0.5% pour les mesures inférieures à 5 SCCM jusqu'à concurrence de 1 SCCM, équivalent air ou azote. Les incertitudes exprimées sont élargies avec un facteur d'élargissement k = 2, et ce, pour un niveau de confiance d'environ 95 %, dans l'hypothèse d'une distribution normale incluant la résolution de l'instrument. Le rapport d'incertitude des essais (RIE) de cet étalonnage respecte un ratio de 4:1 à moins d'indication contraire.

SOMMAIRE DES CONDITIONS DE L'INSTRUMENT EN TEST

Conditions initiales	En bon état
Travail Effectué	Étalonnage de l'instrument
	Lectures Initiales = Lectures finales, aucun ajustement
Résultats	Lectures finales dans les tolérances
Remarques	Fréquence d'étalonnage aux 12 mois

B Poirier
Bernard Poirier
Métrologiste

Olivier Duchesne Bamber
Responsable du laboratoire

POLYCONTROLS
INTEGRATION • CALIBRATION • INSTRUMENTATION

CLAS NRC-CNRC
CLAS 2009-02

SCC Accredited LAB
LAB Accrédité CCN
#655

Certificat d'étalonnage # 15508

Numéro de série:	07J264834	Station de mesure:	3
Date d'étalonnage:	2021-11-16	Procédure:	POS-CAL-005
Identification de l'instrument:	SBI-103	Règle de décision:	Méthode #3

Instrument de mesure de référence utilisé pour l'étalonnage final

Description	Modèle	# Série	Traçabilité	Date dû
Fluke molbloc_30 slpm	3E4-VCR-V-Q	2403	1500308202	2022-06-03
Fluke molbox1	Molbox1	755	1500311473	2022-07-02
RTD Mist	M22	3061002	2021004861	2022-06-21
Module 44.5 PSI avec Baro 163671	Module 30	160659	2021003409	2022-05-04

Spécifications finales de l'appareil

Gaz	Air
Température d'opération	
Pression à l'entrée	
Pression à la sortie	
Température de référence	
Pression de référence	
Étendue d'échelle	0-200 ACFH
Signaux Entrée/Sortie	-
Alimentation	
Tolérance	±2 %F.S.

Condition d'étalonnage

Gaz	Air
Température ambiante	21 °C
Pression ambiante	1011.43 mbar
Orientation	Horizontale
Élastomère	
Valve	

Lectures finales

Débit du test ACFH	Instrument en test ft³	Valeurs mesurées Pression PSIA	Température °C	Référence ft³	Référence calculée ft³	Erreur calculée ft³	Tolérance acceptable ft³	Incertitude k = 2 ft³	TUR
5.0186	0.8420	14.682	21.02	0.8338	0.8343	0.0077	0.6650	0.0034	>4
10.0496	1.6810	14.681	20.98	1.6724	1.6733	0.0077	0.6660	0.0056	>4
15.0522	2.5230	14.680	20.95	2.5036	2.5049	0.0181	0.6657	0.0083	>4
24.9227	4.1870	14.682	20.92	4.1549	4.1561	0.0309	0.6670	0.0138	>4
39.7734	6.6830	14.687	20.92	6.6241	6.6237	0.0593	0.6661	0.0220	>4

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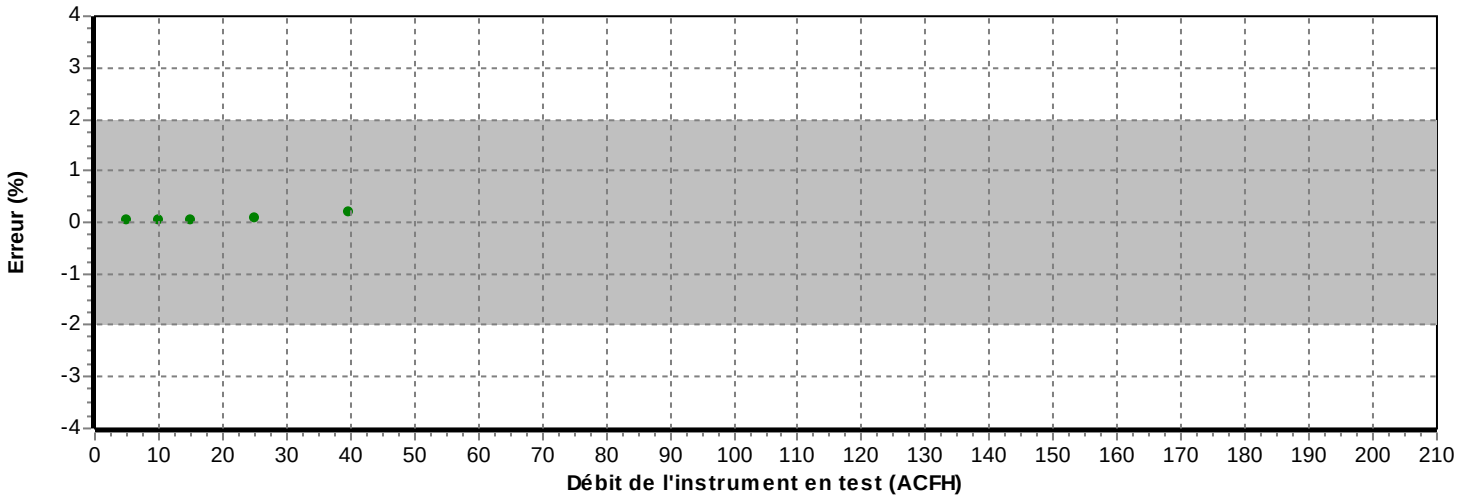
CLAS 2009-02

#655

Certificat d'étalonnage # 15508

Numéro de série:	07J264834	Station de mesure:	3
Date d'étalonnage:	2021-11-16	Procédure:	POS-CAL-005
Identification de l'instrument:	SBI-103	Règle de décision:	Méthode #3

Résultats finaux



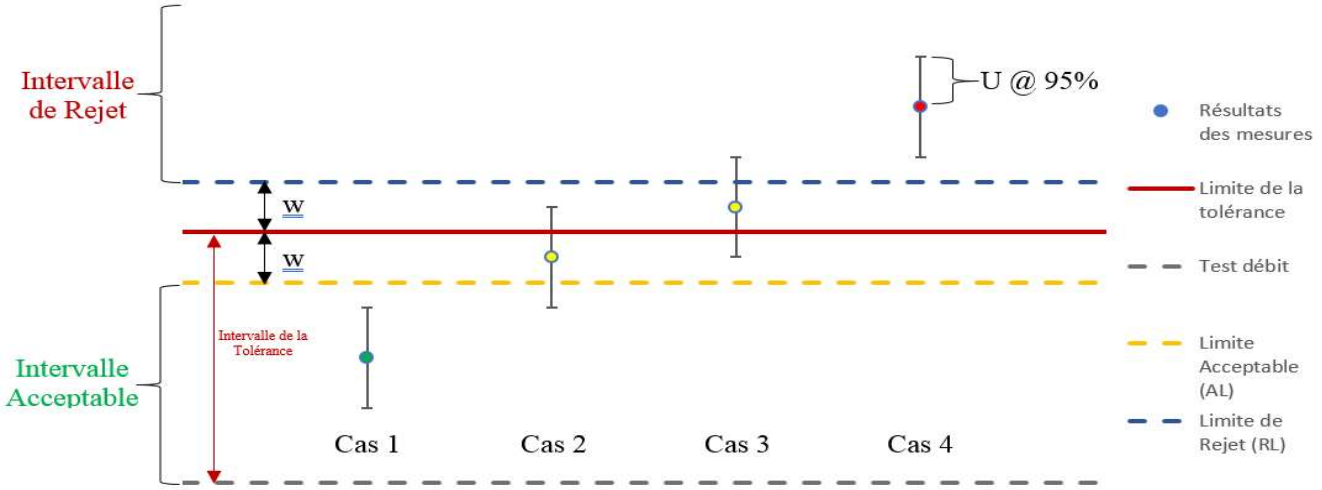
Voir l'annexe pour la règle de décision

Annexe pour la règle de décision

Méthode 3 Statut de Conformité Non-binaire avec Bande de Garde en considérant l'incertitude de la mesure directement

Cette méthode tient compte d'une bande de garde pour définir l'intervalle acceptable et de rejet. La limite acceptable du résultat de la mesure est calculée selon la méthode mathématique suivante AL = TL – w et de rejet RL = TL + w, dont w = rU. Le multiple r de l'incertitude combiné élargie U peut être défini selon la table 1 section 5.2 du document ILAC G8 : 2019. L'incertitude de la mesure U est une incertitude combinée élargie ayant un niveau de confiance de 95% (k = 2). La règle de conformité non-binaire avec bande de garde est définie lorsqu'il y a quatre choix sur le statut de l'essai : dans la tolérance, acceptation conditionnelle, rejet conditionnel, et hors tolérance.

Les conformités de l'essai sont définies telles que :



Explication de la règle Non-Binaire avec Bande de Garde

Cas 1 – *Inférieur à la limite acceptable AL*, ***Statut*** *:* ***Dans les tolérances (In tolerance)****.*

- Le résultat de la mesure est à l'intérieur de l'intervalle acceptable. Cependant, l'estimation du risque en assumant la probabilité d'une distribution normale d'être à l'extérieur de la limite de la tolérance est < 2.5%. L'incertitude de l'essai est directement prise en considération. Couleur verte.

Cas 2 – *Inférieur à la limite de la tolérance TL, supérieur à la limite acceptable AL*, ***Statut*** *:* ***Dans les tolérances-Conditionnel****.*

- Le résultat de la mesure est à l'extérieur de l'intervalle acceptable mais inférieur à la limite de la tolérance. Cependant, la valeur observée est située dans la bande de garde w = TL-AL et le statut du résultat est conditionnel à l'évaluation du risque du client. L'incertitude de la mesure est directement prise en considération. Couleur jaune.

Cas 3 – *Supérieur à la limite de la tolérance, inférieur à RL*, ***Statut*** *:* ***Hors tolérance-Conditionnel****.*

- Le résultat de la mesure est supérieur à la limite de la tolérance mais à l'extérieur de l'intervalle de rejet. Cependant, la valeur observée est située dans la bande de garde w = TL-RL et le statut du résultat est conditionnel à l'évaluation du risque du client. L'incertitude de la mesure est directement prise en considération. Couleur jaune.

Cas 4 – *Supérieur à la limite de rejet RL*, ***Statut*** *:* ***Hors-tolérance (Out of tolerance)****.*

- Le résultat de la mesure est à l'intérieur de l'intervalle de rejet. L'incertitude de l'essai est directement prise en considération. Couleur rouge.

Digital Measurement Metrology Inc.
A Trescal company
26 Automatic Road, Unit 4
Brampton, ON, L6S 5N7
Tel. (905) 790-9400 Fax. (905) 790-9266
www.dmm.ca // service@dmm.ca

ACCREDITED
CERTIFICATE #1692.01

CALIBRATION CERTIFICATE

Description:	WEIGHT	**Calibration Date:**	Oct 02, 2018 **Certificate:** 95513
Asset Number:	SBI-190	**Property of:**	SBI ST-AUGUSTIN
Serial/Model Number:	N / A	**Address:**	250, rue de Copenhague, Doors 10-12
Manufacturer:	N / A	**City/Prov/PC:**	St-Augustin-de-Desmaures QC G3A 2H3
Instrument Capacity:	5 kg	**Country:**	Canada
Procedure:	CP34G	**Method Used:**	COMPARISON
Room Humidity:	45 % **Room Temp:** 19.6 °C	**Conformance Stds:**	ISO/IEC 17025: 2005

CALIBRATION DATA

Units: kg

Range	Std/Nominal	As Found	As Left	Min	Max	Tolerance In	Tolerance Out	Comments
	5	5.0005	5.0005	4.9995	5.0005	✔		

Remarks:
Inspected, cleaned and tested using the mfgr's specs and procedures, customer's, national or international standards, or new procedure design. Measurement uncertainty is not included when any statement of compliance is made. The user must decide on acceptance for the intended use.

Received Condition:
In tolerance.

CALIBRATION STANDARD(S) USED

Traceable No.	Asset Number	Calibration Date	Date Due
95457	DMML-2356075	Oct 01, 2018	Oct 01, 2019
W-046636-25724	DMML-21701	Jan 08, 2018	Jan 08, 2020

Weights are accurate to class F tolerance.

Estimated measurement uncertainty is ± 0.2 g.

Reported uncertainties represent a 95 % confidence level assuming a normal distribution, with a coverage factor of k=2.

This calibration was performed in the lab and is traceable to the International System of Units (SI Units) through NIST or NRC. This report is covered by our accreditation.

Calibration of the instrument expires on Oct 02, 2023

CALIBRATED BY Chris Riddle — Christopher Riddle

Q.A. APPROVAL Andrés Galeano — Andres Galeano

END OF REPORT

ACCREDITATION 17025 ISO/IEC

Fabricant de poêle international inc.
Stove Builder International Inc.

CERTIFICAT DE VÉRIFICATION

VERIFICATION CERTIFICATE

No. Certificat : 20211021003

Identification : SBI-197
Description : EPA sampling banc 4
Manufacturier : Home made
No. Modèle : NA
No. Série : NA
Propriété de : SBI
250 de Copenhague
St-Augustin-de-Desmaures, QC G3A 2H3

Date de vérification : 21 octobre 2021
Prochaine vérification : 21 octobre 2022
Méthode utilisée : Cal-Temp_01
Température : 72.0 °F
Humidité : 41.6 %
État avant calibration : Bon état

Ce certificat de calibration est émis en accordance avec les requis applicables du standard ISO/IEC 17025 et le manuel qualité, version 2.0 de SBI.

MESURES D'INCERTITUDE

Les incertitudes signalées représentent un niveau de confiance de 95% en supposant une distribution normale, avec un facteur de couverture de K = 2.

REMARQUES

L'instrument de mesure est vérifié et nettoyé avant l'étalonnage. Les résultats de calibration de ce certificat se rapportent seulement à l'instrument calibré ci-dessus.

ÉTALON UTILISÉ POUR VÉRIFIER L'ÉQUIPEMENT

No. de l'étalon utilisé	Description	No. de certificat	Date de calibration	Date d'échéance
SBI-096	Calibreur de température de référence	810437	2021-06-08	2022-06-08

Fabricant de poêle international inc.
Stove Builder International Inc.

CERTIFICAT DE VÉRIFICATION

VERIFICATION CERTIFICATE

DONNÉES DE VÉRIFICATION

Unités : °F

Résultat : PASS

S.D.	0.01	%	
R.M.U.	0.14	%	
O.M.U	**97.79**	**%**	
	Ave A.D.	1.10	%
Standard	Reading	A.D.	
°F	°F		
70.0	70.9	1.29	
70.0	70.6	0.86	
70.0	70.8	1.14	

S.D.	0.00	%	
R.M.U.	0.05	%	
O.M.U	**99.42**	**%**	
	Ave A.D.	0.28	%
Standard	Reading	A.D.	
°F	°F		
200.0	200.6	0.30	
200.0	200.5	0.25	
200.0	200.6	0.30	

S.D.	0.00	%	
R.M.U.	0.02	%	
O.M.U	**99.76**	**%**	
	Ave A.D.	0.12	%
Standard	Reading	A.D.	
°F	°F		
600.0	600.7	0.12	
600.0	600.6	0.10	
600.0	600.8	0.13	

S.D.	0.00	%	
R.M.U.	0.01	%	
O.M.U	**99.85**	**%**	
	Ave A.D.	0.07	%
Standard	Reading	A.D.	
°F	°F		
1000.0	1000.7	0.07	
1000.0	1000.6	0.06	
1000.0	1000.9	0.09	

S.D.	0.00	%	
R.M.U.	0.01	%	
O.M.U	**99.89**	**%**	
	Ave A.D.	0.05	%
Standard	Reading	A.D.	
°F	°F		
1400.0	1400.9	0.06	
1400.0	1400.6	0.04	
1400.0	1400.8	0.06	

VÉRIFIÉ PAR : Gabrielle Santerre

Gabrielle Santerre

FIN DU CERTIFICAT

MICRO PRECISION CALIBRATION, INC.
22835 INDUSTRIAL PLACE
GRASS VALLEY CA 95949
530-268-1860

Certificate of Calibration

CALIBRATION LABORATORY
AC-1969.00

Date: Mar 24, 2021

Cert No. 551220084177608

Customer:

STOVE BUILDERS INTERNATIONAL INC.

PORTES 11-12
250 DE COPENHAGUE
SAINT-AUGUSTIN-DE-DESMAURES QC G3A 2H3

		Work Order #:	SAC-70114404
		Purchase Order #:	68065
MPC Control #:	DB8361	Serial Number:	160S-24A50U
Asset ID:	SBI-203	Department:	N/A
Gage Type:	PITOT STATIC TUBE	Performed By:	BARRY MORRIS
Manufacturer:	DWYER INSTRUMENTS INC.	Received Condition:	IN TOLERANCE
Model Number:	160S-24	Returned Condition:	IN TOLERANCE
Size:	N/A	Cal. Date:	March 24, 2021
Temp/RH:	68.0°F / 40.0%	Cal. Interval:	12 MONTHS
Location:	Calibration performed at MPC facility	Cal. Due Date:	March 24, 2022

Calibration Notes:

See attached datasheet (1 page)

Standards Used to Calibrate Equipment

I.D.	Description.	Model	Serial	Manufacturer	Cal. Due Date	Traceability #
AW4419	MULTI-FUNCTION PRESSURE INDICATOR	DPI 145	14501283	DRUCK INC	Aug 31, 2022	551220083774826
AW3587	TIMER	N/A	N/A	SPORTLINE	Dec 31, 2021	551220083997990

Procedures Used in this Event

Procedure Name	Description
MPC-PGC-001 Rev. 04	Pressure, Vacuum and Differential Pressure Gauges, General, rev04, Jan-06-2020

Calibrating Technician: Barry Morris

BARRY MORRIS

QC Approval: Jack A. Wertz III

JACK WERTZ III

STATEMENTS OF PASS OR FAIL CONFORMANCE: The uncertainty of measurement has been taken into account when determining compliance with specification. All measurements and test results guard banded to ensure the probability of false-accept does not exceed 2% in compliance with ANSI/NCSL Z540.3-2006 and in case without guard banded the probability of false-accept depending on test uncertainty ratio.

THE CALIBRATION REPORT STATUS:
PASS- Term used when compliance statement is given, and the measurement result is PASS.
PASS²- Term used when compliance statement is given, and the measurement result is conditional passed or PASS².
FAIL- Term used when compliance statement is given, and the measurement result is FAIL.
FAIL²- Term used when compliance statement is given, and the measurement result is conditional failed or FAIL².
REPORT OF VALUE - Term used when reported measurement is not requiring compliance statement in report.
ADJUSTED- When adjustments are made to an instrument which changes the value of measurement from what was measured as found to new value as left.
LIMITED - When an instrument fails calibration but is still functional in a limited manner.

The expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%, unless otherwise stated. This calibration report complies with ISO/IEC 17025:2017 and ANSI/NCSL Z540.3. Calibration cycles and resulting due dates were submitted/approved by the customer. Any number of factors may cause an instrument to drift out of tolerance before the next scheduled calibration. Recalibration cycles should be based on frequency of use, environmental conditions and customer's established systematic accuracy. All standards are traceable to SI through the National Institute of Standards and Technology (NIST) and/or recognized national or international standards laboratories. Services rendered include proper manufacturer's service instruction and are warranted for no less than thirty (30) days. The information on this report pertains only to the instrument identified,

(CERT, Rev 7)

MICRO PRECISION

Calibration Report of Dwyer Instruments Inc. 160S-24 Pitot Static Tube

MPC Control #:	DB8361	Serial Number:	160S-24A50U
Asset ID:	SBI-203	Calibration Date:	March 24, 2021

Velocity Pressure Accuracy

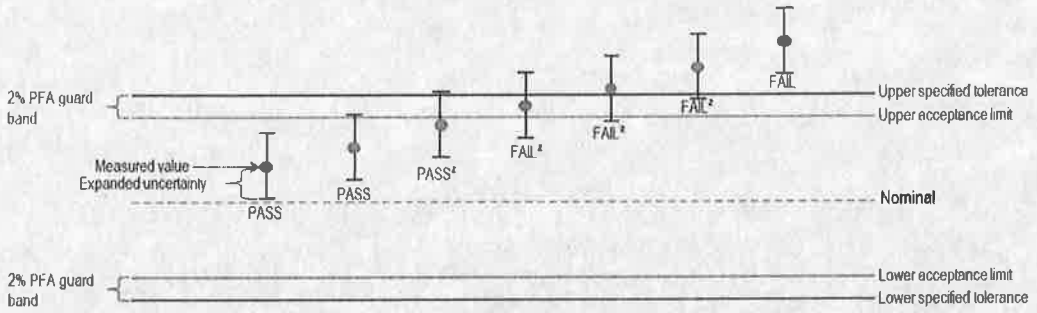
Function Tested	Nominal	Lower Limit	As Found	As Left	Upper Limit	Result	Uncertainty (±)
Pressure	0.100 inH_2O	0.090 inH_2O	0.100 inH_2O	0.100 inH_2O	0.110 inH_2O	PASS	0.00023 inH_2O
Pressure	0.200 inH_2O	0.190 inH_2O	0.200 inH_2O	0.200 inH_2O	0.210 inH_2O	PASS	0.00023 inH_2O
Pressure	0.300 inH_2O	0.290 inH_2O	0.299 inH_2O	0.299 inH_2O	0.310 inH_2O	PASS	0.00023 inH_2O
Pressure	0.400 inH_2O	0.390 inH_2O	0.400 inH_2O	0.400 inH_2O	0.410 inH_2O	PASS	0.00023 inH_2O

Statements of Pass or Fail Conformance

The uncertainty of measurement has been taken into account when determining compliance with specification, as per ILAC-G8:03/2009.
All measurements and test results guard banded to ensure the probability of false-accept does not exceed 2% in compliance with ANSI/NCSL Z540.3-2006.

The status of compliance with the acceptance criteria is reported as:

PASS - Compliant with specification
FAIL - Not compliant with specification.
FAIL^Z - The measured value is not within the acceptance limits. However, a portion of the expanded uncertainty of measurement at 95% is within the specified tolerance.
PASS^Z - The measured value is within acceptance limits. However, a portion of the expanded uncertainty of measurement at 95% exceeds the specified tolerance.



Acceptance limits for ≤ 2 % probability of false accept (PFA) guard band

The expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95% , unless otherwise stated.
This calibration report complies with ISO/IEC 17025:2017 and ANSI/NCSL Z540.3 Method 6-Guard Bands based on Test Uncertainty Ratio.

- End of Calibration Report -

ID Certificat de Calibration
CA0003-001-030921-ACC-USL

METTLER TOLEDO

Mettler-Toledo Inc.
Service Division
1900 Polaris Parkway
Columbus, OH 43240
1-800-METTLER

Accredited by the American Association for Laboratory Accreditation (A2LA)
CALIBRATION CERT #1788.01

ISO 17025 Accredited
ANSI/NCSL Z540-1 Accredited

Certificat de Calibration de Précision

Accuracy Calibration Certificate

Client

Compagnie:	SBI Fabricant De Poeles		
Adresse:	250 Rue de Copenhague		
Ville:	Saint-Augustin-De-Desmaures	**Contact:**	Gabrielle Santerre
Zip/Code Postal:	G3A 2H3		
État/Province:	Quebec		

Weighing Device

Manufacturier:	SARTORIUS	**Type d'Instrument:**	Weighing Instrument
Modèle:	TE214S	**# Outil:**	SBI-206 BAL. ANALYTIQUE
No. Série:	25851066	**Modèle Indicateur:**	N/D
Building:	N/D	**Terminal Serial No.:**	N/D
Floor:	N/D	**Terminal Asset No.:**	N/D
Room:	N/D		

Plage	Capacité Max	Lisibilité (d)
1	210 g	0.0001 g

Procedure

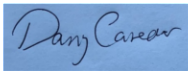
Instruction de Calibration: EURAMET cg-18 v. 4.0 (11/2015)
Instruction de travail METTLER TOLEDO: 30260953

Ce certificat de calibration contient des mesures pour la calibration Tel que Trouvé. Aucune calibration Tel que Laissé n'a été effectuée puisque l'appareil n'a pas été modifié suite à la calibration Tel que Trouvé. Par conséquent, les résultats Tel que Laissé correspondent aux résultats Tel que Trouvé.

	Temperature	
Tel que Trouvé	Start: 67.8 °F	End: 68.1 °F

Environmental conditions have been verified to ensure the accuracy of the calibration.

This certificate is issued in accordance with the conditions of accreditation granted by A2LA, which is based on ISO/IEC 17025. A2LA has assessed the measurement capability of the laboratory and its traceability to recognized national standards.

Date calibration Tel que Trouvé:	09-03-2021	**Authorized A2LA Signatory:**	
Date calibration Tel que Laissé:	N/D		Dany Careau
Date d'Émission:	09-03-2021		
Requested Next Calibration Date:	31-03-2022		

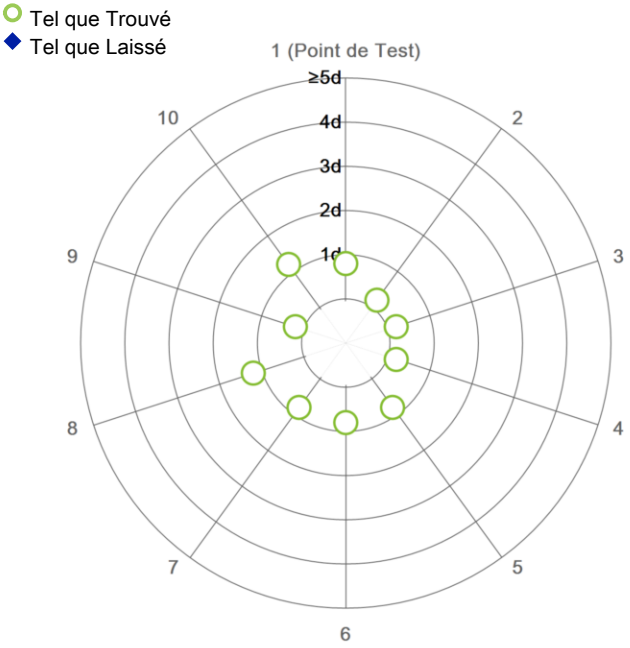
Résultats de Mesure

Répétabilité

Charge de Test: 100 g

	Tel que Trouvé	Tel que Laissé
1	99.9999 g	N/D
2	100.0000 g	N/D
3	100.0000 g	N/D
4	100.0000 g	N/D
5	99.9999 g	N/D
6	99.9999 g	N/D
7	99.9999 g	N/D
8	100.0001 g	N/D
9	100.0000 g	N/D
10	100.0001 g	N/D

Écart Type	**0.00008 g**	**N/D**



The "d" in the graph represents the readability of the range/interval in which the test was performed.

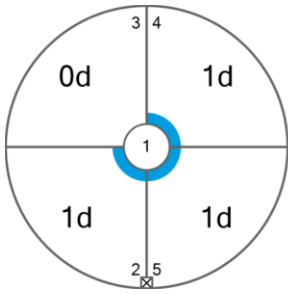
The results of this graph are based upon the absolute values of the differences from the mean value.

Excentricité

Charge de Test: 100 g

Position	Tel que Trouvé	Tel que Laissé
1	99.9999 g	N/D
2	100.0000 g	N/D
3	99.9999 g	N/D
4	100.0000 g	N/D
5	100.0000 g	N/D

Déviation Maximale	**0.0001 g**	**N/A**



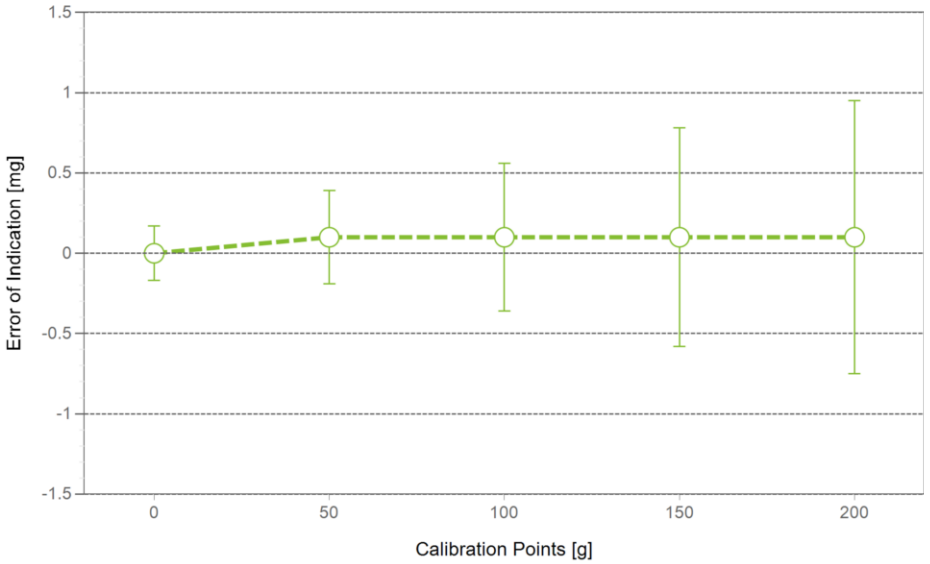
Tel que Trouvé

The "d" in the graph represents the readability of the range/interval in which the test was performed.

Erreur d'indication

Tel que Trouvé

	Reference Value	Indication	Erreur d'indication	Incertitude Élargie	k
1	0.0000 g	0.0000 g	0.0000 g	0.17 mg	2
2	50.0000 g	50.0001 g	0.0001 g	0.29 mg	2
3	99.9999 g	100.0000 g	0.0001 g	0.46 mg	2
4	150.0000 g	150.0001 g	0.0001 g	0.68 mg	2
5	200.0002 g	200.0003 g	0.0001 g	0.85 mg	2



Tel que Trouvé

Tel que Laissé

For improved legibility of the graphics only increasing measurement points are shown and measurement points close to zero are not displayed.

The uncertainty stated is the expanded uncertainty at calibration obtained by multiplying the standard combined uncertainty by the coverage factor k – which can be larger than 2 according to EURAMET cg-18. The value of the measurand lies within the assigned range of values with a probability of approximately 95%. The user is responsible for maintaining environmental conditions and the settings of the weighing instrument when it was calibrated.

Test Equipment

Tous les poids utilisés pour le contrôle métrologique sont retraçables aux étalons Nationaux et Internationaux. Les poids ont été calibrés et certifiés par un laboratoire de calibration accrédité.

Jeu de Poids 1: OIML E2

Weight Set Number:	371	Date d'Émission:	17-02-2021
# Certificat:	01183992-1	Date de Calibration Due:	28-02-2022

Remarques

N/D

End of Accredited Section

The information below and any attachments to this calibration certificate are not part of the accredited calibration.

Incertitude de Mesure du dispositif de pesage en opération

Stated is the expanded uncertainty with k=2 in use. The formula shall be used for the estimation of the uncertainty under consideration of the errors of indication. The value R represents the net load indication in the unit of measure of the device.

Coefficient de température pour l'évaluation de l'incertitude de mesure en opération: $3.0 \cdot 10^{-6}$ / K

Plage d'opération sur le site pour l'évaluation de l'incertitude de mesure en opération: 5 °F

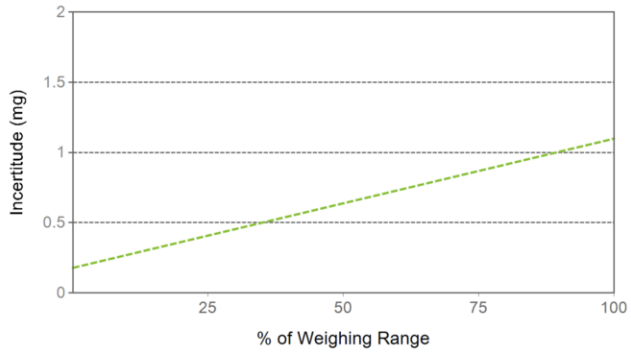
Linéarisation de l'Équation d'Incertitude

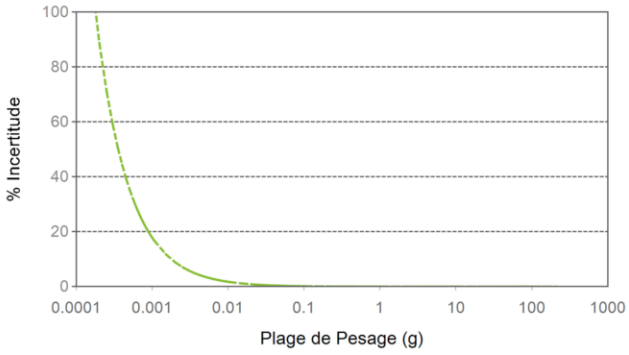
Plage			Tel que Trouvé	Tel que Laissé
	d	Max		
1	0.0001 g	210 g	U_1 = 0.18 mg + 0.00439 mg/g · R	N/A

To optimize the stability of the linearization, besides of the zero load only increasing measurement points with a test load of 5% of the measurement range or larger are taken for the calculation of the linear equation.

Absolute and Relative Measurement Uncertainty in Use for Various Net Indications (Examples)

Indication Net	Tel que Trouvé		Tel que Laissé	
0.0210 g	0.18 mg	0.86%	N/A	N/A
0.2100 g	0.18 mg	0.086%	N/A	N/A
2.1000 g	0.19 mg	0.0090%	N/A	N/A
21.0000 g	0.27 mg	0.0013%	N/A	N/A
210.0000 g	1.1 mg	0.00052%	N/A	N/A





Tel que Trouvé **Tel que Laissé**

METTLER TOLEDO Service

GWP®
Certificate

No Pass/Fail statement is possible because one or more of the process requirements are not specified.

Tests Performed: ☑ ☐ ☑ No adjustments/modifications made. As Left results correspond to As Found.

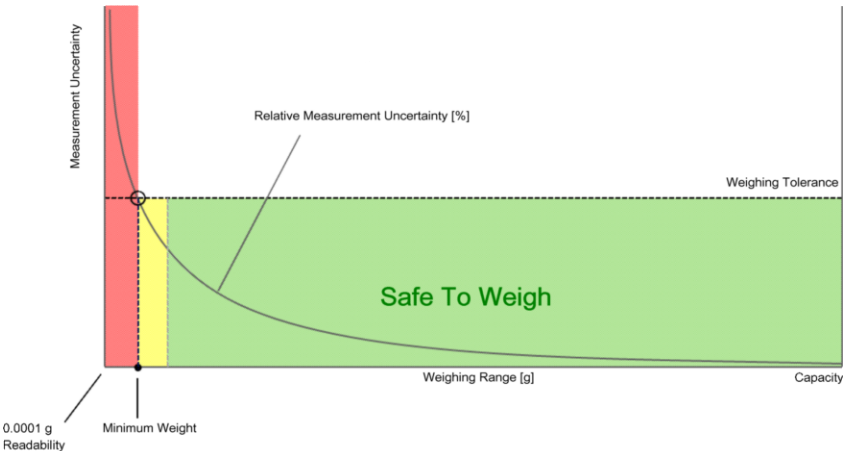
Process Requirements

Weighing Tolerance: **Not Specified**

Smallest Net Weight: **Not Specified**

Facteur de Sécurité: ***Not specified, default = 2**

Safe Weighing Range



Since the weighing tolerance is not specified, only a generic behavior curve is shown.

Poids Minimum

As Found Minimum Weight Table

Poids minimum pour différentes tolérances de pesage et facteurs de sécurité					
	Facteur de Sécurité				
Tolérance	**1**	**2**	**3**	**5**	**10**
0.1%	0.17842 g	0.35842 g	0.54002 g	0.90811 g	1.85786 g
0.2%	0.08901 g	0.17842 g	0.26822 g	0.44902 g	0.90811 g
0.5%	0.03556 g	0.07118 g	0.10686 g	0.17842 g	0.35842 g
1%	0.01777 g	0.03556 g	0.05336 g	0.08901 g	0.17842 g
2%	0.00888 g	0.01777 g	0.02666 g	0.04446 g	0.08901 g
5%	0.00355 g	0.00711 g	0.01066 g	0.01777 g	0.03556 g

As Left Minimum Weight Table

Poids minimum pour différentes tolérances de pesage et facteurs de sécurité					
	Facteur de Sécurité				
Tolérance	**1**	**2**	**3**	**5**	**10**
0.1%	0.17842 g	0.35842 g	0.54002 g	0.90811 g	1.85786 g
0.2%	0.08901 g	0.17842 g	0.26822 g	0.44902 g	0.90811 g
0.5%	0.03556 g	0.07118 g	0.10686 g	0.17842 g	0.35842 g
1%	0.01777 g	0.03556 g	0.05336 g	0.08901 g	0.17842 g
2%	0.00888 g	0.01777 g	0.02666 g	0.04446 g	0.08901 g
5%	0.00355 g	0.00711 g	0.01066 g	0.01777 g	0.03556 g

À ces valeurs de poids net minimum, l'incertitude de mesure du dispositif est égale ou inférieure à 1/1 (pas de facteur de sécurité), 1/2, 1/3, 1/5 ou 1/10 de la tolérance requise. Ces valeurs sont calculées avec k=2 et basées sur la formule linéaire de l'incertitude de mesure du dispositif de pesage en opération.

The safety factor for As Found is always 1. This implies no safety factor. As Found testing looks at the behavior of the instrument from the past until test occurred. For the past, it is necessary to know that the tolerance was met, but not the safety factor. The safety factor is a proactive measure to apply for future measurements.

Notes on minimum weight values in above table:

1. If "N/A" is shown above, no appropriate value could be calculated.
2. METTLER TOLEDO is not responsible for the definition of the process requirements.

Résultats de Mesure

Results Summary

	Répétabilité	Excentricité	Erreur d'indication
As Found	N/D	N/D	N/D
As Left	N/D	N/D	N/D

✓ = Passed

✗ = Failed

⚠ = Safety Factor not met

Répétabilité

Charge de Test: 100 g

		Tel que Trouvé		Tel que Laissé	
Tolérance	Control Limit	Std. Deviation	Result	Std. Deviation	Result
0.1%	N/D	0.00008 g	N/D	0.00008 g	N/D
0.2%	N/D		N/D		N/D
0.5%	N/D		N/D		N/D
1%	N/D		N/D		N/D
2%	N/D		N/D		N/D
5%	N/D		N/D		N/D

An assessment cannot be made because the smallest net weight is not defined.

The weighing tolerance is met if the standard deviation is less than or equal to the corresponding control limit.

Excentricité

Charge de Test: 100 g

		Tel que Trouvé		Tel que Laissé	
Tolérance	Control Limit	Deviation	Result	Deviation	Result
0.1%	0.0500 g	0.0001 g	✓	0.0001 g	✓
0.2%	0.1000 g		✓		✓
0.5%	0.2500 g		✓		✓
1%	0.5000 g		✓		✓
2%	1.0000 g		✓		✓
5%	2.5000 g		✓		✓

The weighing tolerance is met if the deviation is less than or equal to the corresponding control limit.

Erreur d'indication

Tel que Trouvé

		Control limits for various weighing tolerances					
Reference Value	Error	0.1%	0.2%	0.5%	1%	2%	5%
0.0000 g	0.0000 g	N/D	N/D	N/D	N/D	N/D	N/D
50.0000 g	0.0001 g	0.0250 g	0.0500 g	0.1250 g	0.2500 g	0.5000 g	1.2500 g
99.9999 g	0.0001 g	0.0500 g	0.1000 g	0.2500 g	0.5000 g	1.0000 g	2.5000 g
150.0000 g	0.0001 g	0.0750 g	0.1500 g	0.3750 g	0.7500 g	1.5000 g	3.7500 g
200.0002 g	0.0001 g	0.1000 g	0.2000 g	0.5000 g	1.0000 g	2.0000 g	5.0000 g
Result		✓	✓	✓	✓	✓	✓

Tel que Laissé

		Control limits for various weighing tolerances					
Reference Value	Error	0.1%	0.2%	0.5%	1%	2%	5%
0.0000 g	0.0000 g	N/D	N/D	N/D	N/D	N/D	N/D
50.0000 g	0.0001 g	0.0250 g	0.0500 g	0.1250 g	0.2500 g	0.5000 g	1.2500 g
99.9999 g	0.0001 g	0.0500 g	0.1000 g	0.2500 g	0.5000 g	1.0000 g	2.5000 g
150.0000 g	0.0001 g	0.0750 g	0.1500 g	0.3750 g	0.7500 g	1.5000 g	3.7500 g
200.0002 g	0.0001 g	0.1000 g	0.2000 g	0.5000 g	1.0000 g	2.0000 g	5.0000 g
Result		✓	✓	✓	✓	✓	✓

The weighing tolerance is met if the error (of indication) for each test point is less than or equal to the corresponding control limit for that particular weighing tolerance. Results at or close to the zero point cannot be assessed.

METTLER TOLEDO Service

Handbook 44 Tolerance Assessment (Entretien)

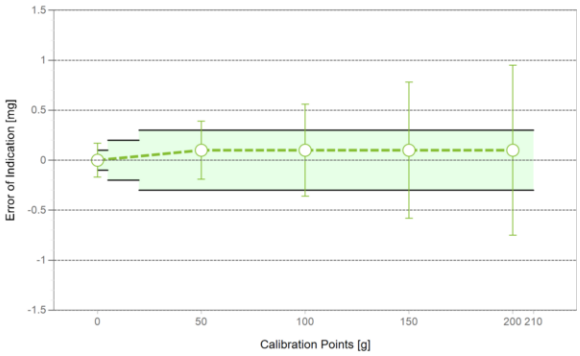
Assessment done without considering measurement uncertainty.
Les mesures du certificat de calibration joint ont été évaluées selon les tolérances définies par NIST HB44.

	Tel que Trouvé	Tel que Laissé
Global	✓	N/D

✓ = Passed
✗ = Failed

Weighing Device

Range	Max. Capacity	Readability (d)	Verification Scale Interval (e)	Class
1	210 g	0.0001 g	0.0001 g	I



Tolerances according to NIST Handbook 44

Test Load		Tolérance
From	To	
0.0000 g	0.0000 g	0.000025 g
0.0001 g	5.0000 g	0.0001 g
5.0001 g	20.0000 g	0.0002 g
20.0001 g	210.0000 g	0.0003 g

○ Tel que Trouvé
◆ Tel que Laissé
— Tolérance

Eccentricity and Repeatability

Test	Test Load	Tolérance	As Found		As Left	
			Max. Error / Range	Result	Max. Error / Range	Result
Excentricité (Maximum Error)	100 g	0.0003 g	0.0001 g	✓	N/D	N/D
Excentricité (Plage)	100 g	0.0003 g	0.0001 g	✓	N/D	N/D
Répétabilité (Maximum Error)	100 g	0.0003 g	0.0002 g	✓	N/D	N/D
Répétabilité (Plage)	100 g	0.0003 g	0.0002 g	✓	N/D	N/D

Max. Error: Maximum of the absolute values of the individual errors.
Range: Difference between largest and smallest measurement value.

Error of Indication

	Reference Value	Tolérance	As Found		As Left	
			Error of Indication	Result	Error of Indication	Result
1	0.0000 g	0.0001 g	0.0000 g	✓	0.0000 g	✓
2	50.0000 g	0.0003 g	0.0001 g	✓	0.0001 g	✓
3	99.9999 g	0.0003 g	0.0001 g	✓	0.0001 g	✓
4	150.0000 g	0.0003 g	0.0001 g	✓	0.0001 g	✓
5	200.0002 g	0.0003 g	0.0001 g	✓	0.0001 g	✓

ID Certificat de Calibration
CA0003-007-030921-ACC-USI

METTLER TOLEDO

Mettler-Toledo Inc.
Service Division
1900 Polaris Parkway
Columbus, OH 43240
1-800-METTLER

Accredited by the American Association for Laboratory Accreditation (A2LA)
CALIBRATION CERT #1902.01

ISO 17025 Registered
ANSI/NCSL Z540-1 Accredited

Certificat de Calibration de Précision

Accuracy Calibration Certificate

Client

Compagnie:	SBI Fabricant De Poeles		
Adresse:	250 Rue de Copenhague		
Ville:	Saint-Augustin-De-Desmaures	**Contact:**	Gabrielle Santerre
Zip/Code Postal:	G3A 2H3		
État/Province:	Quebec		

Weighing Device

Manufacturier:	Ohaus	**Type d'Instrument:**	Weighing Instrument
Modèle:	FD15	**# Outil:**	SBI-222 BALANCE BENCH
No. Série:	B144397174	**Modèle Indicateur:**	N/D
Building:	N/D	**Terminal Serial No.:**	N/D
Floor:	N/D	**Terminal Asset No.:**	N/D
Room:	N/D		

Plage	Capacité Max	Lisibilité (d)
1	15000 g	1 g

Procedure

Instruction de Calibration: EURAMET cg-18 v. 4.0 (11/2015)
Instruction de travail METTLER TOLEDO: 30260953

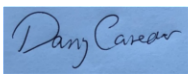
Ce certificat de calibration contient des mesures pour les calibrations Tel que Trouvé et Tel que Laissé.

The sensitivity/span of the weighing instrument was adjusted before As Left calibration with an external weight.

	Temperature	
Tel que Trouvé	Start: 22.0 °C	End: 22.0 °C
Tel que Laissé	Start: 22.0 °C	End: 22.0 °C

Environmental conditions have been verified to ensure the accuracy of the calibration.

This certificate is issued in accordance with the conditions of accreditation granted by A2LA, which is based on ISO/IEC 17025. A2LA has assessed the measurement capability of the laboratory and its traceability to recognized national standards.

Date calibration Tel que Trouvé:	09-03-2021	**Authorized A2LA Signatory:**	
Date calibration Tel que Laissé:	09-03-2021		Dany Careau
Date d'Émission:	09-03-2021		

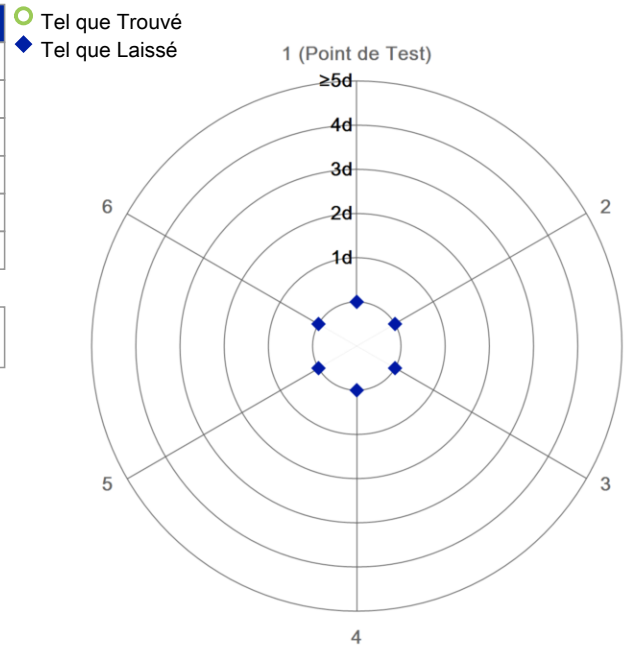
Résultats de Mesure

Répétabilité

Charge de Test: 10000 g

	Tel que Trouvé	Tel que Laissé
1	N/D	10000 g
2	N/D	10000 g
3	N/D	10000 g
4	N/D	10000 g
5	N/D	10000 g
6	N/D	10000 g

Écart Type	**N/D**	**0.0 g**



The "d" in the graph represents the readability of the range/interval in which the test was performed.

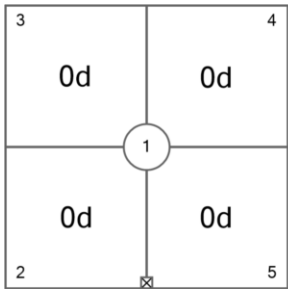
The results of this graph are based upon the absolute values of the differences from the mean value.

Excentricité

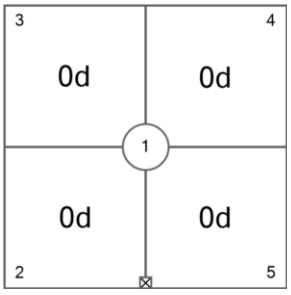
Charge de Test: 5000 g

Position	Tel que Trouvé	Tel que Laissé
1	4999 g	5000 g
2	4999 g	5000 g
3	4999 g	5000 g
4	4999 g	5000 g
5	4999 g	5000 g

Déviation Maximale	**0 g**	**0 g**



Tel que Trouvé



Tel que Laissé

The "d" in the graph represents the readability of the range/interval in which the test was performed.

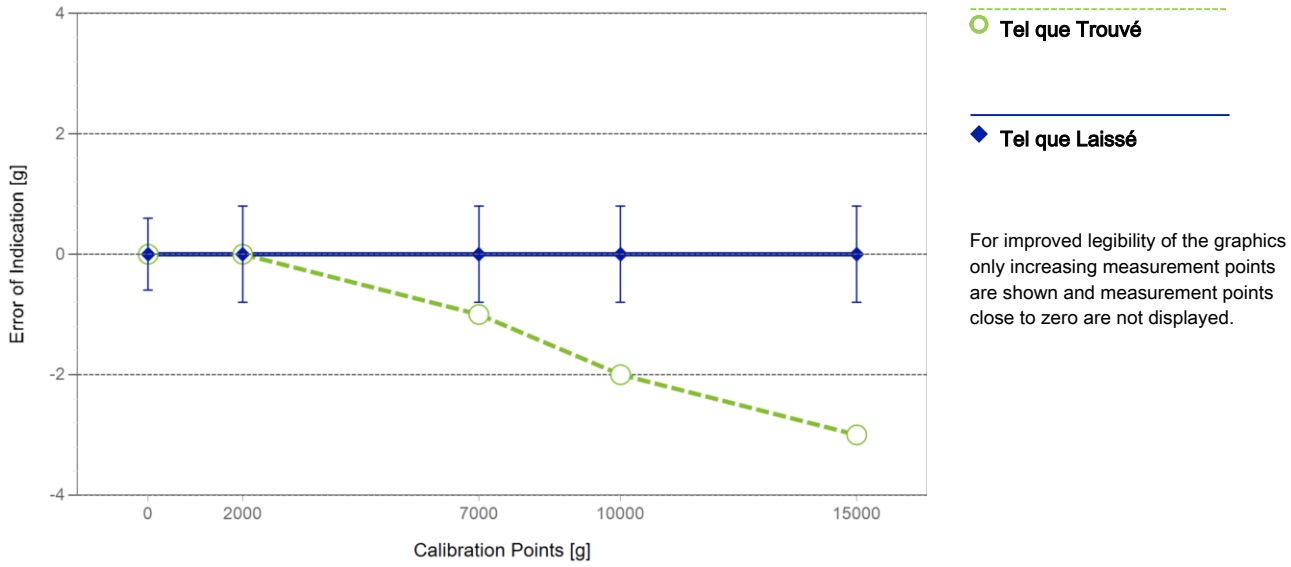
Erreur d'indication

Tel que Trouvé

	Reference Value	Indication	Erreur d'indication	Incertitude Élargie	k
1	0 g	0 g	0 g	N/D	N/D
2	2000 g	2000 g	0 g	N/D	N/D
3	7000 g	6999 g	-1 g	N/D	N/D
4	10000 g	9998 g	-2 g	N/D	N/D
5	15000 g	14997 g	-3 g	N/D	N/D

Tel que Laissé

	Reference Value	Indication	Erreur d'indication	Incertitude Élargie	k
1	0 g	0 g	0 g	0.6 g	2
2	2000 g	2000 g	0 g	0.8 g	2
3	7000 g	7000 g	0 g	0.8 g	2
4	10000 g	10000 g	0 g	0.8 g	2
5	15000 g	15000 g	0 g	0.8 g	2



The uncertainty stated is the expanded uncertainty at calibration obtained by multiplying the standard combined uncertainty by the coverage factor k – which can be larger than 2 according to EURAMET cg-18. The value of the measurand lies within the assigned range of values with a probability of approximately 95%. The user is responsible for maintaining environmental conditions and the settings of the weighing instrument when it was calibrated.

Test Equipment

Tous les poids utilisés pour le contrôle métrologique sont retraçables aux étalons Nationaux et Internationaux. Les poids ont été calibrés et certifiés par un laboratoire de calibration accrédité.

Jeu de Poids 1: OIML F1

Weight Set Number:	607	Date d'Émission:	12-02-2021
# Certificat:	01182891-1	Date de Calibration Due:	28-02-2023

Remarques

N/D

End of Accredited Section

The information below and any attachments to this calibration certificate are not part of the accredited calibration.

Incertitude de Mesure du dispositif de pesage en opération

Stated is the expanded uncertainty with k=2 in use. The formula shall be used for the estimation of the uncertainty under consideration of the errors of indication. The value R represents the net load indication in the unit of measure of the device.

Coefficient de température pour l'évaluation de l'incertitude de mesure en opération: $10.0 \cdot 10^{-6}$ / K

Plage d'opération sur le site pour l'évaluation de l'incertitude de mesure en opération: 10 K

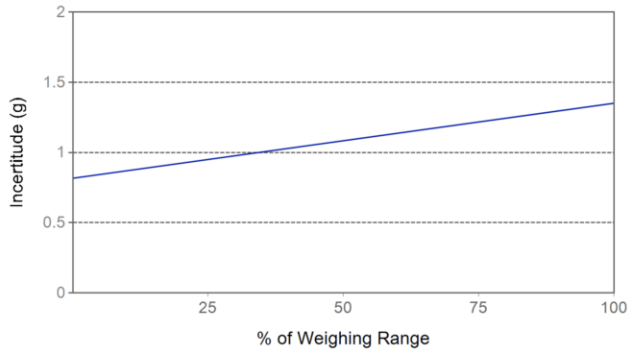
Linéarisation de l'Équation d'Incertitude

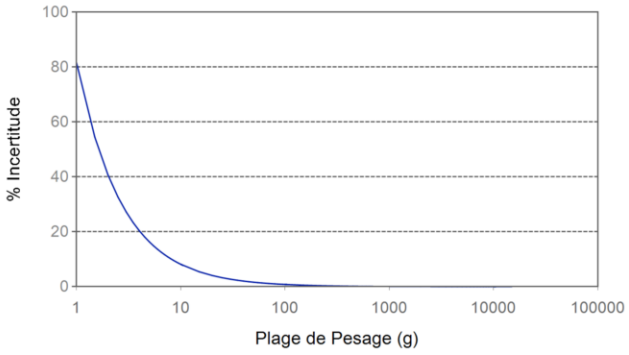
Plage			Tel que Trouvé	Tel que Laissé
	d	Max		
1	1 g	15000 g	N/A	U_1 = 816 mg + 0.0356 mg/g · R

To optimize the stability of the linearization, besides of the zero load only increasing measurement points with a test load of 5% of the measurement range or larger are taken for the calculation of the linear equation.

Absolute and Relative Measurement Uncertainty in Use for Various Net Indications (Examples)

Indication Net	Tel que Trouvé		Tel que Laissé	
15 g	N/A	N/A	0.82 g	5.4%
150 g	N/A	N/A	0.82 g	0.55%
1500 g	N/A	N/A	0.87 g	0.058%
7500 g	N/A	N/A	1.1 g	0.014%
15000 g	N/A	N/A	1.4 g	0.0090%





Tel que Trouvé Tel que Laissé

METTLER TOLEDO Service

Handbook 44 Tolerance Assessment (Entretien)

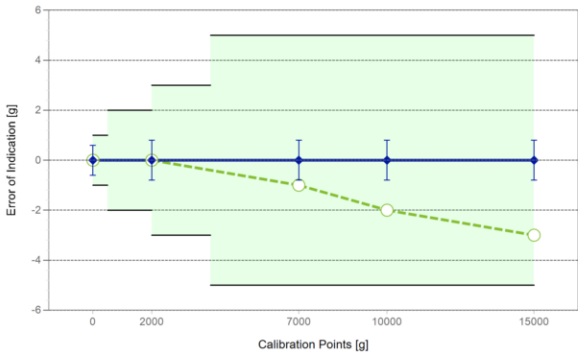
Assessment done without considering measurement uncertainty.
Les mesures du certificat de calibration joint ont été évaluées selon les tolérances définies par NIST HB44.

	Tel que Trouvé	Tel que Laissé
Global	✓	✓

✓ = Passed
✗ = Failed

Weighing Device

Range	Max. Capacity	Readability (d)	Verification Scale Interval (e)	Class
1	15000 g	1 g	1 g	III



Tolerances according to NIST Handbook 44

Test Load		Tolérance
From	To	
0 g	0 g	0.25 g
1 g	500 g	1 g
501 g	2000 g	2 g
2001 g	4000 g	3 g
4001 g	15000 g	5 g

○ Tel que Trouvé
◆ Tel que Laissé
— Tolérance

Eccentricity and Repeatability

Test	Test Load	Tolérance	As Found		As Left	
			Max. Error / Range	Result	Max. Error / Range	Result
Excentricité (Maximum Error)	5000 g	5 g	1 g	✓	0 g	✓
Excentricité (Plage)	5000 g	5 g	0 g	✓	0 g	✓
Répétabilité (Maximum Error)	10000 g	5 g	N/D	N/D	0 g	✓
Répétabilité (Plage)	10000 g	5 g	N/D	N/D	0 g	✓

Max. Error: Maximum of the absolute values of the individual errors.
Range: Difference between largest and smallest measurement value.

Error of Indication

	Reference Value	Tolérance	As Found		As Left	
			Error of Indication	Result	Error of Indication	Result
1	0 g	1 g	0 g	✓	0 g	✓
2	2000 g	2 g	0 g	✓	0 g	✓
3	7000 g	5 g	-1 g	✓	0 g	✓
4	10000 g	5 g	-2 g	✓	0 g	✓
5	15000 g	5 g	-3 g	✓	0 g	✓

Certificate No: 01037944A-1

METTLER TOLEDO

METTLER-TOLEDO, LLC
201 Wolf Dr
Thorofare NJ 08086
1-800-METTLER

NVLAP CALIBRATION
NVLAP LAB CODE 105013-0

ilac-MRA

Mass Calibration Certificate

Customer Information

Customer Name:	Stove Builder International, Inc.	*City:*	
Address:	250 de Copenhauge St.-Augustin-de-Desmaures	*State / Province:*	QC
Purchase Order:	220309982	*Zip / Postal Code:*	G3A 2H3

Measurement and Test Equipment Identification

Serial Number:	B316238717	*Date Received:*	03-OCT-2018
Manufacturer:	Mettler Toledo	*Condition:*	Good
Asset Number:	SBI-237	*Tolerance Class:*	OIML R111 Class E2

Environmental Conditions

Temperature: 21.51 °C *Barometric Pressure:* 770.05 mm Hg *Relative Humidity:* 50 %RH

The standards used to perform this calibration have been compared to reference mass standards that are traceable to the SI through the National Institute of Standards and Technology under Test No 684/289871-17.

The weights calibrated for this report have been calibrated in accordance with the calibration laboratory's process. The calibration performed meets the criteria as described in the current revisions of ASTM E617 and OIML R111. This calibration also meets specifications as outlined in ISO/IEC 17025, ANSI/NCSL Z540-1-1994, and applicable documents.

Calibration Date:	09-OCT-2018	*Next Calibration Due:*	09-OCT-2023
Calibration Technician:	Robotic Calibration	*Signature:*	Joseph Moran, Metrology Manager Approved Signatory 10-OCT-2018

Certificate No: 01037944A-1

As Found Data

Nominal Value&Suffix	Serial Number	True Mass (g)	Conv. Mass (g)	Uncertainty (mg, k = 2)	Tolerance (mg)	Density (g/cm³)
100 mg	B316238717	0.0999983	0.0999983	0.0025	0.0160	8.00

Certificate No: 01037944A-1

As Left Data

Nominal Value&Suffix	Serial Number	True Mass (g)	Conv. Mass (g)	Uncertainty (mg, k = 2)	Tolerance (mg)	Density (g/cm³)
100 mg	B316238717	0.0999983	0.0999983	0.0025	0.0160	8.00

Certificate No: 01037944A-1

Standards and Comparators Used

Nominal Value&Suffix	Serial Number	Standard Set No.	Cal Due	Comparator Used		Cal Due	Procedure Used
100 mg	B316238717	A031	07/01/19	A5XL	131	01/01/19	Multi A-B

Comments

No remarks

1 As Found / 1 Total

Definitions

Nominal Value - The value as labeled on the weight or defined by shape in accordance with OIML R111 for milligram weights.

True Mass - The mass value of the weight if measured in a vacuum.

Conventional Mass - For a mass at 20 °C, "Conventional Mass" is the mass of a reference standard of density 8000 kg/m³ which it balances in air with a density of 1.2 kg/m³. This value should be referenced when testing the accuracy of a weighing device using any of the nominal values contained in this certificate. The As Found results will equal the As Left in cases where no adjustment or replacement was required.

Uncertainty - All Uncertainty values are reported at approximately 95% confidence level (k=2). The uncertainty value does not include a component for the affects due to magnetism.

Tolerance - The acceptable range of deviation (positive and negative) from the nominal value, including the uncertainty, as defined by ASTM and OIML for the respective classes.

Density - The assumed density of the material used by the manufacturer.

Calibration Process - This calibration was performed in the Level I Mass Metrology Laboratory at 201 Wolf Dr Thorofare, New Jersey 08086 unless otherwise noted in Comments.

OOT - The As Found measurement result combined with the uncertainty exceeded the tolerance for the specified weight class.

A - Weight was adjusted after As Found testing to within the appropriate tolerance class.

R - The received weight was replaced due to an out of tolerance condition and the weight was not adjustable or the weight for this nominal value was missing.

Certificate No: 01037944B-1

METTLER TOLEDO

METTLER-TOLEDO, LLC
201 Wolf Dr
Thorofare NJ 08086
1-800-METTLER

NVLAP CALIBRATION NVLAP LAB CODE 105013-0

ilac-MRA

Mass Calibration Certificate

Customer Information

Customer Name:	Stove Builder International, Inc.	*City:*	
Address:	250 de Copenhauge St.-Augustin-de-Desmaures	*State / Province:*	QC
Purchase Order:	220309982	*Zip / Postal Code:*	G3A 2H3

Measurement and Test Equipment Identification

Serial Number:	B316238717	*Date Received:*	03-OCT-2018
Manufacturer:	Mettler Toledo	*Condition:*	Good
Asset Number:	SBI-238	*Tolerance Class:*	OIML R111 Class F1

Environmental Conditions

Temperature: 21.29 °C *Barometric Pressure:* 770.34 mm Hg *Relative Humidity:* 52 %RH

The standards used to perform this calibration have been compared to reference mass standards that are traceable to the SI through the National Institute of Standards and Technology under Test No 684/289871-17.

The weights calibrated for this report have been calibrated in accordance with the calibration laboratory's process. The calibration performed meets the criteria as described in the current revisions of ASTM E617 and OIML R111. This calibration also meets specifications as outlined in ISO/IEC 17025, ANSI/NCSL Z540-1-1994, and applicable documents.

Calibration Date:	09-OCT-2018	*Next Calibration Due:*	09-OCT-2023
Calibration Technician:	Robotic Calibration	*Signature:*	Joseph Moran, Metrology Manager Approved Signatory 10-OCT-2018

Certificate No: 01037944B-1

As Found Data

Nominal Value&Suffix	Serial Number	True Mass (g)	Conv. Mass (g)	Uncertainty (mg, k = 2)	Tolerance (mg)	Density (g/cm³)
10 g	B316238717	10.000070	10.000060	0.012	0.200	7.95

Certificate No: 01037944B-1

As Left Data

Nominal Value&Suffix	Serial Number	True Mass (g)	Conv. Mass (g)	Uncertainty (mg, k = 2)	Tolerance (mg)	Density (g/cm³)
10 g	B316238717	10.000070	10.000060	0.012	0.200	7.95

1 As Found / 1 Total

Certificate No: 01037944B-1

Standards and Comparators Used

Nominal Value&Suffix	Serial Number	Standard Set No.	Cal Due	Comparator Used		Cal Due	Procedure Used
10 g	B316238717	MS002	08/01/19	A200XXL	132	01/01/19	Multi A-B

Comments

No remarks

1 As Found / 1 Total

Definitions

Nominal Value - The value as labeled on the weight or defined by shape in accordance with OIML R111 for milligram weights.

True Mass - The mass value of the weight if measured in a vacuum.

Conventional Mass - For a mass at 20 °C, "Conventional Mass" is the mass of a reference standard of density 8000 kg/m³ which it balances in air with a density of 1.2 kg/m³. This value should be referenced when testing the accuracy of a weighing device using any of the nominal values contained in this certificate. The As Found results will equal the As Left in cases where no adjustment or replacement was required.

Uncertainty - All Uncertainty values are reported at approximately 95% confidence level (k=2). The uncertainty value does not include a component for the affects due to magnetism.

Tolerance - The acceptable range of deviation (positive and negative) from the nominal value, including the uncertainty, as defined by ASTM and OIML for the respective classes.

Density - The assumed density of the material used by the manufacturer.

Calibration Process - This calibration was performed in the Level I Mass Metrology Laboratory at 201 Wolf Dr Thorofare, New Jersey 08086 unless otherwise noted in Comments.

OOT - The As Found measurement result combined with the uncertainty exceeded the tolerance for the specified weight class.

A - Weight was adjusted after As Found testing to within the appropriate tolerance class.

R - The received weight was replaced due to an out of tolerance condition and the weight was not adjustable or the weight for this nominal value was missing.

MICRO PRECISION CALIBRATION, INC.
22835 INDUSTRIAL PLACE
GRASS VALLEY CA 95949
530-268-1860

Certificate of Calibration

CALIBRATION LABORATORY
AC-1969.00

Date: Mar 24, 2021 **Cert No. 551220084177619**

Customer:

STOVE BUILDERS INTERNATIONAL INC.

PORTES 11-12
250 DE COPENHAGUE
SAINT-AUGUSTIN-DE-DESMAURES QC G3A 2H3

		Work Order #:	SAC-70114404
		Purchase Order #:	68065
MPC Control #:	DA0650	Serial Number:	16425450039
Asset ID:	SBI-241	Department:	N/A
Gage Type:	DIGITAL VANE/HOT-WIRE ANEMOMETER	Performed By:	BARRY MORRIS
Manufacturer:	TPI, INC.	Received Condition:	IN TOLERANCE
Model Number:	575	Returned Condition:	IN TOLERANCE
Size:	N/A	Cal. Date:	March 24, 2021
Temp/RH:	68.0°F / 45.0%	Cal. Interval:	12 MONTHS
Location:	Calibration performed at MPC facility	Cal. Due Date:	March 24, 2022

Calibration Notes:

See attached datasheet (1 page)

Standards Used to Calibrate Equipment

I.D.	Description.	Model	Serial	Manufacturer	Cal. Due Date	Traceability #
CJ5100	WIND TUNNEL WITH CONTROLLER	JS-500	375/305	INTERACTIVE INSTRUMENTS	Oct 31, 2021	551220083300219
DA8367	PRECISION PLATINUM RESISTANCE THERMOMETER SPRT W/ CASE	8167-25	180322	LEEDS & NORTHRUP CO.	Oct 31, 2022	551220083240044
DF8059	DIGITAL MULTIMETER	34401A	US36090404	HEWLETT PACKARD	Apr 30, 2021	551220083566237
DS2399	AIR VELOCITY TRANSDUCER	8455-03	56020622	TSI	Oct 3, 2021	800406957

Procedures Used in this Event

Procedure Name	Description
MPC-AIR-001 Rev. 01	Air Velocity, Temperature and Flow Meters, General, rev01, Feb-11-2020

Calibrating Technician: Barry Morris
BARRY MORRIS

QC Approval: Jack R. Wertz III
JACK WERTZ III

STATEMENTS OF PASS OR FAIL CONFORMANCE: The uncertainty of measurement has been taken into account when determining compliance with specification. All measurements and test results guard banded to ensure the probability of false-accept does not exceed 2% in compliance with ANSI/NCSL Z540.3-2006 and in case without guard banded the probability of false-accept depending on test uncertainty ratio.

THE CALIBRATION REPORT STATUS:
PASS- Term used when compliance statement is given, and the measurement result is PASS.
PASS²- Term used when compliance statement is given, and the measurement result is conditional passed or PASS².
FAIL- Term used when compliance statement is given, and the measurement result is FAIL.
FAIL²- Term used when compliance statement is given, and the measurement result is conditional failed or FAIL².
REPORT OF VALUE - Term used when reported measurement is not requiring compliance statement in report.
ADJUSTED- When adjustments are made to an instrument which changes the value of measurement from what was measured as found to new value as left.
LIMITED - When an instrument fails calibration but is still functional in a limited manner.

The expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%, unless otherwise stated. This calibration report complies with ISO/IEC 17025:2017 and ANSI/NCSL Z540.3. Calibration cycles and resulting due dates were submitted/approved by the customer. Any number of factors may cause an instrument to drift out of tolerance before the next scheduled calibration. Recalibration cycles should be based on frequency of use, environmental conditions and customer's established systematic accuracy. All standards are traceable to SI through the National Institute of Standards and Technology (NIST) and/or recognized national or international standards laboratories. Services rendered include proper manufacturer's service instruction and are warranted for no less than thirty (30) days. The information on this report pertains only to the instrument identified, this may not be reproduced in part or in a whole without the prior written approval of the issuing MP Calibration Laboratory.

(CERT, Rev 7)

MICRO PRECISION

Calibration Report of TPI Inc. 575 Digital Vane/Hot-Wire Anemometer

MPC Control #:	DA0650	Serial Number:	16425450039
Asset ID:	SBI-241	Calibration Date:	March 24, 2024

Velocity Measurement

Hot Wire

Function Tested	Nominal	Lower Limit	As Found	As Left	Upper Limit	Result	Uncertainty (±)
0.2 to 20 m/s	5.0 m/s	4.7 m/s	4.9 m/s	4.9 m/s	5.3 m/s	PASS	0.15 m/s
	10.0 m/s	9.7 m/s	9.9 m/s	9.9 m/s	10.4 m/s	PASS[Z]	0.29 m/s
	15.0 m/s	14.6 m/s	15.0 m/s	15.0 m/s	15.4 m/s	PASS	0.30 m/s
	19.0 m/s	18.6 m/s	18.8 m/s	18.8 m/s	19.4 m/s	PASS[Z]	0.38 m/s

Vane

Function Tested	Nominal	Lower Limit	As Found	As Left	Upper Limit	Result	Uncertainty (±)
0.4 to 25 m/s	6.3 m/s	5.8 m/s	6.2 m/s	6.2 m/s	6.7 m/s	PASS	0.18 m/s
	12.5 m/s	12.0 m/s	12.4 m/s	12.4 m/s	13.1 m/s	PASS	0.36 m/s
	18.8 m/s	18.1 m/s	18.9 m/s	18.9 m/s	19.4 m/s	PASS	0.38 m/s
	23.8 m/s	23.0 m/s	23.9 m/s	23.9 m/s	24.5 m/s	PASS	0.48 m/s

Temperature Measurement

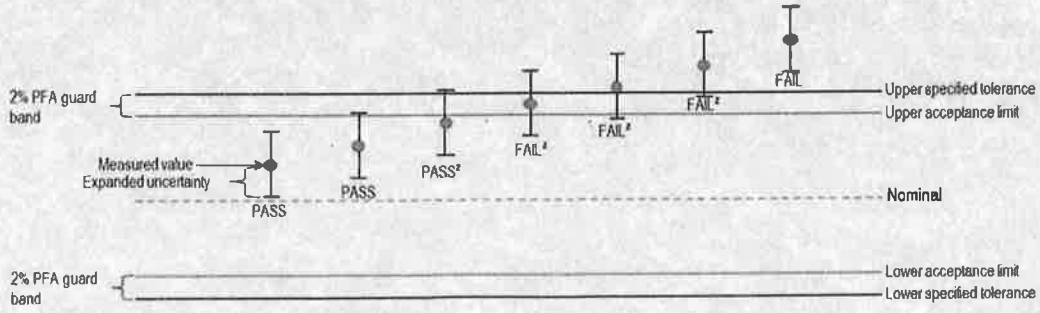
Function Tested	Nominal	Lower Limit	As Found	As Left	Upper Limit	Result	Uncertainty (±)
-20°C to 80°C	20.0 °C	19.3 °C	20.2 °C	20.2 °C	20.7 °C	PASS	0.0090 °C
	40.0 °C	39.1 °C	40.1 °C	40.1 °C	40.9 °C	PASS	0.0090 °C
	60.0 °C	58.9 °C	60.1 °C	60.1 °C	61.1 °C	PASS	0.0090 °C
	76.0 °C	74.7 °C	76.2 °C	76.2 °C	77.3 °C	PASS	0.0090 °C

Statements of Pass or Fail Conformance

The uncertainty of measurement has been taken into account when determining compliance with specification, as per ILAC-G8:03/2009.
All measurements and test results guard banded to ensure the probability of false-accept does not exceed 2% in compliance with ANSI/NCSL Z540.3-2006.

The status of compliance with the acceptance criteria is reported as:

- PASS - Compliant with specification
- FAIL - Not compliant with specification.
- FAIL[Z] - The measured value is not within the acceptance limits. However, a portion of the expanded uncertainty of measurement at 95% is within the specified tolerance.
- PASS[Z] - The measured value is within acceptance limits. However, a portion of the expanded uncertainty of measurement at 95% exceeds the specified tolerance.



Acceptance limits for ≤ 2 % probability of false accept (PFA) guard band

The expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%, unless otherwise stated.
This calibration report complies with ISO/IEC 17025:2017 and ANSI/NCSL Z540.3 Method 6-Guard Bands based on Test Uncertainty Ratio.

CERTIFICATE OF CALIBRATION

ACCREDITED
CALIBRATION
CERT #2260.01

Certificate Number: 2021005174

Manufacturer:	Dwyer Instruments Inc.	***RMA:***	AC21061937
Model:	MS-121-LCD	***Workorder:***	2021005174
Description:	Digital Pressure Gauge	***Barcode:***	AL0015068-P
Serial:	E51U01003410	***Received Conditions:***	Out of Tolerance
ID:	SBI-247	***Calibration Date:***	09-Jul-2021
Customer:	STOVE BUILDER INTERNATIONAL INC. 250 RUE DE COPENHAGUE ST-AUGUSTIN-DE-DESMAURES QC G3A 2H3	***Calibration Due:***	09-Jul-2022
		Temperature:	23.42°C
		Humidity:	65.4%RH

STATEMENT OF UNCERTAINTY: The reported expanded uncertainty of measurement is stated as the standard measurement uncertainty multiplied by the coverage factor K = 2, which for a normal distribution corresponds to a coverage probability of approximately 95 percent. Alpha Controls & Instrumentation Inc. certifies this instrument was calibrated on the date shown using standards traceable to NIST/NRC or accepted intrinsic standards and in compliance with ISO/IEC-17025:2017 and ANSI/NCSL Z540-1.

Any statement of compliance is made without taking measurement uncertainty into account and is based on UUT performance against required tolerance only. The customer must ensure equipment calibrated meets the intended use.

Tolerance is based on manufacturer specification if not stated otherwise. Calibration results relate to items calibrated only.

STANDARDS USED

Description	*Model*	*ID*	*Cal Date*	*Due Date*
Multimeter	Fluke 8845A	ELC-MTR-04	11-Jan-2021	11-Jan-2022
Low Pressure Calibrator	Ruska 7250LP	PRE-CAL-06	29-Nov-2020	29-Nov-2021

Notes: Adjusted trim pots.

Performed by: Sree Chukka
Technician
(digitally signed on 09-Jul-2021 1:47 pm)

QA Reviewed by: Anthony Morra
Technician
(digitally signed on 09-Jul-2021 4:44 pm)

Form: ROC101 Rev 9.3

Procedure: Dwyer MS-121-LCD 0 to 0.1;0.5 inH2O/7520lp 8845A (1.0.A) **As Found (Fail)**

Test Description	True Value	Test Results	Tolerance	Lower Limit	Upper Limit	Status	Uncertainty
Range: 0 to 0.5 inH2O							
Output signal: 4 to 20 mA							
PRESSURE TEST							
Display Reading						-0.002	
Output @ 0.0000 inH2O, mA						3.919	
0.0000 inH2O	0.0000 inH2O	-0.0025 inH2O	±0.0050 inH2O	-0.0050 inH2O	0.0050 inH2O	Pass	0.00015 inH2O
Display Reading						0.1184	
Output @ 0.1250 inH2O, mA						7.774	
0.1250 inH2O	0.1250 inH2O	0.1179 inH2O	±0.0050 inH2O	0.1200 inH2O	0.1300 inH2O	Fail	0.00015 inH2O
Display Reading						0.2380	
Output @ 0.2500 inH2O, mA						11.627	
0.2500 inH2O	0.2500 inH2O	0.2383 inH2O	±0.0050 inH2O	0.2450 inH2O	0.2550 inH2O	Fail	0.00015 inH2O
Display Reading						0.3611	
Output @ 0.3750 inH2O, mA						15.578	
0.3750 inH2O	0.3750 inH2O	0.3618 inH2O	±0.0050 inH2O	0.3700 inH2O	0.3800 inH2O	Fail	0.00015 inH2O
Display Reading						0.4866	
Output @ 0.5000 inH2O, mA						19.580	
0.5000 inH2O	0.5000 inH2O	0.4869 inH2O	±0.0050 inH2O	0.4950 inH2O	0.5050 inH2O	Fail	0.00015 inH2O
Display Reading						0.3633	
Output @ 0.3750 inH2O, mA						15.638	
0.3750 inH2O	0.3750 inH2O	0.3637 inH2O	±0.0050 inH2O	0.3700 inH2O	0.3800 inH2O	Fail	0.00015 inH2O
Display Reading						0.241	
Output @ 0.2500 inH2O, mA						11.697	
0.2500 inH2O	0.2500 inH2O	0.2405 inH2O	±0.0050 inH2O	0.2450 inH2O	0.2550 inH2O	Fail	0.00015 inH2O
Display Reading						0.1211	
Output @ 0.1250 inH2O, mA						7.862	
0.1250 inH2O	0.1250 inH2O	0.1207 inH2O	±0.0050 inH2O	0.1200 inH2O	0.1300 inH2O	Pass	0.00015 inH2O
Display Reading						-0.0012	
Output @ 0.0000 inH2O, mA						3.954	
0.000 inH2O	0.0000 inH2O	-0.0014 inH2O	±0.0050 inH2O	-0.0050 inH2O	0.0050 inH2O	Pass	0.00015 inH2O

Procedure: Dwyer MS-121-LCD 0 to 0.1;0.5 inH2O/7520lp 8845A (1.0.A) **As Left (Pass)**

Test Description	True Value	Test Results	Tolerance	Lower Limit	Upper Limit	Status	Uncertainty
Range: 0 to 0.5 inH2O							
Output signal: 4 to 20 mA							
PRESSURE TEST							
Display Reading						0	
Output @ 0.0000 inH2O, mA						4.006	
0.0000 inH2O	0.0000 inH2O	0.0002 inH2O	±0.0050 inH2O	-0.0050 inH2O	0.0050 inH2O	Pass	0.00015 inH2O
Display Reading						0.1235	
Output @ 0.1250 inH2O, mA						7.966	
0.1250 inH2O	0.1250 inH2O	0.1239 inH2O	±0.0050 inH2O	0.1200 inH2O	0.1300 inH2O	Pass	0.00015 inH2O
Display Reading						0.2463	
Output @ 0.2500 inH2O, mA						11.889	

Test Description	True Value	Test Results	Tolerance	Lower Limit	Upper Limit	Status	Uncertainty
0.2500 inH2O	0.2500 inH2O	0.2465 inH2O	±0.0050 inH2O	0.2450 inH2O	0.2550 inH2O	Pass	0.00015 inH2O
Display Reading						0.3721	
Output @ 0.3750 inH2O, mA						15.917	
0.3750 inH2O	0.3750 inH2O	0.3724 inH2O	±0.0050 inH2O	0.3700 inH2O	0.3800 inH2O	Pass	0.00015 inH2O
Display Reading						0.4988	
Output @ 0.5000 inH2O, mA						19.982	
0.5000 inH2O	0.5000 inH2O	0.4994 inH2O	±0.0050 inH2O	0.4950 inH2O	0.5050 inH2O	Pass	0.00015 inH2O
Display Reading						0.3733	
Output @ 0.3750 inH2O, mA						15.935	
0.3750 inH2O	0.3750 inH2O	0.3730 inH2O	±0.0050 inH2O	0.3700 inH2O	0.3800 inH2O	Pass	0.00015 inH2O
Display Reading						0.2478	
Output @ 0.2500 inH2O, mA						11.924	
0.2500 inH2O	0.2500 inH2O	0.2476 inH2O	±0.0050 inH2O	0.2450 inH2O	0.2550 inH2O	Pass	0.00015 inH2O
Display Reading						0.1248	
Output @ 0.1250 inH2O, mA						7.984	
0.1250 inH2O	0.1250 inH2O	0.1245 inH2O	±0.0050 inH2O	0.1200 inH2O	0.1300 inH2O	Pass	0.00015 inH2O
Display Reading						0	
Output @ 0.0000 inH2O, mA						4.006	
0.000 inH2O	0.0000 inH2O	0.0002 inH2O	±0.0050 inH2O	-0.0050 inH2O	0.0050 inH2O	Pass	0.00015 inH2O

END OF CERTIFICATE

CERTIFICATE OF CALIBRATION

ACCREDITED
CALIBRATION
CERT #2260.01

Certificate Number: 2021009039

Manufacturer:	Dwyer Instruments Inc.	***RMA:***	AC21111873
Model:	MS-121-LCD	***Workorder:***	2021009039
Description:	Pressure transmitter	***Barcode:***	AL0015072-P
Serial:	E52U0100652	***Received Conditions:***	Out of Tolerance
ID:	SBI-252	***Calibration Date:***	27-Jan-2022
Customer:	STOVE BUILDER INTERNATIONAL INC. 250 RUE DE COPENHAGUE ST-AUGUSTIN-DE-DESMAURES QC G3A 2H3	***Calibration Due:***	27-Jan-2023
		Temperature:	21.40°C
		Humidity:	14.4%RH

STATEMENT OF UNCERTAINTY: The reported expanded uncertainty of measurement is stated as the standard measurement uncertainty multiplied by the coverage factor K = 2, which for a normal distribution corresponds to a coverage probability of approximately 95 percent. Alpha Controls & Instrumentation Inc. certifies this instrument was calibrated on the date shown using standards traceable to NIST/NRC or accepted intrinsic standards and in compliance with ISO/IEC-17025:2017 and ANSI/NCSL Z540-1.

Any statement of compliance is made without taking measurement uncertainty into account and is based on UUT performance against required tolerance only. The customer must ensure equipment calibrated meets the intended use.

Tolerance is based on manufacturer specification if not stated otherwise. Calibration results relate to items calibrated only.

STANDARDS USED

Description	***Model***	***ID***	***Cal Date***	***Due Date***
Multimeter	Fluke 8845A	ELC-MTR-04	12-Jan-2022	31-Jan-2023
Low Pressure Calibrator	Setra 869	PRE-CAL-05	23-Apr-2021	23-Apr-2022

Notes: Adjusted trim pots.

Performed by: Sree Chukka
Technician
(digitally signed on 27-Jan-2022 9:28 am)

QA Reviewed by: Slava Peciurov
Lab Manager
(digitally signed on 27-Jan-2022 10:03 am)

Form: ROC101 Rev 9.3

Test Description	True Value	Test Results	Tolerance	Lower Limit	Upper Limit	Status	Uncertainty
Display Reading						0.499	
Output @ 0.5000 inH2O, mA						19.965	
0.5000 inH2O	0.5000 inH2O	0.4989 inH2O	±0.0050 inH2O	0.4950 inH2O	0.5050 inH2O	Pass	1.5e-004 inH2O
Display Reading						0.3757	
Output @ 0.3750 inH2O, mA						16.02	
0.3750 inH2O	0.3750 inH2O	0.3756 inH2O	±0.0050 inH2O	0.3700 inH2O	0.3800 inH2O	Pass	1.5e-004 inH2O
Display Reading						0.2529	
Output @ 0.2500 inH2O, mA						12.077	
0.2500 inH2O	0.2500 inH2O	0.2524 inH2O	±0.0050 inH2O	0.2450 inH2O	0.2550 inH2O	Pass	1.5e-004 inH2O
Display Reading						0.1284	
Output @ 0.1250 inH2O, mA						8.100	
0.1250 inH2O	0.1250 inH2O	0.1281 inH2O	±0.0050 inH2O	0.1200 inH2O	0.1300 inH2O	Pass	1.5e-004 inH2O
Display Reading						0.0005	
Output @ 0.0000 inH2O, mA						3.996	
0.000 inH2O	0.0000 inH2O	-0.0001 inH2O	±0.0050 inH2O	-0.0050 inH2O	0.0050 inH2O	Pass	1.5e-004 inH2O

END OF CERTIFICATE

CERTIFICATE OF CALIBRATION

ACCREDITED
CALIBRATION
CERT #2260.01

Certificate Number: 2021008468

Manufacturer:	Dwyer Instruments Inc.	***RMA:***	AC21111272
Model:	626-06-GH-P1-E1-S1	***Workorder:***	2021008468
Description:	Pressure Transmitter	***Barcode:***	AL00034373-P
Serial:	046946	***Received Conditions:***	In Tolerance
ID:	SB1-326	***Calibration Date:***	23-Nov-2021
Customer:	STOVE BUILDER INTERNATIONAL INC. 250 RUE DE COPENHAGUE ST-AUGUSTIN-DE-DESMAURES QC G3A 2H3	***Calibration Due:***	23-Nov-2022
		Temperature:	21.29°C
		Humidity:	22%RH

STATEMENT OF UNCERTAINTY: The reported expanded uncertainty of measurement is stated as the standard measurement uncertainty multiplied by the coverage factor K = 2, which for a normal distribution corresponds to a coverage probability of approximately 95 percent. Alpha Controls & Instrumentation Inc. certifies this instrument was calibrated on the date shown using standards traceable to NIST/NRC or accepted intrinsic standards and in compliance with ISO/IEC-17025:2017 and ANSI/NCSL Z540-1.

Any statement of compliance is made without taking measurement uncertainty into account and is based on UUT performance against required tolerance only. The customer must ensure equipment calibrated meets the intended use.

Tolerance is based on manufacturer specification if not stated otherwise. Calibration results relate to items calibrated only.

STANDARDS USED

Description	*Model*	*ID*	*Cal Date*	*Due Date*
Multimeter	Fluke 8845A	ELC-MTR-04	11-Jan-2021	11-Jan-2022
Pressure Controller/Calibrator	DH Instruments PPC3	PRE-CAL-04	01-Jun-2021	01-Jun-2022

Notes: None.

Performed by: Tony Wheaton
Technician
(digitally signed on 23-Nov-2021 10:34 am)

QA Reviewed by: Slava Peciurov
Lab Manager
(digitally signed on 23-Nov-2021 11:25 am)

Procedure: Pressure Transducer: BFSL: CAL VER (1.3.A) **FOUND-LEFT (Pass)**

Test Description	True Value	Test Results	Tolerance	Lower Limit	Upper Limit	Status	Uncertainty
RANGE: 0 psi to 5 psi							
OUTPUT: 4mA to 20mA							
EXCITATION: 24 V							
ACCURACY: 0.25 %FS							
PRESSURE RAW DATA							
@ 0 %FS: 0psi ---> 3.9629mA							
@ 25 %FS: 1.25psi ---> 7.9553mA							
@ 50 %FS: 2.5psi ---> 11.9682mA							
@ 75 %FS: 3.75psi ---> 15.9656mA							
@ 100 %FS: 5psi ---> 19.9655mA							
BEST FIT STRAIGHT LINE (BFSL) COEFFICIENTS							
SLOPE: 3.20124							
INTERCEPT: 3.9604							
PRESSURE BFSL COMPARISON							
0 %FS	3.9600 mA	3.963 mA	±0.0400 mA	3.920 mA	4.000 mA	Pass	5.9e-007 A
25 %FS	7.9620 mA	7.955 mA	±0.0400 mA	7.922 mA	8.002 mA	Pass	7.0e-007 A
50 %FS	11.9630 mA	11.968 mA	±0.0400 mA	11.923 mA	12.003 mA	Pass	9.8e-007 A
75 %FS	15.9650 mA	15.966 mA	±0.0400 mA	15.925 mA	16.005 mA	Pass	1.3e-006 A
100 %FS	19.9670 mA	19.965 mA	±0.0400 mA	19.927 mA	20.007 mA	Pass	1.7e-006 A
CALCULATED PARAMETERS							
ZERO: 3.9604mA							
SPAN: 19.9666mA							
SENSITIVITY: 3.2012mA/psi							

END OF CERTIFICATE

CERTIFICATE OF CALIBRATION

ACCREDITED
CALIBRATION
CERT #2260.01

Certificate Number: 2021008470

Manufacturer:	Dwyer Instruments Inc.	***RMA:***	AC21111272
Model:	626-06-GH-P1-E1-S1	***Workorder:***	2021008470
Description:	Pressure Transmitter	***Barcode:***	AL00034372-P
Serial:	046945	***Received Conditions:***	In Tolerance
ID:	SB1-327	***Calibration Date:***	23-Nov-2021
Customer:	STOVE BUILDER INTERNATIONAL INC. 250 RUE DE COPENHAGUE ST-AUGUSTIN-DE-DESMAURES QC G3A 2H3	***Calibration Due:***	23-Nov-2022
		Temperature:	21.51°C
		Humidity:	21.4%RH

STATEMENT OF UNCERTAINTY: The reported expanded uncertainty of measurement is stated as the standard measurement uncertainty multiplied by the coverage factor K = 2, which for a normal distribution corresponds to a coverage probability of approximately 95 percent. Alpha Controls & Instrumentation Inc. certifies this instrument was calibrated on the date shown using standards traceable to NIST/NRC or accepted intrinsic standards and in compliance with ISO/IEC-17025:2017 and ANSI/NCSL Z540-1.

Any statement of compliance is made without taking measurement uncertainty into account and is based on UUT performance against required tolerance only. The customer must ensure equipment calibrated meets the intended use.

Tolerance is based on manufacturer specification if not stated otherwise. Calibration results relate to items calibrated only.

STANDARDS USED

Description	*Model*	*ID*	*Cal Date*	*Due Date*
Multimeter	Fluke 8845A	ELC-MTR-04	11-Jan-2021	11-Jan-2022
Pressure Controller/Calibrator	DH Instruments PPC3	PRE-CAL-04	01-Jun-2021	01-Jun-2022

Notes: None.

Performed by: Tony Wheaton
Technician
(digitally signed on 23-Nov-2021 10:20 am)

QA Reviewed by: Slava Peciurov
Lab Manager
(digitally signed on 23-Nov-2021 11:25 am)

Form: ROC101 Rev 9.3.a

Procedure: Pressure Transducer: BFSL: CAL VER (1.3.A) **FOUND-LEFT (Pass)**

RANGE: 0 psi to 5 psi

OUTPUT: 4mA to 20mA

EXCITATION: 24 V

ACCURACY: 0.25 %FS

PRESSURE RAW DATA

@ 0 %FS: -0psi ---> 3.9576mA

@ 25 %FS: 1.25psi ---> 7.9389mA

@ 50 %FS: 2.5psi ---> 11.9541mA

@ 75 %FS: 3.75psi ---> 15.9491mA

@ 100 %FS: 5psi ---> 19.9476mA

BEST FIT STRAIGHT LINE (BFSL) COEFFICIENTS

SLOPE: 3.19922

INTERCEPT: 3.95142

PRESSURE BFSL COMPARISON

Test Description	True Value	Test Results	Tolerance	Lower Limit	Upper Limit	Status	Uncertainty
0 %FS	3.9510 mA	3.958 mA	±0.0400 mA	3.911 mA	3.991 mA	Pass	5.9e-007 A
25 %FS	7.9500 mA	7.939 mA	±0.0400 mA	7.910 mA	7.990 mA	Pass	7.0e-007 A
50 %FS	11.9490 mA	11.954 mA	±0.0400 mA	11.909 mA	11.989 mA	Pass	9.8e-007 A
75 %FS	15.9480 mA	15.949 mA	±0.0400 mA	15.908 mA	15.988 mA	Pass	1.3e-006 A
100 %FS	19.9480 mA	19.948 mA	±0.0400 mA	19.908 mA	19.988 mA	Pass	1.7e-006 A

CALCULATED PARAMETERS

ZERO: 3.9514mA

SPAN: 19.9475mA

SENSITIVITY: 3.1992mA/psi

END OF CERTIFICATE

CERTIFICATE OF CALIBRATION

ACCREDITED
CALIBRATION
CERT #2260.01

Certificate Number: 2021005178

Manufacturer:	Dwyer Instruments Inc.	***RMA:***	AC21061937
Model:	628-00C-GH-P1-E1-S1	***Workorder:***	2021005178
Description:	Pressure Transmitter	***Barcode:***	AL00023737-P
Serial:	N/A	***Received Conditions:***	In Tolerance
ID:	SBI-305	***Calibration Date:***	09-Jul-2021
Customer:	STOVE BUILDER INTERNATIONAL INC. 250 RUE DE COPENHAGUE ST-AUGUSTIN-DE-DESMAURES QC G3A 2H3	***Calibration Due:***	09-Jul-2022
		Temperature:	23.17°C
		Humidity:	68%RH

STATEMENT OF UNCERTAINTY: The reported expanded uncertainty of measurement is stated as the standard measurement uncertainty multiplied by the coverage factor K = 2, which for a normal distribution corresponds to a coverage probability of approximately 95 percent. Alpha Controls & Instrumentation Inc. certifies this instrument was calibrated on the date shown using standards traceable to NIST/NRC or accepted intrinsic standards and in compliance with ISO/IEC-17025:2017 and ANSI/NCSL Z540-1.

Any statement of compliance is made without taking measurement uncertainty into account and is based on UUT performance against required tolerance only. The customer must ensure equipment calibrated meets the intended use.

Tolerance is based on manufacturer specification if not stated otherwise. Calibration results relate to items calibrated only.

STANDARDS USED

Description	*Model*	*ID*	*Cal Date*	*Due Date*
Multimeter	Fluke 8845A	ELC-MTR-04	11-Jan-2021	11-Jan-2022
Pressure Controller/Calibrator	DH Instruments PPC3	PRE-CAL-04	01-Jun-2021	01-Jun-2022
Reference Pressure Monitor	Fluke RPM4	PRE-MTR-04	31-May-2021	31-May-2022

Notes: Unit was calibrated in vertical position.
Unit cannot be adjusted. Tolerance specified by customer.

Performed by: Sree Chukka
Technician
(digitally signed on 09-Jul-2021 11:31 am)

QA Reviewed by: Anthony Morra
Technician
(digitally signed on 09-Jul-2021 4:44 pm)

Form: ROC101 Rev 9.3

Procedure: Pressure/Vacuum: CAL VER /DHI PPC3 (2.3.A) **FOUND-LEFT (Pass)**

Test Description	True Value	Test Results	Tolerance	Lower Limit	Upper Limit	Status	Uncertainty
VACUUM TEST							
MEASUREMENT UNITS: inHg							
OUT = 4.933 mA							
-28.5000	-28.5000	-28.250	±0.4000	-28.900	-28.100	Pass	1.9e-003
OUT = 7.849 mA							
-23.0000	-23.0000	-22.783	±0.4000	-23.400	-22.600	Pass	1.9e-003
OUT = 11.048 mA							
-17.0000	-17.0000	-16.785	±0.4000	-17.400	-16.600	Pass	1.9e-003
OUT = 14.249 mA							
-11.0000	-11.0000	-10.783	±0.4000	-11.400	-10.600	Pass	1.9e-003
OUT = 16.922 mA							
-6.0000	-6.0000	-5.771	±0.4000	-6.400	-5.600	Pass	1.9e-003
OUT = 20.134 mA							
0.0000	0.0000	0.251	±0.4000	-0.400	0.400	Pass	1.9e-003
OUT = 16.953 mA							
-6.0000	-6.0000	-5.713	±0.4000	-6.400	-5.600	Pass	1.9e-003
OUT = 14.297 mA							
-11.0000	-11.0000	-10.693	±0.4000	-11.400	-10.600	Pass	1.9e-003
OUT = 11.108 mA							
-17.0000	-17.0000	-16.672	±0.4000	-17.400	-16.600	Pass	1.9e-003
OUT = 7.916 mA							
-23.0000	-23.0000	-22.657	±0.4000	-23.400	-22.600	Pass	1.9e-003
OUT = 4.956 mA							
-28.5000	-28.5000	-28.207	±0.4000	-28.900	-28.100	Pass	1.9e-003

END OF CERTIFICATE

CERTIFICATE OF CALIBRATION

ACCREDITED
CALIBRATION
CERT #2260.01

Certificate Number: 2021006029

Manufacturer:	Dwyer Instruments Inc.	***RMA:***	AC21081020
Model:	628-00C-GH-P1-E1-S1	***Workorder:***	2021006029
Description:	Pressure Transmitter	***Barcode:***	AL00023153-P
Serial:	N/A	***Received Conditions:***	In Tolerance
ID:	SBI-301	***Calibration Date:***	11-Aug-2021
Customer:	STOVE BUILDER INTERNATIONAL INC. 250 RUE DE COPENHAGUE ST-AUGUSTIN-DE-DESMAURES QC G3A 2H3	***Calibration Due:***	11-Aug-2022
		Temperature:	24.19°C
		Humidity:	59%RH

STATEMENT OF UNCERTAINTY: The reported expanded uncertainty of measurement is stated as the standard measurement uncertainty multiplied by the coverage factor K = 2, which for a normal distribution corresponds to a coverage probability of approximately 95 percent. Alpha Controls & Instrumentation Inc. certifies this instrument was calibrated on the date shown using standards traceable to NIST/NRC or accepted intrinsic standards and in compliance with ISO/IEC-17025:2017 and ANSI/NCSL Z540-1.

Any statement of compliance is made without taking measurement uncertainty into account and is based on UUT performance against required tolerance only. The customer must ensure equipment calibrated meets the intended use.

Tolerance is based on manufacturer specification if not stated otherwise. Calibration results relate to items calibrated only.

STANDARDS USED

Description	***Model***	***ID***	***Cal Date***	***Due Date***
Multimeter	Fluke 8845A	ELC-MTR-04	11-Jan-2021	11-Jan-2022
Pressure Controller/Calibrator	DH Instruments PPC3	PRE-CAL-04	01-Jun-2021	01-Jun-2022
Reference Pressure Monitor	Fluke RPM4	PRE-MTR-04	31-May-2021	31-May-2022

Notes: Tolerance specified by customer.

Performed by: Sree Chukka
Technician
(digitally signed on 11-Aug-2021 3:22 pm)

QA Reviewed by: Lauren Lazar
Lab Administrator
(digitally signed on 12-Aug-2021 8:44 am)

Form: ROC101 Rev 9.3

Procedure: Pressure/Vacuum: CAL VER /DHI PPC3 (2.3.A) — **FOUND-LEFT (Pass)**

Test Description	True Value	Test Results	Tolerance	Lower Limit	Upper Limit	Status	Uncertainty
PRESSURE TEST							
MEASUREMENT UNITS: inHg							
OUT = 5.067 mA							
-28.5000	-28.5000	-27.999	±0.6000	-29.100	-27.900	Pass	1.9e-003
OUT = 7.955 mA							
-23.0000	-23.0000	-22.584	±0.6000	-23.600	-22.400	Pass	1.9e-003
OUT = 11.146 mA							
-17.0000	-17.0000	-16.601	±0.6000	-17.600	-16.400	Pass	1.9e-003
OUT = 14.34 mA							
-11.0000	-11.0000	-10.612	±0.6000	-11.600	-10.400	Pass	1.9e-003
OUT = 17.015 mA							
-6.0000	-6.0000	-5.596	±0.6000	-6.600	-5.400	Pass	1.9e-003
OUT = 20.208 mA							
0.0000	0.0000	0.390	±0.6000	-0.600	0.600	Pass	1.9e-003
OUT = 17.033 mA							
-6.0000	-6.0000	-5.563	±0.6000	-6.600	-5.400	Pass	1.9e-003
OUT = 14.385 mA							
-11.0000	-11.0000	-10.528	±0.6000	-11.600	-10.400	Pass	1.9e-003
OUT = 11.195 mA							
-17.0000	-17.0000	-16.509	±0.6000	-17.600	-16.400	Pass	1.9e-003
OUT = 8.005 mA							
-23.0000	-23.0000	-22.490	±0.6000	-23.600	-22.400	Pass	1.9e-003
OUT = 5.064 mA							
-28.5000	-28.5000	-28.005	±0.6000	-29.100	-27.900	Pass	1.9e-003

END OF CERTIFICATE

ULRICH
DIVISION - TRANSCAT CANADA

Transcat Canada Inc.
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Montréal (Québec)
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ACCREDITATION
ISO 17025
SCC Scope Number 220

CALIBRATION CERTIFICATE

Certificate no.:	827062	**Calibration date:**	September 23, 2021
Identification:	SBI-212	**Certificate issued:**	September 23, 2021
Description:	THERMO-HYGROMETER, AMPROBE TH-3	**Interval:**	12 months
Manufacturer:	AMPROBE	**Due date:**	September 23, 2022
Model no.:	TH-3	**Procedure no.:**	METCAL-U rev. 2
Serial no.:	100906351	**Procedure date:**	2019-02-07
		Environment:	CLAS Type 2 Laboratory
		Temperature:	23 ± 2°C
		Humidity:	35 - 55% RH
		Metrologist:	NFS

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

Approved by: David Llorens, Quality Manager

This calibration certificate is issued in accordance with the applicable requirements of ISO/IEC 17025 and Ulrich Metrology's quality manual QM-09 Revision 9. Measurement results provi 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 C 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 uncertainties are expanded using a coverage factor K=2 for a level of confidence of approximately 95%, assuming a normal distribution.

CALIBRATION DATA

See next page for measurement results.

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CALIBRATION DATA

Certificate No.: 827062

Identification: SBI-212
Description: THERMO-HYGROMETER
Serial no.: 100906351
Procedure: Amprobe TH-3: 2500ST-LT-M

Result: PASS
Condition: FOUND-LEFT

CALIBRATION STANDARDS

Standard ID	Type	Manufacturer	Model no.	Cal. Date	Due Date
1304953	HUMIDITY GENERATOR	THUNDER SCIENTIFIC	2500ST-LT	2021-01-28	2022-01-31

MEASURMENT RESULTS (Per MET/CAL)

PARAMETER	TEST RESULT	ACCEPTANCE LIMITS LOW	HIGH	UNITS	Exp Uncert	Condition
TEMPERATURE CALIBRATION						
23°C						
23.050 °C	23.50	22.25	23.85	°C	1.0e-001°C	Pass
RELATIVE HUMIDITY CALIBRATION AT 23°C						
20% RH						
20.000 %	21.00	17.00	23.00	%	6.0e-001%	Pass
50% RH						
50.000 %	49.80	47.00	53.00	%	6.0e-001%	Pass
80% RH						
79.990 %	77.10	76.99	82.99	%	6.0e-001%	Pass

End of Test Data

ULRICH
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ACCREDITATION
ISO 17025
SCC Scope Number 220

CALIBRATION CERTIFICATE

Certificate no.:	805846	**Calibration date:**	May 07, 2021
Identification:	SBI-213	**Certificate issued:**	May 07, 2021
Description:	THERMO-HYGROMETER, AMPROBE TH-3	**Interval:**	12 months
Manufacturer:	AMPROBE	**Due date:**	May 07, 2022
Model no.:	TH-3	**Procedure no.:**	MET/CAL
Serial no.:	101004044	**Environment:**	CLAS Type 2 Laboratory
		Temperature:	23 ± 2°C
		Humidity:	35 - 55% RH
		Metrologist:	NFS

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

Approved by: David Llorens, Quality Manager

This calibration certificate is issued in accordance with the applicable requirements of ISO/IEC 17025 and Ulrich Metrology's quality manual QM-09 Revision 9. Measurement results provi 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 C 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:

EQUIPMENT RECEIVED OUT OF SPECIFICATIONS:

High humidity is out of tolerance @80% (reading of 73.9% instead of 77% minimum).
No adjustment. No support from manufacturer.

226673 L

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CALIBRATION DATA

Certificate No.: 805846

Identification: SBI-213
Description: THERMO-HYGROMETER
Serial no.: 101004044
Procedure: Amprobe TH-3: 2500ST-LT-M

Result: PASS
Condition: FOUND-LEFT

CALIBRATION STANDARDS

Standard ID	Type	Manufacturer	Model no.	Cal. Date	Due Date
1304953	HUMIDITY GENERATOR	THUNDER SCIENTIFIC	2500ST-LT	2021-01-28	2022-01-31

MEASURMENT RESULTS (Per MET/CAL)

PARAMETER	TEST RESULT	ACCEPTANCE LIMITS LOW	HIGH	UNITS	Exp Uncert	Condition
TEMPERATURE CALIBRATION						
23°C						
23.050 °C	23.40	22.25	23.85	°C	1.0e-001°C	Pass
RELATIVE HUMIDITY CALIBRATION AT 23°C						
20% RH						
20.000 %	19.00	17.00	23.00	%	6.0e-001%	Pass
50% RH						
50.010 %	47.80	47.01	53.01	%	6.0e-001%	Pass
80% RH						
80.000 %	73.80	77.00	83.00	%	6.0e-001%	Fail

End of Test Data

Certificate No: 01037944-1

METTLER TOLEDO

METTLER-TOLEDO, LLC
201 Wolf Dr
Thorofare NJ 08086
1-800-METTLER

NVLAP® CALIBRATION NVLAP LAB CODE 105013-0

ilac-MRA

Mass Calibration Certificate

Customer Information

Customer Name:	Stove Builder International, Inc.	*City:*	
Address:	250 de Copenhauge St.-Augustin-de-Desmaures	*State / Province:*	QC
Purchase Order:	220309982	*Zip / Postal Code:*	G3A 2H3

Measurement and Test Equipment Identification

Serial Number:	B739752165	*Date Received:*	03-OCT-2018
Manufacturer:	Mettler Toledo	*Condition:*	Good
Asset Number:	SBI-312	*Tolerance Class:*	OIML R111 Class E2

Environmental Conditions

Temperature: 21.07 °C *Barometric Pressure:* 769.28 mm Hg *Relative Humidity:* 52 %RH

The standards used to perform this calibration have been compared to reference mass standards that are traceable to the SI through the National Institute of Standards and Technology under Test No 684/289871-17.

The weights calibrated for this report have been calibrated in accordance with the calibration laboratory's process. The calibration performed meets the criteria as described in the current revisions of ASTM E617 and OIML R111. This calibration also meets specifications as outlined in ISO/IEC 17025, ANSI/NCSL Z540-1-1994, and applicable documents.

Calibration Date:	09-OCT-2018	*Next Calibration Due:*	09-OCT-2023
Calibration Technician:	Robotic Calibration	*Signature:*	Joseph Moran, Metrology Manager Approved Signatory 10-OCT-2018

Certificate No: 01037944-1

As Found Data

Nominal Value&Suffix	Serial Number	True Mass (g)	Conv. Mass (g)	Uncertainty (mg, k = 2)	Tolerance (mg)	Density (g/cm³)
200 g	B739752165	200.00009	200.00009	0.06	0.30	8.00

1 As Found / 1 Total

Certificate No: 01037944-1

As Left Data

Nominal Value&Suffix	Serial Number	True Mass (g)	Conv. Mass (g)	Uncertainty (mg, k = 2)	Tolerance (mg)	Density (g/cm³)
200 g	B739752165	200.00009	200.00009	0.06	0.30	8.00

1 As Found / 1 Total

Certificate No: 01037944-1

Standards and Comparators Used

Nominal Value&Suffix	Serial Number	Standard Set No.	Cal Due	Comparator Used		Cal Due	Procedure Used
200 g	B739752165	MS002	08/01/19	A200XXL	132	01/01/19	Multi A-B

Comments

1 As Found / 1 Total

Definitions

Nominal Value - The value as labeled on the weight or defined by shape in accordance with OIML R111 for milligram weights.

True Mass - The mass value of the weight if measured in a vacuum.

Conventional Mass - For a mass at 20 °C, "Conventional Mass" is the mass of a reference standard of density 8000 kg/m³ which it balances in air with a density of 1.2 kg/m³. This value should be referenced when testing the accuracy of a weighing device using any of the nominal values contained in this certificate. The As Found results will equal the As Left in cases where no adjustment or replacement was required.

Uncertainty - All Uncertainty values are reported at approximately 95% confidence level (k=2). The uncertainty value does not include a component for the affects due to magnetism.

Tolerance - The acceptable range of deviation (positive and negative) from the nominal value, including the uncertainty, as defined by ASTM and OIML for the respective classes.

Density - The assumed density of the material used by the manufacturer.

Calibration Process - This calibration was performed in the Level I Mass Metrology Laboratory at 201 Wolf Dr Thorofare, New Jersey 08086 unless otherwise noted in Comments.

OOT - The As Found measurement result combined with the uncertainty exceeded the tolerance for the specified weight class.

A - Weight was adjusted after As Found testing to within the appropriate tolerance class.

R - The received weight was replaced due to an out of tolerance condition and the weight was not adjustable or the weight for this nominal value was missing.

ilac-MRA ACCREDITED A2LA Certificate No. 1750.01 Calibration

Calibration complies with ISO/IEC 17025, ANSI/NCSL Z540-1, and 9001

Cert. No.: 4199-11583105

Traceable® Certificate of Calibration for Dial Barometer

Manufactured for and distributed by : Control Company 12554 Galveston Rd B230, Webster, TX 77598

Instrument Identification: SBI-331

Model: 4199, S/N: 200586704 Manufacturer: Control Company

Standards/Equipment:

Description	Serial Number	Due Date	NIST Traceable Reference
Digital Barometer	D4540001	01 Nov 2020	1000447551

Certificate Information:

Technician: 57 Procedure: CAL-33 Cal Date: 01 Oct 2020 Cal Due Date: 01 Oct 2022

Test Conditions: 44.14%RH 23.01°C 1018mBar

Calibration Data: (New Instrument)

Unit(s)	Nominal	As Found	In Tol	Nominal	As Left	In Tol	Min	Max	±U	TUR
mb/hPa	N.A.	N.A.		960.40	960	Y	955	965	0.62	>4:1
mb/hPa	N.A.	N.A.		985.58	984	Y	981	991	0.62	>4:1
mb/hPa	N.A.	N.A.		1015.85	1015	Y	1011	1021	0.62	>4:1

This certificate indicates Traceability to standards provided by (NIST) National Institute of Standards and Technology and/or a National Standards Laboratory.

A Test Uncertainty Ratio of at least 4:1 is maintained unless otherwise stated and is calculated using the expanded measurement uncertainty. Uncertainty evaluation includes the instrument under test and is calculated in accordance with the ISO "Guide to the Expression of Uncertainty in Measurement : (GUM). The uncertainty represents an expanded uncertainty using a coverage factor k=2 to approximate a 95% confidence level. In tolerance conditions are based on test results falling within specified limits with no reduction by the uncertainty of the measurement. The results contained herein relate only to the item calibrated. This certificate shall not be reproduced except in full, without written approval of Control Company.

Nominal=Standard's Reading; As Left=Instrument's Reading; In Tol=In Tolerance; Min/Max=Acceptance Range; ± U=Expanded Measurement Uncertainty; TUR=Test Uncertainty Ratio; Accuracy=±(Max-Min)/2; Min=As Left Nominal(Rounded) – Tolerance; Max= As Left Nominal(Rounded) + Tolerance;

Nicol Rodriguez

Nicol Rodriguez, Quality Manager

Marisa Elms

Marisa Elms, Technical Manager

Note :

Maintaining Accuracy:

In our opinion once calibrated your Dial Barometer should maintain its accuracy. There is no exact way to determine how long calibration will be maintained. Dial Barometer change little, if any at all, but can be affected by aging, temperature, shock, and contamination.

Recalibration:

For factory calibration and re-certification traceable to National Institute of Standards and Technology contact Control Company.

Issue Date : 01 Oct 2020

CONTROL COMPANY 12554 Galveston RD Suite B230 Webster TX USA 77598
Phone 281 482-1714 Fax 281 482-9448 sales@control3.com www.traceable.com

Fabricant de poêle international inc.
Stove Builder International Inc.

CERTIFICAT DE VÉRIFICATION

VERIFICATION CERTIFICATE

No. Certificat : 20211021001

Identification : SBI-153
Description : Moisture content standard
Manufacturier : Delmhorst
No. Modèle : MCS-1
No. Série : 81808
Propriété de : SBI
250 de Copenhague
St-Augustin-de-Desmaures, QC G3A 2H3

Date de vérification : 21 octobre 2021
Prochaine vérification : 21 octobre 2022
Méthode utilisée : Cal-MCS_01
Température : 72 °F
Humidité : 41.2 %
État avant calibration : Bon état

Ce certificat de calibration est émis en accordance avec les requis applicables du standard ISO/IEC 17025 et le manuel qualité, version 2.0 de SBI.

MESURES D'INCERTITUDE

Les incertitudes signalées représentent un niveau de confiance de 95% en supposant une distribution normale, avec un facteur de couverture de K = 2.

REMARQUES

L'instrument de mesure est vérifié et nettoyé avant l'étalonnage. Les résultats de calibration de ce certificat se rapportent seulement à l'instrument calibré ci-dessus.

ÉTALON UTILISÉ POUR VÉRIFIER L'ÉQUIPEMENT

No. de l'étalon utilisé	Description	No. de certificat	Date de calibration	Date d'échéance
SBI-194	Multimètre	780975	2020-11-24	2021-11-24

Fabricant de poêle international inc.
Stove Builder International Inc.

CERTIFICAT DE VÉRIFICATION

VERIFICATION CERTIFICATE

DONNÉES DE VÉRIFICATION

Unités : MΩ

Résultat : PASS

22%			
S.D.	0.00	%	
R.M.U.	0.91	%	
O.M.U	**98.08**	**%**	
	Ave A.D.	0.30	%
Standard	Reading	A.D.	
1.10	1.10	0.00	
1.10	1.10	0.00	
1.10	1.09	0.91	

12%			
S.D.	0.00	%	
R.M.U.	0.83	%	
O.M.U	**98.24**	**%**	
	Ave A.D.	0.28	%
Standard	Reading	A.D.	
120	120	0.00	
120	120	0.00	
120	119	0.83	

VÉRIFIÉ PAR : Gabrielle Santerre

Gabrielle Santerre

FIN DU CERTIFICAT

21 octobre 2021

Certificat # 20211021001

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Transcat Canada Inc.
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ACCREDITATION
ISO 17025
SCC Scope Number 220

CLAS NRC·CNRC CLAS 1986-01

CALIBRATION CERTIFICATE

Certificate no.:	836234	**Calibration date:**	November 23, 2021
Identification:	SBI-194	**Certificate issued:**	November 23, 2021
Description:	MULTIMETER, RADIO SHACK 22-168A	**Interval:**	12 months
Manufacturer:	RADIO SHACK	**Due date:**	November 23, 2022
Model no.:	22-168A	**Procedure no.:**	METCAL-U rev. 2
Serial no.:	FC388201	**Procedure date:**	2019-02-07
		Environment:	CLAS Type 2 Laboratory
		Temperature:	23 ± 2°C
		Humidity:	35 - 55% RH
		Metrologist:	MOZ

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

Approved by: David Llorens, Quality Manager

This calibration certificate is issued in accordance with the applicable requirements of ISO/IEC 17025 and Ulrich Metrology's quality manual QM-09 Revision 9. Measurement results provi 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 C. 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 uncertainties are expanded using a coverage factor K=2 for a level of confidence of approximately 95%, assuming a normal distribution.

CALIBRATION DATA

See next page for measurement results.

Notes:

EQUIPMENT RECEIVED OUT OF SPECIFICATIONS:

Resistance was out of tolerance at 190 Ohm. The (V/|) connector was resoldered and it is now passing.
All AC voltages below 700V,60Hz are out of tolerance. See as-found and as-left data sheets for more details.
LIMITED CALIBRATION as per customer request

248501 L

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CALIBRATION DATA

Certificate No.: 836234

Identification: SBI-194
Description: MULTIMETER
Serial no.: FC388201
Procedure: MICRONTA 22-168A: 5520A-M

Result: FAIL
Condition: AS-FOUND

CALIBRATION STANDARDS

Standard ID	Type	Manufacturer	Model no.	Cal. Date	Due Date
BM11	CALIBRATOR	FLUKE	5522A-SC1100	2021-09-02	2022-09-30

MEASURMENT RESULTS (Per MET/CAL)

PARAMETER	TEST RESULT	ACCEPTANCE LIMITS LOW	HIGH	UNITS	Exp Uncert	Condition
DC VOLTAGE CALIBRATION						
200 mV Range						
190.0 mV	189.9	187.8	192.2	mV	5.8e-005V	Pass
2V Range						
1.900 V	1.898	1.878	1.922	V	5.8e-004V	Pass
-1.900 V	-1.896	-1.922	-1.878	V	5.8e-004V	Pass
20V Range						
19.00 V	18.98	18.78	19.22	V	5.8e-003V	Pass
200V Range						
190.0 V	190.1	187.8	192.2	V	5.8e-002V	Pass
1000V Range						
950 V	950	938	962	V	5.8e-001V	Pass
AC VOLTAGE CALIBRATION						
AC VOLTAGE CALIBRATION						
200 mV Range						
200 mV Range						
190.0 mV @ 60 Hz	185.4	185.8	194.2	mV	6.4e-005V	Fail
2V Range						
1.900 V @ 60 Hz	1.852	1.858	1.942	V	6.4e-004V	Fail
20V Range						
19.00 V @ 60 Hz	18.53	18.58	19.42	V	6.4e-003V	Fail
200V Range						
190.0 V @ 60 Hz	185.6	185.8	194.2	V	6.5e-002V	Fail
750V Range						
700 V @ 60 Hz	683	678	723	V	6.0e-001V	Pass
FREQUENCY CALIBRATION						
1.900 kHz @ 5 V	1.903	1.809	1.990	kHz	5.8e-001Hz	Pass
RESISTANCE CALIBRATION						
200 Ohm Range						
190.0 Ohm	194.6	186.8	193.2	Ω	5.8e-002Ω	Fail
2 kOhm Range						
1.900 kOhm	1.900	1.870	1.930	kΩ	5.8e-001Ω	Pass
20 kOhm Range						
19.00 kOhm	18.97	18.70	19.30	kΩ	5.8e+000Ω	Pass
200 kOhm Range						
190.0 kOhm	190.0	187.0	193.0	kΩ	5.8e+001Ω	Pass

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PARAMETER	TEST RESULT	ACCEPTANCE LIMITS LOW	HIGH	UNITS	Exp Uncert	Condition
2 MOhm Range						
1.900 MOhm	1.903	1.870	1.930	MΩ	5.9e+002Ω	Pass
20 MOhm Range						
19.00 MOhm	18.98	18.50	19.50	MΩ	8.1e+003Ω	Pass
2000 MOhm Range						
1100 MOhm	1085	935	1266	MΩ	1.3e+007Ω	Pass
CONTINUITY CALIBRATION						
Is the beeper on when 30 Ohms resistance is applied?						
Result of Operator Evaluation						Pass
Is the beeper off when 100 Ohms resistance is applied?						
Result of Operator Evaluation						Pass
DC CURRENT CALIBRATION						
200 µA Range						
190.0 µA	189.6	187.0	193.0	µA	6.9e-008A	Pass
2 mA Range						
1.900 mA	1.899	1.870	1.930	mA	6.1e-007A	Pass
20 mA Range						
19.00 mA	19.06	18.47	19.54	mA	6.0e-006A	Pass
200 mA Range						
190.0 mA	191.6	184.7	195.3	mA	6.0e-005A	Pass
20 A Range						
20 A Range						
10.00 A	9.89	9.30	10.70	A	7.2e-003A	Pass
AC CURRENT CALIBRATION						
200 µA Range						
190.0 µA @ 60 Hz	185.1	184.8	195.2	µA	2.7e-007A	Pass
2 mA Range						
1.900 mA @ 60 Hz	1.854	1.848	1.952	mA	1.7e-006A	Pass
20 mA Range						
19.00 mA @ 60 Hz	18.60	18.15	19.85	mA	9.4e-006A	Pass
200 mA Range						
190.0 mA @ 60 Hz	186.8	181.5	198.5	mA	9.4e-005A	Pass
20 A Range						
10.00 A @ 60 Hz	9.86	8.98	11.02	A	8.5e-003A	Pass
CAPACITANCE CALIBRATION						
200 nF Range						
190.0 nF	188.2	180.9	199.1	nF	4.0e-010F	Pass
20 µF Range						
19.00 µF	18.41	17.30	20.70	µF	8.2e-008F	Pass
200 µF Range						
190.0 µF	183.3	172.9	207.1	µF	9.0e-007F	Pass

End of Test Data

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CALIBRATION DATA

Certificate No.: 836234

Identification: SBI-194
Description: MULTIMETER
Serial no.: FC388201
Procedure: MICRONTA 22-168A: 5520A-M

Result: PASS
Condition: AS-LEFT

CALIBRATION STANDARDS

Standard ID	Type	Manufacturer	Model no.	Cal Date	Due Date
BM11	CALIBRATOR	FLUKE	5522A-SC1100	2021-09-02	2022-09-30

MEASURMENT RESULTS (Per MET/CAL)

PARAMETER	TEST RESULT	ACCEPTANCE LIMITS LOW	HIGH	UNITS	Exp Uncert	Condition
DC VOLTAGE CALIBRATION						
200 mV Range						
190.0 mV	189.8	187.8	192.2	mV	5.8e-005V	Pass
2V Range						
1.900 V	1.897	1.878	1.922	V	5.8e-004V	Pass
-1.900 V	-1.895	-1.922	-1.878	V	5.8e-004V	Pass
20V Range						
19.00 V	18.97	18.78	19.22	V	5.8e-003V	Pass
200V Range						
190.0 V	190.0	187.8	192.2	V	5.8e-002V	Pass
1000V Range						
950 V	949	938	962	V	5.8e-001V	Pass
AC VOLTAGE CALIBRATION						
200 mV Range						
190.0 mV @ 60 Hz	185.4	185.8	194.2	mV	6.4e-005V	Fail
2V Range						
1.900 V @ 60 Hz	1.851	1.858	1.942	V	6.4e-004V	Fail
20V Range						
19.00 V @ 60 Hz	18.52	18.58	19.42	V	6.4e-003V	Fail
200V Range						
190.0 V @ 60 Hz	185.5	185.8	194.2	V	6.5e-002V	Fail
750V Range						
700 V @ 60 Hz	683	678	723	V	6.0e-001V	Pass
FREQUENCY CALIBRATION						
1.900 kHz @ 5 V	1.904	1.809	1.990	kHz	5.8e-001Hz	Pass
RESISTANCE CALIBRATION						
200 Ohm Range						
190.0 Ohm	190.0	186.8	193.2	Ω	5.8e-002Ω	Pass
2 kOhm Range						
1.900 kOhm	1.899	1.870	1.930	kΩ	5.8e-001Ω	Pass
20 kOhm Range						
19.00 kOhm	18.97	18.70	19.30	kΩ	5.8e+000Ω	Pass
200 kOhm Range						
190.0 kOhm	189.9	187.0	193.0	kΩ	5.8e+001Ω	Pass
2 MOhm Range						
1.900 MOhm	1.901	1.870	1.930	MΩ	5.9e+002Ω	Pass
20 MOhm Range						

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PARAMETER	TEST RESULT	ACCEPTANCE LIMITS LOW	HIGH	UNITS	Exp Uncert	Condition
19.00 MOhm	19.02	18.50	19.50	MΩ	8.1e+003Ω	Pass
2000 MOhm Range						
1100 MOhm	1088	935	1266	MΩ	1.3e+007Ω	Pass
CONTINUITY CALIBRATION						
Is the beeper on when 30 Ohms resistance is applied?						
Result of Operator Evaluation						Pass
Is the beeper off when 100 Ohms resistance is applied?						
Result of Operator Evaluation						Pass
DC CURRENT CALIBRATION						
200 µA Range						
190.0 µA	189.7	187.0	193.0	µA	6.9e-008A	Pass
2 mA Range						
1.900 mA	1.899	1.870	1.930	mA	6.1e-007A	Pass
20 mA Range						
19.00 mA	19.05	18.47	19.54	mA	6.0e-006A	Pass
200 mA Range						
190.0 mA	191.5	184.7	195.3	mA	6.0e-005A	Pass
20 A Range						
20 A Range						
10.00 A	9.87	9.30	10.70	A	7.2e-003A	Pass
AC CURRENT CALIBRATION						
200 µA Range						
190.0 µA @ 60 Hz	185.0	184.8	195.2	µA	2.7e-007A	Pass
2 mA Range						
1.900 mA @ 60 Hz	1.854	1.848	1.952	mA	1.7e-006A	Pass
20 mA Range						
19.00 mA @ 60 Hz	18.60	18.15	19.85	mA	9.4e-006A	Pass
200 mA Range						
190.0 mA @ 60 Hz	186.9	181.5	198.5	mA	9.4e-005A	Pass
20 A Range						
10.00 A @ 60 Hz	9.86	8.98	11.02	A	8.5e-003A	Pass
CAPACITANCE CALIBRATION						
200 nF Range						
190.0 nF	188.3	180.9	199.1	nF	4.0e-010F	Pass
20 µF Range						
19.00 µF	18.53	17.30	20.70	µF	8.2e-008F	Pass
200 µF Range						
190.0 µF	183.3	172.9	207.1	µF	9.0e-007F	Pass

End of Test Data

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ACCREDITATION
ISO 17025
SCC Scope Number 220

CALIBRATION CERTIFICATE

Certificate no.:	810437	**Calibration date:**	June 08, 2021
Identification:	SBI-096	**Certificate issued:**	June 08, 2021
Description:	CALIBRATOR, OMEGA CL23A	**Interval:**	12 months
Size:	TC K/J/T	**Due date:**	June 08, 2022
Manufacturer:	OMEGA	**Procedure no.:**	METCAL-U rev. 2
Model no.:	CL23A	**Procedure date:**	2019-02-07
Serial no.:	T-256137	**Environment:**	CLAS Type 2 Laboratory
		Temperature:	23 ± 2°C
		Humidity:	35 - 55% RH
		Metrologist:	NIN

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

Approved by: David Llorens, Quality Manager

This calibration certificate is issued in accordance with the applicable requirements of ISO/IEC 17025 and Ulrich Metrology's quality manual QM-09 Revision 9. Measurement results provi 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 C. 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 uncertainties are expanded using a coverage factor K=2 for a level of confidence of approximately 95%, assuming a normal distribution.

CALIBRATION DATA

See next page for measurement results.

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CALIBRATION DATA

Certificate No.: 810437

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

Result: PASS
Condition: FOUND-LEFT

CALIBRATION STANDARDS

Standard ID	Type	Manufacturer	Model no.	Cal. Date	Due Date
7985015	CALIBRATOR	Fluke	5520A	2021-03-03	2022-03-31

MEASURMENT RESULTS (Per MET/CAL)

PARAMETER	TEST RESULT	ACCEPTANCE LIMITS LOW	HIGH	UNITS	Exp Uncert	Condition
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						
-200.0 °F	-200.6	-201.0	-199.0	°F	6.0e-001°F	Pass
-60.0 °F	-60.3	-61.0	-59.0	°F	3.3e-001°F	Pass
-40.0 °F	-40.3	-40.5	-39.5	°F	3.3e-001°F	Pass
32.0 °F	31.6	31.5	32.5	°F	2.9e-001°F	Pass
300.0 °F	299.7	299.5	300.5	°F	4.7e-001°F	Pass
572.0 °F	571.6	571.5	572.5	°F	4.7e-001°F	Pass
1240.0 °F	1239.6	1239.5	1240.5	°F	4.7e-001°F	Pass
1260.0 °F	1259.6	1259.5	1260.5	°F	4.7e-001°F	Pass
2500.0 °F	2499.6	2499.0	2501.0	°F	7.2e-001°F	Pass
J Type Thermocouple						
-200.0 °F	-200.9	-201.0	-199.0	°F	4.9e-001°F	Pass
-60.0 °F	-60.4	-61.0	-59.0	°F	2.9e-001°F	Pass
-40.0 °F	-40.4	-40.5	-39.5	°F	2.9e-001°F	Pass
32.0 °F	31.6	31.5	32.5	°F	2.6e-001°F	Pass
572.0 °F	571.7	571.5	572.5	°F	3.1e-001°F	Pass
300.0 °F	299.6	299.5	300.5	°F	2.6e-001°F	Pass
1240.0 °F	1239.6	1239.5	1240.5	°F	3.1e-001°F	Pass
1260.0 °F	1259.6	1259.5	1260.5	°F	3.1e-001°F	Pass
1400.0 °F	1399.6	1399.4	1400.6	°F	3.1e-001°F	Pass
T Type Thermocouple						
-200.0 °F	-200.1	-201.0	-199.0	°F	4.4e-001°F	Pass
-60.0 °F	-59.8	-61.0	-59.0	°F	4.4e-001°F	Pass
-40.0 °F	-39.9	-40.5	-39.5	°F	4.4e-001°F	Pass
32.0 °F	32.0	31.5	32.5	°F	2.9e-001°F	Pass
300.0 °F	299.9	299.5	300.5	°F	2.6e-001°F	Pass
572.0 °F	571.9	571.5	572.5	°F	2.6e-001°F	Pass
750.0 °F	749.9	749.5	750.5	°F	2.6e-001°F	Pass

Ulrich Métrologie inc.
Ulrich Metrology Inc.
9900, Côte-de-Liesse
Montréal (Québec) H8T 1A1

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

PARAMETER	TEST RESULT	ACCEPTANCE LIMITS LOW	HIGH	UNITS	Exp Uncert	Condition
CALIBRATOR CALIBRATION						
K Type Thermocouple						
-200.0 °F	-199.34	-201.00	-199.00	°F	6.0e-001°F	Pass
-60.0 °F	-59.60	-61.00	-59.00	°F	3.3e-001°F	Pass
-40.0 °F	-39.59	-40.50	-39.50	°F	3.3e-001°F	Pass
32.0 °F	32.29	31.50	32.50	°F	2.9e-001°F	Pass
300.0 °F	300.18	299.50	300.50	°F	4.7e-001°F	Pass
572.0 °F	572.34	571.50	572.50	°F	4.7e-001°F	Pass
1240.0 °F	1240.30	1239.50	1240.50	°F	4.7e-001°F	Pass
1260.0 °F	1260.23	1259.50	1260.50	°F	4.7e-001°F	Pass
2500.0 °F	2500.50	2499.00	2501.00	°F	7.2e-001°F	Pass
J Type Thermocouple						
-200.0 °F	-199.68	-201.00	-199.00	°F	4.9e-001°F	Pass
-60.0 °F	-59.94	-61.00	-59.00	°F	2.9e-001°F	Pass
-40.0 °F	-39.80	-40.50	-39.50	°F	2.9e-001°F	Pass
32.0 °F	32.04	31.50	32.50	°F	2.6e-001°F	Pass
300.0 °F	300.11	299.50	300.50	°F	2.6e-001°F	Pass
572.0 °F	572.02	571.50	572.50	°F	3.1e-001°F	Pass
1240.0 °F	1240.21	1239.50	1240.50	°F	3.1e-001°F	Pass
1260.0 °F	1260.12	1259.50	1260.50	°F	3.1e-001°F	Pass
1400.0 °F	1399.96	1399.44	1400.56	°F	3.1e-001°F	Pass
T Type Thermocouple						
-200.0 °F	-199.55	-201.00	-199.00	°F	4.4e-001°F	Pass
-60.0 °F	-59.80	-61.00	-59.00	°F	4.4e-001°F	Pass
-40.0 °F	-39.68	-40.50	-39.50	°F	4.4e-001°F	Pass
32.0 °F	32.07	31.50	32.50	°F	2.9e-001°F	Pass
300.0 °F	300.04	299.50	300.50	°F	2.6e-001°F	Pass
572.0 °F	572.02	571.50	572.50	°F	2.6e-001°F	Pass
750.0 °F	750.00	749.50	750.50	°F	2.6e-001°F	Pass

End of Test Data

Air Liquide creative oxygen | Specialty Gases

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CERTIFICATE OF ANALYSIS

Customer: SBI FABRICANT DE POELES INTERNATIONAL INC
250 RUE DE COPENHAGUE
SAINT-AUGUSTIN-DE-DESMAURES QC
G3A 2H3

Analysis Date:	8/6/2021 11:41:41AM	**Servitrax barcode No:**	T2L7ER7
Product code:	A1326555	**Work order number:**	1530112
Grade:	CERTIFIED	**Pressure:**	2000 psig
Size:	30AL		
CGA #:	590	**Volume:**	4.53 M3
		Expiry date:	08/06/2024

COMPONENTS	NOMINAL CONCENTRATION	ANALYSIS RESULTS
CARBON DIOXIDE	18.0000 % Molar	18.0 % Molar
CARBON MONOXIDE	4,000.0000 ppm Molar	4252 ppm Molar
OXYGEN	18.0000 % Molar	18.0 % Molar
NITROGEN	BALANCE	BALANCE

Analysis performed by:

Evgeny Makarov

EVGENY MAKAROV - CHEMIST SPG

Verified by:

This Air Liquide Canada mixture is traceable to NIST

METHOD OF ANALYSIS:

Method of analysis is based on principles of gas chromatography and as documented in Air Liquide Canada operating procedure , where applicable, FID, TCD, PDHID, FT-IR, FPD,NO/NOx and SO2 chemiluminescence , hygrometer, and electrochemical cells and paramagnetic cell. Detectors were used in conjunction with packed or capillary columns calibrated flow meters and dilution calibrated system.

ANALYTICAL ACCURACY:

Qualitiy	Concentiration	Blend Tolerance	AA
PRIMARY	5%-50%	+/-1%	+/-1%
	0.5%-5%	+/-2%	
	1ppm-0.5%	+/-5%	
CERTIFIED	5%-50%	+/-5%	+/-2%
	0.5%-5%	+/-10%	+/-2%
	1ppm-0.5%	+/-20%	+/-5%
UNANALYZE	5%-50%	+/-10%	
	<5%	+/-20%	

This mixture was certified by a combination of weight and analysis (depending on component) using scales certified against weights traceable to the Institute for National Measurement Standards (INMS) of the National Research Council of Canada (NRCC), Report # W-021221-13857(MTL) and CA3033-022-050621-ACC (Calgary) or calibration standards prepared in that manner.

How to contact us & order

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Customer Solution Center: 1 800 217-2688 Online 24/7 through My.Airliquide.ca Air Liquide Mobile App

Air Liquide creative oxygen | Specialty Gases

Your complete laboratory solution

CERTIFICATE OF ANALYSIS

Customer: SBI FABRICANT DE POELES
INTERNATIONAL INC
250 RUE DE COPENHAGUE
SAINT-AUGUSTIN-DE-DESMAURES QC
G3A 2H3

Analysis Date:	8/3/2021 4:48:08PM	**Servitrax barcode No:**	T267TH8
Product code:	A1326591	**Work order number:**	1530113
Grade:	CERTIFIED	**Pressure:**	1450 psig
Size:	30AL		
CGA #:	590	**Volume:**	4.32 M3
		Expiry date:	08/03/2024

COMPONENTS	NOMINAL CONCENTRATION	ANALYSIS RESULTS
CARBON DIOXIDE	10.0000 % Molar	10.1 % Molar
CARBON MONOXIDE	2.0000 % Molar	1.98 % Molar
OXYGEN	8.0000 % Molar	7.99 % Molar
NITROGEN	BALANCE	BALANCE

Analysis performed by:

Eugeny Makarov
EUGENY MAKAROV - CHEMIST SPG

Verified by:

RL

This Air Liquide Canada mixture is traceable to NIST

METHOD OF ANALYSIS:

Method of analysis is based on principles of gas chromatography and as documented in Air Liquide Canada operating procedure , where applicable, FID, TCD, PDHID, FT-IR, FPD-NONOx and SO2 chemiluminescence , hygrometer, and electrochemical cells and paramagnetic cell. Detectors were used in conjunction with packed or capillary columns calibrated flow meters and dilution calibrated system.

ANALYTICAL ACCURACY:

Qualitiy	Concentiration	Blend Tolerance	AA
PRIMARY	5%-50%	+/-1%	+/-1%
	0.5%-5%	+/-2%	
	1ppm-0.5%	+/-5%	
CERTIFIED	5%-50%	+/-5%	+/-2%
	0.5%-5%	+/-10%	+/-2%
	1ppm-0.5%	+/-20%	+/-5%
UNANALYZE	5%-50%	+/-10%	
	<5%	+/-20%	

This mixture was certified by a combination of weight and analysis (depending on component) using scales certified against weights traceable to the Institute for National Measurement Standards (INMS) of the National Research Council of Canada (NRCC), Report # W-021221-13857(MTL) and CA3033-022-050621-ACC (Calgary) or calibration standards prepared in that manner.

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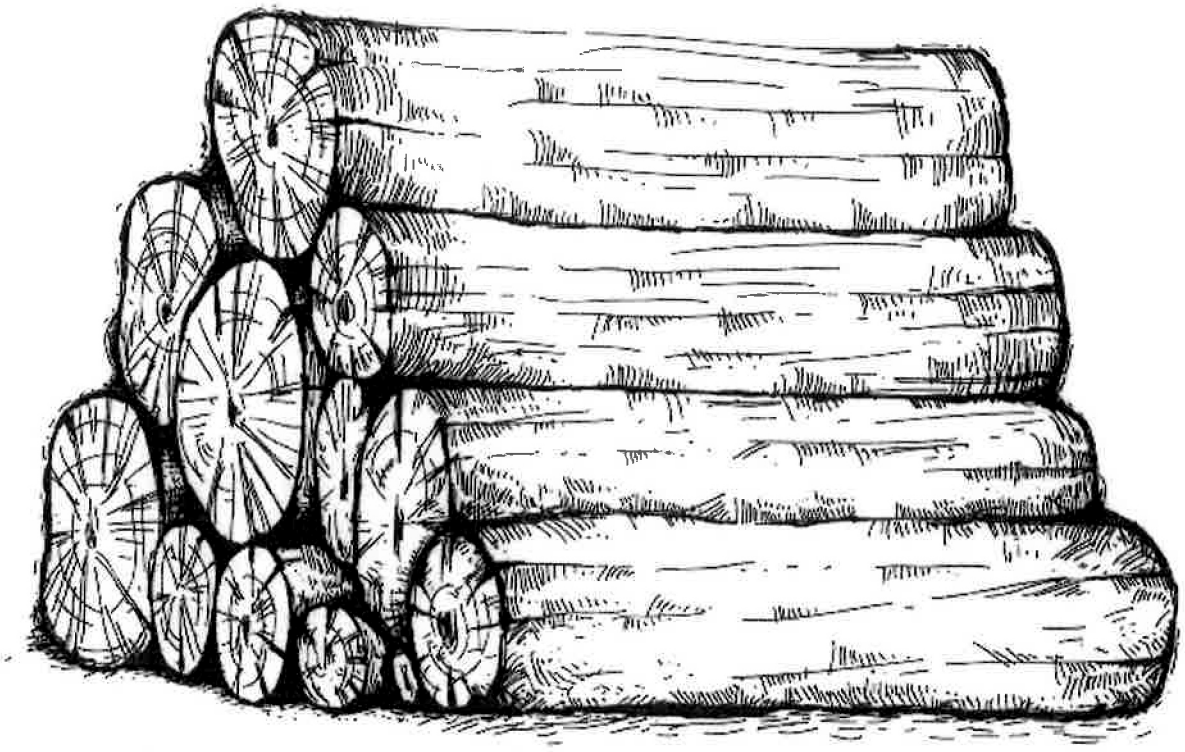
Wood Stove Owner's Manual

Part 1 of 2

SAFETY NOTIFICATIONS AND GENERAL INFORMATION



ENGLISH

CONTACT LOCAL BUILDING OR FIRE OFFICIALS ABOUT RESTRICTIONS AND INSTALLATION INSPECTION REQUIREMENTS IN LOCAL AREA.

READ THIS ENTIRE GUIDE BEFORE INSTALLATION AND USE OF THIS WOOD STOVE. FAILURE TO FOLLOW THESE INSTRUCTIONS COULD RESULT IN PROPERTY DAMAGE, BODILY INJURY OR EVEN DEATH.

READ AND KEEP THIS GUIDE FOR REFERENCE

Printed in Canada

46231_UA
2022-01-24

THANK YOU FOR CHOOSING THIS WOOD STOVE.

If this stove is not installed properly, combustible materials near it may overheat and catch fire.

To reduce the risk of fire, follow the installation instructions in this manual.

As one of North America's largest and most respected wood stove and fireplace manufacturers, Stove Builder International takes pride in the quality and performance of all its products.

The following pages provide general advice on wood heating, detailed instructions for safe and effective installation, and guidance on how to get the best performance from this stove.

It is highly recommended that this wood burning hearth product be installed and serviced by professionals who are certified by a «Qualified Agency» such as NFI (National Fireplace Institute®) or CSIA (Chimney Safety Institute of America) in the United States and in Canada by WETT (Wood Energy Technology Transfer) or in Quebec by APC (Association des Professionnels du Chauffage).

Contact local building or fire officials about restrictions and installation inspection requirements in your local area.

A building permit might be required for the installation of this stove and the chimney that it is connected to. It is also highly recommended to inform your home insurance company.

Please read this entire manual before installing and using this stove.

A primary alternative heat source should be available in the home. This heating unit may serve as a supplementary heat source. The manufacturer cannot be responsible for additional heating costs associated with the use of an alternative heat source.

TABLE DES MATIÈRES

ENGLISH

ENGLISH

1. Safety Information and Environment

- Some stoves have been tested for use with an open door in conjunction with a fire screen, sold separately (See in the *Wood Stove Installation and Operation Manual* if your appliance has this option). The door may be opened, or fire screen removed only during lighting procedures or reloading. Always close the door or put back on the fire screen after ignition. **Do not leave the insert unattended when the door is open with or without a fire screen.**
- **WARNING : OPERATE ONLY WITH THE DOOR FULLY CLOSED OR FULLY OPEN WITH THE FIRE SCREEN IN PLACE. IF THE DOOR IS LEFT PARTLY OPEN, GAS AND FLAME MAY BE DRAWN OUT OF THE OPENING, CREATING RISKS FROM BOTH FIRE AND SMOKE.**
- **HOT WHILE IN OPERATION, KEEP CHILDREN, CLOTHING AND FURNITURE AWAY. CONTACT MAY CAUSE SKIN BURNS. GLOVES MAY BE NEEDED FOR THE STOVE OPERATION.**
- Using a stove with cracked or broken components, such as glass, firebricks or baffle may produce an unsafe condition and may damage the stove.
- Open the air control fully before opening the loading door.
- **NEVER USE GASOLINE, LANTERN FUEL (NAPHTHA), FUEL OIL, MOTOR OIL, KEROSENE, CHARCOAL LIGHTER FLUID, OR SIMILAR LIQUIDS OR AEROSOLS TO START A FIRE IN THIS STOVE. KEEP ALL SUCH LIQUIDS OR AEROSOLS WELL AWAY FROM THE STOVE WHILE IT IS IN USE.**
- Do not store fuel within heater minimum installation clearances.
- Burn only seasoned natural firewood.
- This appliance should always be maintained and operated in accordance with these instructions.
- Do not elevate the fire by using a grate.
- Do not use makeshift materials or make any compromises when installing this appliance.
- This wood heater needs periodic inspection and repairs for the proper operation. It is against federal regulations to operate this wood heater in a manner inconsistent with operating instructions in this guide.
- A smoke detector, a carbon monoxide detector and a fire extinguisher should be installed in the house. The location of the fire extinguisher should be known by all family members.

This product can expose you to chemicals including carbon monoxide, which is known to the State of California to cause cancer, birth defects or other reproductive harm. For more information go to www.P65warnings.ca.gov/

- The information given on the certification label affixed to the appliance always overrides the information published, in any other media (owner's manual, catalogues, flyers, magazines and web sites).
- Mixing of appliance components from different sources or modifying components may result in hazardous conditions. Where any such changes are planned, Stove Builder International Inc. Should be contacted in advance.

- Any modification of the appliance that has not been approved in writing by the testing authority violates CSA-B365 (Canada), and ANSI NFPA 211 (USA).
- **DO NOT CONNECT TO OR USE IN CONJUNCTION WITH ANY AIR DISTRIBUTION DUCTWORK UNLESS SPECIFICALLY APPROVED FOR SUCH INSTALLATION.**
- **DO NOT CONNECT THIS UNIT TO A CHIMNEY FLUE SERVING ANOTHER APPLIANCE.**
- Connect this stove only to a listed factory-built chimney for use with solid fuel or to a lined masonry chimney conforming to national and local building codes.
- If required, a supply of combustion air shall be provided to the room.

1.1 Mobile Home

- Some appliances may be installed in a mobile home. The installation requires a fresh air kit, sold separately.
- **WARNING : DO NOT INSTALL IN THE SLEEPING ROOM OF A MOBILE HOME.**
- **IF INSTALLATION OF THIS PRODUCT IS PERMITTED IN A MOBILE HOME, IT MUST BE SECURED TO THE STRUCTURE.**
- **CAUTION : WHEN THE INSTALLATION IN A MOBILE HOME IS ACCEPTED, THE STRUCTURAL INTEGRITY OF THE MOBILE HOME FLOOR, WALL, CEILING AND ROOF MUST BE MAINTAINED.**
- **IT IS PROHIBITED TO USE THIS WOOD STOVE WITH A FIRE SCREEN IN A MOBILE HOME.**

1.2 Regulations Covering Stove Installation

When installed and operated as described in these instructions, this wood stove is suitable for use as a freestanding heater in residential installations.

In Canada, the CSA-B365 *Installation Code for Solid Fuel Burning Appliances and Equipment* and the CSA-C22.1 *Canadian National Electrical Code* are to be followed in the absence of local code requirements. In the USA, the ANSI NFPA 211 *Standard for Chimneys, Fireplaces, Vents and Solid Fuel-Burning Appliances* and the ANSI NFPA 70 *National Electrical Code* are to be followed in the absence of local code requirements.

This stove must be connected to a chimney complying with the requirements for Type HT chimneys in the *Standard for Factory-Built Chimneys for Residential Type and Building Heating Appliances*, UL 103HT and ULC S629 or to a code-approved masonry chimney with a flue liner.

1.3 Location of the Certification Label

Since the information given on the certification label affixed to the appliance always overrides the information published, in any other media (owner's manual, catalogues, flyers, magazines and web sites) it is important to refer to it in order to have a safe and compliant installation. In addition, important information about the stove can be found (model, serial number, etc.). The certification label is located on the back of the stove.

It is recommended to note the stove serial number on page 1 of the *Wood Stove Installation and Operation Manual* since it will be needed to precisely identify the version of the appliance in the event replacement parts or technical assistance is required.

1.4 Emissions and Efficiency

The low smoke emissions produced by the special features inside this stove firebox mean that the household will release up to 90% less smoke into the outside environment than if an older conventional stove was used. But there is more to the emission control technologies than protecting the environment.

The smoke released from wood when it is heated contains about half of the energy content of the fuel. By burning the wood completely, this stove releases all the heat energy from the wood instead of wasting it as smoke up the chimney. Also, the features inside the firebox allow control of the air supply meaning controlling the heat output, while maintaining clean and efficient flaming combustion, which boosts the efficient delivery of heat to the home.

The emission control and advanced combustion features of this stove can only work properly if the fuel used is in the correct moisture content range of 15% to 20%. Refer to the Fuel Section for suggestions on preparing fuelwood and judging its moisture.

1.5 Materials

The SBI team is committed to protecting the environment, so they do everything they can to use only materials in their products that will have no lasting negative impact on the environment.

The **body** of this stove, which is most of its weight, is carbon steel. Should it ever become necessary many years in the future, almost the entire stove can be recycled into new products, thus eliminating the need to mine new materials.

The **paint** coating on the stove is very thin. Its VOC content (Volatile Organic Compounds) is very low. VOCs can be responsible for smog, so all the paint used during the manufacturing process meets the latest air quality requirements regarding VOC reduction or elimination.

The **air tubes** are stainless steel, which can also be recycled.

The **baffle** is made of aluminosilicate fibre material that is compressed with a binder to form a rigid board. C-Cast or Vermiculite can withstand temperatures above 2,000 °F. It is not considered hazardous waste. Disposal at a ecocenter is recommended.

The **Grey firebrick** is made of cement and pumice stone. Pumice stone is made from volcanic rock. It is recommended to send it to the ecocenter.

The **Yellow firebrick** is mainly composed of silicon dioxide, also known as silica, a product processed from a mined mineral. It is most commonly found in nature in the form of sand and clay. Disposal at a ecocenter is recommended.

The door and glass **gaskets** are fibreglass which is spun from melted sand. Black gaskets have been dipped into a solvent-free solution. Disposal at a ecocenter is recommended.

The door **glass** is a 5/32" (4 mm) thick ceramic material that contains no toxic chemicals. It is made of natural raw materials such as sand and quartz that are combined in such a way to form a high temperature glass. Ceramic glass cannot be recycled in the same way as normal glass, so it should not be disposed of with your regular household products. Disposal at a ecocenter is recommended.

2. Fuel

Good firewood has been cut to the correct length for the stove, split to a range of sizes and stacked in the open until its moisture content is down to 15% to 20%.

DO NOT BURN:

- **GARBAGE;**
- **LAWN CLIPPINGS OR YARD WASTE;**
- **MATERIALS CONTAINING RUBBER, INCLUDING TIRES;**
- **MATERIALS CONTAINING PLASTIC;**
- **WASTE PETROLEUM PRODUCTS, PAINTS OR PAINT THINNERS, OR ASPHALT PRODUCTS;**
- **MATERIALS CONTAINING ASBESTOS;**
- **CONSTRUCTION OR DEMOLITION DEBRIS;**
- **RAILROAD TIES OR PRESSURE-TREATED WOOD;**
- **MANURE OR ANIMAL REMAINS;**
- **SALT WATER DRIFTWOOD OR OTHER PREVIOUSLY SALT WATER SATURATED MATERIALS;**
- **UNSEASONED WOOD; OR**
- **PAPER PRODUCTS, CARDBOARD, PLYWOOD, OR PARTICLE BOARD. THE PROHIBITION AGAINST BURNING THESE MATERIALS DOES NOT PROHIBIT THE USE OF FIRE STARTERS MADE FROM PAPER, CARDBOARD, SAW DUST, WAX AND SIMILAR SUBSTANCES FOR THE PURPOSE OF STARTING A FIRE IN AN AFFECTED WOOD HEATER.**
- **BURNING THESE MATERIALS MAY RESULT IN THE RELEASE OF TOXIC FUMES OR RENDER THE HEATER INEFFECTIVE AND CAUSE SMOKE.**

2.1 Tree Species

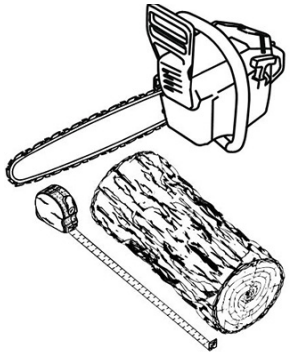
The tree species the firewood is produced from is less important than its moisture content. The main difference in firewood from various tree species is the density of the wood. Hardwoods are denser than softwoods.

Homeowners with access to both hardwood and softwood use both types for different purposes.

Softer woods make good fuel for mild weather in spring and fall because they light quickly and produce less heat. Softwoods are not as dense as hardwoods so a given volume of wood contains less energy. Using softwoods avoids overheating the house, which can be a common problem with wood heating in moderate weather. Harder woods are best for colder winter weather when more heat and longer burn cycles are desirable.

Note that hardwood trees like oak, maple, ash and beech are slower growing and longer lived than softer woods like poplar and birch. That makes hardwood trees more valuable. The advice that only hardwoods are good to burn is outdated. Old, leaky cast iron stoves wouldn’t hold a fire overnight unless they were fed large pieces of hardwood. That is no longer true.

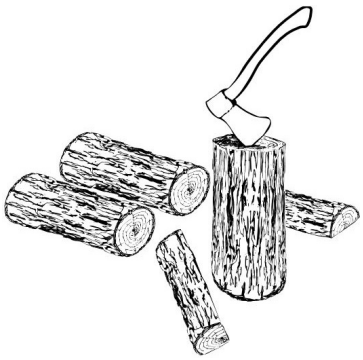
2.2 Log Length

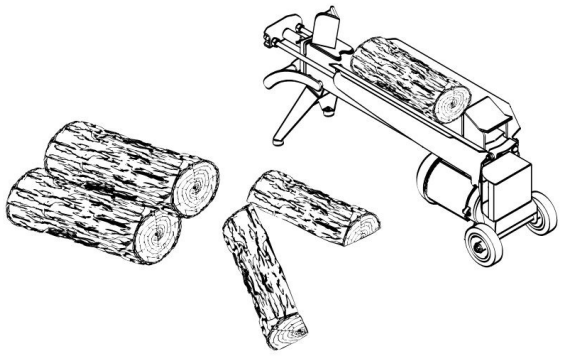


Logs should be cut at least 1" (25 mm) shorter than the firebox so they fit in easily. Pieces that are even slightly too long makes loading the stove very difficult. The most common standard length of firewood is 16" (400 mm).

2.3 Piece Size

Firewood dries more quickly when it is split. Large unsplit rounds can take years to dry enough to burn. Even when dried, unsplit logs are difficult to ignite because they don't have the sharp edges where the flames first catch.

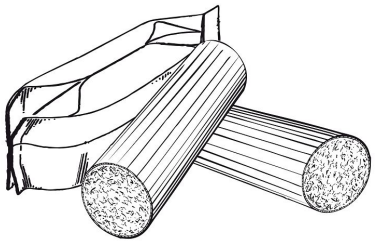




Wood should be split to a range of sizes, from about 3" to 6" (75 mm to 150 mm) in cross section. Having a range of sizes makes starting and rekindling fires much easier.

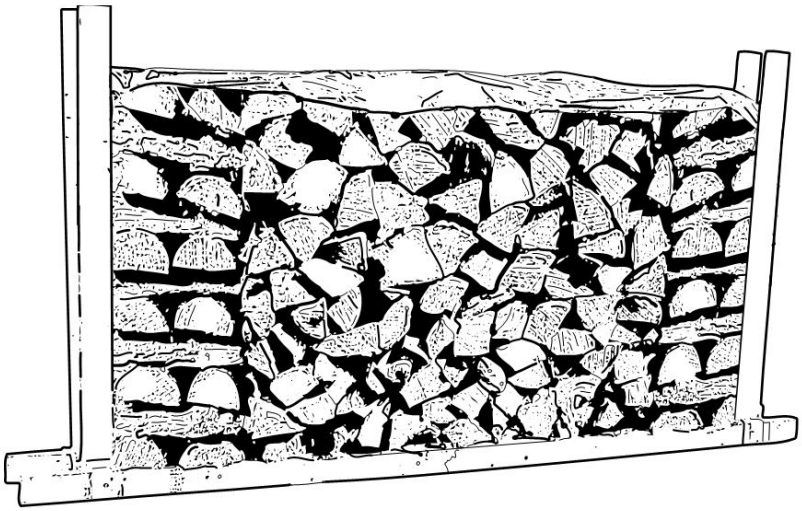
2.4 Compressed Wood Logs

Compressed wood logs made of 100% compressed sawdust can be burned with caution in the number of these logs burned at once. Do not burn compressed logs made of wax impregnated sawdust or logs with any chemical additives. Follow the manufacturer's instructions and warnings.



2.5 Drying Time

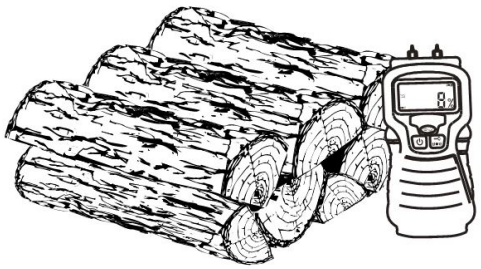
Firewood that is not dry enough to burn is the cause of most complaints about wood burning appliances. Continually burning green or unseasoned wood produces more creosote and involves lack of heat and dirty glass door. Firewood with a moisture content between 15% and 20% will allow the stove to produce its highest possible efficiency.



Here are some facts to consider in estimating drying time:

- Firewood bought from a dealer is rarely dry enough to burn, so it is advisable to buy the wood in spring and dry it yourself;
- Drying happens faster in dry weather than in a damp climate;
- Drying happens faster in warm summer weather than in winter weather;
- Small pieces dry more quickly than large pieces;
- Split pieces dry more quickly than unsplit rounds;
- Softwoods like pine, spruce, poplar, and aspen take less time to dry than hardwoods. they can be dry enough to burn after being stacked to air dry only for the summer months;
- Hardwoods like oak, maple and ash can take one, or even two years to dry fully, especially if the pieces are big;
- Firewood dries more quickly when stacked outside in a location exposed to sun and wind; it takes much longer to dry when stacked in a wood shed;

Use these guidelines to find out if the firewood is dry enough to burn:



- Cracks form at the ends of logs as they dry;
- The wood turns from white or cream colored to grey or yellow;
- Two pieces of wood struck together sounds hollow;
- Dry wood is much lighter in weight than wet wood,
- The face of a fresh cut feels warm and dry;
- The moisture content read by a moisture meter is between 15% to 20%.

3. Burning Wood Efficiently

3.1 First Use

Two things happen when burning the first few fires; the paint cures and the internal components are conditioned. As the paint cures, some of the chemicals vaporize. The vapors are not poisonous, but they smell bad. Fresh paint fumes can also trigger false alarms in smoke detectors. When lighting the heater for the first few times, it may be wise to open doors and windows to ventilate the house.

Burn two or three small fires to begin the curing and conditioning process. Then build bigger and hotter fires until there is no longer paint smell from the stove. As hotter and hotter fires are burned, more of the painted surfaces reach the curing temperature of the paint. The smell of curing paint does not disappear until one or two very hot fires have been burned.

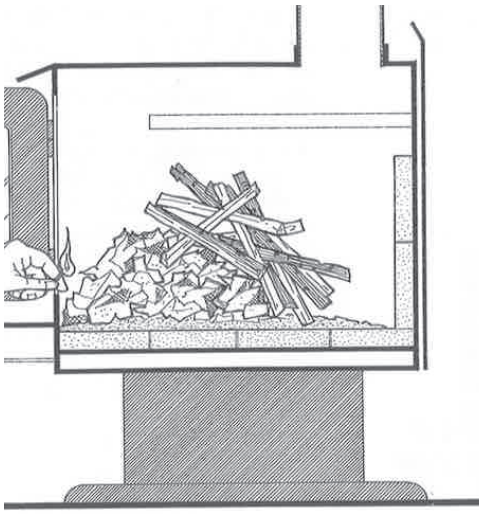
3.2 Lighting Fires

Each person heating with wood develops its own favorite way to light fires. Regardless of the method chosen, the goal should be to have a hot fire burning, quickly. A fire that ignites fast produces less smoke and deposits less creosote in the chimney.

Never use gasoline, gasoline-type lantern fuel (naphtha), fuel oil, motor oil, kerosene, charcoal lighter fluid, or similar liquids or aerosols to start or 'freshen up' a fire in this wood stove. Keep all such liquids well away from the stove while it is in use.

Here are three popular and effective ways to ignite wood fires.

3.2.1 Conventional Method



The conventional method to build a wood fire is to crumple 5 to 10 sheets of newspaper and place them in the firebox and hold them in place with ten pieces of kindling wood. The kindling should be placed on and behind the newspaper.

Then add two or three small pieces of firewood. Open the air intake control completely and ignite the newspaper. Leave the door slightly ajar.

Once the fire has ignited, the door can be closed with the air control still fully open. When the kindling is almost completely burned, standard firewood pieces can be added.

Do not leave the heater unattended when the door is slightly open. Always close and latch the door after the fire ignites.

3.2.2 The Top Down Method

This method is the opposite of the conventional method and only works properly if well-seasoned wood is used.

Place three or four small, split, dry logs in the firebox. Arrange the kindling wood on the logs in two layers at right angles and place a dozen finely split kindling on the second row.

It is possible to use ragged paper but it may not hold in place since it tends to roll while it is burning. The best is to wrap a sheet on itself, grab the ends of the roll and make a knot. Use four or five sheets of paper tied together and put them on top and around the kindling. Open the air intake control completely, ignite the paper and close the door.

The top down fire method has two advantages over the traditional method: first, the fire does not collapse on itself, and it is not necessary to add wood gradually since the combustion chamber is full before the fire is lit.

3.2.3 Two Parallel Logs Method

Two spit logs are placed in the firebox with a few sheets of twisted newspapers in between the logs. Fine kindling is added across the two logs and some larger kindling across those, log cabin style. Newspaper is lit.

3.2.4 Using Fire Starters

Commercial fire starters can be used instead of a newspaper. Some of these starters are made of sawdust and wax and others are made of specialized flammable solid chemicals. Always follow the package directions when using. Gel starters can also be used, but only to light a fire, in a cold combustion chamber without hot embers inside.

3.3 Zone Heating

This stove is a space heater, which means it is intended to heat the area it is installed in, as well as spaces that connect to that area, although to a lower temperature. This is called zone heating and it is an increasingly popular way to heat homes or spaces within homes.

Zone heating can be used to supplement another heating system by heating a particular space within a home, such as a basement, a family room or an addition that lacks another heat source.

Houses of moderate size and relatively new construction can be heated with a properly sized and located wood stove. Whole house zone heating works best when the stove is in the part of the house where the family spends most of its time. This is normally the main living area where the kitchen, dining and living rooms are located.

Locating the stove in this area will give the maximum benefit of the heat it produces and will achieve the highest possible heating efficiency and comfort. The space where the most time is spent will be warmest, while bedrooms and basement (if there is one) will stay cooler. In this way, less wood is burnt than with other forms of heating.

Although the stove may be able to heat the main living areas of the house to an adequate temperature, it is strongly recommended to also have a conventional oil, gas or electric heating system to provide backup heating.

The success of zone heating will depend on several factors, including the correct sizing and location of the stove, the size, layout and age of your home and your climate zone. Three-season vacation homes can usually be heated with smaller stoves than houses that are heated all winter.

3.4 Combustion Cycles

Wood heating with a space heater is very different than other forms of heating. There will be temperature variations in different parts of the house and there will be temperature variations throughout day and night. This is normal, and for experienced wood burners these are advantages of zone heating wood burning.

Wood heaters don’t have a steady heat output. It is normal for the temperature to rise after a new load of wood is ignited and for its temperature to gradually decrease throughout the burning cycle. This increasing and decreasing temperature can be matched with the household routines. For example, the temperature in the area can be cooler when the household is active, and it can be warmer when it is inactive.

Wood burns best in cycles. A cycle starts when a new load of wood is ignited by hot coals and ends when that load has been consumed down to a bed of charcoal about the same size as it was when the wood was loaded.

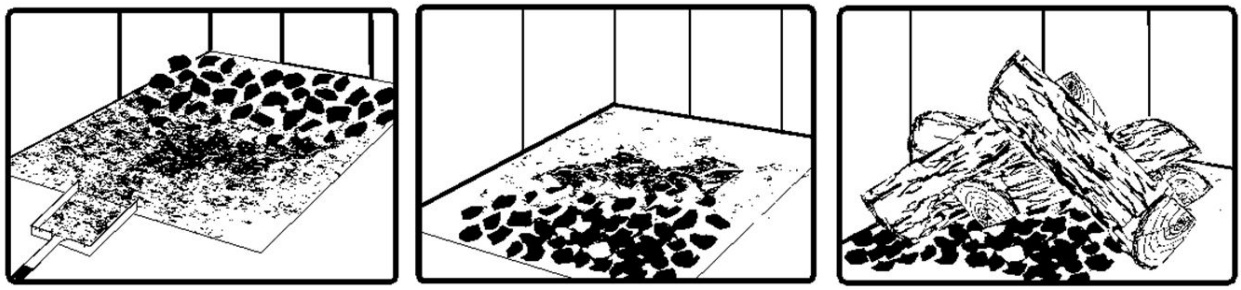
Trying to produce a steady heat output by placing a single log on the fire at regular intervals is not recommended. Always place at least three, and preferably more pieces on the fire at a time so that the heat radiated from one piece helps to ignite the pieces next to it. Each load of wood should provide several hours of heating. The size of each load may vary depending on the amount of heat required.

Burning in cycles means the loading door does not need to be opened while the wood is flaming. This is an advantage since it is preventing smoke leaking from the heater when the door is opened as a full fire is burning. This is especially true if the chimney is on the outside wall of the house.

If the door must be opened while the fire is flaming, fully open air control for a few minutes then open the door slowly.

3.5 Rekindling a Fire

When the temperature of the room is lower and all that remains is embers, it is time to reload. Remove excess ash from the front of the firebox and bring the ashes forward. Place a new load of wood on, and at the back of the embers. Open the air control completely and close the door.



Raking the coals is useful for two reasons. First, it brings them near where most of the combustion air enters the firebox. This will ignite the new load quickly. Secondly, the charcoal will not be smothered by the new load of wood. When the embers are simply spread inside the combustion chamber, the new load smoulder for a long time before igniting.

Close the air control only when the firebox is full of bright turbulent flames, the wood is charred, and its edges are glowing.

The heater should not be left unattended during ignition and the fire should not burn at full intensity for more than a few minutes.

When lighting a new load, the appliance produces a heat surge. This heat surge is pleasant when the room temperature is cool but can be unpleasant when the room is already warm. Therefore, it is best to let each load of wood burn completely so that the room cools down before putting a load of wood back on.

3.6 Removing Ashes

Ash should be removed from the firebox every two to three days of full time heating. Ash should not accumulate excessively in the firebox since it will affect the proper operation of the appliance. The best time to remove ash is in the morning, after an overnight fire when the heater is relatively cold, but there is still a little chimney draft to draw the ash dust into the heater and prevent going out into the room.

Ashes almost always contain live embers that can stay hot for days and which release carbon monoxide gas. Ashes should be placed in a tightly covered metal container. The container must be placed on a non-combustible floor or on the ground well away from all combustible materials.

If the ashes are disposed of by burial in soil or otherwise locally dispersed, they should be kept in a closed metal container until they are completely cooled. No other waste should be placed in this container.

NEVER STORE ASHES INDOORS OR IN A NON-METALLIC CONTAINER OR ON A WOODEN DECK.

3.7 Air Intake Control

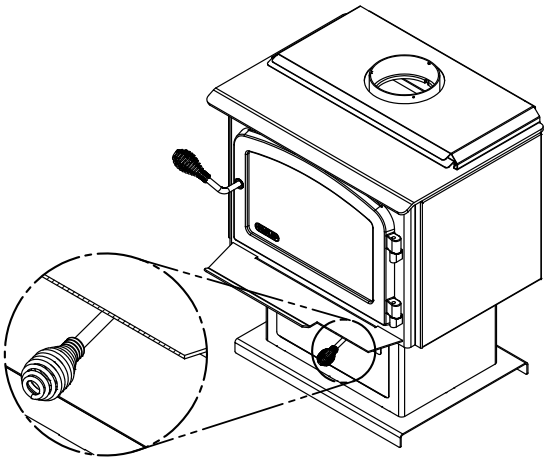
Once the firewood, firebox and chimney are hot, air intake can be reduced to achieve a steady burn.

As the air intake is reduced, the burn rate decreases. This has the effect of distributing the thermal energy of the fuel over a longer period of time. In addition, the flow rate of exhaust through the appliance and flue pipe slows down, which increases the duration of the energy transfer of the exhaust gases. As the air intake is reduced, the flame slows down.

If the flames diminish to the point of disappearing, the air intake has been reduced too early in the combustion cycle or the wood used is too wet. If the wood is dry and the air control is used properly, the flames should decrease, but remain bright and stable.

On the other hand, too much air can make the fire uncontrollable, creating very high temperatures in the unit as well as in the chimney and seriously damaging them. A reddish glow on the unit and on the chimney components indicates overheating. Excessive temperatures can cause a chimney fire.

The images shown are for guidance only and may differ from your product, but the operation remains the same. See the EPA Loading Section of the Wood Stove Installation and Operation Manual **for a specific overview of the air control of your appliance.**



3.8 Fire Types

Using the air intake control is not the only way to match the appliance heat output to the desired temperature in the house. A house will need far less heating in October than in January to maintain a comfortable temperature. Filling the firebox full in fall weather will overheat the space. Otherwise, the combustion rate will have to be reduced to a minimum and the fire will be smoky and inefficient. Here are some suggestions for building fires suitable for different heating needs. The method used to certify your appliance according to EPA Standards is presented in the EPA Loading Section of the *Wood Stove Installation and Operation Manual* of your appliance.

3.8.1 Flash Fire

To build a small fire that will produce a low heat output, use small pieces of firewood and load them crisscross in the firebox. The pieces should only be 3» to 4» in diameter. After raking the coals, lay two pieces parallel to each other diagonally in the firebox and lay two more across them in the other direction. Open the air control fully and only reduce the air after the wood is fully flaming. This kind of fire is good for mild weather and should provide enough heat for

up to four hours. Small fires like this are a good time to use softer wood species and avoid overheating the house.

3.8.2 Long Lasting Fire

For a fire that will last up to eight hours but will not produce intense heat, use soft wood and place the logs compactly in the firebox. Before reducing the air intake, the load will have to burn at full heat for long enough for charring the surface of the logs. The flame must be bright before letting the fire burn by itself.

3.8.3 High Output Fires

When heating needs are high during cold weather, the fire should burn steadily and brightly. This is the time to use larger pieces of hardwood. Place the biggest pieces at the back of the firebox and place the rest of the pieces compactly. A densely built fire like this will produce the longest combustion this stove is capable of.

Special attention must be paid when building fires like this since if the air intake is reduced too quickly, the fire could smoulder. The wood must be flaming brightly before leaving the fire to burn.

3.8.4 Burn Cycle Time

The burn cycle time is the period between loading wood on a coal bed and the consumption of that wood back to a coal bed of the same size. The flaming phase of the fire lasts for roughly the first half of the burn cycle and the second half is the coal bed phase during which there is little or no flame. The burning time expected from this stove, including both phases, will vary depending on a number of things, such as:

- firebox size,
- the amount of wood loaded,
- the species of wood,
- the wood moisture content,
- the size of the space to be heated,
- the climate zone where the house is, and
- the time of the year.

The table below gives an approximate maximum burn cycle time, based on firebox volume.

Table 1 : Approximate Maximum Burn Cycle Time

FIREBOX VOLUME	MAXIMUM BURN CYCLE TIME
<1.5 cubic feet	3 to 5 hours
1.5 c.f. to 2.0 c.f	5 to 6 hours
2.0 c.f. to 2.5 c.f.	6 to 8 hours
2.5 c.f. to 3.0 c.f.	8 to 9 hours
>3.0 c.f.	9 to 10 hours

A longer burning time is not necessarily an indication of efficient operation. It is preferable to build a smaller fire that will provide three or four hours of heating than to fully load the firebox for a much longer burn. Shorter burn cycles make it easier to match the heat output of the stove to heat demand for the space.

3.8.5 Logs Orientation

In a relatively square firebox, the wood can be loaded north-south (ends of the logs visible) or east-west (sides of the logs visible).

North-south loads allow more wood to be loaded at the same time. On the other hand, they break into smaller pieces faster. North-south loading is good for high output, long lasting fires for cold weather.

East-west loads allow a limited amount of wood since too many logs could cause them to fall on the glass. East-west loads, placed in a compact way, take a long time before breaking down. They are excellent for low-intensity, long-lasting fires in relatively mild weather.

3.8.6 Carbon Monoxide

When unburned logs remain in the firebox and the flame disappears, go outside and look at the chimney exit. If there is visible smoke, it means that there is still combustible to burn but that the fire lacks air to burn properly. In this situation, the CO rate will increase so it is important to react. Open the door slightly and move the log with a poker. Turn it over and create a passage for the air below, making a trench with the coal bed. Add small pieces of wood to restart the combustion.

4. Maintenance

This heater will give many years of reliable service if used and maintained properly. Internal components of the firebox such as firebricks or refractory panels, baffle and air tubes will wear over time. Defective parts should always be replaced with original parts (see « Exploded diagram and parts list » in the *Wood Stove Installation and Operation Manual)*.

To avoid premature deterioration, follow the lighting and reloading procedures in section "3. Burning Wood Efficiently" and also avoid letting the heater run with the air intake fully open for entire burn cycles.

4.1 Heater

4.1.1 Cleaning and Painting

Painted and plated surfaces can be wiped down with a soft, damp cloth. If the paint is scratched or damaged, it is possible to repaint the heater with a heat-resistant paint (see « Exploded diagram and parts list » in the *Wood Stove Installation and Operation Manual)*. **Do not clean or paint the appliance when it is hot.** Before painting, the surface should be sanded lightly with sandpaper and then wiped off to remove dust. Apply two thin layers of paint.

4.2 Refractory Materials and Baffle

Inspect the firebricks or the refractory panels and the baffle for damage periodically and replace anything that is broken.

Operation of the heater with a cracked or missing baffle may cause unsafe temperatures and hazardous conditions and will void the warranty.

4.3 Glass Door

4.3.1 Cleaning

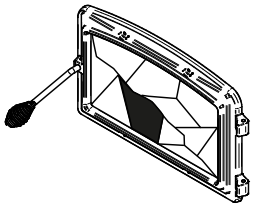
Under normal conditions, the door glass should stay relatively clear. If the firewood is dry enough and the operating instructions in this guide are followed, a whitish, dusty deposit will form on the inner surface of the glass after a week or so of use. This is normal and can be easily removed when the heater is cold by wiping with a damp cloth or paper towel and then drying.

When the stove runs at a low combustion rate, light brown stains may form, especially in the lower corners of the glass. This indicates that the fire has been smoky and some of the smoke has condensed on the glass. It also indicates incomplete combustion of the wood, which also means more smoke emissions and faster formation of creosote in the chimney.

The deposits that form on the glass are the best indication of the fuel quality and success in properly using the stove. These stains can be cleaned with a special wood stove glass cleaner. **Do not use abrasive products to clean the glass.**

The goal should be having a clear glass with no brown stains. If brown stains appear regularly on the glass, something about the fuel or the operating procedure needs to be changed. When brown streaks are coming from the edge of the glass, it is time to replace the gasket around the glass.

The glass gasket should be self-adhesive. Always replace the gasket with a genuine one.



Do not clean the glass when the stove is hot.

Do not abuse the glass door by striking or slamming shut.

Do not use the stove if the glass is broken.

4.3.2 Replacement

In case of breakage or change of wearing parts, refer to the Wood Stove Installation and Operation Manual.

5. Operating the Stove

This wood heater has a manufacturer-set minimum low burn rate that must not be altered. It is against federal regulations to alter this setting or otherwise operate this wood heater in a manner inconsistent with operating instructions in this guide.

- Before using the stove, a pedestal base or leg kit must be installed under the product, if this is not already the case. Refer to the *Wood Stove Installation and Operation Manual*.
- The installation of the options is optional, see the *Wood Stove Installation and Operation Manual* for the available options and their installation.

5.1 Blower Operation

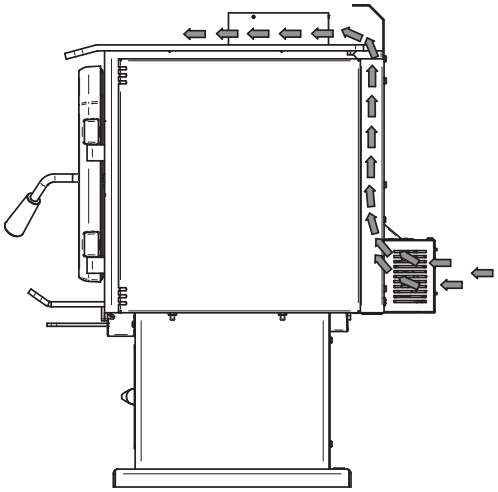


Figure 1: Air flow with a blower

It is possible, on wood stoves, to install a fan (depending on your product, it could be included or sold separately). See the Exploded View and Parts List in the *Wood Stove Installation and Operation Manual* for the original part number.

The blower is installed on the back of the stove to increase the airflow through the heat exchanger and improve hot air circulation in the room. When used regularly, the blower can provide a small increase in efficiency, up to 2%. However, the use of a blower should not be used as a way to gain more output from a stove that is undersized for the space it is intended to heat.

Ensure the blower cord is not in contact with any surface of the stove to prevent electrical shock or fire damage. Do not run cord beneath the stove.

The blower has a rheostat that can be adjusted in three different positions; either from high (HI) to low (LO) or closed (OFF).

Allow the stove to reach operating temperature (approximately one hour) before turning on the blower, since increased airflow from the blower will remove heat and affect the start up combustion efficiency.

It is possible to add a heat sensor, sold separately, to the blower. When the blower is ON, the blower will start automatically when the stove is hot enough and it will stop when the stove has cooled down. Therefore, you can leave the blower speed control at the desired setting.

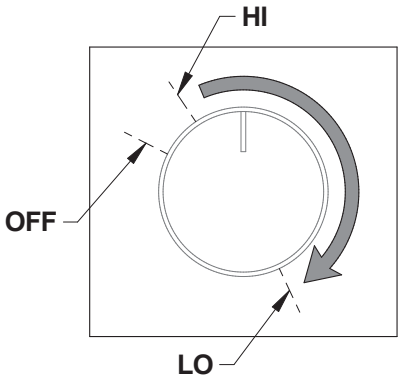


Figure 2: Blower operation

5.2 The Use of a Fire Screen

Some stoves have been tested for use with an open door in conjunction with a fire screen **(In the United States or in provinces with a particulate matter emission rate limit (e.g. US EPA), the use of wood stoves with door open with a fire screen is prohibited)**, this option is sold separately (to confirm that your product has been tested with it, please refer to the Wood Stove Installation and Operation Manual). If applicable on your model, the fire screen must be properly secured on the stove to avoid any risk of sparks damaging the flooring. When the fire screen is in use, do not leave the stove unattended to respond promptly in the event of smoke spillage into the room. Potential causes of smoke spillage are described in Section "The venting system" of this guide. See "Optional Fire Screen Installation" in the *Wood Stove Installation and Operation Manual* for specifications about installation instructions.

OPERATING THE STOVE WITH A FIRE SCREEN INCREASES POSSIBILITIES OF GENERATING CARBON MONOXIDE. CARBON MONOXIDE IS AN ODOURLESS GAS THAT IS HIGHLY TOXIC WHICH CAN CAUSE DEATH AT HIGH CONCENTRATION IN AIR.

5.3 Exhaust System

Wood smoke can condense inside the chimney, forming a inflammable deposit called creosote. If creosote builds up in the system, it can ignite when a hot fire is burned in the stove. A very hot fire can progress to the top of the chimney. Severe chimney fires can damage even the best chimneys. Smouldering, smoky fires can quickly cause a thick layer of creosote to form. When the stove is operated properly, the exhaust from the chimney is mostly clear and creosote builds up more slowly.

«Creosote - Formation and Need to Removal

When wood is burned slowly, it produces tar and other organic vapors, which combine with expelled moisture to form creosote. The creosote vapors condense in the relatively cooler chimney flue of a slow-burning fire. As a result, creosote residue accumulates on the flue lining. When ignited this creosote makes an extremely hot fire.

The chimney connector and chimney should be inspected at least once every two months during the heating season to determine if a creosote buildup has occurred.

If a significant layer of creosote has accumulated (⅛" [3 mm] or more) it should be removed to reduce the risk of a chimney fire.»

5.3.1 Cleaning Frequency

It is not possible to predict how much or how quickly creosote will form in the chimney. It is important, therefore, to check the build-up in the chimney monthly until the rate of creosote formation is determined. Even if creosote forms slowly in the system, the chimney should be cleaned and inspected at least once each year.

Establish a routine for the fuel, wood stove and firing technique. Check daily for creosote build-up until experience shows how often you need to clean to be safe. Be aware that the hotter the fire the less creosote is deposited, and weekly cleaning may be necessary in mild weather even though monthly cleaning may be enough in the coldest months.

Contact your local municipal or provincial fire authority for information on how to handle a chimney fire. Have a clearly understood plan to handle a chimney fire.

5.3.2 Sweeping the Chimney

Chimney sweeping can be a difficult and dangerous job. People with no chimney sweeping experience will often prefer to hire a professional chimney sweep to inspect and clean the system for the first time. After seeing the cleaning process, some will choose to do it themselves.

The chimney should be checked regularly for creosote build-up. Inspection and cleaning of the chimney can be facilitated by removing the baffle. See "Air Tubes and Baffle Installation" in the *Wood Stove Installation and Operation Manual* for more details.

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5.3.3 Chimney Fire

Regular chimney maintenance and inspection can prevent chimney fires. If you have a chimney fire, follow these steps:

1. Close the stove door and the air intake control;
2. Alert the occupants of the house of the possible danger;
3. If you require assistance, alert the fire department;
4. If possible, use a dry chemical fire extinguisher, baking soda or sand to control the fire. Do not use water as it may cause a dangerous steam explosion;

Do not use the appliance again until the stove and its chimney have been inspected by a qualified chimney sweep or a fire department inspector.

6. The Venting System

6.1 General

The venting system, made of the chimney and the connecting pipe between the stove and the chimney, acts as the engine that drives the wood heating system. Even the best stove will not function safely and efficiently if it is not connected to a suitable chimney.

The heat in the flue gases that pass from the stove and chimney connector into the chimney is not waste heat. This heat is what the chimney uses to make the draft that draws in combustion air, keeps smoke inside the stove and safely vents exhaust to outside. The heat in the flue gas can be seen as the fuel the chimney uses to create draft.

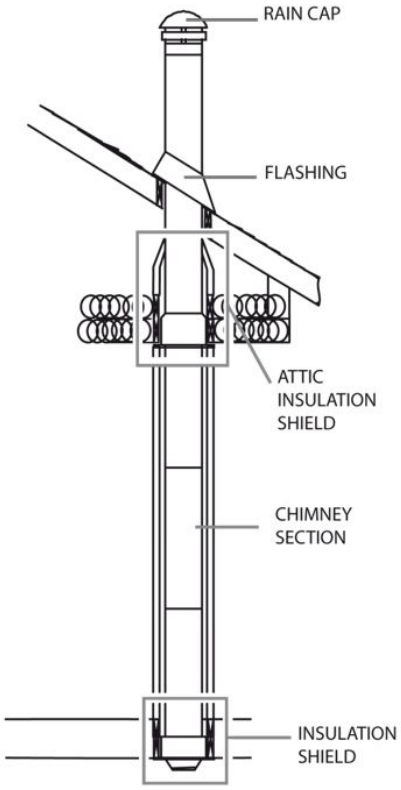
6.2 Suitable Chimneys

This stove will provide optimum efficiency and performance when connected to a 6" diameter chimney flue system. The connection to a chimney having a diameter of at least 5" (Canada only) or no more than 7" is permitted, if it allows the proper venting of combustion gases and that such application is verified and authorized by a qualified installer. Otherwise, the diameter of the flue should be 6".

To be suitable, a factory-built metal chimney must comply with UL 103 HT (U.S.A.) or ULC S629 (Canada).

6.3 Factory-Built Metal Chimneys

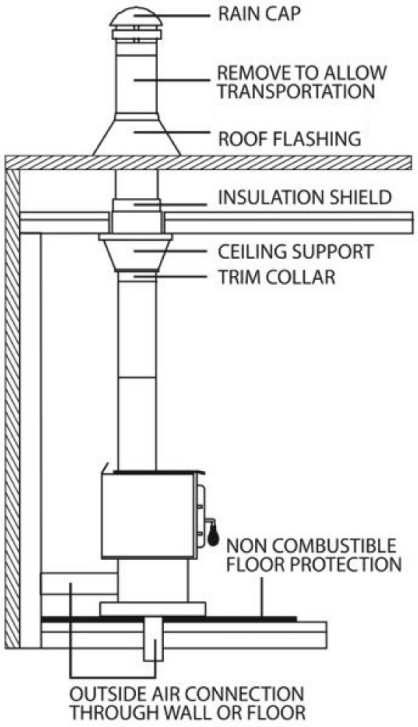
These are sometimes referred to as 'high temp' chimneys because they have the specific characteristics to withstand temperatures that can be created by wood burning stoves. Factory-built chimneys are tested as a system with all the necessary components for installation. The instructions provided with the chimney by its manufacturer are the only reliable source of installation guidelines. To be safe and effective, the chimney must be installed exactly in accordance with the manufacturer's instructions. Only components intended for the brand and model of chimney should be used. Never fabricate or substitute parts from other chimney brands. The chimney must be a type suitable for solid fuel.



6.3.1 Factory-Built Metal Chimneys in Mobile Homes

For use in a mobile home (if allowed), this stove is to be connected to a 6" double wall factory built chimney pipe conforming to ULC-S629 or UL 103HT standards for 650°C Factory-built chimney. The total length of the flue system should be at least 12 feet including elbows, from the top of the stove.

To maintain an effective vapour barrier, insulation and waterproof at the chimney and outside flue pipe, a roof flashing must be installed and sealed with silicone adhesive.



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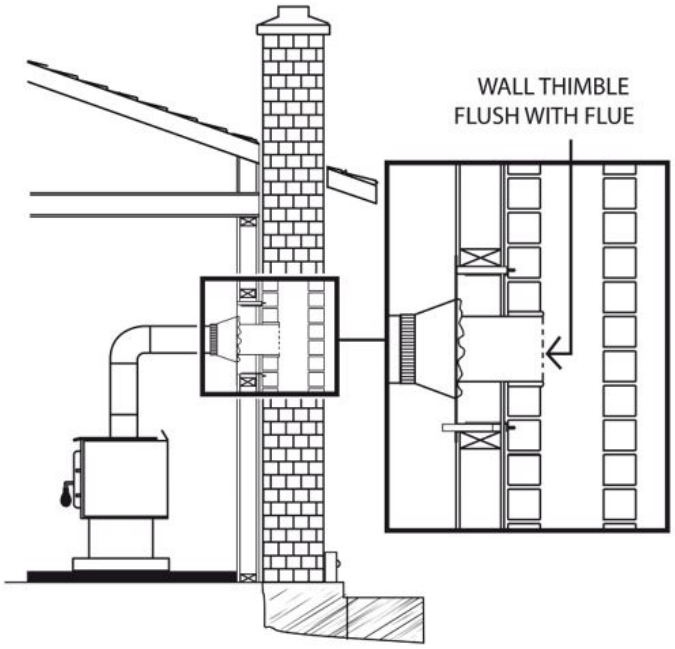
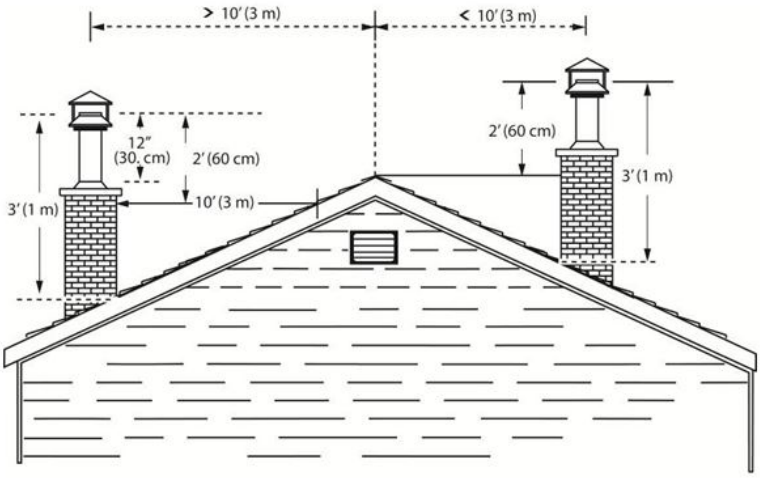
6.3.2 Masonry Chimneys

The stove may also be connected to a masonry chimney, provided the chimney complies with the construction rules found in the building code enforced locally. The chimney must have either a clay liner or a suitably listed stainless steel liner. If the masonry chimney has a square or rectangular liner that is larger in cross-sectional area than a round 6" flue, it should be relined with a suitably listed 6" stainless steel liner. Do not downsize the flue to less than 6" unless the venting system is straight and exceeds 25 feet in height. When passing through a combustible wall, the use of an insulated listed thimble is required.



6.4 Minimum Chimney Height

The top of the chimney should be tall enough to be above the air turbulence caused when wind blows against the house and its roof. The chimney must extend at least 3 ft. (1 m) above the highest point of contact with the roof, and at least 2 ft. (60 cm) higher than any roof line or obstacle within a horizontal distance of 10 ft. (3 m).



6.5 Chimney Location

Because the venting system is the engine that drives the wood heating system, it must have the right characteristics. The signs of bad system design are cold back drafting when there is no fire in the stove, slow kindling of new fires, and smoke roll-out when the door is opened for loading. There are two guidelines to follow. First, the chimney should be installed up through the heated space of the house, not out and up an outside wall. Second, the chimney should penetrate to the top of the building at or near the highest heated space.

Venting systems that rise straight up from the stove flue collar provide the best performance. Chimneys that rise inside the warm space of the house tend to provide a small amount of draft even when there is no fire burning. This means that when a fire is lit, the smoke goes up the

ENGLISH

chimney and strong draft build quickly as the chimney flue warms up. Although they are common in North America, chimneys that exit a house wall and run up outside can cause problems.

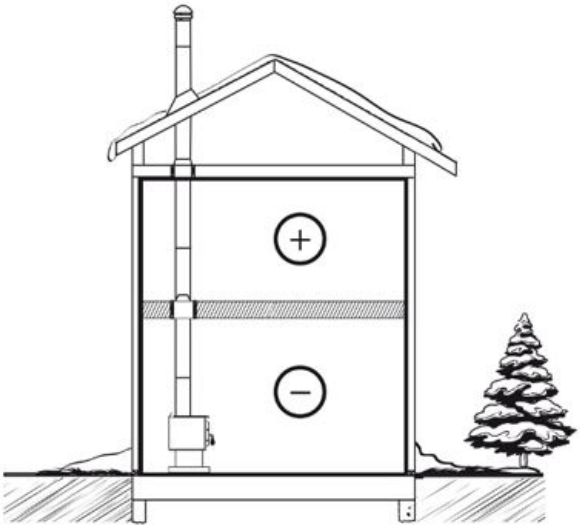


Figure 3: Good System Design

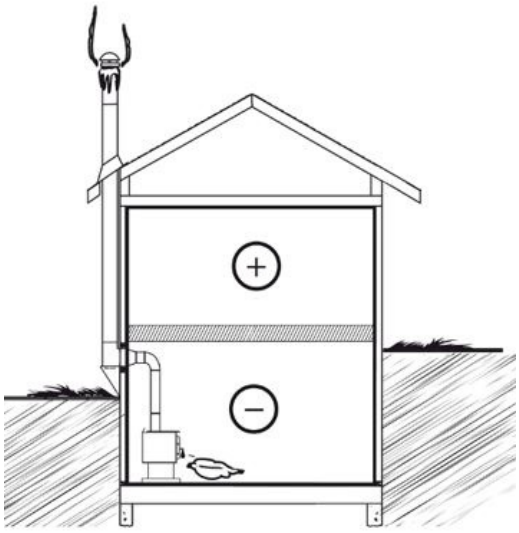
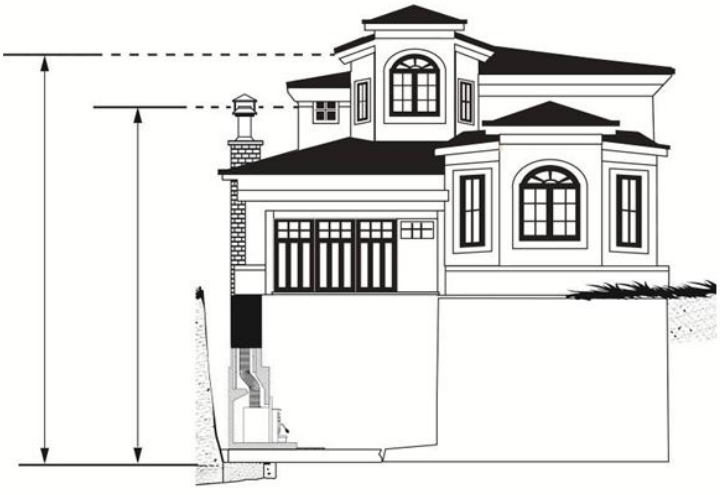


Figure 4: Inferior System Design

When it is cold outside, the warm air in the house is buoyant so it tends to rise. This creates a slight pressure difference in the house. Called ‘stack effect’, it produces a slightly negative pressure in the lower part of the house (compared to the outside) and a slightly positive pressure zone in the high part of the house. If there is no fire burning in a heater connected to a chimney that is shorter than the warm space inside the house, the slight negative pressure in the lower part of the house will compete against the desired upward flow in the chimney. This occurs for the two following reasons:

First, the chimney runs up the outside of the house, so the air in it is colder and denser than the warm air in the house. And second, the chimney is shorter than the heated space of the house, meaning the negative pressure in the lower part of the house will draw cold air down the chimney, through the stove and into the room. Even the finest stove will not work well when connected to this chimney.



6.6 Supply of Combustion Air

In Canada, wood stoves are not required to have a combustion air supply from outside, except for mobile homes. Research has shown that outside air supply do not compensate for the depressurization of the house and may not be sufficient to provide a supply of combustion air in windy weather. However, to reduce the risks against smoke spillage due to house depressurization, a carbon monoxide (CO) detector is required in the room where the stove is installed. The CO detector will provide warning if for any reason the wood stove fails to function correctly.

6.6.1 Mobile Home

If your stove is 'mobile home approved', It must have a supply of combustion air from outdoors. The air intake must not draw air from the attic, from the basement, from a garage or any enclosed space. Air must be drawn from a ventilated crawl space under the floor or directly from outside. Install a flexible or rigid, insulated pipe (HVAC type, must comply to ULC S110 and/or UL 181, Class 0 or Class 1) to the fresh air intake.

Where a mobile home has been converted to a standard house by mounting it on a permanent basement foundation, the supply of outdoor air is not required.

It is prohibited to use this wood stove with a fire screen in a mobile home.

6.6.2 Conventional House

The safest and most reliable supply of combustion air for a wood stove is from the room in which it is installed. Room air is already preheated so it will not chill the fire, and its availability is not affected by wind pressures on the house. Contrary to commonly expressed concerns, almost all tightly sealed new houses have enough natural leakage to provide the small amount of air needed by the stove. The only case in which the wood stove may not have adequate access to combustion air is if the operation of a powerful exhaust device (such as a kitchen range exhaust) causes the pressure in the house to become negative relative to outdoors.

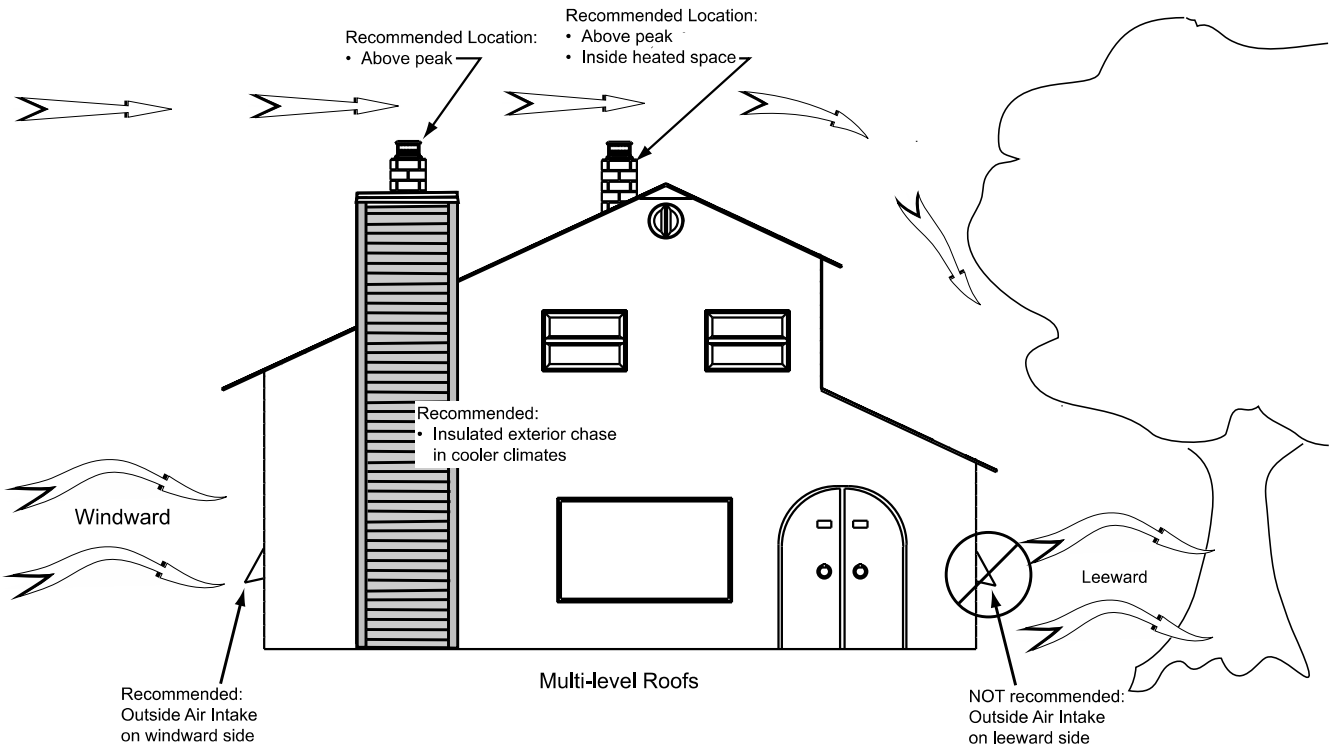


Figure 5: Air supply in conventional houses

If an air intake is installed through the wall of the house, its pressure can vary during windy weather. If there are changes in wood stove performance in windy weather, and in particular if smoke puffs from the stove, the air duct should be disconnected from the stove to determine if it is the cause of the problem. In some windy conditions, negative pressure at the duct weather hood outside the house wall may draw hot exhaust gases from the stove backwards through the duct to outdoors. Check the outdoor air duct for soot deposits when the full system is cleaned and inspected at least once each year.

6.7 Installing the Chimney Connector

The chimney connector is the single or double wall pipe installed between the stove flue collar and the chimney breech. Single wall pipe components are available from most hardware and building supply stores. These components are not usually tested to a particular standard and certified as compliant. Therefore, a list of rules found in solid fuel installation codes apply to the installation of a single wall pipe.

Double wall chimney connectors are tested and certified. The rules for double wall pipe are found in the manufacturer's installation instructions. These rules will be very different than those for single wall.

6.7.1 Installation of Single Wall Chimney Connector

The chimney connector assembly has been called 'the weak link' in the safety of wood heating systems because failure to install the connector properly (which has been common in the past) can result in house fires.

The best flue pipe assembly is one that rises straight up from the stove to the base of the chimney with no elbows. Straight assemblies are less likely to cause problems like smoke roll-out when the door is opened for loading. They are also more stable and easier to maintain than assemblies with elbows. Horizontal runs of flue pipe should be avoided where possible because they reduce chimney draft.

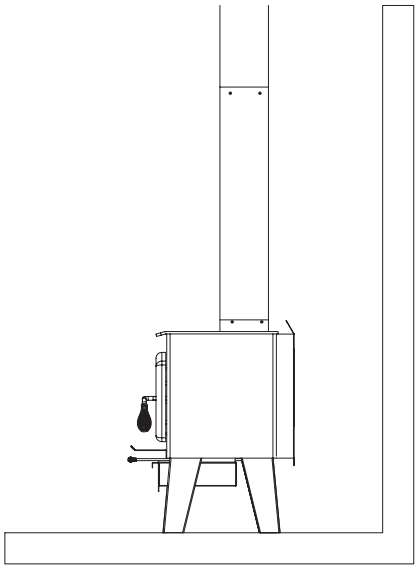


Figure 6: Best

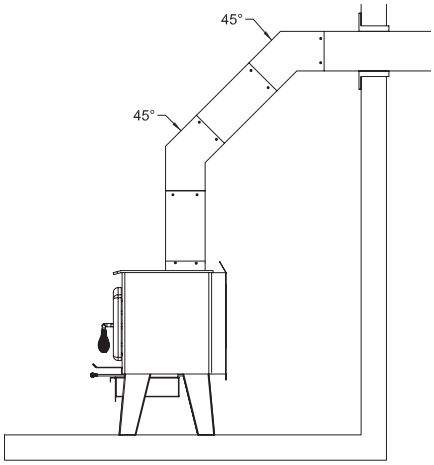


Figure 7: Acceptable

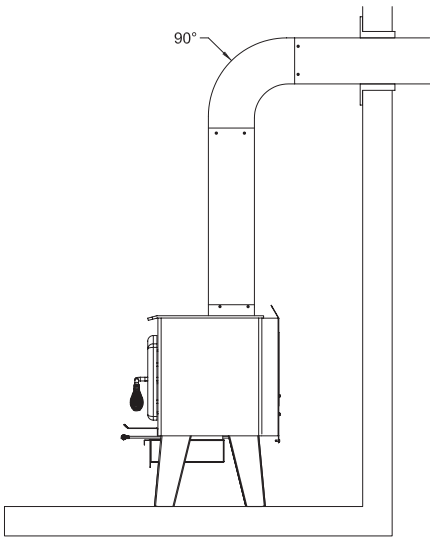


Figure 8: Avoid

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The rules below are based on those found in the CSA-B365 installation code. Please carefully follow these installation instruction rules, or those enforced by the local code.

- Maximum overall length of horizontal pipe: 10 ft. (3 m) including elbows.
- Minimum clearance from combustible material: 18" (450 mm). The minimum clearance may be reduced by 50 percent to 9" (225 mm) if suitable shielding is installed either on the pipe or on the combustible surface.

- The assembly should be as short and direct as possible between the stove and chimney. The use of two 45 degree elbows is often preferable to a single 90 degree elbow because less turbulence is created in the exhaust flow and they result in less horizontal run.
- The minimum overall height of the chimney system, measured from the stove top to the exterior termination cap of the chimney should be at least 12 ft. (3.66 m). A chimney which is too short may lack the “tunnel effect” required to obtain a proper draft.
- Maximum number of 90-degree elbows: 2.
- Maximum unsupported horizontal length: 3 ft. (1 m).
- Galvanized flue pipes must not be used because the coatings vaporize at high temperatures and release dangerous gases. Use black painted flue pipes.
- Flue pipes must be at least 24 gauge in thickness.
- Flue pipe joints should overlap 1 ¼" (30 mm).
- Each joint in the assembly must be fastened with at least three screws.
- The assembly must make allowance for expansion: elbows in assemblies allow for expansion; straight assemblies should include an inspection wrap with one end unfastened, or a telescopic section.
- Minimum upward slope towards the chimney: ¼ in/ft. (20 mm/m).
- **One end of the assembly must be securely fastened to the flue collar** with 3 sheet metal screws and the other end securely fastened to the chimney.
- There must be provision for cleaning of the pipes, either through a clean out or by removal of the pipe assembly. Removal of the assembly should not require that the stove be moved.
- The male ends of the sections must be oriented towards the appliance so that falling dust and condensation stay inside the pipe.
- A flue pipe must never pass through a combustible floor or ceiling or through an attic, roof space, closet or concealed space. Where passage through a wall or partition of combustible construction is desired, the installation shall conform to CAN/CSA-B365, Installation Code for Solid-Fuel-Burning Appliances and Equipment.
- A straight up connector assembly needs either a telescopic length or an inspection wrap (pipe coupler) to allow it to be assembled and disassembled without moving the stove.
- A straight flue pipe assembly offers the least restriction to gas flow and results in a stronger draft. Straight assemblies also need less maintenance because there are no corners to collect creosote.
- The chimney connector must be clean and in good condition.

ENGLISH

Stove Builder International inc.
250, rue de Copenhague,
St-Augustin-de-Desmaures (Québec) Canada
G3A 2H3
418-908-8002
www.sbi-international.com
tech@sbi-international.com

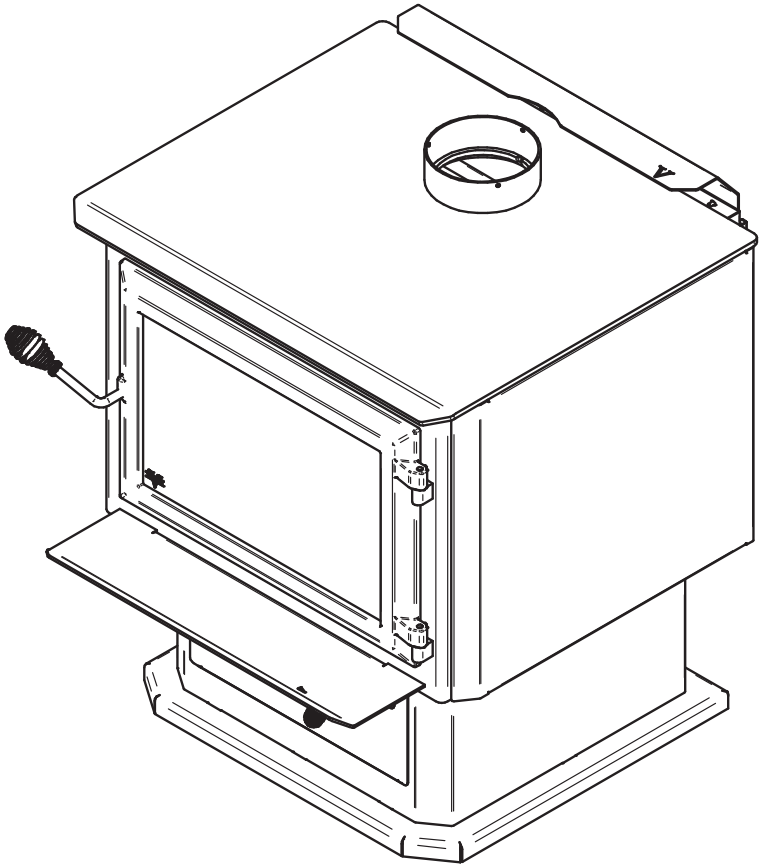
Wood Stove Owner's Manual

Part 2 of 2

INSTALLATION AND OPERATION REQUIREMENTS

HES350

(VB00020 model)



US Environmental Protection Agency phase II certified wood stove compliant with 2020 cord wood standard

EPA ≤2.5 g/h

Safety tested according to ULC S627, UL 1482 and UL 737 standards by an accredited laboratory.

ALCOVE

MOBILE HOME

ENGLISH

CONTACT LOCAL BUILDING OR FIRE OFFICIALS ABOUT RESTRICTIONS AND INSTALLATION INSPECTION REQUIREMENTS IN LOCAL AREA.

READ THIS ENTIRE MANUAL BEFORE INSTALLATION AND USE OF THIS WOOD STOVE. FAILURE TO FOLLOW THESE INSTRUCTIONS COULD RESULT IN PROPERTY DAMAGE, BODILY INJURY OR EVEN DEATH.

READ AND KEEP THIS MANUAL FOR REFERENCE

Printed in Canada

46256_IA
2022-08-19

Dealer: _____

_____

Installer: _____

_____

Phone Number: _____

Serial Numbrer: _____

ONLINE WARRANTY REGISTRATION

If the unit requires repairs during the warranty period, proof of purchase must be provided. The purchase invoice must be kept. The date indicated on it establishes the warranty period. If it can not be provided, the warranty period will be determined by the date of manufacture of the product. It is also highly recommended to register the warranty online at

https://www.occanada.com/ca/en/warranty-registration/

Registering the warranty will help to quickly find the information needed on the unit.

TABLE OF CONTENTS

ENGLISH

1. CERTIFICATION PLATE

REFER TO INTERTEK'S DIRECTORY OF BUILDING PRODUCTS FOR DETAILED INFORMATION
SE RÉFÉRER AU RÉPERTOIRE DES PRODUITS HOMOLOGUÉS D'INTERTEK POUR PLUS D'INFORMATION

C ETL US LISTED

Intertek
Jan/Jan 2021
Control number: 4002461

STANDARDS / NORMES D'ESSAI:
Certified to/Certifié selon ULC S627
Certified to/Certifié selon UL 1482
Certified to/Certifié selon UL 737
Certified to/Certifié selon CSA B415.1-10
Certified to/Certifié selon ASTM E3053-17
Certified to/Certifié selon ASTM E2515-11 (R2017)

LISTED SOLID FUEL BURNING APPLIANCE
POÊLE À COMBUSTIBLE SOLIDE HOMOLOGUÉ
MODEL / MODÈLE :
HES350

Serial Number / No. de Série: 999998

Clearances to combustibles / Dégagements aux combustibles

DOOR OPENING / OUVERTURE DE PORTE

CANADA

Single wall connector / Tuyau à paroi simple		Double wall connector / Tuyau à paroi double	
A: 13.25 in./po.	(337 mm)	A: 7 in./po.	(178 mm)
B: 14 in./po.	(356 mm)	B: 14 in./po.	(356 mm)
C: 7.25 in./po.	(184 mm)	C: 7 in./po.	(178 mm)
D: 18 in./po.	(457 mm)	D: 11.75 in./po.	(298 mm)
E: 24.875 in./po	(632 mm)	E: 24.875 in./po	(632 mm)
F: 18 in./po.	(457 mm)	F: 17.75 in./po.	(451 mm)

Floor-ceiling/plancher-plafond: 84 in./po. (213cm)

U.S.A.

MOBILE HOME
MAISONS MOBILES
Double wall connector
Tuyau à paroi double

A: 9 in./po.	(229 mm)	D: 13.75 in./po.	(349 mm)
B: 19 in./po.	(483 mm)	E: 29.875 in./po.	(759 mm)
C: 10 in./po.	(254 mm)	F: 20.75 in./po.	(527 mm)

Single wall connector / Tuyau à paroi simple		Double wall connector / Tuyau à paroi double	
A: 13 in./po.	(330 mm)	A: 7 in./po.	(178 mm)
B: 14 in./po.	(356 mm)	B: 14 in./po.	(356 mm)
C: 7.25 in./po.	(184 mm)	C: 7 in./po.	(178 mm)
D: 17.75 in./po.	(451 mm)	D: 11.75 in./po.	(298 mm)
E: 24.875 in./po	(632 mm)	E: 24.875 in./po.	(632 mm)
F: 18 in./po.	(457 mm)	F: 17.75 in./po.	(451 mm)

* See owner's manual for other clearances with lowered ceiling/
voir manuel d'installation pour autres dégagements avec plafond abaissé

Back / Arrière

Protection de plancher/Floor protection

CANADA		U.S.A.	
G: 8 in./po.	(203 mm)	I: 16 in./po.	(406 mm)
H: 8 in./po	(203 mm)	J: 8 in./po.	(203 mm)
I: 18 in./po.	(457 mm)	K: 36 in./po.	(914 mm)
K: 48 in./po.	(1219 mm)		

PREVENT HOUSE FIRES

- Install and use only in accordance with the manufacturer's installation and operating instructions.
- Contact local building or fire officials about restrictions and installation inspection in your area.
- Use listed 152 mm /6 in. diameter single or double wall connectors with prefabricated chimneys approved UL 103 HT (US) and ULC S629 (CAN) suitable for solid fuels or lined masonry chimneys.
- See local building code and manufacturer's instructions for precautions required for passing a chimney through a combustible wall or ceiling.
- This stove must be installed as a freestanding heater with the clearances listed in the manufacturer's installation instructions. It is strictly forbidden to install this stove in a factory-built fireplace.
- Do not pass connector through combustible wall or ceiling.
- Do not connect this unit to a chimney serving another appliance.
- Use with wood only. Do not use other fuels.
- Operate only with door closed or door open with firescreen installed. Open door or remove firescreen to feed the stove only.
- Do not obstruct the space underneath the stove.
- Do not use grate or elevate fire. Build fire directly on hearth.
- Do not overfire. If heater or chimney connector glows, you are overfiring.
- Inspect and clean chimney frequently. Under certain condition of use, creosote buildup may occur rapidly.
- Replace glass with ceramic type only.
- Install unit on a non-combustible material extending as shown above on this label.
- Suitable for mobile-home installation. Floor protection may vary from pedestal to legs version refer to owner's manual.
- Combustion air openings shall not be obstructed.
- This wood heater needs periodic inspection and repair for proper operation. Consult the owner's manual for further information. It is against US federal regulations to operate this wood heater in a manner inconsistent with the operating instructions in the owner's manual.

PRÉVENEZ LES INCENDIES

- Installer et utiliser conformément au manuel d'utilisation du fabricant.
- Contacter les autorités de votre localité ayant juridiction concernant les restrictions et inspections d'installation.
- Utiliser des tuyaux d'évacuation à parois simple ou double homologués d'un diamètre de 6 po. (152 mm) avec une cheminée préfabriquée approuvée UL 103 HT (US) et ULC S629 (CAN) pour utilisation au bois ou une cheminée de maçonnerie gainée.
- Voir les codes locaux et le manuel d'installation du manufacturier pour le passage de la cheminée à travers un mur ou un plafond combustible.
- Ce poêle doit être installé comme appareil de chauffage autonome avec les dégagements indiqués dans les instructions d'installation du fabricant. Il est strictement défendu d'installer ce poêle dans un foyer préfabriqué.
- Ne pas traverser un plafond ou un mur combustible avec un tuyau d'évacuation.
- Ne pas raccorder cet appareil à une cheminée déservant un autre appareil.
- Brûler du bois seulement. Ne pas utiliser d'autres combustibles.
- Garder la porte fermée ou le pare-étincelle en place en tout temps. Ouvrir la porte ou retirer le pare-étincelle que lors du chargement.
- Ne rien entreposer sous l'appareil.
- Ne pas utiliser de grilles ou de chenets pour surélever le feu.Préparer le feu directement sur l'âtre.
- Ne pas surchauffer. Si l'appareil ou le tuyau rougit, il y a surchauffe.
- Inspecter et nettoyer la cheminée fréquemment. Sous certaines conditions, l'accumulation de créosote peut être rapide.
- Remplacer la vitre seulement avec un verre de céramique.
- Installer l'appareil sur une plaque non combustible tel qu'indiqué sur l'étiquette.
- Poêle approuvé pour maison mobile.La protection de plancher peut varier entre la version plédestal et sur pattes. Voir le manuel d'instructions.
- Les entrées d'air servant à la combustion ne doivent pas être obstruées.
- Cet appareil de chauffage requiert des inspections et réparations périodiques. Consulter le manuel de l'utilisateur pour plus d'information. Opérer cet appareil de chauffage de façon inconsistente par rapport au manuel de l'utilisateur consiste une violation de la loi fédérale (USA).

Optional blower: (115V, 0.8A, 60Hz) — Option ventilateur: (115V, 0.8A, 60Hz)

U.S. ENVIRONMENTAL PROTECTION AGENCY Certified to comply with 2020 particulate emission standards using cordwood.
AGENCE DE PROTECTION DE L'ENVIRONNEMENT DES É.-U. Conforme aux normes d'émission de particules de 2020 avec bûche de bois.
Weighted average emission rate / Moyenne pondérée des émissions : 1.32 g/h
Tested and certified in compliance with CFR 10 part 60, subpart AAA, section 60.534(a)(1(ii))

WARNING: This product can expose you to carbon monoxide, which is known to the State of California to cause cancer, birth defects or other reproductive harm.
(For more information go to www.p65warnings.ca.gov)

CAUTION

- HOT WHILE IN OPERATION.
- DO NOT TOUCH. KEEP CHILDREN, CLOTHING AND FURNITURE AWAY.
- CONTACT MAY CAUSE SKIN BURNS. SEE NAME-PLATE AND INSTRUCTIONS.

ATTENTION

- CHAUD EN FONCTIONNEMENT.
- NE PAS TOUCHER. GARDER LES ENFANTS, LES VÊTEMENTS ET LES MEUBLES ÉLOIGNÉS.
- UN CONTACT AVEC LA PEAU PEUT OCCASIONNER DES BRÛLURES. VOIR LES INSTRUCTIONS.

27872

Made in St-Augustin-de-Desmaures (Qc), Canada
16/06/2022 (# test)

VENTIS

Fabriqué à St-Augustin-de-Desmaures (Qc), Canada
16/06/2022 (# test)

ENGLISH

2. General Information

2.1 Performances

Values are as measured per test method, except for the recommended heating area, firebox volume, maximum burn time and maximum heat output.

Model	HES350 (VB00020)	
Type of combustion	Non-catalytic	
Fuel Type	Dry Cordwood	
Recommended heating area (sq. ft.)[1]	1,000 to 2,700 ft^2 (93 to 251 m^2)	
Overall firebox volume[2]	3.5 ft^3 (0.099 m^3)	
Loading volume EPA	2.88 ft^3 (0.082 m^3)	
Maximum burn time[1]	10 hours	
Maximum heat output (dry cordwood)[3]	110,000 BTU/h (32.2 kW)	
Overall heat output rate (min. to max.)[2 4]	17,200 BTU/h to 57,800 BTU/h (5.0 kW to 16.9 kW)	
Average overall efficiency[3] (Dry cordwood)	71 % (HHV)[5]	76 % (LHV)[6]
Optimum overall efficiency[7]	77 %	
Optimum heat transfer efficiency[8]	75 %	
Average particulate emissions rate[9]	1.6 g/h (EPA / CSA B415.1-10)[10]	
Average CO[11]	73 g/h	

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[1] Recommended heating area and maximum burn time may vary subject to location in home, chimney draft,heat loss factors, climate, fuel type and other variables. The recommended heated area for a given appliance is defined by the manufacturer as its capacity to maintain a minimum acceptable temperature in the designated area in case of a power failure.
[2] The overall firebox calculation is an approximation and is not intended to be used for loading. This volume includes a buffer zone to allow an easier fuel insertion, prevent ash spillage and allow the air wash to work properly.
[3] The maximum heat output (dry cordwood) is based on a loading density varying between 15 lb/ft^3 and 20 lb/ft^3. Other performances are based on a fuel load prescribed by the standard. The specified loading density varies between 7 lb/ft^3 and 12 lb/ft^3. The moisture content is between 19% and 25%.
[4] As measured per CSA B415.1-10 stack loss method.
[5] Higher Heating Value of the fuel.
[6] Lower Heating Value of the fuel.
[7] Optimum overall efficiency at a specific burn rate (LHV).
[8] The optimum heat transfer efficiency is for the low burn rate and represents the appliance's ability to convert the energy contained in the wood logs into energy transferred to the room in the form of heat and does not take into account the chemical losses during combustion.
[9] This appliance is officially tested and certified by an independent agency.
[10] Tested and certified in compliance with CFR 40 part 60, subpart AAA, section 60.534(a)(1(ii) and ASTM E3053-17 based on the ATM send by EPA on October 12th, 2017
[11] Carbon monoxide.

2.2 Specifications

Recommended log length	16 in (406 mm) east-west
Maximum log length[12]	22 in (560 mm) east-west
Flue outlet diameter	6 in (150 mm)
Recommended connector pipe diameter	6 in (150 mm)
Type of chimney	ULC-S629, UL 103 HT (2100 °F)
Minimum chimney height	12 feet
Baffle material	Vermiculite
Approved for alcove installation	Yes
Approved for mobile home installation[13]	Yes
Type of door	Simple, glass with cast iron frame
Type of glass	Ceramic glass
Blower	Included (up to 130 CFM)
Particulate emission standard[14]	EPA / CSA B415.1-10
USA standard (Safety)	UL 1482, UL 737
Canada standard (Safety)	ULC-S627

ENGLISH

[12] North-south: ends of the logs visible, East-west: sides of the logs visible.

[13] Mobile homes (Canada) or manufactured homes (USA): The US Department of Housing and Urban Development describes “manufactured homes” better known as “mobile homes” as follows; buildings built on fixed wheels and those transported on temporary wheels/axles and set on a permanent foundation. In Canada, a mobile home is a dwelling for which the manufacture and assembly of each component is completed or substantially completed prior to being moved to a site for installation on a foundation and connection to service facilities and which conforms to the CAN/CSA-Z240 MH standard.

[14] Tested and certified in compliance with CFR 40 part 60, subpart AAA, section 60.534(a)(1(ii) and ASTM E3053-17 based on the ATM send by EPA on October 12th, 2017

2.3 Dimensions

2.3.1 Stove Dimensions

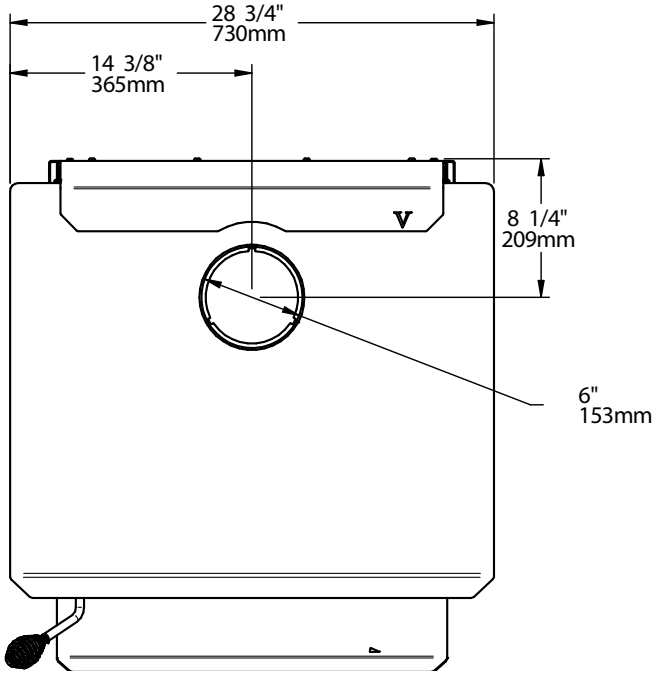


Figure 1: Top View

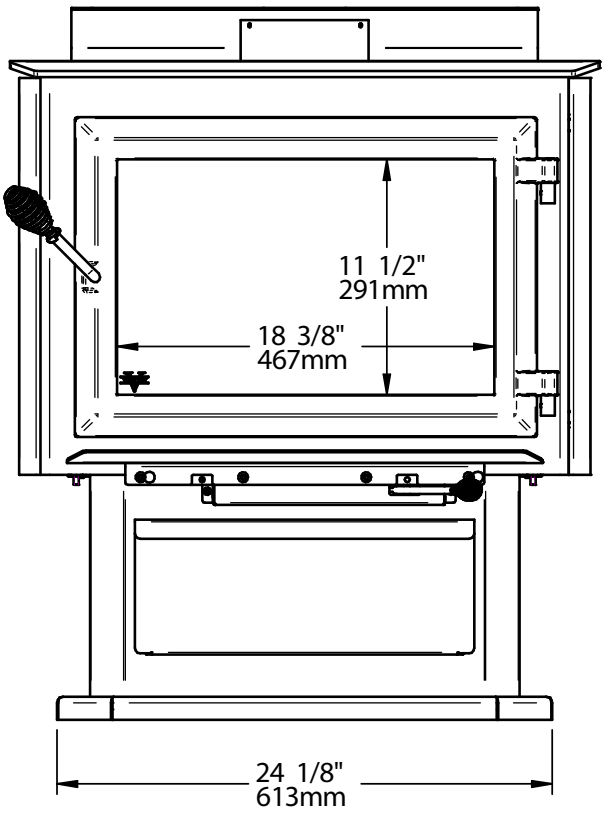


Figure 2: Front View

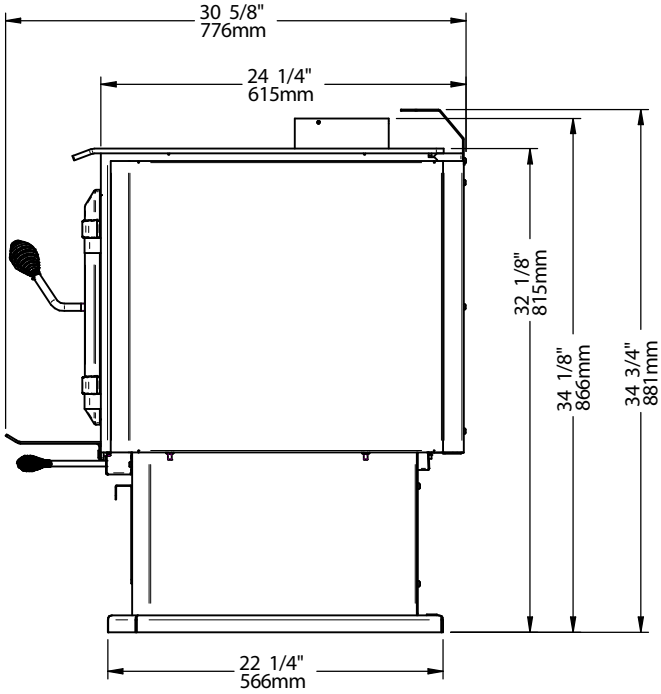


Figure 3: Side View

ENGLISH

2.3.2 Combustion Chamber Dimensions

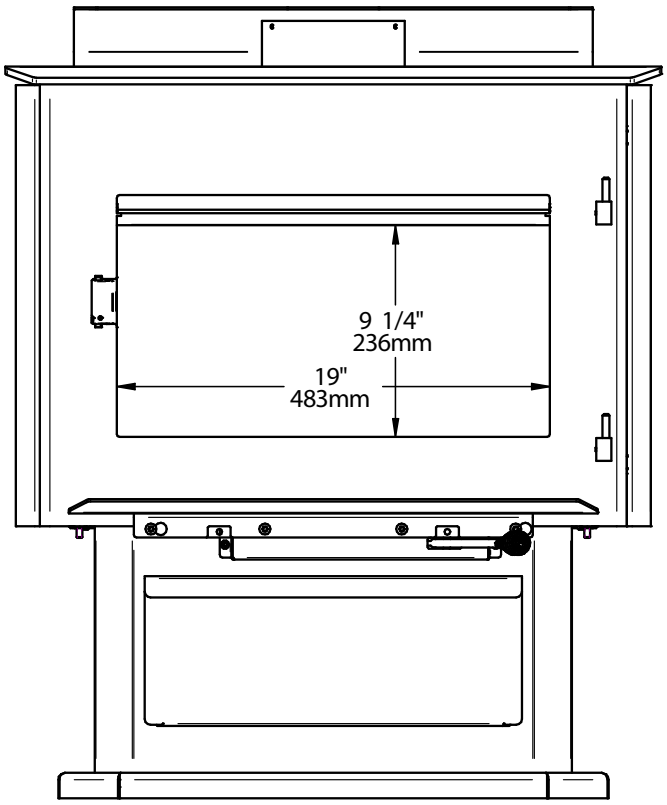


Figure 4: Door Opening

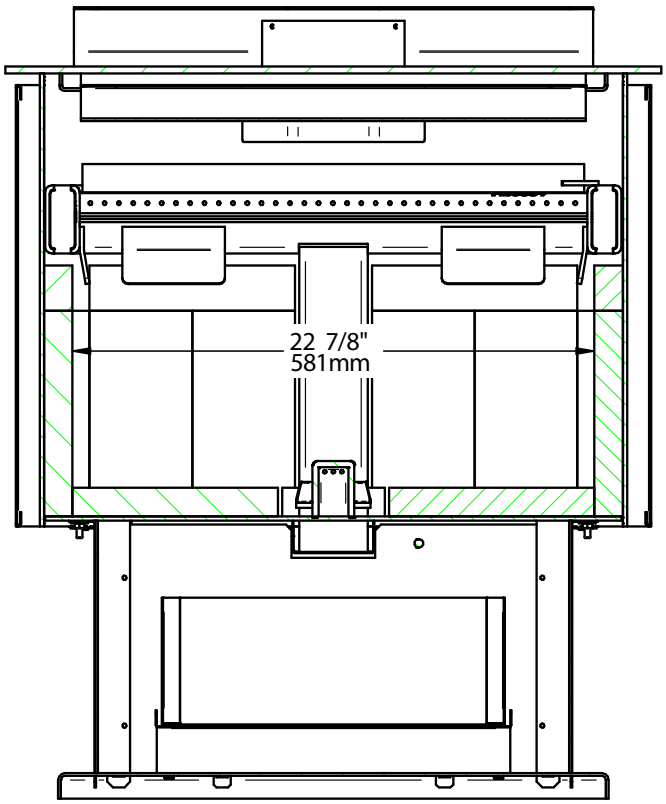


Figure 5: Front View - Combustion Chamber

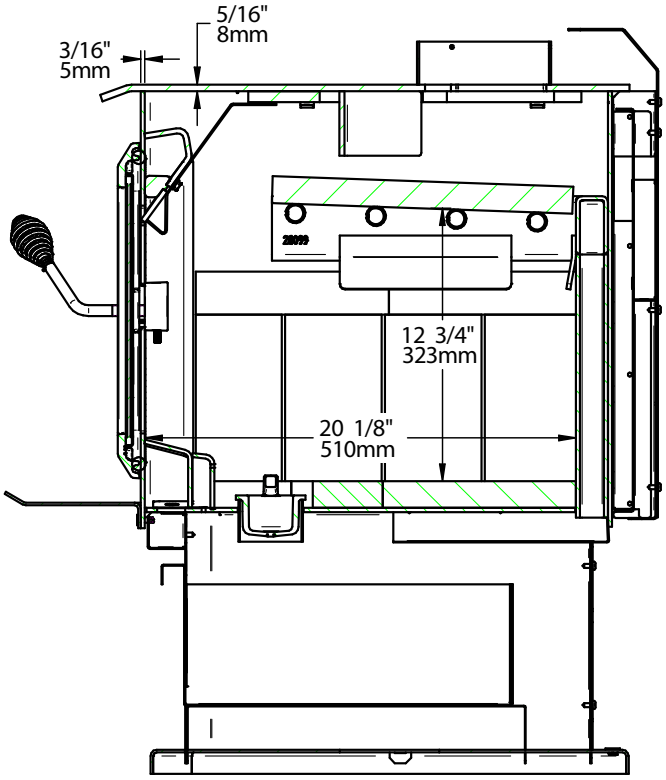
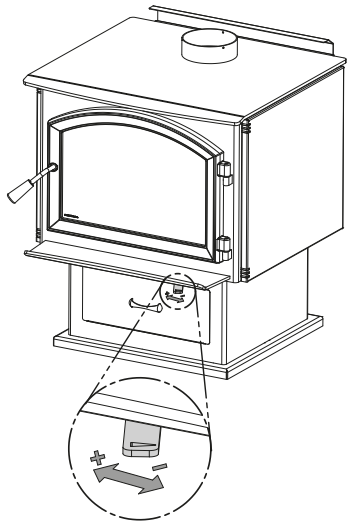


Figure 6: Side View - Combustion Chamber

ENGLISH

2.4 EPA Loading

For EPA Certification testing, wood logs were 16 ± 1 inches long and the specie used was beech.



2.4.1 Air control

The air control is located underneath the ash shelf. To open the air control, push the air control handle completely to the left (High). This will increase the burn rate. To close the air control, push the air control handle completely to the right (Low). This will decrease the burn rate.

2.4.2 High burn rate

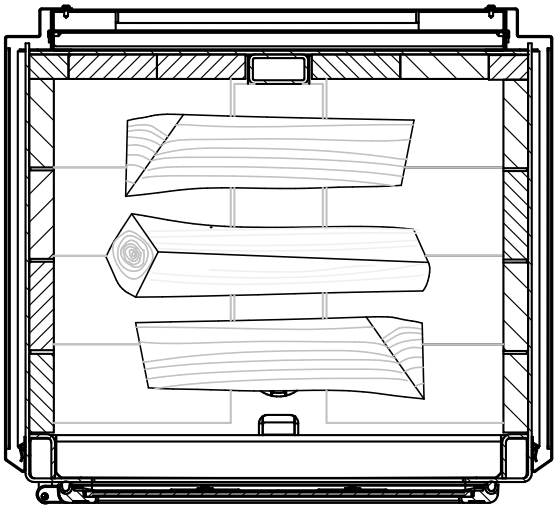
Open the air control completely. Place height small pieces (2 1/2" x 2 1/2" approximately) of wood in two layers in the firebox crossing them at the greatest possible angle. Criss cross 15 to 20 kindling wood pieces (1"x1" approximately) on the small pieces of wood in three or four layers at the greatest possible angle. Tie knot with five sheets of paper and place them on top of the kindling wood. Light up the paper and let the door ajar at 90° until all the kindling wood is on fire. Close the door. When there is no more fire in the front of the firebox and there are only faint flames on the wood in the back of the firebox, break ashes, level the coal bed and put six logs in the firebox. Put 3 pieces centered on the coal bed, without air space between them. Leave one inch of air space between the rear firebrick and the first piece. The three other pieces should be added on top of the first 3, still in an East-West configuration. Let the door ajar at 90° for 1 minute and then close the door.

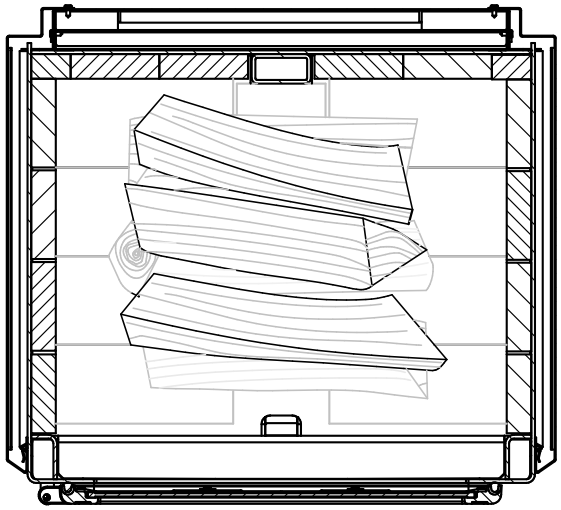
2.4.3 Medium and low burn rate

On a two inches thick coal bed that is still red, place three logs centered on the coal bed in an East-West orientation. There should be air space between each log and between the logs and the bricks. The three other pieces should be added on top of the first three, in an East-West orientation but slightly angled of 10° still with air space between each log and the bricks. Let the door ajar at 90° for approximately 5 min. Then, close the door with the primary air control open. Leave to burn with the primary air control open for approximately 10 more minutes and then close the primary air control completely for the low burn rate and halfway for the medium burn rate. For better results, close the air control gradually from the closing of the door to the complete closing of the air control.

2.4.4 Logs placement

The images below show how to place the logs in the combustion chamber as described previously.





ENGLISH

3. Clearances to Combustible Material

The clearances shown in this section have been determined by tests according to procedures set out in safety standards ULC S627 (Canada), UL 1482 (U.S.A.) and UL 737 (U.S.A.). When the stove is installed so that its surfaces are at or beyond the minimum clearances specified, combustible surfaces will not overheat under normal and even abnormal operating conditions.

No part of the stove or flue pipe may be located closer to combustibles than the minimum clearance figures given.

The clearances to combustible walls may be slightly different in Canada and the U.S.A. and may also differ depending on whether single or double wall flue pipe is used. Make sure to choose the correct clearance for the stove location and type of flue pipe.

The clearances of the appliance and the flue pipes must be met individually, meaning the appliance cannot be installed closer to the combustible materials than the single or double wall pipe allows. For a safe way to reduce clearances refer to section"5. Reducing Wall and Ceiling Clearances Safely" of this manual.

3.1 Clearances

	APPLIANCE CLEARANCES WITH SINGLE WALL PIPE CONNECTOR	
	Canada	**USA**
A	13 ¼" (337 mm)	13" (330 mm)
B	14" (356 mm)	14" (356 mm)
C	7 ¼" (184 mm)	7 ¼" (184 mm)

	APPLIANCE CLEARANCES WITH DOUBLE WALL PIPE CONNECTOR	
	Canada	**USA**
A	7" (178 mm)	7" (178 mm)
B	14" (356 mm)	14" (356 mm)
C	7" (178 mm)	7" (178 mm)

If the above clearances are met, then the distances measured from the flue outlet will be:

	DISTANCES[14] FROM PIPE CONNECTOR WITH SINGLE WALL PIPE CONNECTOR	
	Canada	**USA**
D	18" (457 mm)	17 ¾" (451 mm)
E	24 ⅞" (632 mm)	24 ⅞" (632 mm)
F	18" (457 mm)	18" (457 mm)

	DISTANCES[15] FROM PIPE CONNECTOR WITH DOUBLE WALL PIPE CONNECTORE	
	Canada	**USA**
D	11 ¾" (298 mm)	11 ¾" (298 mm)
E	24 ⅞" (632 mm)	24 ⅞" (632 mm)
F	17 ¾" (451 mm)	17 ¾" (451 mm)

ENGLISH

[15] The pipe distances listed in this table refer to the distances obtained when the stove is installed in accordance with the appliance clearances above mentioned.

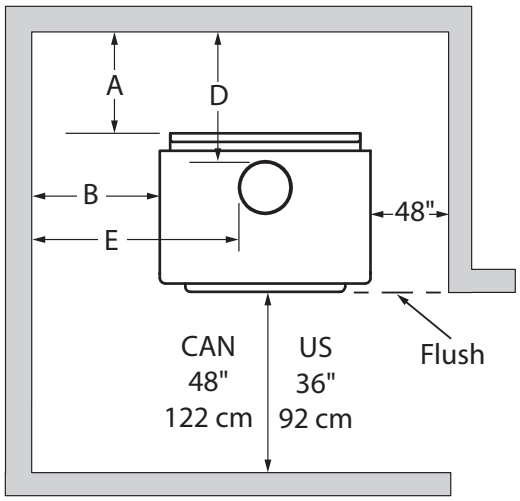


Figure 7: Clearances - Top

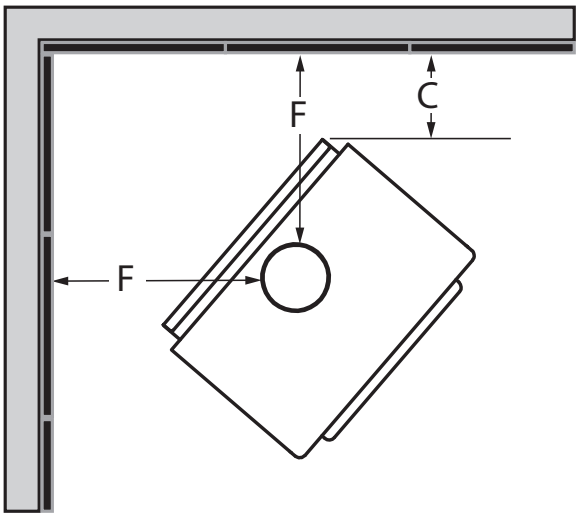


Figure 8: Clearances - Corner

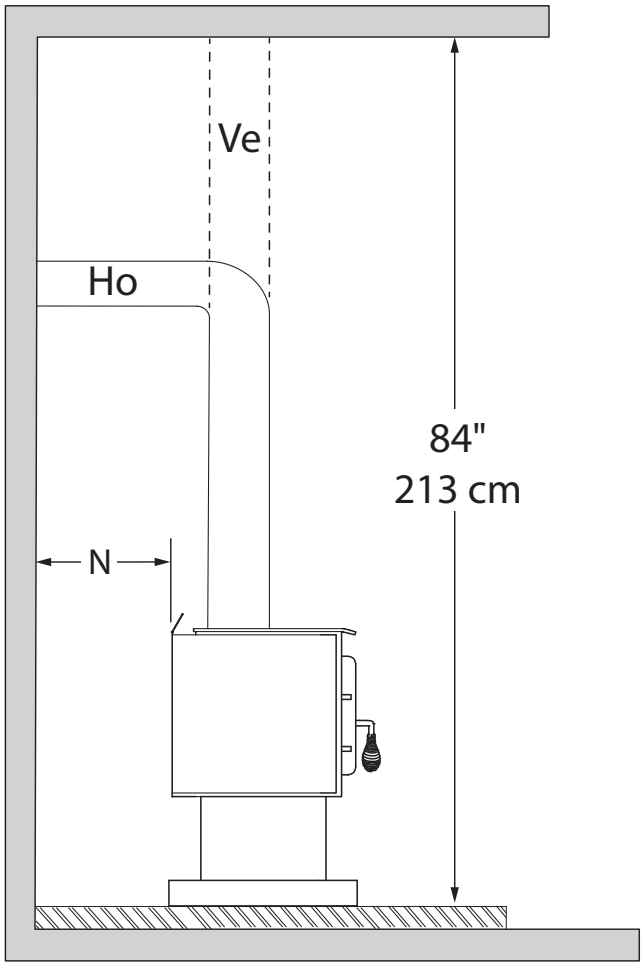


Figure 9: Clearances - Side

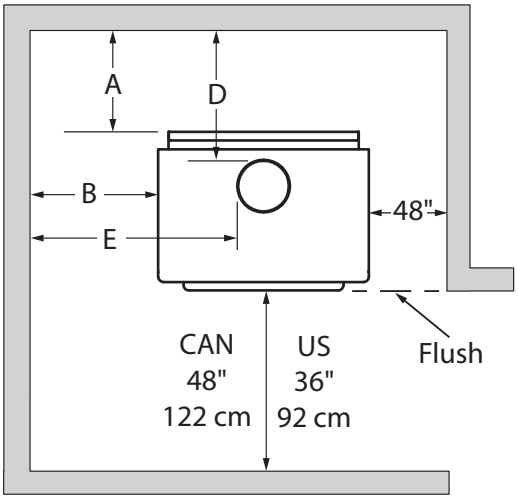
ENGLISH

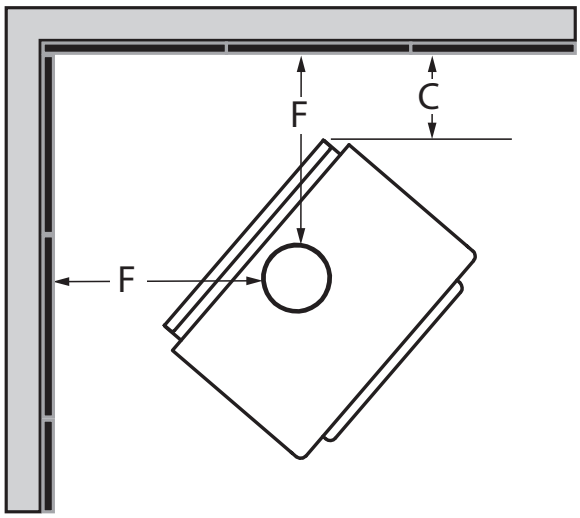
3.1.1 With Heat Shield AC02762[16]

To reduce the clearances of an appliance using a single wall pipe connector, the use of a heat shield certified with the single wall pipe connector to be used as close as 6" from combustible materials must be used. Only in this case, the same clearances as a certified double wall pipe connector can be used. Refer to the booklet in the screen options to obtain the dimensions to be respected.

	APPLIANCE CLEARANCES WITH DOUBLE WALL PIPE CONNECTOR	
	Canada	**USA**
A	2 ½" (64 mm)	2 ½" (64 mm)
B	2 ½" (64 mm)	2 ½" (64 mm)
C	2 ½" (64 mm)	2 ½" (64 mm)

	DISTANCES[17] FROM DOUBLE WALL PIPE CONNECTOR	
	Canada	**USA**
D	7 ¼" (184 mm)	7 ¼" (184 mm)
E	13 ⅜" (340 mm)	13 ⅜" (340 mm)
F	13 ¼" (337 mm)	13 ¼" (337 mm)





If the clearance reduction is on the same side as the door handle, position the stove at a minimum of 6 inches from the side wall (clearance B), otherwise it may be located at the clearance shown in the table above.

ENGLISH

[16] Note that to reduce the clearances of an appliance using a single wall pipe connector, the use of a heat shield certified with the single wall pipe connector to be used as close as 6" from combustible materials must be used. Only in this case, the same clearances as a certified double wall pipe connector can be used.

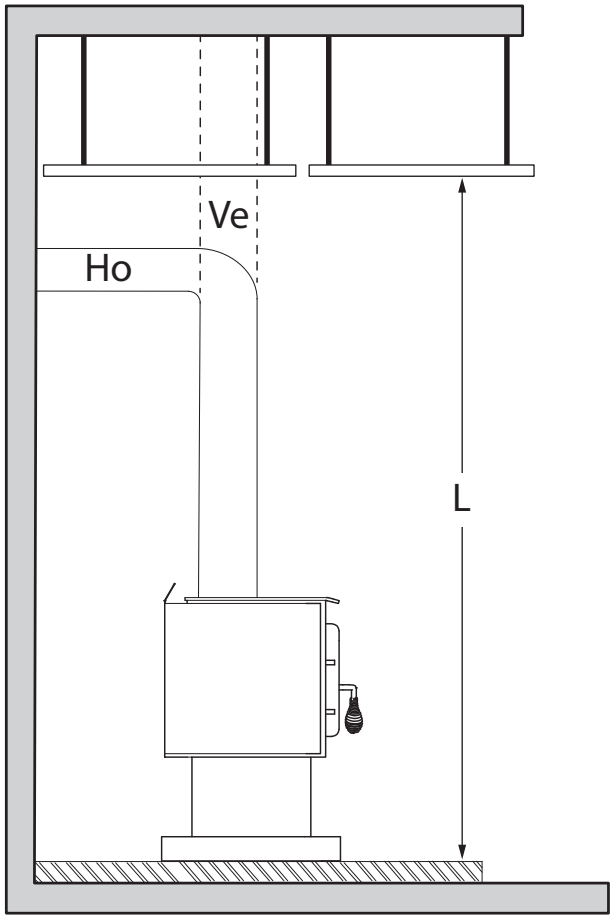
[17] The pipe distances listed in this table refer to the distances obtained when the stove is installed in accordance with the appliance clearances above mentioned.

3.1.2 With Lowered Ceiling

	APPLIANCE CLEARANCES WITH DOUBLE WALL PIPE CONNECTOR	
	Canada	**USA**
A	11" (279 mm)	11" (279 mm)
B	16" (406 mm)	16" (406 mm)
C	10" (254 mm)	10" (254 mm)
L	72" (1,830 mm)	72" (1,830 mm)

If the above clearances are met, then the distances measured from the flue outlet will be:

	DISTANCES[18] FROM PIPE CONNECTOR WITH DOUBLE WALL PIPE CONNECTOR	
	Canada	**USA**
D	15 ¾" (400 mm)	15 ¾" (400 mm)
E	26 ⅞" (683 mm)	26 ⅞" (683 mm)
F	20 ¾" (527 mm)	20 ¾" (527 mm)



ENGLISH

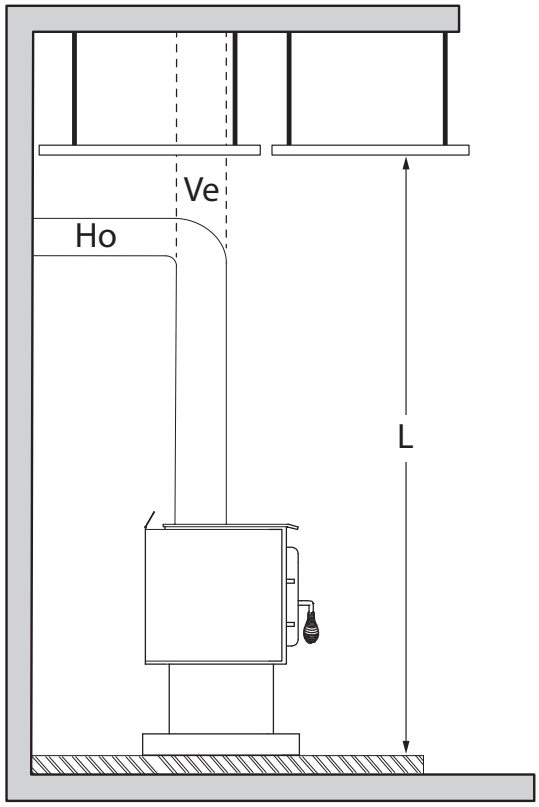
[18] The pipe distances listed in this table refer to the distances obtained when the stove is installed in accordance with the appliance clearances above mentioned.

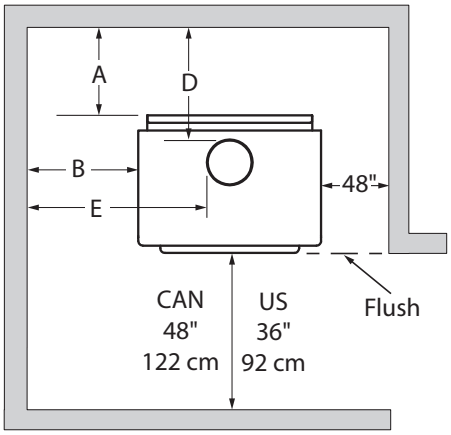
3.1.3 With Heat Shield AC02762 and Lowered Ceiling

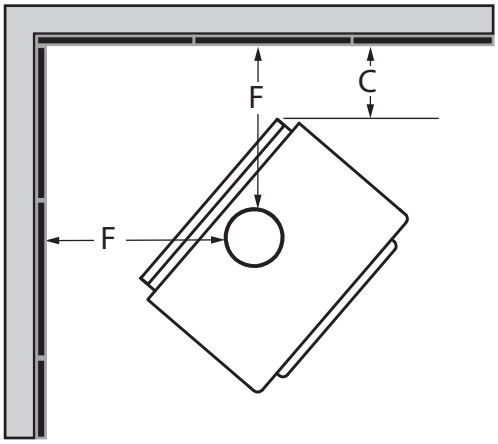
To reduce the clearances of an appliance using a single wall pipe connector, the use of a heat shield certified with the single wall pipe connector to be used as close as 6" from combustible materials must be used. Only in this case, the same clearances as a certified double wall pipe connector can be used. Refer to the booklet in the screen options to obtain the dimensions to be respected.

	APPLIANCE CLEARANCES WITH DOUBLE WALL PIPE CONNECTOR	
	Canada	**USA**
A	2 ½" (64 mm)	2 ½" (64 mm)
B	2 ½" (64 mm)	2 ½" (64 mm)
C	2 ½" (64 mm)	2 ½" (64 mm)
L	74" (1,880 mm)	74" (1,880 mm)

	DISTANCES[19] FROM PIPE CONNECTOR WITH DOUBLE WALL PIPE CONNECTOR	
	Canada	**USA**
D	7 ¼" (184 mm)	7 ¼" (184 mm)
E	13 ⅜" (340 mm)	13 ⅜" (340 mm)
F	13 ¼" (337 mm)	13 ¼" (337 mm)







If the clearance reduction is on the same side as the door handle, position the stove at a minimum of 6 inches from the side wall (clearance B), otherwise it may be located at the clearance shown in the table above.

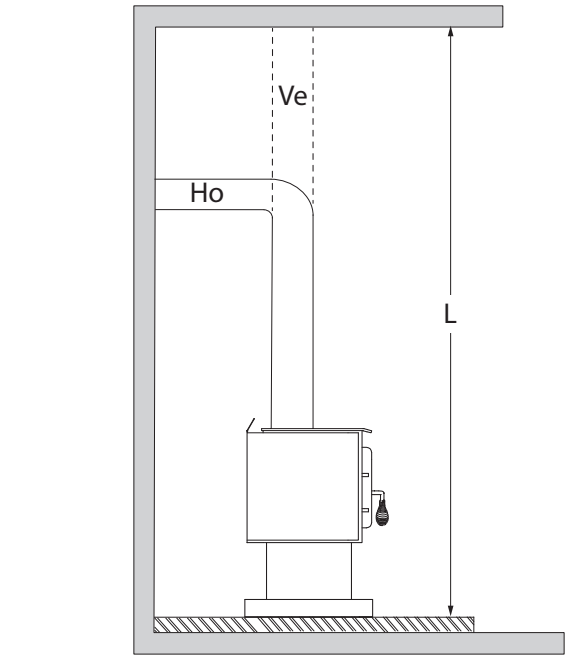
[19] The pipe distances listed in this table refer to the distances obtained when the stove is installed in accordance with the appliance clearances above mentioned.

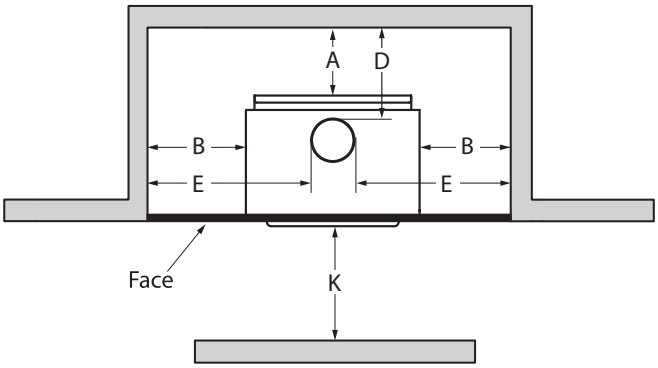
3.1.4 Inside a Combustible Alcove

See section 3.1 for the single wall pipe installation.

	APPLIANCE CLEARANCES WITH DOUBLE WALL PIPE CONNECTOR	
	Canada	**USA**
A	11" (279 mm)	11" (279 mm)
B	16" (406 mm)	16" (406 mm)
K	48" (1220 mm)	36" (910 mm)
L	74" (1,880 mm)	74" (1,880 mm)

	DISTANCES[19] FROM PIPE CONNECTOR WITH DOUBLE WALL PIPE CONNECTOR	
	Canada	**USA**
D	15 ¾" (400 mm)	15 ¾" (400 mm)
E	26 ⅞" (683 mm)	26 ⅞" (683 mm)





3.1.5 Mobile Home

It is strictly **forbidden** to install a unit with **a single wall pipe** in a **mobile home**.

	APPLIANCE CLEARANCES WITH DOUBLE WALL PIPE CONNECTOR	
	Canada	**USA**
A	10" (254 mm)	10" (254 mm)
B	19" (483 mm)	19" (483 mm)
C	10" (254 mm)	10" (254 mm)

	DISTANCES[20] FROM PIPE CONNECTOR WITH DOUBLE WALL PIPE CONNECTOR	
	Canada	**USA**
D	14 ¾" (375 mm)	14 ¾" (375 mm)
E	29 ⅞" (759 mm)	29 ⅞" (759 mm)
F	20 ¾" (527 mm)	20 ¾" (527 mm)

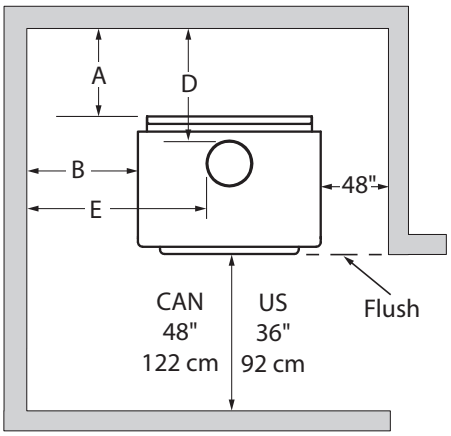
[20] The pipe distances listed in this table refer to the distances obtained when the stove is installed in accordance with the appliance clearances above mentioned.

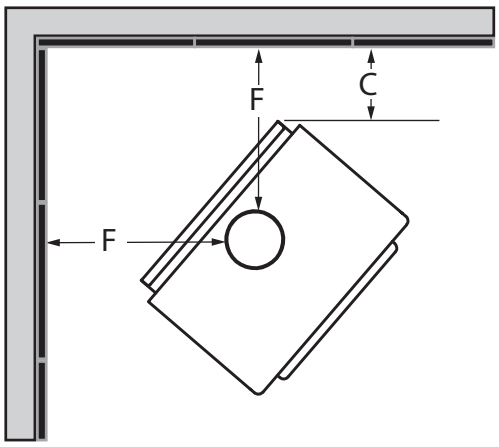
3.1.6 Mobile Home With Heat Shield AC02762

It is strictly **forbidden** to install a unit with **a single wall pipe** in a **mobile home**.

	APPLIANCE CLEARANCES WITH DOUBLE WALL PIPE CONNECTOR	
	Canada	**USA**
A	3" (76 mm)	3" (76 mm)
B	5" (127 mm)	5" (127 mm)
C	3" (76 mm)	3" (76 mm)

	DISTANCES[21] FROM PIPE CONNECTOR WITH DOUBLE WALL PIPE CONNECTOR	
	Canada	**USA**
D	7 ¾" (197 mm)	7 ¾" (197 mm)
E	15 ⅞" (403 mm)	15 ⅞" (403 mm)
F	13 ¾" (349 mm)	13 ¾" (349 mm)





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[21] Les distances de tuyau listées dans ce tableau se réfèrent aux distances obtenues lorsque le poêle est installé en accord avec les dégagements de l'appareil mentionnés ci-dessus.

4. Floor Protection

This stove is designed to prevent the floor from overheating. However, it must be placed on a non-flammable surface to protect the floor from hot embers that may fall during loading.

The floor protection must be a continuous, non combustible material, such as steel with a minimum thickness of 0.015" (0.38 mm) or ceramic tiles sealed together with grout. Cement board, brick, or any other approved or listed material suited for floor protection. No R factor required.

Any type of tile will require a continuous non combustible sheet beneath to prevent the possibility of embers falling through to the combustible floor if cracks or separation should occur in the finished surface. Check local codes for approved alternatives.

No protection is required if the unit is installed on a non-combustible floor (ex: concrete).

	FLOOR PROTECTION	
	Canada	**USA**
G[22]	8" (203 mm)	N/A
H	8" (203 mm)	N/A
I	18" (457 mm) from door opening	16" (406 mm) from door opening
J	N/A	8" (203 mm)
K	44 ¾" (1137 mm)	35" (889 mm)
N[23]	N/A	See note 22
S	50 ¼" (1276 mm)	40 ¼" (1022 mm)
T	35 ½" (902 mm)	28 ½" (724 mm)
U	44 ¾" (1137 mm)	35" (889 mm)
V	72 5/8" (1845 mm)	57 ¾" (1467 mm)

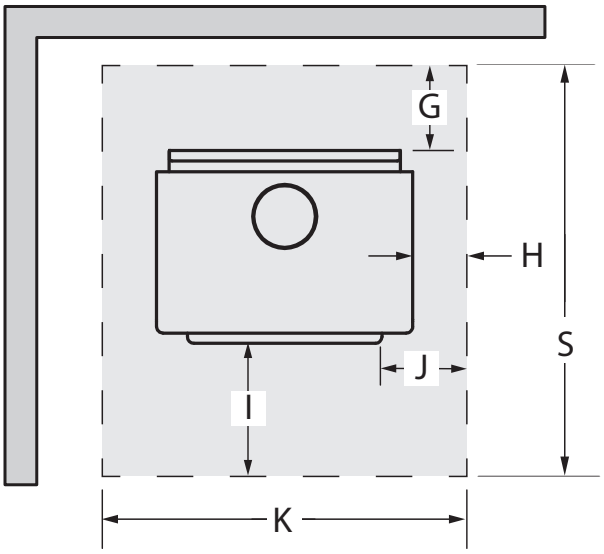
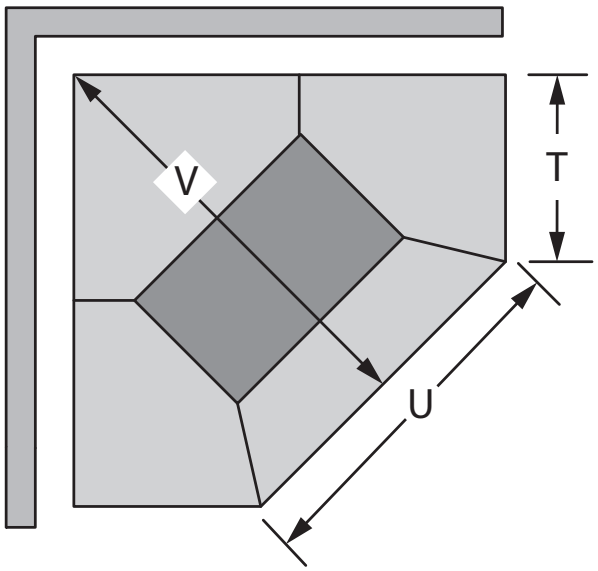
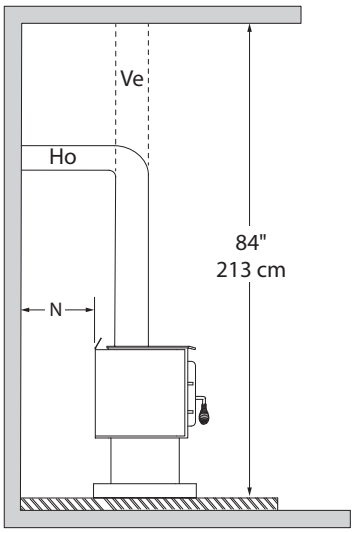


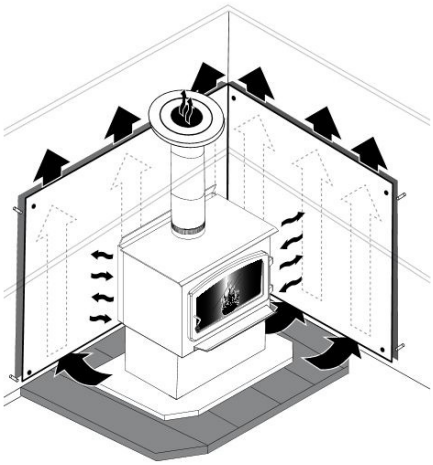
Figure 10: Floor Protection





[22] The floor protection at the back of the stove is limited to the stove's required clearance if such clearance is smaller than 8 inches (203 mm).
[23] Only required under the horizontal section (Ho) of the connector. Must exceed each side of the connector by at least 2 inches (51 mm).

5. Reducing Wall and Ceiling Clearances Safely



It is often desired to use as little space as possible when installing a wood stove. To do this, it is possible to reduce the clearances safely and install the stove closer to the walls by permanently installing a heat shield between the stove and the flammable material.

The rules for heat shields are sometimes complicated. Read and apply the instructions carefully. Some regions may have different regulations. Consult the local building code or contact the fire department for restrictions, inspection and installation requirements in the area.

Warning: To reduce the clearances of an appliance using a single wall pipe connector, the use of a heat shield certified with the single wall pipe connector to be used as close as 6" from combustible materials must be used. Only in this case, the same clearances as a certified double wall pipe connector can be used. Refer to the booklet in the screen options to obtain the dimensions to be respected.

5.1 Shield Construction Rules

– Adhesives used in shield construction must not ignite or lose adhesive qualities at temperatures likely to be encountered.
– Mounting hardware which extends from the shield surface into combustibles may be used only at the edges of the shield.
– Mounting hardware must allow full vertical ventilation.

A) Minimum clearance between the appliance top and an unshielded combustible ceiling: 39 7/8" (1013 mm)
B) Shield extension above the appliance: 20" (500 mm)
C) Minimum space behind the shield: 1" (25 mm). In Canada 7/8" (21 mm)
D) Clearance along the bottom of the shield: minimum 1" (25 mm) and maximum 3" (75 mm)
E) Minimum clearance along the top of the shield: 3" (75 mm)
F) Mounting hardware must not be located closer than 8" (200 mm) from the vertical centre line of the appliance.
G) Edge clearance for ceiling shields to side and back walls: 3" (75 mm)
H) Shield extension beyond each side of the appliance: 18" (450 mm)

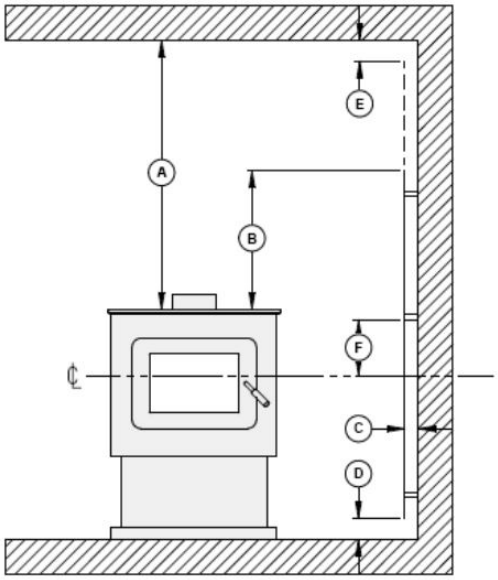


Figure 11: Heat shield clearances

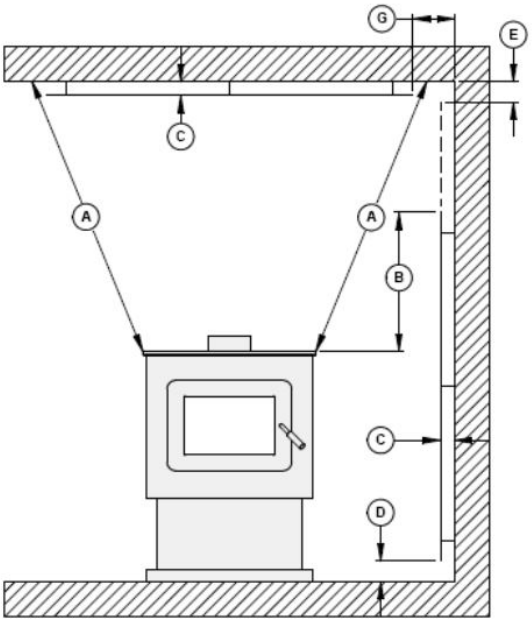


Figure 12: Heat shield clearances

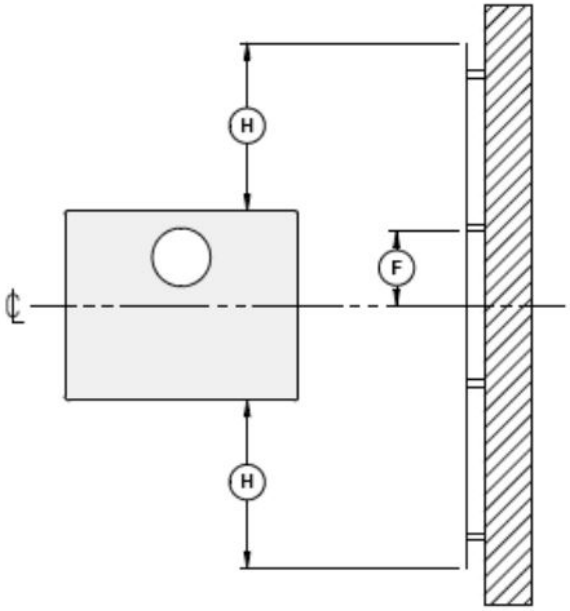


Figure 13: Heat shield clearances

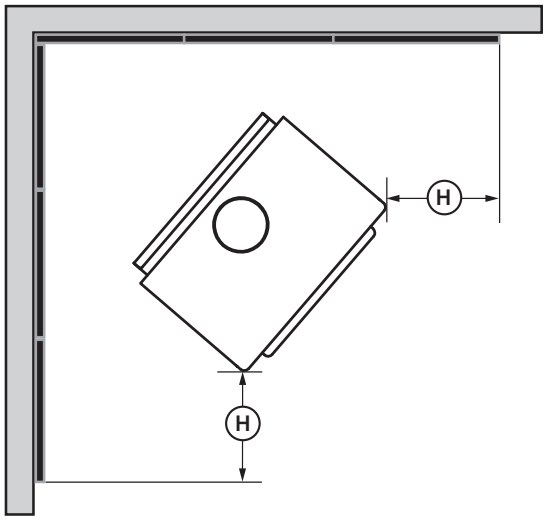
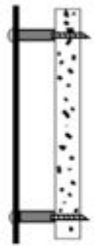
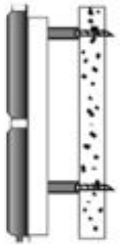
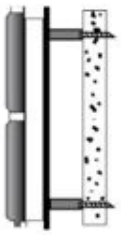
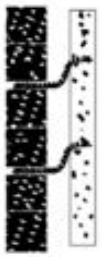
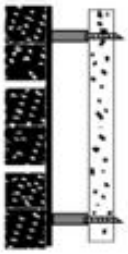


Figure 14: Heat shield clearances

ENGLISH

TYPE OF SHIELD	CLEARANCES MAY BE REDUCED BY THESE PERCENTAGES				
	SIDES AND REAR		TOP (CEILING)		
	CAN / USA (%)	USA MIN.	CAN / USA (%)	USA MIN.	
Sheet metal, a minimum of 24 gauge (0.61 mm) in thickness , spaced out at least 1" (25 mm)* by non-combustible spacers	67	12" (305 mm)	50	18" (457 mm)	
Ceramic tiles, or equivalent non-combustible material, on non-combustible board spaced out at least 1" (25 mm)* by non-combustible spacers	50	18" (457 mm)	33	24" (610 mm)	
Ceramic tiles, or equivalent non-combustible material, on non-combustible board, with a minimum of 24 gauge (0.61 mm) sheet metal backing spaced out at least 1" (25 mm)* by non-combustible spacers	67	12" (305 mm)	50	24" (610 mm)	
Brick, spaced out at least 1" (25 mm)* by non-combustible spacers	50	18" (457 mm)	N/A	N/A	
Brick, with a minimum of 24 gauge (0.61 mm) sheet metal backing, spaced out at least 1" (25 mm)* by non-combustible spacers	67	12" (305 mm)	N/A	N/A	

* In Canada this space can be ⅞" (21 mm)

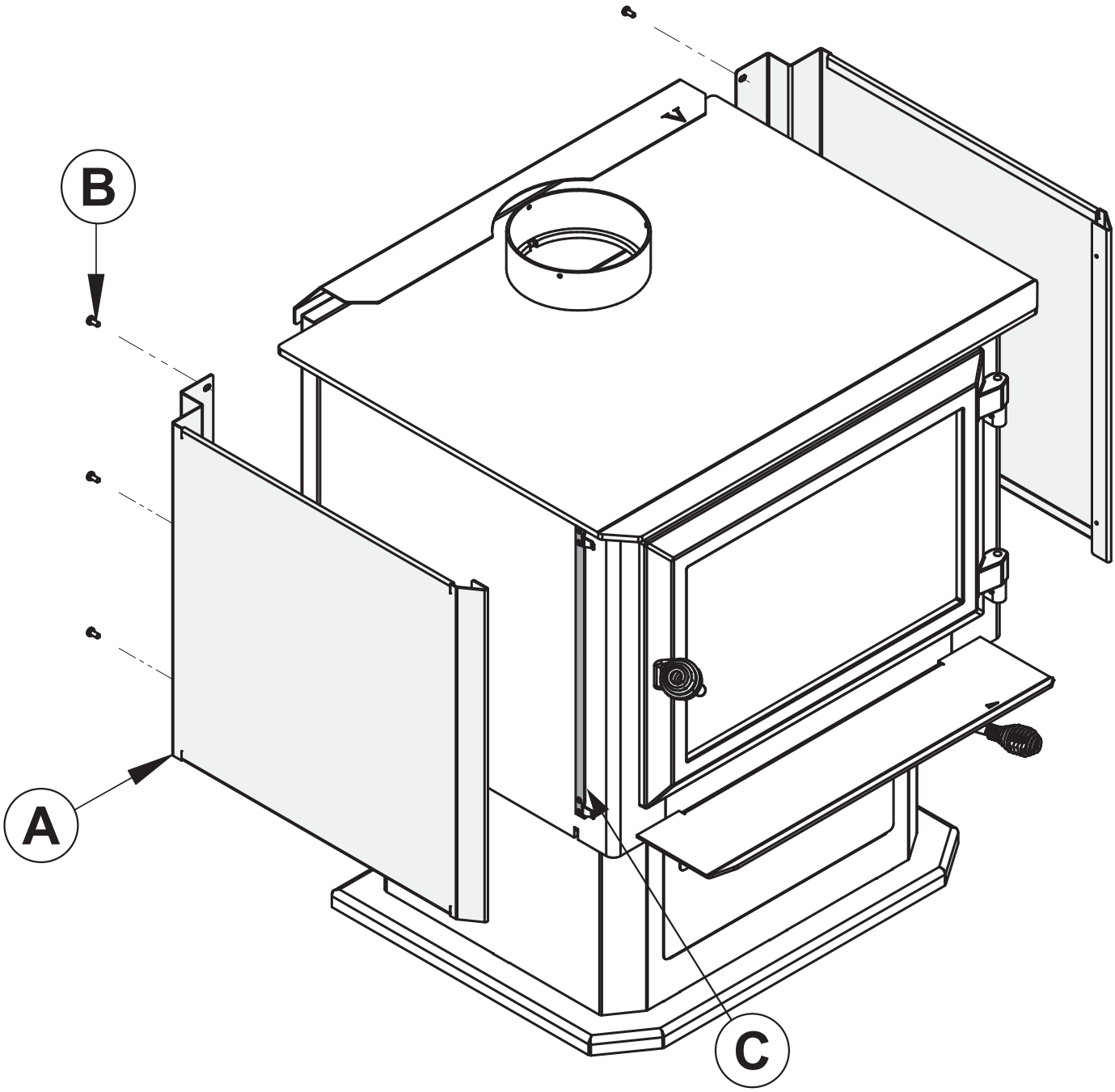
ENGLISH

6. INSTALLATION OF OPTIONS ON YOUR PRODUCT

6.1 Decorative Panels

THE IMAGES SHOWN ARE FOR GUIDANCE ONLY AND MAY BE DIFFERENT FROM YOUR PRODUCT, BUT THE ASSEMBLY REMAINS THE SAME.

To remove the decorative panel **(A)**, remove the screws **(B)** and push forward on the panel to unhook it from the bracket **(C).**

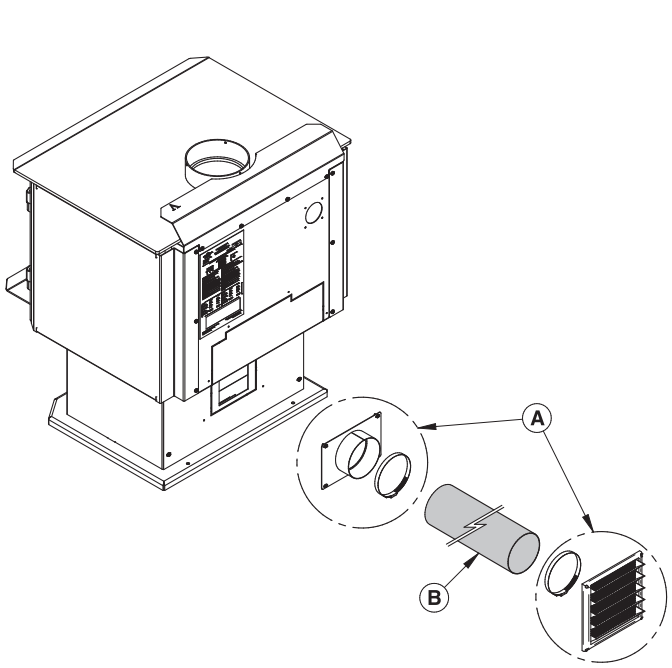


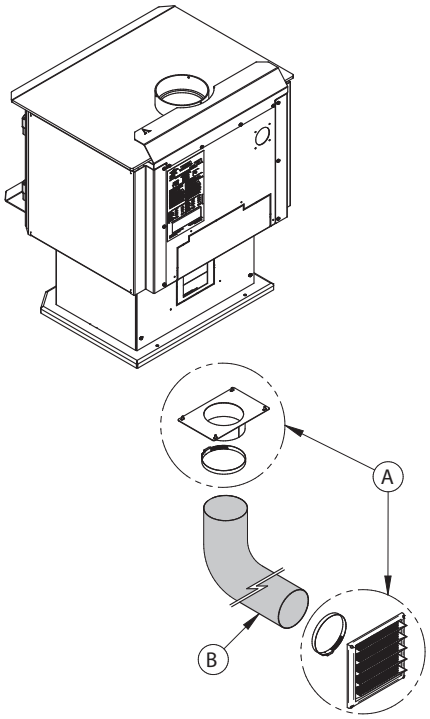
6.2 Optional Fresh Air Intake Kit Installation

THE IMAGES SHOWN ARE FOR GUIDANCE ONLY AND MAY BE DIFFERENT FROM YOUR PRODUCT, BUT THE ASSEMBLY REMAINS THE SAME.

This mobile home approved stove requires the installation of a fresh air intake kit **(A)** and an insulated fresh air intake pipe (HVAC type, must meet ULC S110 or UL 181 class 0 or class 1) **(B)**, sold separately. Refer to air intake kit installation instructions for more details.

Installation with pedestal





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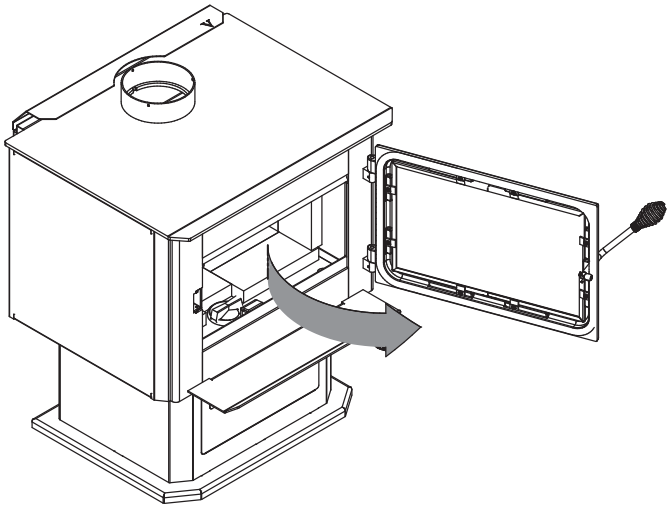
6.3 Optional Fire Screen Installation

THE IMAGES SHOWN ARE FOR GUIDANCE ONLY AND MAY BE DIFFERENT FROM YOUR PRODUCT, BUT THE ASSEMBLY REMAINS THE SAME.

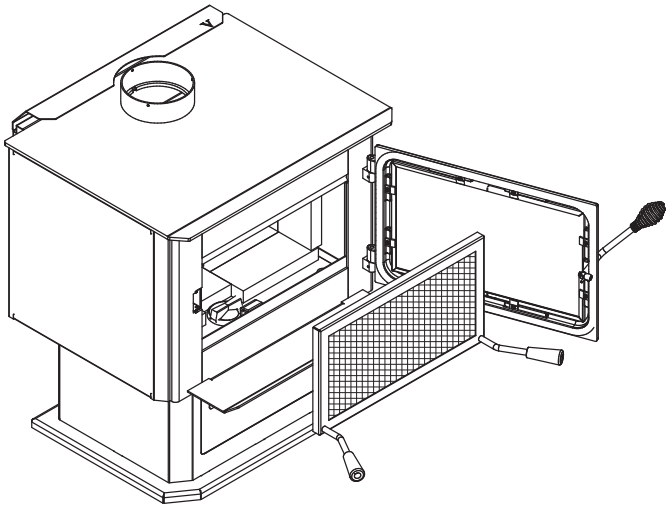
In the United States or in provinces with a particulate emission limit (eg. US EPA), the use of wood stoves with the door open with a rigid firescreen is prohibited.

It is prohibited to use this wood stove with a fire screen in a mobile home.

1. Open the door.



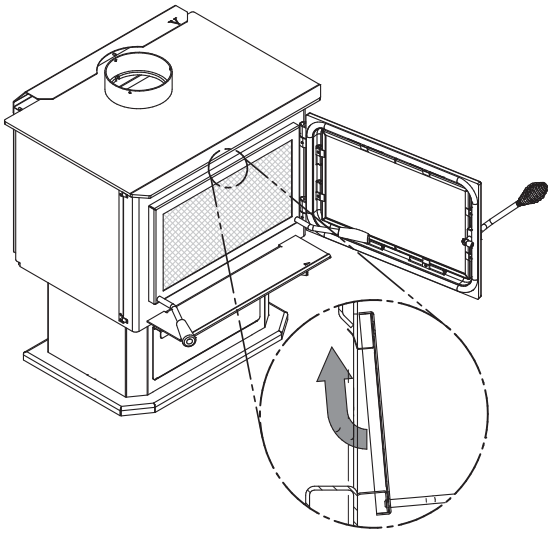
2. Hold the fire screen by the two handles and bring it close to the door opening.



3. Lean the upper part of the fire screen against the top door opening making sure to position the top fire screen brackets behind the primary air deflector.

4. Lift the fire screen upwards and push the bottom part towards the stove then let the fire screen rest on the bottom of the door opening.

Warning: Never leave the stove unattended while in use with the fire screen.



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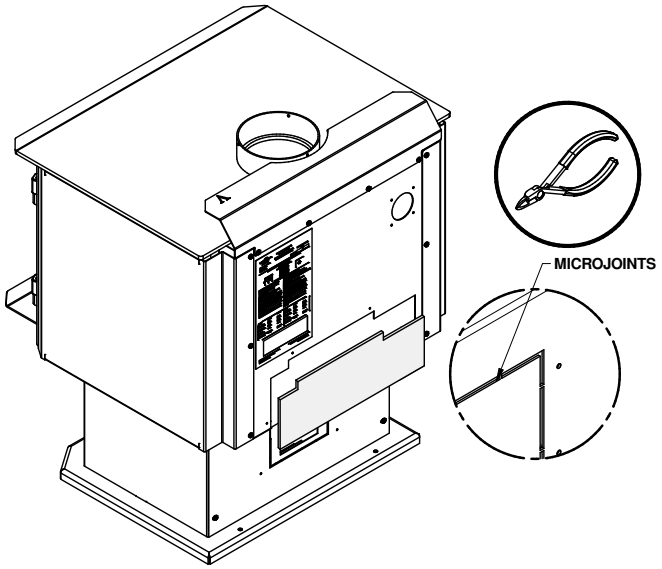
6.4 Optional Blower And Thermodisc Installation

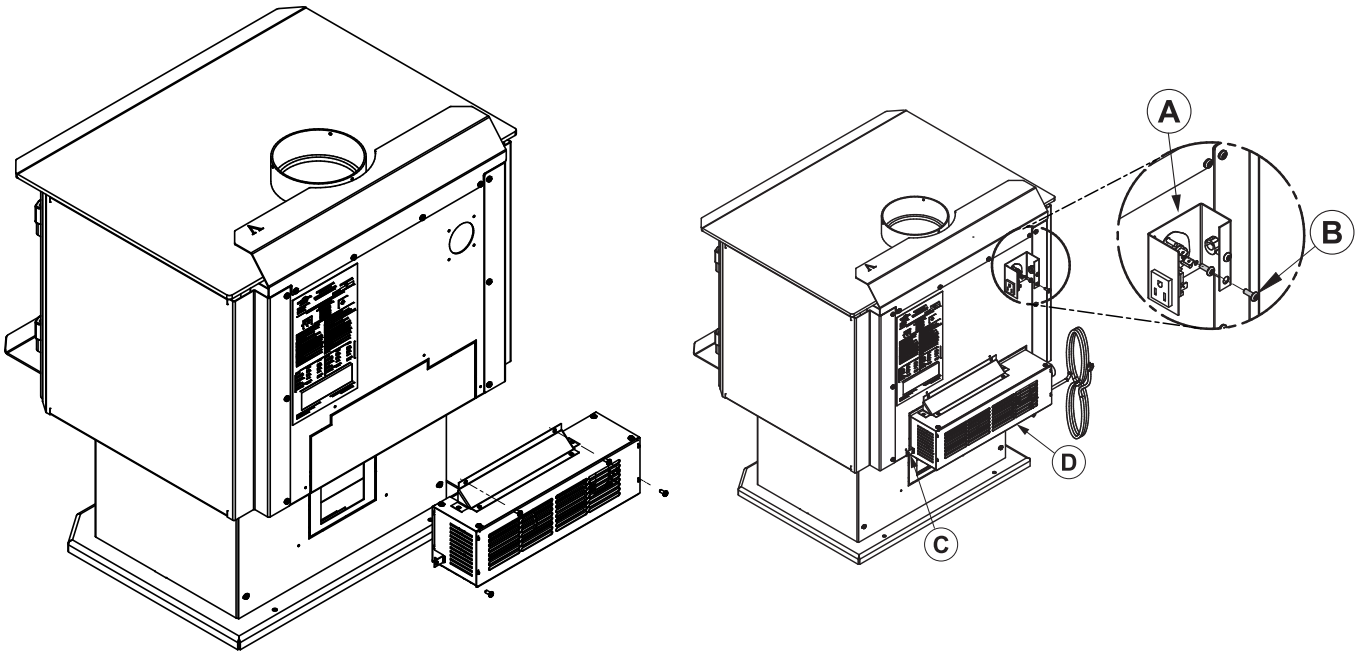
THE IMAGES SHOWN ARE FOR GUIDANCE ONLY AND MAY BE DIFFERENT FROM YOUR PRODUCT, BUT THE ASSEMBLY REMAINS THE SAME.

A blower and a thermodisc, sold separately, can be installed on the stove. The installation of the blower is identical for a stove on legs or pedestal. Thermodisc allows the blower to operate only when the stove is hot enough. See the instructions provided with the thermodisc for more details.

1. Remove the backplate by cutting the knockouts with pliers.



2. Screw the blower **(D)** in place using the screws **(C)** included in the installation manual. Screw the thermodisc **(A)** with the screws **(B)** supplied with the thermodisc on the back of the stove. **Ensure that the blower's power cord is not in contact with any surface of the stove to prevent electrical shock or fire damage. Do not run the power cord beneath the stove.**



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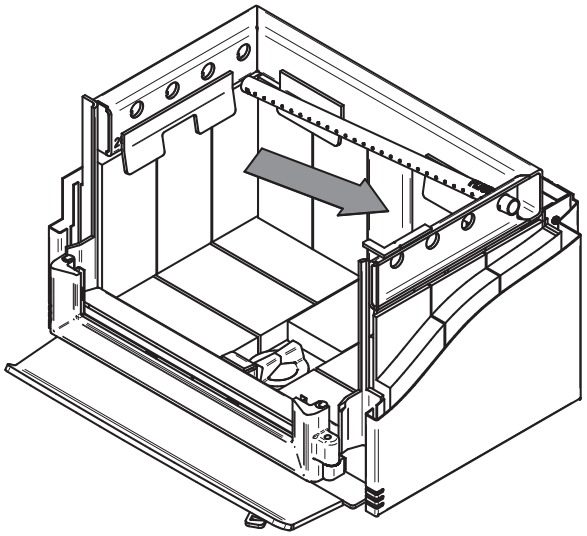
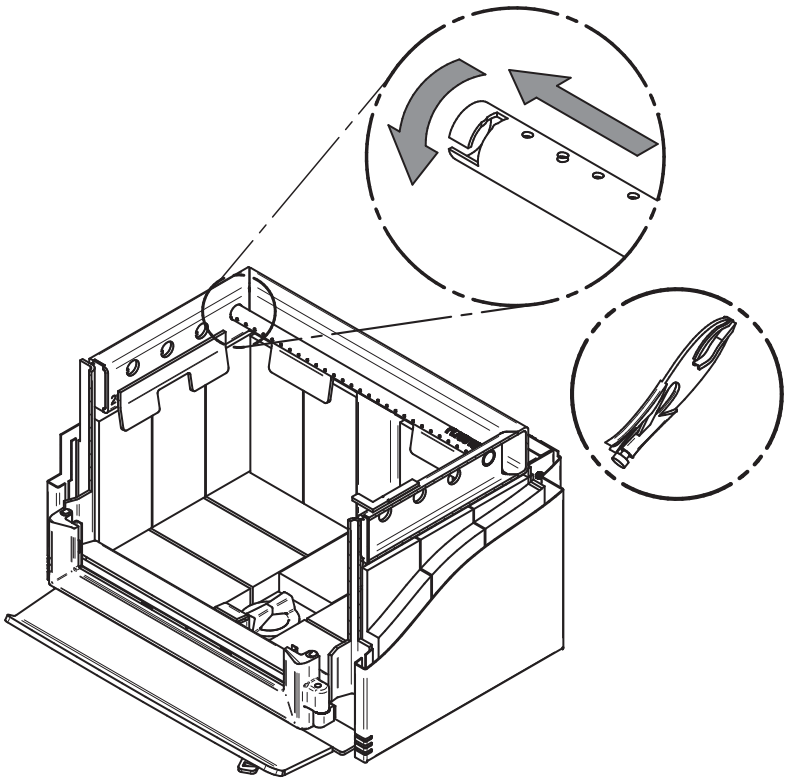
6.5 Air Tubes And Baffle Installation

1. Starting with the rear tube, lean and insert the right end of the secondary air tube into the rear right channel hole. Then lift and insert the left end of the tube into the rear left channel.



2. Align the notch in the left end of the tube with the key of the left air channel hole. Using a « Wise grip » hold the tube and lock it in place by turning the tube as shown. Make sure the notch reaches the end of the key way.



3. Put the baffle in place.
4. Repeat steps 1 and 2 for the three other tubes.
5. To remove the tubes use the above steps in reverse order.

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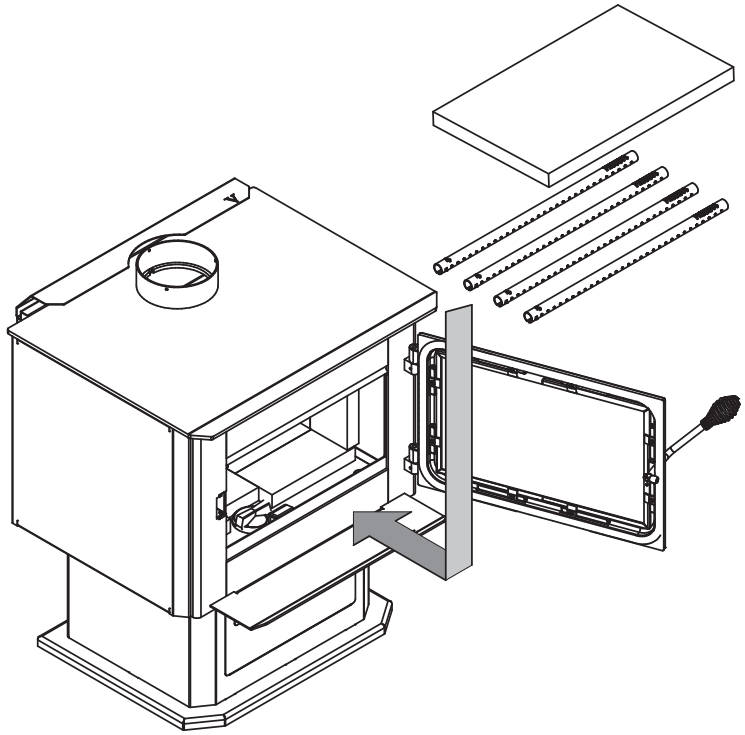
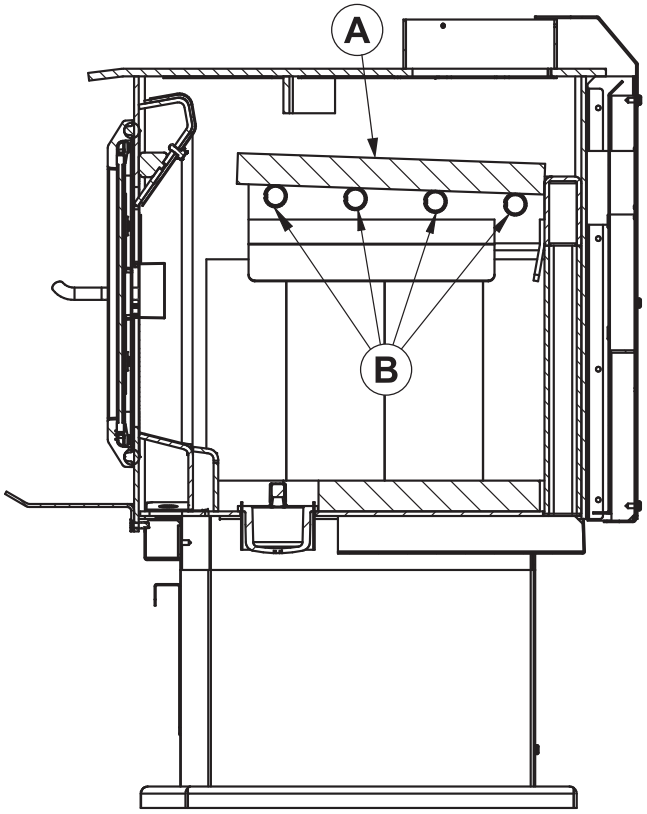
Note that secondary air tubes **(B)** *can be replaced without removing the baffle board* **(A)** *and that all tubes are not necessarely identical (look at the part number on the tube).*





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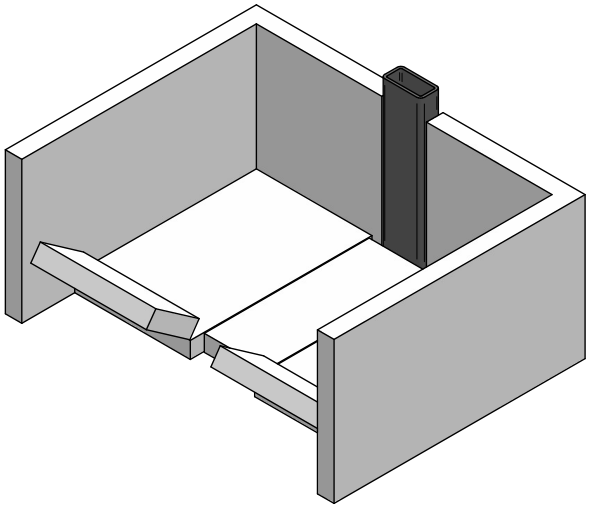
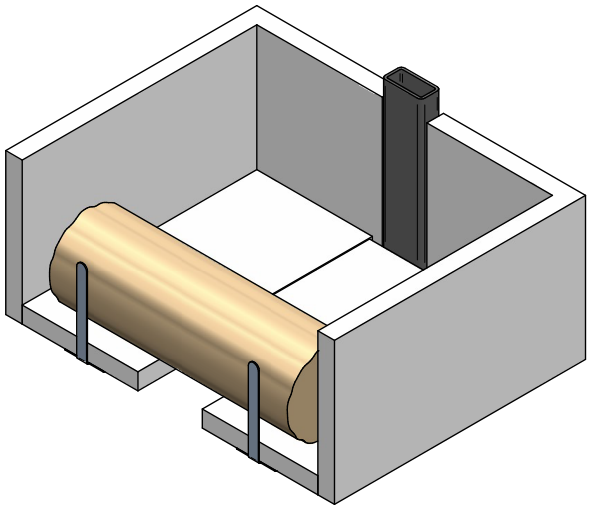
6.6 Log Retainers Installation

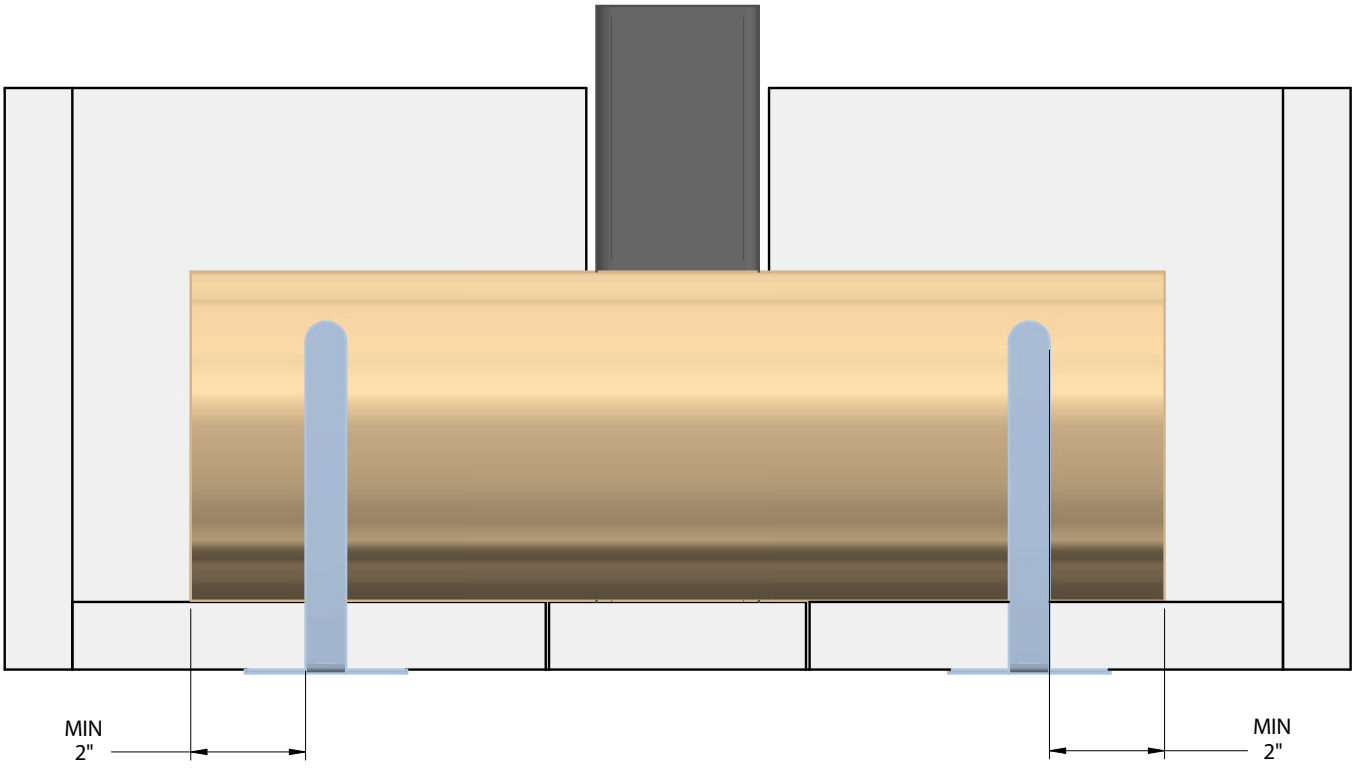
1.



2.



3.



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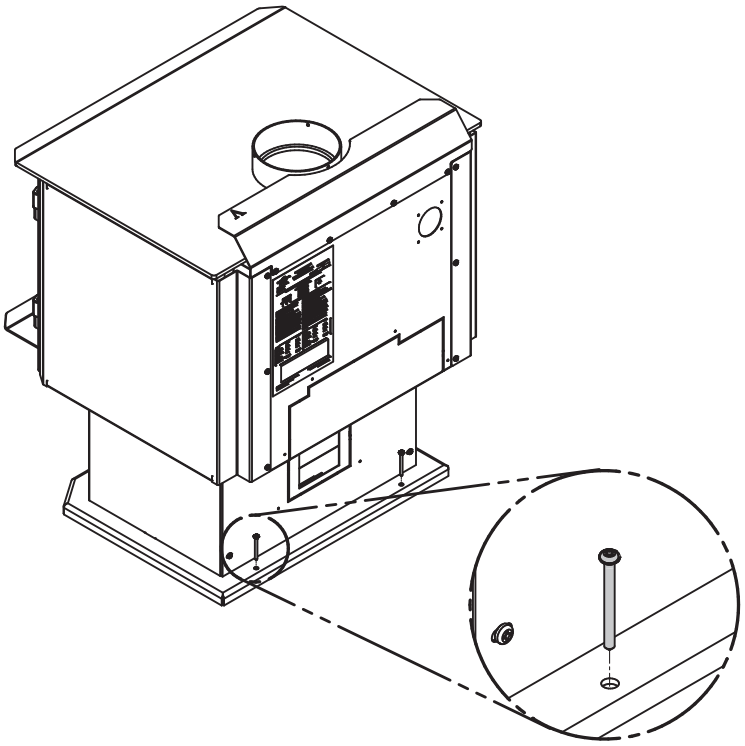
6.7 Mobile Home Installation

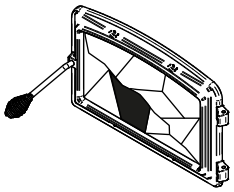
THE IMAGES SHOWN ARE FOR GUIDANCE ONLY AND MAY BE DIFFERENT FROM YOUR PRODUCT, BUT THE ASSEMBLY REMAINS THE SAME.

Screw the base on the floor with the proper hardware.



ENGLISH

7. Maintenance/Parts Replacement



Do not clean the glass when the stove is hot.

Do not abuse the glass door by striking or slamming shut.

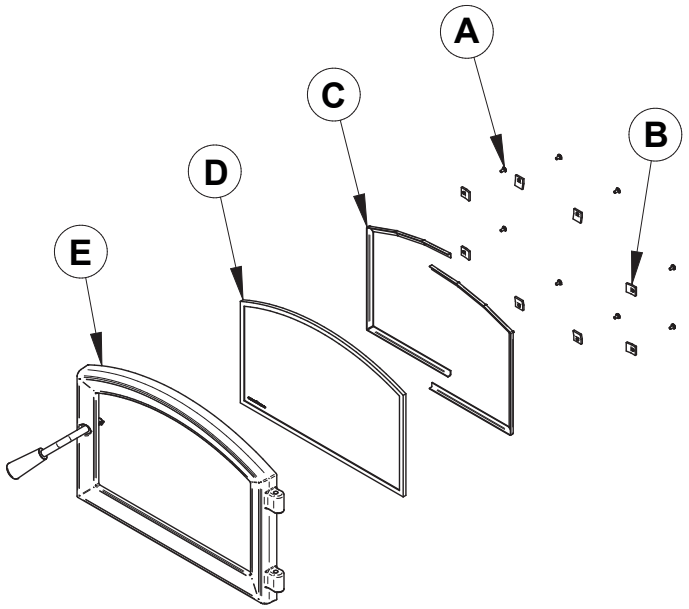
Do not use the stove if the glass is broken.

7.1 Replacement

The glass used is a ceramic glass, 5/32" (4 mm) thick, tested to reach temperatures up to 1400º F. If the glass breaks, it must be replaced with one having the same specification.

To remove or replace the glass (D):

THE IMAGES SHOWN ARE FOR GUIDANCE ONLY AND MAY BE DIFFERENT FROM YOUR PRODUCT, BUT THE ASSEMBLY REMAINS THE SAME.



1. Remove the door **(E)** from its hinges and lay it on a soft, flat surface.
2. Remove the eight screws **(A)**, the eight glass retainers **(B)**, and the metal frames **(C)**.
3. Remove the glass **(D)**. If it is damaged install a new one in place. The replacement glass must have a gasket all around (see procedure below).
4. Reinstall the glass, being careful to centre the glass in the door and not to over-tightening the retaining screw.

The two main causes of broken door glass are uneven placement in the door and over-tightening the retaining screws.

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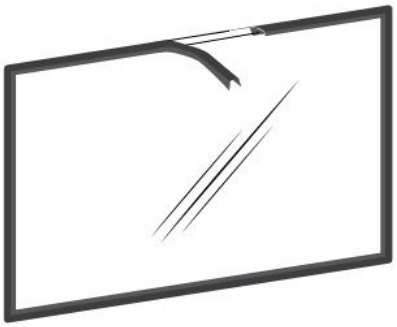
7.2 Gasket

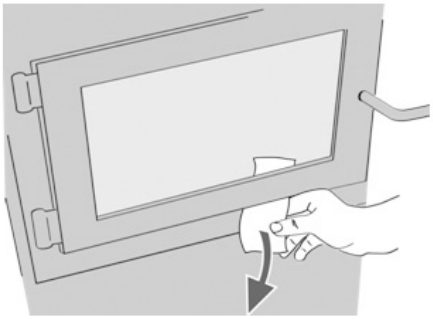


The glass gasket is flat, adhesive-backed, woven fibreglass. The gasket must be centred on the edge of the glass.

1. Follow the steps of the previous section to remove the glass.
2. Remove the old gasket and clean the glass thoroughly.
3. Peel back a section of the paper covering the adhesive and place the gasket on a table with the adhesive side up.
4. Stick the end of the gasket to the middle of one edge, then press the edge of the glass down onto the gasket, taking care that it is perfectly centred on the gasket.
5. Peel off more of the backing and rotate the glass. The gasket must not be stretched during installation.
6. Cut the gasket to the required length.
7. Pinch the gasket onto the glass in a U shape, all around the glass.

7.3 Door

In order for the stove to burn at its best efficiency, the door must provide a perfect seal with the firebox. The tightness of the door seal can be verified by closing and latching the door on a strip of paper. The test must be performed all around the door. If the paper slips out easily anywhere, either adjust the door or replace the gasket.



7.3.1 Adjustment

In order for the stove to burn at its best efficiency, the door must provide a perfect seal with the firebox. Therefore, the gasket should be inspected periodically to check for a good seal. The gasket seal may be improved with a simple latch mechanism adjustment:

1. Remove the split pin by pulling and turning it using pliers.
2. Turn the handle one counterclockwise turn to increase pressure.
3. Reinstall the split pin with a small hammer.

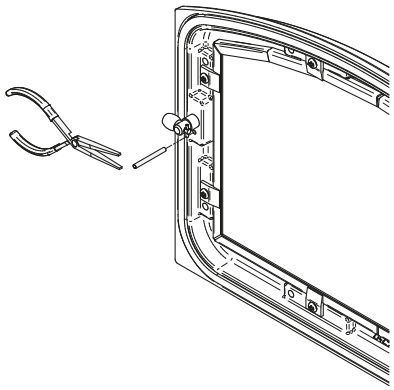


Figure 15: Removing the split pin

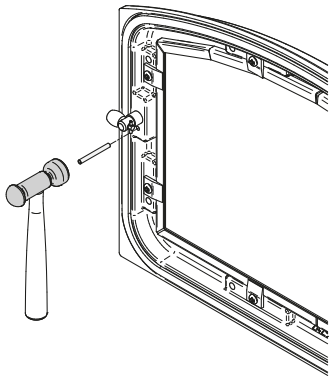


Figure 16: Installing the split pin

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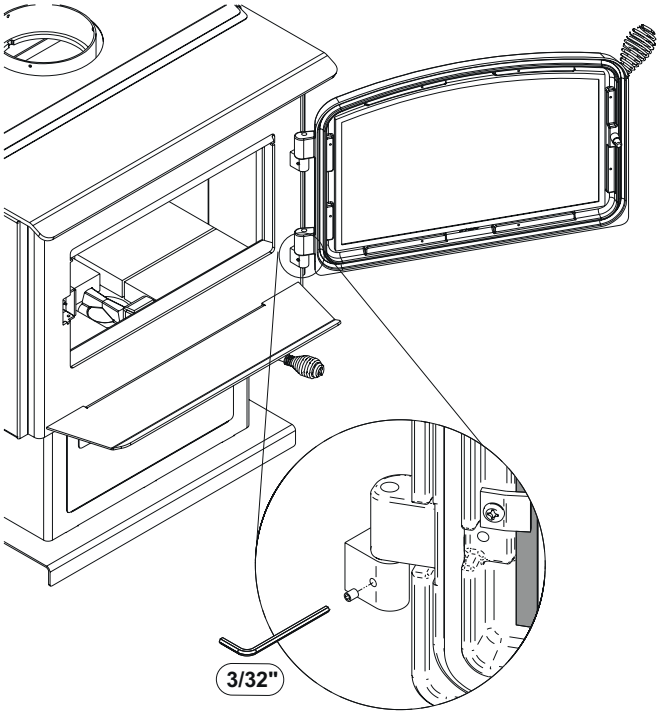
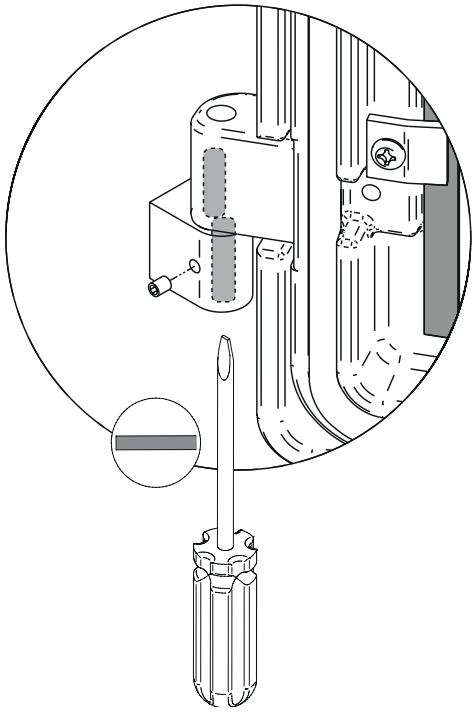
7.3.2 Door Alignment

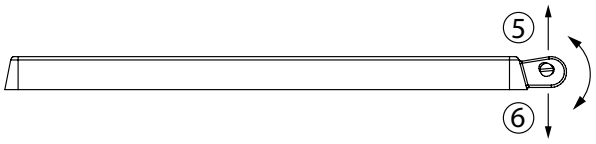
To align, open the door and loosen the pressures screws located on the lower and upper hinges of the door using a 3/32” Allen key to free the adjustable hinge rods.

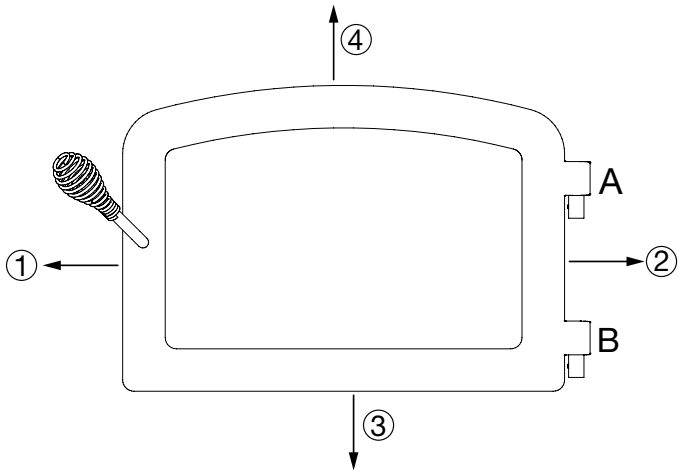




Using a flat screwdriver, turn the adjustable hinge rods in the direction shown to adjust the doors. Tighten all door hinge pressure screws when they are at the desired positions. Configurations 1-2-3-4-5-6, show in which direction these act on the adjustment of the door.

①		②		③		④	
	A		A		A		A
	B		B		B		B





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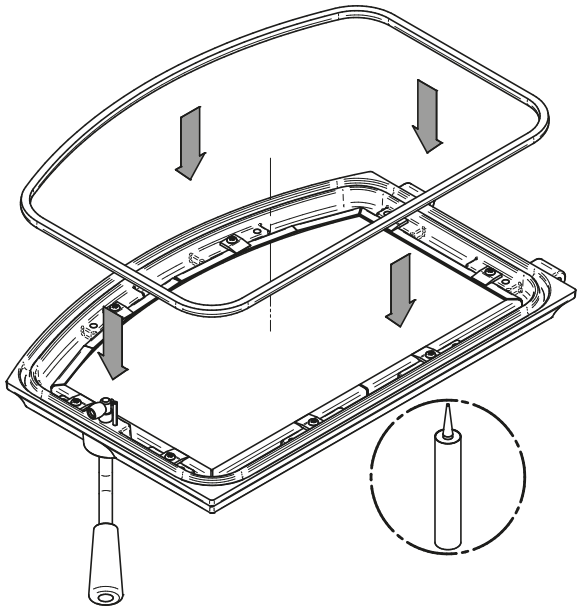
7.3.3 Gasket

It is important to replace the gasket with another having the same diameter and density to maintain a good seal.

1. Remove the door and place it face-down on something soft like a cushion of rags or a piece of carpet.
2. Remove the old gasket from the door. Use a screwdriver to scrape the old gasket adhesive from the door gasket groove.
3. Apply a bead of approximately 3/16" (5 mm) of high temperature silicone in the door gasket groove. Starting from the middle, hinges side, press the gasket into the groove. The gasket must not be stretched during installation.
4. Leave about ½" long of the gasket when cutting and press the end into the groove. Tuck any loose fibers under the gasket and into the silicone.
5. Close the door. Do not use the stove for 24 hours.



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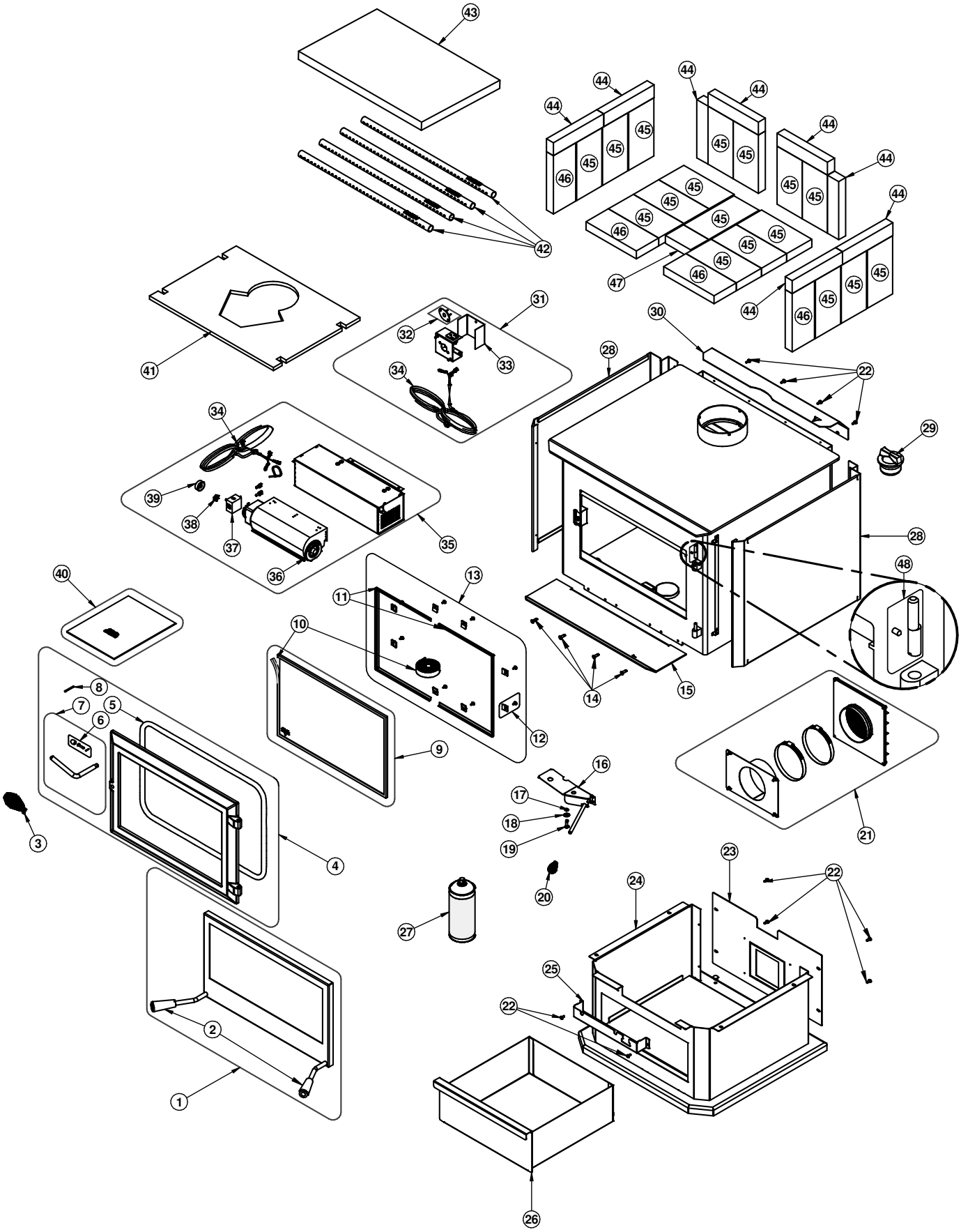
8. Exploded Diagram and Parts List



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IMPORTANT: THIS IS DATED INFORMATION. When requesting service or replacement parts for your unit, please provide the model number and the serial number. We reserve the right to change parts due to technology upgrades or availability. Contact an authorized dealer to obtain any of these parts. Never use substitute materials. Use of non-approved parts can result in poor performance and safety hazards.

#	Item	Description	Qty
1	AC01281	RIGID FIRESCREEN	1
2	SE74166	HANDLE 30898 REPLACEMENT KIT	2
3	AC07868	1/2" BLACK COIL HANDLE	1
4	SE24366	CAST IRON DOOR WITH HANDLE AND GASKET	1
5	AC06500	SILICONE AND 5/8" X 8' BLACK DOOR GASKET KIT	1
6	AC09185	DOOR LATCH KIT	1
7	SE70697	REPLACEMENT HANDLE WITH LATCH KIT	1
8	30101	SPRING TENSION PIN 5/32"Ø X 1 1/2"L	1
9	SE70978	GLASS WITH GASKET 19 9/16" X 12 1/8"	1
10	AC06400	3/4" X 6' FLAT BLACK SELF-ADHESIVE GLASS GASKET	2
11	PL70979	GLASS FRAME	2
12	SE53585	GLASS RETAINER KIT WITH SCREWS (12 PER KIT)	1
13	SE70988	GLASS FRAME KIT	1
14	30507	BLACK TORX SCREW WITH FLAT HEAD TYPE F 1/4-20 X 3/4"	4
15	PL70974	ASH SHELF	1
16	SE70904	AIR DAMPER ASSEMBLY	1
17	30187	STAINLESS WASHER ID 17/64" X OD 1/2"	1
18	30206	ZINC WASHER 5/16"ID X 3/4"OD	1
19	30506	SCREW PAN TORX TYPE F 1/4-20 X 1" BLACK	1
20	AC07866	1/4" BLACK COIL HANDLE	1
21	AC01336	5"Ø FRESH AIR INTAKE KIT FOR WOOD STOVE ON PEDESTAL	1
22	30154	BLACK SCREW #10 X 5/8" QUADREX #2 TYPE A	10
23	PL70823	PEDESTAL BACK PANEL	1
24	SE70975	BASE	1
25	PL70774	AIR CONTROL COVER	1
26	PL70838	ASH PAN	1
27	AC05959	METALLIC BLACK STOVE PAINT - 342 g (12oz) AEROSOL	1
28	PL70971	DECORATIVE PANEL	1
29	24096	ROUND CAST IRON ASH PLUG	1
30	PL70977	AIR DEFLECTOR	1
31	AC02055	QUICK CONNECT THERMODISC	1
32	44028	CERAMIC THERMODISC F110-20F	1
33	PL05530-02	THERMODISC BOX (COVER)	1
34	60013	POWER CORD 96" X 18-3 type SJT (50 pcs per carton)	2
35	SE53560	130 CFM BLOWER WITH VARIABLE SPEED CONTROL	1

#	Item	Description	Qty
36	44070	CROSSFLOW BLOWER SINGLE CAGE 130 CFM 115V-60Hz-56W	1
37	44080	RHEOSTAT WITHOUT NUT (MODEL KBMS-13BV)	1
38	44087	RHEOSTAT NUT	1
39	44085	RHEOSTAT KNOB	1
40	SE46256	HES350(VB00020) INSTRUCTION MANUAL KIT	1
41	21564	C-CAST 3.5 SERIE INSULATION TOP	1
42	PL70864	SECONDARY AIR TUBE	4
43	21585	VERMICULITE BAFFLE	1
44	PL36759	2" X 9" X 1 1/4" REFRACTORY BRICK	8
45	29010	4 1/2" X 9" X 1 1/4" REFRACTORY BRICK	17
46	29015	4" X 9" X 1 1/4" REFRACTORY BRICK	4
47	PL36760	3 1/4" X 4 1/2" X 1 1/4" REFRACTORY BRICK	1
48	SE74167	DOOR HINGE REPLACEMENT KIT	1

9. VENTIS LIMITED LIFETIME WARRANTY

The warranty of the manufacturer extends only to the original retail purchaser and is not transferable. This warranty covers brand new products only, which have not been altered, modified nor repaired since shipment from factory. Proof of purchase (dated bill of sale), model name and serial number must be supplied when making any warranty claim to your VENTIS dealer.

This warranty applies to normal residential use only. This warranty applies to normal residential use only. This warranty is void if the unit is used to burn material other than cordwood (for which the unit is not certified by EPA) and void if not operated according to the owner's manual. Damages caused by misuse, abuse, improper installation, lack of maintenance, over firing, negligence or accident during transportation, power failures, downdrafts, venting problems or under-estimated heating area are not covered by this warranty. The recommended heated area for a given appliance is defined by the manufacturer as its capacity to maintain a minimum acceptable temperature in the designated area in case of a power failure.

This warranty does not cover any scratch, corrosion, distortion, or discoloration. Any defect or damage caused by the use of unauthorized or other than original parts voids this warranty. An authorized qualified technician must perform the installation in accordance with the instructions supplied with this product and all local and national building codes. Any service call related to an improper installation is not covered by this warranty.

The manufacturer may require that defective products be returned or that digital pictures be provided to support the claim. Returned products are to be shipped prepaid to the manufacturer for investigation. Transportation fees to ship the product back to the purchaser will be paid by the manufacturer. Repair work covered by the warranty, executed at the purchaser's domicile by an authorized qualified technician requires the prior approval of the manufacturer. All parts and labour costs covered by this warranty are limited according to the table below.

The manufacturer, at its discretion, may decide to repair or replace any part or unit after inspection and investigation of the defect. The manufacturer may, at its discretion, fully discharge all obligations with respect to this warranty by refunding the wholesale price of any warranted but defective parts. The manufacturer shall, in no event, be responsible for any uncommon, indirect, consequential damages of any nature, which are in excess of the original purchase price of the product. **A one-time replacement limit applies to all parts benefiting from lifetime coverage.** This warranty applies to products purchased after March 1st, 2015.

DESCRIPTION	**WARRANTY APPLICATION**	
	PARTS	**LABOUR**
Combustion chamber (welds only), castings and convector air-mate	Lifetime**	4 years
Plating* (defective manufacture) - subject to limitations above Ceramic glass (thermal breakage only*)	Lifetime**	N/A
Stainless steel firebox components, vermiculite, C-Cast or equivalent baffle* and secondary air tubes*, glass retainers and handle assembly	5 years**	3 years
Surrounds and heat shields, ash drawer, steel legs, pedestal and trim (aluminum extrusions)	5 years	N/A
Carbon steel firebox components	3 years	2 years
Blowers, heat sensors, switches, rheostat, wiring and electronics	2 years	1 year
Paint (peeling*), gaskets, insulations, refractory bricks (fireplace only**) and ceramic fibre blankets	1 year	N/A
All parts replaced under the warranty	90 days	N/A

Pictures required** ****Limited to one replacement

Labour cost and repair work to the account of the manufacturer are based on a predetermined rate schedule and must not exceed the wholesale price of the replacement part.

Shall your unit or a components be defective, contact immediately your **VENTIS** dealer. To accelerate processing of your warranty claim, make sure to have on hand the following information when calling:

- Your name, address and telephone number
- Bill of sale and dealer's name
- Installation configuration
- Serial number and model name as indicated on the nameplate fixed to the back of your unit
- Nature of the defect and any relevant information

Before shipping your unit or defective component to our plant, you must obtain an Authorization Number from your VENTIS dealer. Any merchandise shipped to our plant without authorization will be refused automatically and returned to sender.

Wood_Revision : May 2021

ENGLISH

Stove Builder International inc.
250, rue de Copenhague,
St-Augustin-de-Desmaures (Québec) Canada
G3A 2H3
418-908-8002
https://www.occanada.com/ca/en/
tech@sbi-international.com

REFER TO INTERTEK'S DIRECTORY OF BUILDING PRODUCTS FOR DETAILED INFORMATION
SE RÉFÉRER AU RÉPERTOIRE DES PRODUITS HOMOLOGUÉS D'INTERTEK POUR PLUS D'INFORMATION

Intertek
July/Juillet 2020
Control number: 4002461

STANDARDS / NORMES D'ESSAI:
Certified to/Certifié selon ULC S627
Certified to/Certifié selon UL 1482
Certified to/Certifié selon UL 737
Certified to/Certifié selon CSA B415.1-10
Certified to/Certifié selon ASTM E3053-17
Certified to/Certifié selon ASTM E2515-11 (R2017)

LISTED SOLID FUEL BURNING APPLIANCE

POÊLE À COMBUSTIBLE SOLIDE HOMOLOGUÉ

MODEL / MODÈLE :

FW3500

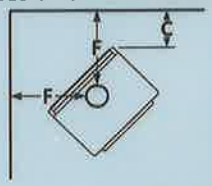
Serial Number / No. de Série: 0

Clearances to combustibles / Dégagements aux combustibles

CANADA

Single wall connector / Tuyau à paroi simple		Double wall connector / Tuyau à paroi double	
A: 13.75 in./po.	(349 mm)	A: 8 in./po.	(203 mm)
B: 22 in./po.	(559 mm)	B: 19 in./po.	(483 mm)
C: 12 in./po.	(305 mm)	C: 12 in./po.	(305 mm)
D: 18.5 in./po.	(470 mm)	D: 12.75 in./po.	(324 mm)
E: 32.875 in./po	(835 mm)	E: 29.875 in./po	(759 mm)
F: 22.75 in./po.	(578 mm)	F: 22.75 in./po.	(578 mm)

Floor-ceiling/plancher-plafond: 84 in./po. (213cm)



U.S.A.

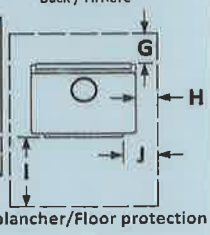
MOBILE HOME
MAISONS MOBILES
Double wall connector
Tuyau à paroi double

A: 10 in./po.	(254 mm)	D: 14.75 in./po.	(375 mm)
B: 25 in./po.	(635 mm)	E: 35.875 in./po.	(911 mm)
C: 12 in./po.	(305 mm)	F: 22.75 in./po.	(578 mm)

Single wall connector / Tuyau à paroi simple		Double wall connector / Tuyau à paroi double	
A: 13.75 in./po.	(349 mm)	A: 8 in./po.	(203 mm)
B: 22 in./po.	(559 mm)	B: 19 in./po.	(483 mm)
C: 12 in./po.	(305 mm)	C: 12 in./po.	(305 mm)
D: 18.5 in./po.	(470 mm)	D: 12.75 in./po.	(324 mm)
E: 32.875 in./po	(835 mm)	E: 29.875 in./po.	(759 mm)
F: 22.75 in./po.	(578 mm)	F: 22.75 in./po.	(578 mm)

* See owner's manual for other clearances with lowered ceiling/
voir manuel d'installation pour autres dégagements avec plafond abaissé

Back / Arrière



Protection de plancher/Floor protection

CANADA		U.S.A.	
G: 8 in./po.	(203 mm)	I: 16 in./po.	(406 mm)
H: 8 in./po	(203 mm)	J: 8 in./po.	(203 mm)
I: 18 in./po.	(457 mm)	K: 36 in./po.	(914 mm)
K: 48 in./po.	(1219 mm)		

PREVENT HOUSE FIRES

- Install and use only in accordance with the manufacturer's installation and operating instructions.
- Contact local building or fire officials about restrictions and installation inspection in your area.
- Use listed 152 mm /6 in. diameter single or double wall connectors with prefabricated chimneys approved UL 103 HT (US) and ULC S629 (CAN) suitable for solid fuels or lined masonry chimneys.
- See local building code and manufacturer's instructions for precautions required for passing a chimney through a combustible wall or ceiling.
- Do not pass connector through combustible wall or ceiling.
- Do not connect this unit to a chimney serving another appliance.
- Use with wood only. Do not use other fuels.
- Operate only with door closed or door open with firescreen installed. Open door or remove firescreen to feed the stove only.
- Do not obstruct the space underneath the stove.
- Do not use grate or elevate fire. Build fire directly on hearth.
- Do not overfire. If heater or chimney connector glows, you are overfiring.
- Inspect and clean chimney frequently. Under certain condition of use, creosote buildup may occur rapidly.
- Replace glass with ceramic type only.
- Install unit on a non-combustible material extending as shown above on this label.
- Suitable for mobile-home installation. Floor protection may vary from pedestal to legs version refer to owner's manual.
- Combustion air openings shall not be obstructed.
- This wood heater needs periodic inspection and repair for proper operation. Consult the owner's manual for further information. It is against US federal regulations to operate this wood heater in a manner inconsistent with the operating instructions in the owner's manual.

PRÉVENEZ LES INCENDIES

- Installer et utiliser conformément au manuel d'utilisation du fabricant.
- Contacter les autorités de votre localité ayant juridiction concernant les restrictions et inspections d'installation.
- Utiliser des tuyaux d'évacuation à parois simple ou double homologués d'un diamètre de 6 po. (152 mm) avec une cheminée préfabriquée approuvée UL 103 HT (US) et ULC S629 (CAN) pour utilisation au bois ou une cheminée de maçonnerie gainée.
- Voir les codes locaux et le manuel d'installation du manufacturier pour le passage de la cheminée à travers un mur ou un plafond combustible.
- Ne pas traverser un plafond ou un mur combustible avec un tuyau d'évacuation.
- Ne pas raccorder cet appareil à une cheminée déservant un autre appareil.
- Brûler du bois seulement. Ne pas utiliser d'autres combustibles.
- Garder la porte fermée ou le pare-étincelle en place en tout temps. Ouvrir la porte ou retirer le pare-étincelle que lors du chargement.
- Ne rien entreposer sous l'appareil.
- Ne pas utiliser de grilles ou de chenets pour surélever le feu.Préparer le feu directement sur l'âtre.
- Ne pas surchauffer. Si l'appareil ou le tuyau rougit, il y a surchauffe.
- Inspecter et nettoyer la cheminée fréquemment. Sous certaines conditions, l'accumulation de créosote peut être rapide.
- Remplacer la vitre seulement avec un verre de céramique.
- Installer l'appareil sur une plaque non combustible tel qu'indiqué sur l'étiquette.
- Poêle approuvé pour maison mobile.La protection de plancher peut varier entre la version plédestal et sur pattes. Voir le manuel d'instructions.
- Les entrées d'air servant à la combustion ne doivent pas être obstruées.
- Cet appareil de chauffage requiert des inspections et réparations périodiques. Consulter le manuel de l'utilisateur pour plus d'information. Opérer cet appareil de chauffage de façon inconsistente par rapport au manuel de l'utilisateur consiste une violation de la loi fédérale (USA).

Optional blower: (115V, 0.8A, 60Hz) — Option ventilateur: (115V, 0.8A, 60Hz)

U.S. ENVIRONMENTAL PROTECTION AGENCY Certified to comply with 2020 particulate emission standards using cordwood.
AGENCE DE PROTECTION DE L'ENVIRONNEMENT DES É.-U. Conforme aux normes d'émission de particules de 2020 avec bûche de bois.

Weighted average emission rate / Moyenne pondérée des émissions : 1.6 g/h
Tested and certified in compliance with CFR 40 part 60, subpart AAA, section 60.534(a)(1(ii))

WARNING: This product can expose you to carbon monoxide, which is known to the State of California to cause cancer, birth defects or other reproductive harm.
(For more information go to www.p65warnings.ca.gov)

CAUTION

- HOT WHILE IN OPERATION.
- DO NOT TOUCH. KEEP CHILDREN, CLOTHING AND FURNITURE AWAY.
- CONTACT MAY CAUSE SKIN BURNS. SEE NAME-PLATE AND INSTRUCTIONS.

ATTENTION

- CHAUD EN FONCTIONNEMENT.
- NE PAS TOUCHER. GARDER LES ENFANTS, LES VÊTEMENTS ET LES MEUBLES ÉLOIGNÉS.
- UN CONTACT AVEC LA PEAU PEUT OCCASIONNER DES BRÛLURES. VOIR LES INSTRUCTIONS.

Made in St-Augustin-de-Desmaures (Qc), Canada
14/03/2022 (# test)

SBI
Fabricant de poêles international
Stove Builder International

Fabriqué à St-Augustin-de-Desmaures (Qc), Canada
14/03/2022 (# test)

27847

C ETL LISTED US

Intertek

Control number: 4002461
(March/Mars 2022)

REFER TO INTERTEK'S DIRECTORY OF BUILDING PRODUCTS FOR DETAILED INFORMATION
SE RÉFÉRER AU RÉPERTOIRE DES PRODUITS HOMOLOGUÉS D'INTERTEK POUR PLUS D'INFORMATION

STANDARDS / NORMES D'ESSAI:

Certified to/Certifié selon CSA B415.1-10
Certified to/Certifié selon ASTM E3053-17
Certified to/Certifié selon ASTM E2515-11 (R2017)

LISTED SOLID FUEL BURNING INSERT APPLIANCE

APPAREIL ENCASTRABLE À COMBUSTIBLE SOLIDE HOMOLOGUÉ

MODEL / MODÈLE :

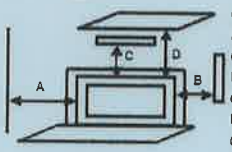
CW3500

Serial Number / No. de Série: 999998

Clearances to combustibles / Dégagements aux combustibles

Measured from insert body

Mesuré à partir de la chemise de l'encastrable



Combustible side wall
Mur côté adjacent
Combustible side surround [1]
Parement latéral combustible [1]
Combustible top surround [1]
Parement supérieur combustible [1]
Combustible mantle shelf [1]
Tablette combustible [1]

A: 19 in./po. (483 mm)
B: 9 in./po. (229 mm)
C: 27 in./po. (686 mm)
D: 27 in./po. (686 mm)

Floor protection
Protection de plancher

E: 16 in./po. (406 mm) USA
18 in./po. (457 mm) CANADA
I: 8 in./po. (203 mm) CANADA
J: 8 in./po. (203 mm) USA

Blower / Ventilateur:
115VOLTS, 0.8 AMPS, 60Hz

[1] Subject to a maximum protrusion (consult owner's manual) / Sujet à une saillie maximale (consultez le manuel d'instructions)

PREVENT HOUSE FIRES

- Install and use only in accordance with the manufacturer's installation and operating instructions.
- Contact local building or fire officials about restrictions and installation inspection in your area.
- Use with solid wood fuel only. Do not use other fuels.
- Risk of smoke and flame spillage. Operate only with door closed or door open with screen door installed. Open door or remove screen door only to feed the stove.
- Do not connect this unit to a chimney serving another appliance.
- Install only in masonry fireplaces. Do not remove bricks or mortar from masonry fireplace.
- The non-combustible floor protection in front of the unit should have an R value equal or greater than 2.00 extending 27 inches (686 mm) in front of the insert if the hearth elevation is lower than 6 inches (152 mm) or extend 16 inches (406 mm) (USA), 18 inches (457 mm) (CANADA) without a R value if the hearth elevation is higher than 6 inches (152 mm).
- Connect to a code-approved masonry chimney or listed factory-built fireplace chimney with a direct flue connector into the first chimney liner section.
- Do not overfire. If stove or chimney connector glows, your are overfiring.
- Inspect and clean chimney frequently. Under certain conditions of use, creosote buildup may occur rapidly.
- Do not use grate or elevate fire. Build wood fire directly on hearth.
- Replace glass only with ceramic glass.
- This wood heater needs periodic inspection and repair for proper operation. Consult the owner's manual for further information. It is against US federal regulations to operate this wood heater in a manner inconsistent with the operating instructions in the owner's manual.

PRÉVENEZ LES INCENDIES

- Installer et utiliser conformément au manuel d'utilisation du fabricant.
- Contacter les autorités de votre localité ayant juridiction concernant les restrictions et inspections d'installation.
- Utiliser avec le bois seulement. Ne pas utiliser d'autres combustibles.
- Risque de fuite de fumée et de flammes. Utiliser l'appareil la porte fermée ou ouverte avec le pare-étincelle en place uniquement. Ouvrir la porte ou retirer le pare-étincelle seulement lors du chargement.
- Ne pas raccorder à un conduit de fumée servant déjà pour un autre appareil.
- Installer seulement dans un foyer de maçonnerie. Ne pas enlever les briques ou le mortier du foyer de maçonnerie.
- La protection de plancher incombustible au devant de l'encastrable devrait avoir un facteur d'isolation R égal ou supérieure à 2.00 et se prolonger 27 pouces (686 mm) au devant de l'appareil lorsque l'âtre possède moins de 6 pouces (152 mm) d'élévation et se prolonger 16 pouces (406 mm) (USA), 18 pouces (457 mm) (CANADA), sans facteur d'isolation R au devant de l'encastrable lorsque l'âtre possède plus de 6 pouces (152 mm) d'élévation.
- Raccorder à une cheminée de maçonnerie respectant les codes ou à une cheminée préfabriquée homologuée, directement à la première section de cheminée gainée.
- Ne pas surchauffer. Si l'appareil ou le tuyau rougit, il y a surchauffe.
- Inspecter et nettoyer la cheminée fréquemment. Dans certaines conditions, la formation de créosote peut être rapide.
- Ne pas utiliser de chenets ou de grilles pour élever le feu. Préparer le feu directement sur l'âtre.
- Remplacer la vitre avec un verre de céramique.
- Cet appareil de chauffage requiert des inspections et réparations périodiques. Consulter le manuel de l'utilisateur pour plus d'information. Opérer cet appareil de chauffage de façon inconsistente par rapport au manuel de l'utilisateur consiste une violation de la loi fédérale (USA).

U.S. ENVIRONMENTAL PROTECTION AGENCY Certified to comply with 2020 particulate emission standards using cordwood.
AGENCE DE PROTECTION DE L'ENVIRONNEMENT DES É.-U. Conforme aux normes d'émission de particules de 2020 avec bûche de bois.
Weighted average emission rate: / Moyenne pondérée des émissions: 1.6 g/h
Tested and certified in compliance with CFR 40 part 60, subpart AAA, section 60.534(a)(1(ii))

WARNING: This product can expose you to carbon monoxide, which is known to the State of California to cause cancer, birth defects or other reproductive harm. (For more information go to www.p65warnings.ca.gov)

CAUTION

- HOT WHILE IN OPERATION.
- DO NOT TOUCH. KEEP CHILDREN, CLOTHING AND FURNITURE AWAY.
- CONTACT MAY CAUSE SKIN BURNS. SEE NAME-PLATE AND INSTRUCTIONS.

ATTENTION

- CHAUD EN FONCTIONNEMENT.
- NE PAS TOUCHER. GARDER LES ENFANTS, LES VÊTEMENTS ET LES MEUBLES ÉLOIGNÉS.
- UN CONTACT AVEC LA PEAU PEUT OCCASIONNER DES BRÛLURES. VOIR LES INSTRUCTIONS.

Made in St-Augustin-de-Desmaures (Qc), Canada
14/03/2022 (# test)

SBI
Fabricant de poêles international
Stove Builder International

Fabriqué à St-Augustin-de-Desmaures (Qc), Canada
14/03/2022 (# test)

27898

REFER TO INTERTEK'S DIRECTORY OF BUILDING PRODUCTS FOR DETAILED INFORMATION
SE RÉFÉRER AU RÉPERTOIRE DES PRODUITS HOMOLOGUÉS D'INTERTEK POUR PLUS D'INFORMATION

C ETL US LISTED

Intertek
May/Mai 2019
Control number: 4002461

STANDARDS / NORMES D'ESSAI:
Certified to/Certifié selon ULC S627
Certified to/Certifié selon UL 1482
Certified to/Certifié selon UL 737
Certified to/Certifié selon CSA B415.1-10
Certified to/Certifié selon ASTM E3053-17
Certified to/Certifié selon ASTM E2515-11 (R2017)

LISTED SOLID FUEL BURNING APPLIANCE

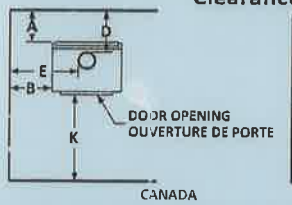
POÊLE À COMBUSTIBLE SOLIDE HOMOLOGUÉ

MODEL / MODÈLE :

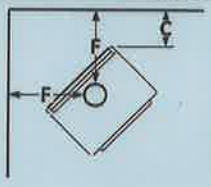
ESCAPE 2100

Serial Number / No. de Sérle: 1

Clearances to combustibles / Dégagements aux combustibles



CANADA

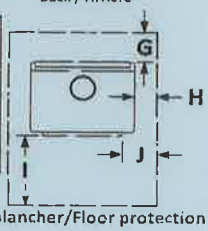


U.S.A.

MOBILE HOME
MAISONS MOBILES
Double wall connector
Tuyau à paroi double

A: 9 in./po.	(229 mm)	D: 13.75 in./po.	(349 mm)
B: 19 in./po.	(483 mm)	E: 29.875 in./po.	(759 mm)
C: 10 in./po.	(254 mm)	F: 20.75 in./po.	(527 mm)

Back / Arrière



Single wall connector / Tuyau à paroi simple		Double wall connector / Tuyau à paroi double	
A: 13.25 in./po.	(337 mm)	A: 6 in./po.	(152 mm)
B: 14 in./po.	(356 mm)	B: 14 in./po.	(356 mm)
C: 7.25 in./po.	(184 mm)	C: 7 in./po.	(178 mm)
D: 18 in./po.	(457 mm)	D: 10.75 in./po.	(273 mm)
E: 24.875 in./po	(632 mm)	E: 24.875 in./po	(632 mm)
F: 18 in./po.	(457 mm)	F: 17.75 in./po.	(451 mm)

Floor-ceiling/plancher-plafond: 84 in./po. (213cm)

Single wall connector / Tuyau à paroi simple		Double wall connector / Tuyau à paroi double	
A: 13 in./po.	(330 mm)	A: 6 in./po.	(152 mm)
B: 14 in./po.	(356mm)	B: 14 in./po.	(356 mm)
C: 7.25 in./po.	(184 mm)	C: 7 in./po.	(178 mm)
D: 17.75 in./po.	(451 mm)	D: 10.75 in./po.	(273 mm)
E: 24.875 in./po	(632 mm)	E: 24.875 in./po.	(632 mm)
F: 18 in./po.	(457 mm)	F: 17.75 in./po.	(451 mm)

* See owner's manual for other clearances with lowered ceiling/
voir manuel d'installation pour autres dégagements avec plafond abaissé

Protection de plancher/Floor protection

CANADA		U.S.A.	
G: 8 in./po.	(203 mm)	I: 16 in./po.	(406 mm)
H: 8 in./po.	(203 mm)	J: 8 in./po.	(203 mm)
I: 18 in./po.	(457 mm)	K: 36 in./po.	(914 mm)
K: 48 in./po.	(1219 mm)		

PREVENT HOUSE FIRES

- Install and use only in accordance with the manufacturer's installation and operating instructions.
- Contact local building or fire officials about restrictions and installation inspection in your area.
- Use listed 152 mm /6 in. diameter single or double wall connectors with prefabricated chimneys approved UL 103 HT (US) and ULC S629 (CAN) suitable for solid fuels or lined masonry chimneys.
- See local building code and manufacturer's instructions for precautions required for passing a chimney through a combustible wall or ceiling.
- Do not pass connector through combustible wall or ceiling.
- Do not connect this unit to a chimney serving another appliance.
- Use with wood only. Do not use other fuels.
- Operate only with door closed or door open with firescreen installed. Open door or remove firescreen to feed the stove only.
- Do not obstruct the space underneath the stove.
- Do not use grate or elevate fire. Build fire directly on hearth.
- Do not overfire. If heater or chimney connector glows, you are overfiring.
- Inspect and clean chimney frequently. Under certain condition of use, creosote buildup may occur rapidly.
- Replace glass with ceramic type only.
- Install unit on a non-combustible material extending as shown above on this label.
- Suitable for mobile-home installation. Floor protection may vary from pedestal to legs version refer to owner's manual.
- Combustion air openings shall not be obstructed.
- This wood heater needs periodic inspection and repair for proper operation. Consult the owner's manual for further information. It is against US federal regulations to operate this wood heater in a manner inconsistent with the operating instructions in the owner's manual.

PRÉVENEZ LES INCENDIES

- Installer et utiliser conformément au manuel d'utilisation du fabricant.
- Contacter les autorités de votre localité ayant juridiction concernant les restrictions et inspections d'installation.
- Utiliser des tuyaux d'évacuation à parois simple ou double homologués d'un diamètre de 6 po. (152 mm) avec une cheminée préfabriquée approuvée UL 103 HT (US) et ULC S629 (CAN) pour utilisation au bois ou une cheminée de maçonnerie gainée.
- Voir les codes locaux et le manuel d'installation du manufacturier pour le passage de la cheminée à travers un mur ou un plafond combustible.
- Ne pas traverser un plafond ou un mur combustible avec un tuyau d'évacuation.
- Ne pas raccorder cet appareil à une cheminée déservant un autre appareil.
- Brûler du bois seulement. Ne pas utiliser d'autres combustibles.
- Garder la porte fermée ou le pare-étincelle en place en tout temps. Ouvrir la porte ou retirer le pare-étincelle que lors du chargement.
- Ne rien entreposer sous l'appareil.
- Ne pas utiliser de grilles ou de chenets pour surélever le feu. Préparer le feu directement sur l'âtre.
- Ne pas surchauffer. Si l'appareil ou le tuyau rougit, il y a surchauffe.
- Inspecter et nettoyer la cheminée fréquemment. Sous certaines conditions, l'accumulation de créosote peut être rapide.
- Remplacer la vitre seulement avec un verre de céramique.
- Installer l'appareil sur une plaque non combustible tel qu'indiqué sur l'étiquette.
- Poêle approuvé pour maison mobile. La protection de plancher peut varier entre la version plédestal et sur pattes. Voir le manuel d'instructions.
- Les entrées d'air servant à la combustion ne doivent pas être obstruées.
- Cet appareil de chauffage requiert des inspections et réparations périodiques. Consulter le manuel de l'utilisateur pour plus d'information. Opérer cet appareil de chauffage de façon inconsistente par rapport au manuel de l'utilisateur consiste une violation de la loi fédérale (USA).

Optional blower: (115V, 0.8A, 60Hz) — Option ventilateur: (115V, 0.8A, 60Hz)

U.S. ENVIRONMENTAL PROTECTION AGENCY Certified to comply with 2020 particulate emission standards using cordwood.
AGENCE DE PROTECTION DE L'ENVIRONNEMENT DES É.-U. Conforme aux normes d'émission de particules de 2020 avec bûche de bois.

Weighted average emission rate / Moyenne pondérée des émissions : 1.6 g/h
Tested and certified in compliance with CFR 40 part 60, subpart AAA, section 60.534(a)(1(ii))

WARNING: This product can expose you to carbon monoxide, which is known to the State of California to cause cancer, birth defects or other reproductive harm.
(For more information go to www.p65warnings.ca.gov)

CAUTION

- HOT WHILE IN OPERATION.
- DO NOT TOUCH. KEEP CHILDREN, CLOTHING AND FURNITURE AWAY.
- CONTACT MAY CAUSE SKIN BURNS. SEE NAME-PLATE AND INSTRUCTIONS.

ATTENTION

- CHAUD EN FONCTIONNEMENT.
- NE PAS TOUCHER. GARDER LES ENFANTS, LES VÊTEMENTS ET LES MEUBLES ÉLOIGNÉS.
- UN CONTACT AVEC LA PEAU PEUT OCCASIONNER DES BRÛLURES. VOIR LES INSTRUCTIONS.

Made in St-Augustin-de-Desmaures (Qc), Canada
14/03/2022 (# test)

SBI
Fabricant de poêles international
Stove Builder International

Fabriqué à St-Augustin-de-Desmaures (Qc), Canada
14/03/2022 (# test)

27780

REFER TO INTERTEK'S DIRECTORY OF BUILDING PRODUCTS FOR DETAILED INFORMATION
SE RÉFÉRER AU RÉPERTOIRE DES PRODUITS HOMOLOGUÉS D'INTERTEK POUR PLUS D'INFORMATION

STANDARDS / NORMES D'ESSAI:

LISTED SOLID FUEL BURNING INSERT APPLIANCE

APPAREIL ENCASTRABLE À COMBUSTIBLE SOLIDE HOMOLOGUÉ

MODEL / MODÈLE :

ESCAPE 2100-I

Intertek

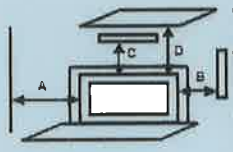
Control number: 4002461
(March/Mars 2022)

Certified to/Certifié selon CSA B415.1-10
Certified to/Certifié selon ASTM E3053-17
Certified to/Certifié selon ASTM E2515-11 (R2017)

Serial Number / No. de Série: 999999

Clearances to combustibles / Dégagements aux combustibles

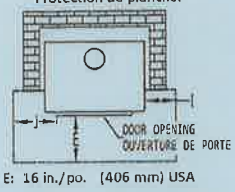
Measured from insert body
Mesuré à partir de la chemise de l'encastrable



Combustible side wall
Mur côté adjacent
Combustible side surround [1]
Parement latéral combustible [1]
Combustible top surround [1]
Parement supérieur combustible [1]
Combustible mantle shelf [1]
Tablette combustible [1]

A: 19 in./po. (483 mm)
B: 9 in./po. (229 mm)
C: 27 in./po. (686 mm)
D: 27 in./po. (686 mm)

Floor protection
Protection de plancher



E: 16 in./po. (406 mm) USA
18 in./po. (457 mm) CANADA
I: 8 in./po. (203 mm) CANADA
J: 8 in./po. (203 mm) USA

Blower / Ventilateur:
115VOLTS, 0.8 AMPS, 60Hz

[1] Subject to a maximum protrusion (consult owner's manual) / Sujet à une saillie maximale (consultez le manuel d'instructions)

PREVENT HOUSE FIRES

- Install and use only in accordance with the manufacturer's installation and operating instructions.
- Contact local building or fire officials about restrictions and installation inspection in your area.
- Use with solid wood fuel only. Do not use other fuels.
- Risk of smoke and flame spillage. Operate only with door closed or door open with screen door installed. Open door or remove screen door only to feed the stove.
- Do not connect this unit to a chimney serving another appliance.
- Install only in masonry fireplaces. Do not remove bricks or mortar from masonry fireplace.
- The non-combustible floor protection in front of the unit should have an R value equal or greater than 2.00 extending 27 inches (686 mm) in front of the insert if the hearth elevation is lower than 6 inches (152 mm) or extend 16 inches (406 mm) (USA), 18 inches (457 mm) (CANADA) without a R value if the hearth elevation is higher than 6 inches (152 mm).
- Connect to a code-approved masonry chimney or listed factory-built fireplace chimney with a direct flue connector into the first chimney liner section.
- Do not overfire. If stove or chimney connector glows, your are overfiring.
- Inspect and clean chimney frequently. Under certain conditions of use, creosote buildup may occur rapidly.
- Do not use grate or elevate fire. Build wood fire directly on hearth.
- Replace glass only with ceramic glass.
- This wood heater needs periodic inspection and repair for proper operation. Consult the owner's manual for further information. It is against US federal regulations to operate this wood heater in a manner inconsistent with the operating instructions in the owner's manual.

PRÉVENEZ LES INCENDIES

- Installer et utiliser conformément au manuel d'utilisation du fabricant.
- Contacter les autorités de votre localité ayant juridiction concernant les restrictions et inspections d'installation.
- Utiliser avec le bois seulement. Ne pas utiliser d'autres combustibles.
- Risque de fuite de fumée et de flammes. Utiliser l'appareil la porte fermée ou ouverte avec le pare-étincelle en place uniquement. Ouvrir la porte ou retirer le pare-étincelle seulement lors du chargement.
- Ne pas raccorder à un conduit de fumée servant déjà pour un autre appareil.
- Installer seulement dans un foyer de maçonnerie. Ne pas enlever les briques ou le mortier du foyer de maçonnerie.
- La protection de plancher incombustible au devant de l'encastrable devrait avoir un facteur d'isolation R égal ou supérieure à 2.00 et se prolonger 27 pouces (686 mm) au devant de l'appareil lorsque l'âtre possède moins de 6 pouces (152 mm) d'élévation et se prolonger 16 pouces (406 mm) (USA), 18 pouces (457 mm) (CANADA), sans facteur d'isolation R au devant de l'encastrable lorsque l'âtre possède plus de 6 pouces (152 mm) d'élévation.
- Raccorder à une cheminée de maçonnerie respectant les codes ou à une cheminée préfabriquée homologuée, directement à la première section de cheminée gainée.
- Ne pas surchauffer. SI l'appareil ou le tuyau rougit, il y a surchauffe.
- Inspecter et nettoyer la cheminée fréquemment. Dans certaines conditions, la formation de créosote peut être rapide.
- Ne pas utiliser de chenets ou de grilles pour élever le feu. Préparer le feu directement sur l'âtre.
- Remplacer la vitre avec un verre de céramique.
- Cet appareil de chauffage requiert des inspections et réparations périodiques. Consulter le manuel de l'utilisateur pour plus d'information. Opérer cet appareil de chauffage de façon inconsistente par rapport au manuel de l'utilisateur consiste une violation de la loi fédérale (USA).

U.S. ENVIRONMENTAL PROTECTION AGENCY Certified to comply with 2020 particulate emission standards using cordwood.
AGENCE DE PROTECTION DE L'ENVIRONNEMENT DES É.-U. Conforme aux normes d'émission de particules de 2020 avec bûche de bois.
Weighted average emission rate: / Moyenne pondérée des émissions: 1.6 g/h
Tested and certified in compliance with CFR 40 part 60, subpart AAA, section 60.534(a)(1(ii))

WARNING: This product can expose you to carbon monoxide, which is known to the State of California to cause cancer, birth defects or other reproductive harm. (For more information go to www.p65warnings.ca.gov)

CAUTION

- HOT WHILE IN OPERATION.
- DO NOT TOUCH. KEEP CHILDREN, CLOTHING AND FURNITURE AWAY.
- CONTACT MAY CAUSE SKIN BURNS. SEE NAME-PLATE AND INSTRUCTIONS.

ATTENTION

- CHAUD EN FONCTIONNEMENT.
- NE PAS TOUCHER. GARDER LES ENFANTS, LES VÊTEMENTS ET LES MEUBLES ÉLOIGNÉS.
- UN CONTACT AVEC LA PEAU PEUT OCCASIONNER DES BRÛLURES. VOIR LES INSTRUCTIONS.

Made in St-Augustin-de-Desmaures (Qc), Canada
14/03/2022 (# test)

SBI
Fabricant de poêles international
Stove Builder International

Fabriqué à St-Augustin-de-Desmaures (Qc), Canada
14/03/2022 (# test)

27998

REFER TO INTERTEK'S DIRECTORY OF BUILDING PRODUCTS FOR DETAILED INFORMATION
SE RÉFÉRER AU RÉPERTOIRE DES PRODUITS HOMOLOGUÉS D'INTERTEK POUR PLUS D'INFORMATION

Intertek
May/Mai 2019
Control number: 4002461

STANDARDS / NORMES D'ESSAI:
Certified to/Certifié selon ULC S627
Certified to/Certifié selon UL 1482
Certified to/Certifié selon UL 737
Certified to/Certifié selon CSA B415.1-10
Certified to/Certifié selon ASTM E3053-17
Certified to/Certifié selon ASTM E2515-11 (R2017)

LISTED SOLID FUEL BURNING APPLIANCE

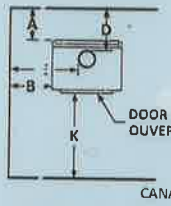
POÊLE À COMBUSTIBLE SOLIDE HOMOLOGUÉ

MODEL / MODÈLE :

HT-3000

Serial Number / No. de Série: 1

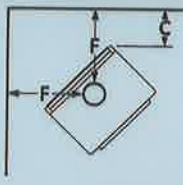
Clearances to combustibles / Dégagements aux combustibles



CANADA

Single wall connector / Tuyau à paroi simple		Double wall connector / Tuyau à paroi double	
A: 13.25 in./po.	(337 mm)	A: 6 in./po.	(152 mm)
B: 14 in./po.	(356 mm)	B: 14 in./po.	(356 mm)
C: 7.25 in./po.	(184 mm)	C: 7 in./po.	(178 mm)
D: 18 in./po.	(457 mm)	D: 10.75 in./po.	(273 mm)
E: 24.875 in./po	(632 mm)	E: 24.875 in./po	(632 mm)
F: 18 in./po.	(457 mm)	F: 17.75 in./po.	(451 mm)

Floor-ceiling/plancher-plafond: 84 in./po. (213cm)



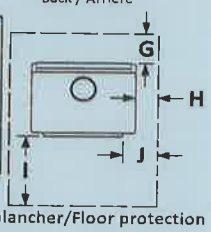
U.S.A.

MOBILE HOME
MAISONS MOBILES
Double wall connector
Tuyau à paroi double

A: 9 in./po.	(229 mm)	D: 13.75 in./po.	(349 mm)
B: 19 in./po.	(483 mm)	E: 29.875 in./po.	(759 mm)
C: 10 in./po.	(254 mm)	F: 20.75 in./po.	(527 mm)

Single wall connector / Tuyau à paroi simple		Double wall connector / Tuyau à paroi double	
A: 13 in./po.	(330 mm)	A: 6 in./po.	(152 mm)
B: 14 in./po.	(356 mm)	B: 14 in./po.	(356 mm)
C: 7.25 in./po.	(184 mm)	C: 7 in./po.	(178 mm)
D: 17.75 in./po.	(451 mm)	D: 10.75 in./po.	(273 mm)
E: 24.875 in./po	(632 mm)	E: 24.875 in./po.	(632 mm)
F: 18 in./po.	(457 mm)	F: 17.75 in./po.	(451 mm)

Back / Arrière



Protection de plancher/Floor protection

CANADA		U.S.A.	
G: 8 in./po.	(203 mm)	I: 16 in./po.	(406 mm)
H: 8 in./po	(203 mm)	J: 8 in./po.	(203 mm)
I: 18 in./po.	(457 mm)	K: 36 in./po.	(914 mm)
K: 48 in./po.	(1219 mm)		

* See owner's manual for other clearances with lowered ceiling/
voir manuel d'installation pour autres dégagements avec plafond abaissé

PREVENT HOUSE FIRES

- Install and use only in accordance with the manufacturer's installation and operating instructions.
- Contact local building or fire officials about restrictions and installation inspection in your area.
- Use listed 152 mm /6 in. diameter single or double wall connectors with prefabricated chimneys approved UL 103 HT (US) and ULC S629 (CAN) suitable for solid fuels or lined masonry chimneys.
- See local building code and manufacturer's instructions for precautions required for passing a chimney through a combustible wall or ceiling.
- Do not pass connector through combustible wall or ceiling.
- Do not connect this unit to a chimney serving another appliance.
- Use with wood only. Do not use other fuels.
- Operate only with door closed or door open with firescreen installed. Open door or remove firescreen to feed the stove only.
- Do not obstruct the space underneath the stove.
- Do not use grate or elevate fire. Build fire directly on hearth.
- Do not overfire. If heater or chimney connector glows, you are overfiring.
- Inspect and clean chimney frequently. Under certain condition of use, creosote buildup may occur rapidly.
- Replace glass with ceramic type only.
- Install unit on a non-combustible material extending as shown above on this label.
- Suitable for mobile-home installation. Floor protection may vary from pedestal to legs version refer to owner's manual.
- Combustion air openings shall not be obstructed.
- This wood heater needs periodic inspection and repair for proper operation. Consult the owner's manual for further information. It is against US federal regulations to operate this wood heater in a manner inconsistent with the operating instructions in the owner's manual.

PRÉVENEZ LES INCENDIES

- Installer et utiliser conformément au manuel d'utilisation du fabricant.
- Contacter les autorités de votre localité ayant juridiction concernant les restrictions et inspections d'installation.
- Utiliser des tuyaux d'évacuation à parois simple ou double homologués d'un diamètre de 6 po. (152 mm) avec une cheminée préfabriquée approuvée UL 103 HT (US) et ULC S629 (CAN) pour utilisation au bois ou une cheminée de maçonnerie gainée.
- Voir les codes locaux et le manuel d'installation du manufacturier pour le passage de la cheminée à travers un mur ou un plafond combustible.
- Ne pas traverser un plafond ou un mur combustible avec un tuyau d'évacuation.
- Ne pas raccorder cet appareil à une cheminée déservant un autre appareil.
- Brûler du bois seulement. Ne pas utiliser d'autres combustibles.
- Garder la porte fermée ou le pare-étincelle en place en tout temps. Ouvrir la porte ou retirer le pare-étincelle que lors du chargement.
- Ne rien entreposer sous l'appareil.
- Ne pas utiliser de grilles ou de chenets pour surélever le feu.Préparer le feu directement sur l'âtre.
- Ne pas surchauffer. Si l'appareil ou le tuyau rougit, il y a surchauffe.
- Inspecter et nettoyer la cheminée fréquemment. Sous certaines conditions, l'accumulation de créosote peut être rapide.
- Remplacer la vitre seulement avec un verre de céramique.
- Installer l'appareil sur une plaque non combustible tel qu'indiqué sur l'étiquette.
- Poêle approuvé pour maison mobile.La protection de plancher peut varier entre la version plédestal et sur pattes. Voir le manuel d'instructions.
- Les entrées d'air servant à la combustion ne doivent pas être obstruées.
- Cet appareil de chauffage requiert des inspections et réparations périodiques. Consulter le manuel de l'utilisateur pour plus d'information. Opérer cet appareil de chauffage de façon inconsistente par rapport au manuel de l'utilisateur consiste une violation de la loi fédérale (USA).

Optional blower: (115V, 0.8A, 60Hz) — Option ventilateur: (115V, 0.8A, 60Hz)

U.S. ENVIRONMENTAL PROTECTION AGENCY Certified to comply with 2020 particulate emission standards using cordwood.
AGENCE DE PROTECTION DE L'ENVIRONNEMENT DES É.-U. Conforme aux normes d'émission de particules de 2020 avec bûche de bois.

Weighted average emission rate / Moyenne pondérée des émissions : 1.6 g/h
Tested and certified in compliance with CFR 40 part 60, subpart AAA, section 60.534(a)(1(ii))

WARNING: This product can expose you to carbon monoxide, which is known to the State of California to cause cancer, birth defects or other reproductive harm.
(For more information go to www.p65warnings.ca.gov)

CAUTION

- HOT WHILE IN OPERATION.
- DO NOT TOUCH. KEEP CHILDREN, CLOTHING AND FURNITURE AWAY.
- CONTACT MAY CAUSE SKIN BURNS. SEE NAME-PLATE AND INSTRUCTIONS

ATTENTION

- CHAUD EN FONCTIONNEMENT.
- NE PAS TOUCHER. GARDER LES ENFANTS, LES VÊTEMENTS ET LES MEUBLES ÉLOIGNÉS.
- UN CONTACT AVEC LA PEAU PEUT OCCASIONNER DES BRÛLURES. VOIR LES INSTRUCTIONS.

Made in St-Augustin-de-Desmaures (Qc), Canada
14/03/2022 (# test)

SBI
Fabricant de poêles international
Stove Builder International

Fabriqué à St-Augustin-de-Desmaures (Qc), Canada
14/03/2022 (# test)

27782

REFER TO INTERTEK'S DIRECTORY OF BUILDING PRODUCTS FOR DETAILED INFORMATION
SE RÉFÉRER AU RÉPERTOIRE DES PRODUITS HOMOLOGUÉS D'INTERTEK POUR PLUS D'INFORMATION

Intertek
May/Mai 2019
Control number: 4002461

STANDARDS / NORMES D'ESSAI:
Certified to/Certifié selon ULC S627
Certified to/Certifié selon UL 1482
Certified to/Certifié selon UL 737
Certified to/Certifié selon CSA B415.1-10
Certified to/Certifié selon ASTM E3053-17
Certified to/Certifié selon ASTM E2515-11 (R2017)

LISTED SOLID FUEL BURNING APPLIANCE

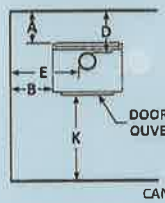
POÊLE À COMBUSTIBLE SOLIDE HOMOLOGUÉ

MODEL / MODÈLE :

SOLUTION 3.5

Serial Number / No. de Série: 999999

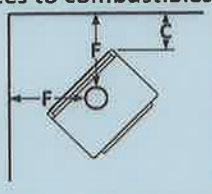
Clearances to combustibles / Dégagements aux combustibles



CANADA

Single wall connector / Tuyau à paroi simple		Double wall connector / Tuyau à paroi double	
A: 13.25 in./po.	(337 mm)	A: 7 in./po.	(178 mm)
B: 14 in./po.	(356 mm)	B: 14 in./po.	(356 mm)
C: 7.25 in./po.	(184 mm)	C: 7 in./po.	(178 mm)
D: 18 in./po.	(457 mm)	D: 11.75 in./po.	(298 mm)
E: 24.875 in./po	(632 mm)	E: 24.875 in./po	(632 mm)
F: 18 in./po.	(457 mm)	F: 17.75 in./po.	(451 mm)

Floor-ceiling/plancher-plafond: 84 in./po. (213cm)



U.S.A.

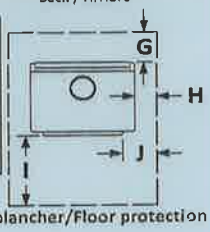
MOBILE HOME
MAISONS MOBILES
Double wall connector
Tuyau à paroi double

A: 9 in./po.	(229 mm)	D: 13.75 in./po.	(349 mm)
B: 19 in./po.	(483 mm)	E: 29.875 in./po.	(759 mm)
C: 10 in./po.	(254 mm)	F: 20.75 in./po.	(527 mm)

Single wall connector / Tuyau à paroi simple		Double wall connector / Tuyau à paroi double	
A: 13 in./po.	(330 mm)	A: 7 in./po.	(178 mm)
B: 14 in./po.	(356 mm)	B: 14 in./po.	(356 mm)
C: 7.25 in./po.	(184 mm)	C: 7 in./po.	(178 mm)
D: 17.75 in./po.	(451 mm)	D: 11.75 in./po.	(298 mm)
E: 24.875 in./po	(632 mm)	E: 24.875 in./po.	(632 mm)
F: 18 in./po.	(457 mm)	F: 17.75 in./po.	(451 mm)

* See owner's manual for other clearances with lowered ceiling/
voir manuel d'installation pour autres dégagements avec plafond abaissé

Back / Arrière



Protection de plancher/Floor protection

CANADA		U.S.A.	
G: 8 in./po.	(203 mm)	I: 16 in./po.	(406 mm)
H: 8 in./po	(203 mm)	J: 8 in./po.	(203 mm)
I: 18 in./po.	(457 mm)	K: 36 in./po.	(914 mm)
K: 48 in./po.	(1219 mm)		

PREVENT HOUSE FIRES

- Install and use only in accordance with the manufacturer's installation and operating instructions.
- Contact local building or fire officials about restrictions and installation inspection in your area.
- Use listed 152 mm /6 in. diameter single or double wall connectors with prefabricated chimneys approved UL 103 HT (US) and ULC S629 (CAN) suitable for solid fuels or lined masonry chimneys.
- See local building code and manufacturer's instructions for precautions required for passing a chimney through a combustible wall or ceiling.
- Do not pass connector through combustible wall or ceiling.
- Do not connect this unit to a chimney serving another appliance.
- Use with wood only. Do not use other fuels.
- Operate only with door closed or door open with firescreen installed. Open door or remove firescreen to feed the stove only.
- Do not obstruct the space underneath the stove.
- Do not use grate or elevate fire. Build fire directly on hearth.
- Do not overfire. If heater or chimney connector glows, you are overfiring.
- Inspect and clean chimney frequently. Under certain condition of use, creosote buildup may occur rapidly.
- Replace glass with ceramic type only.
- Install unit on a non-combustible material extending as shown above on this label.
- Suitable for mobile-home installation. Floor protection may vary from pedestal to legs version refer to owner's manual.
- Combustion air openings shall not be obstructed.
- This wood heater needs periodic inspection and repair for proper operation. Consult the owner's manual for further information. It is against US federal regulations to operate this wood heater in a manner inconsistent with the operating instructions in the owner's manual.

PRÉVENEZ LES INCENDIES

- Installer et utiliser conformément au manuel d'utilisation du fabricant.
- Contacter les autorités de votre localité ayant juridiction concernant les restrictions et inspections d'installation.
- Utiliser des tuyaux d'évacuation à parois simple ou double homologués d'un diamètre de 6 po. (152 mm) avec une cheminée préfabriquée approuvée UL 103 HT (US) et ULC S629 (CAN) pour utilisation au bois ou une cheminée de maçonnerie gainée.
- Voir les codes locaux et le manuel d'installation du manufacturier pour le passage de la cheminée à travers un mur ou un plafond combustible.
- Ne pas traverser un plafond ou un mur combustible avec un tuyau d'évacuation
- Ne pas raccorder cet appareil à une cheminée déservant un autre appareil.
- Brûler du bois seulement. Ne pas utiliser d'autres combustibles.
- Garder la porte fermée ou le pare-étincelle en place en tout temps. Ouvrir la porte ou retirer le pare-étincelle que lors du chargement.
- Ne rien entreposer sous l'appareil.
- Ne pas utiliser de grilles ou de chenets pour surélever le feu. Préparer le feu directement sur l'âtre.
- Ne pas surchauffer. Si l'appareil ou le tuyau rougit, il y a surchauffe.
- Inspecter et nettoyer la cheminée fréquemment. Sous certaines conditions, l'accumulation de créosote peut être rapide.
- Remplacer la vitre seulement avec un verre de céramique.
- Installer l'appareil sur une plaque non combustible tel qu'indiqué sur l'étiquette.
- Poêle approuvé pour maison mobile. La protection de plancher peut varier entre la version piédestal et sur pattes. Voir le manuel d'instructions.
- Les entrées d'air servant à la combustion ne doivent pas être obstruées.
- Cet appareil de chauffage requiert des inspections et réparations périodiques. Consulter le manuel de l'utilisateur pour plus d'information. Opérer cet appareil de chauffage de façon inconsistente par rapport au manuel de l'utilisateur consiste une violation de la loi fédérale (USA).

Optional blower: (115V, 0.8A, 60Hz) — Option ventilateur: (115V, 0.8A, 60Hz)

U.S. ENVIRONMENTAL PROTECTION AGENCY Certified to comply with 2020 particulate emission standards using cordwood.
AGENCE DE PROTECTION DE L'ENVIRONNEMENT DES É.-U. Conforme aux normes d'émission de particules de 2020 avec bûche de bois.

Weighted average emission rate / Moyenne pondérée des émissions : 1.6 g/h
Tested and certified in compliance with CFR 40 part 60, subpart AAA, section 60.534(a)(1(ii))

WARNING: This product can expose you to carbon monoxide, which is known to the State of California to cause cancer, birth defects or other reproductive harm.
(For more information go to www.p65warnings.ca.gov)

CAUTION

- HOT WHILE IN OPERATION.
- DO NOT TOUCH. KEEP CHILDREN, CLOTHING AND FURNITURE AWAY.
- CONTACT MAY CAUSE SKIN BURNS. SEE NAME-PLATE AND INSTRUCTIONS.

ATTENTION

- CHAUD EN FONCTIONNEMENT.
- NE PAS TOUCHER. GARDER LES ENFANTS, LES VÊTEMENTS ET LES MEUBLES ÉLOIGNÉS.
- UN CONTACT AVEC LA PEAU PEUT OCCASIONNER DES BRÛLURES. VOIR LES INSTRUCTIONS.

Made in St-Augustin-de-Desmaures (Qc), Canada
14/03/2022 (# test)

SBI
Fabricant de poêles international
Stove Builder International

Fabriqué à St-Augustin-de-Desmaures (Qc), Canada
14/03/2022 (# test)

27741

REFER TO INTERTEK'S DIRECTORY OF BUILDING PRODUCTS FOR DETAILED INFORMATION
SE RÉFÉRER AU RÉPERTOIRE DES PRODUITS HOMOLOGUÉS D'INTERTEK POUR PLUS D'INFORMATION

C ETL LISTED US

Intertek

Control number: 4002461
(July/Juillet 2020)

STANDARDS / NORMES D'ESSAI:

Certified to / Certifié selon ULC S628
Certified to / Certifié selon UL 1482
Certified to / Certifié selon UL 737
Certified to/Certifié selon CSA B415.1-10
Certified to/Certifié selon ASTM E3053-17
Certified to/Certifié selon ASTM E2515-11 (R2017)

LISTED SOLID FUEL BURNING INSERT APPLIANCE

APPAREIL ENCASTRABLE À COMBUSTIBLE SOLIDE HOMOLOGUÉ

MODEL / MODÈLE :

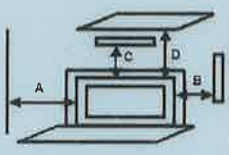
SOLUTION 3.5-I

Serial Number / No. de Série: 1

Clearances to combustibles / Dégagements aux combustibles

Measured from insert body

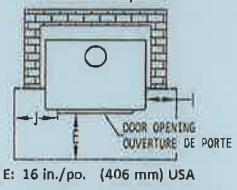
Mesuré à partir de la chemise de l'encastrable



Combustible side wall
Mur côté adjacent
Combustible side surround [1]
Parement latéral combustible [1]
Combustible top surround [1]
Parement supérieur combustible [1]
Combustible mantle shelf [1]
Tablette combustible [1]

A: 19 in./po. (483 mm)
B: 9 in./po. (229 mm)
C: 27 in./po. (686 mm)
D: 27 in./po. (686 mm)

Floor protection
Protection de plancher



E: 16 in./po. (406 mm) USA
18 in./po. (457 mm) CANADA
I: 8 in./po. (203 mm) CANADA
J: 8 in./po. (203 mm) USA

Blower / Ventilateur:
115VOLTS, 0.8 AMPS, 60Hz

[1] Subject to a maximum protrusion (consult owner's manual) / Sujet à une saillie maximale (consultez le manuel d'instructions)

PREVENT HOUSE FIRES

- Install and use only in accordance with the manufacturer's installation and operating instructions.
- Contact local building or fire officials about restrictions and installation inspection in your area.
- Use with solid wood fuel only. Do not use other fuels.
- Risk of smoke and flame spillage. Operate only with door closed or door open with screen door installed. Open door or remove screen door only to feed the stove.
- Do not connect this unit to a chimney serving another appliance.
- Install only in masonry fireplaces. Do not remove bricks or mortar from masonry fireplace.
- The non-combustible floor protection in front of the unit should have an R value equal or greater than 2.00 extending 27 inches (686 mm) in front of the insert if the hearth elevation is lower than 6 inches (152 mm) or extend 16 inches (406 mm) (USA), 18 inches (457 mm) (CANADA) without a R value if the hearth elevation is higher than 6 inches (152 mm).
- Connect to a code-approved masonry chimney or listed factory-built fireplace chimney with a direct flue connector into the first chimney liner section.
- Do not overfire. If stove or chimney connector glows, your are overfiring.
- Inspect and clean chimney frequently. Under certain conditions of use, creosote buildup may occur rapidly.
- Do not use grate or elevate fire. Build wood fire directly on hearth.
- Replace glass only with ceramic glass.
- This wood heater needs periodic inspection and repair for proper operation. Consult the owner's manual for further information. It is against US federal regulations to operate this wood heater in a manner inconsistent with the operating instructions in the owner's manual.

PRÉVENEZ LES INCENDIES

- Installer et utiliser conformément au manuel d'utilisation du fabricant.
- Contacter les autorités de votre localité ayant juridiction concernant les restrictions et inspections d'installation.
- Utiliser avec le bois seulement. Ne pas utiliser d'autres combustibles.
- Risque de fuite de fumée et de flammes. Utiliser l'appareil la porte fermée ou ouverte avec le pare-étincelle en place uniquement. Ouvrir la porte ou retirer le pare-étincelle seulement lors du chargement.
- Ne pas raccorder à un conduit de fumée servant déjà pour un autre appareil.
- Installer seulement dans un foyer de maçonnerie. Ne pas enlever les briques ou le mortier du foyer de maçonnerie.
- La protection de plancher incombustible au devant de l'encastrable devrait avoir un facteur d'isolation R égal ou supérieure à 2.00 et se prolonger 27 pouces (686 mm) au devant de l'appareil lorsque l'âtre possède moins de 6 pouces (152 mm) d'élévation et se prolonger 16 pouces (406 mm) (USA), 18 pouces (457 mm) (CANADA), sans facteur d'isolation R au devant de l'encastrable lorsque l'âtre possède plus de 6 pouces (152 mm) d'élévation.
- Raccorder à une cheminée de maçonnerie respectant les codes ou à une cheminée préfabriquée homologuée, directement à la première section de cheminée gainée.
- Ne pas surchauffer. Si l'appareil ou le tuyau rougit, il y a surchauffe.
- Inspecter et nettoyer la cheminée fréquemment. Dans certaines conditions, la formation de créosote peut être rapide.
- Ne pas utiliser de chenets ou de grilles pour élever le feu. Préparer le feu directement sur l'âtre.
- Remplacer la vitre avec un verre de céramique.
- Cet appareil de chauffage requiert des inspections et réparations périodiques. Consulter le manuel de l'utilisateur pour plus d'information. Opérer cet appareil de chauffage de façon inconsistente par rapport au manuel de l'utilisateur consiste une violation de la loi fédérale (USA).

U.S. ENVIRONMENTAL PROTECTION AGENCY Certified to comply with 2020 particulate emission standards using cordwood.
AGENCE DE PROTECTION DE L'ENVIRONNEMENT DES É.-U. Conforme aux normes d'émission de particules de 2020 avec bûche de bois.
Weighted average emission rate: / Moyenne pondérée des émissions: 1.6 g/h
Tested and certified in compliance with CFR 40 part 60, subpart AAA, section 60.534(a)(1(ii))

WARNING: This product can expose you to carbon monoxide, which is known to the State of California to cause cancer, birth defects or other reproductive harm. (For more information go to www.p65warnings.ca.gov)

CAUTION

- HOT WHILE IN OPERATION.
- DO NOT TOUCH. KEEP CHILDREN, CLOTHING AND FURNITURE AWAY.
- CONTACT MAY CAUSE SKIN BURNS. SEE NAME-PLATE AND INSTRUCTIONS.

ATTENTION

- CHAUD EN FONCTIONNEMENT.
- NE PAS TOUCHER. GARDER LES ENFANTS, LES VÊTEMENTS ET LES MEUBLES ÉLOIGNÉS.
- UN CONTACT AVEC LA PEAU PEUT OCCASIONNER DES BRÛLURES. VOIR LES INSTRUCTIONS.

Made in St-Augustin-de-Desmaures (Qc), Canada
14/03/2022 (# test)

SBI
Fabricant de poêles international
Stove Builder International

Fabriqué à St-Augustin-de-Desmaures (Qc), Canada
14/03/2022 (# test)

27836

REFER TO INTERTEK'S DIRECTORY OF BUILDING PRODUCTS FOR DETAILED INFORMATION
SE RÉFÉRER AU RÉPERTOIRE DES PRODUITS HOMOLOGUÉS D'INTERTEK POUR PLUS D'INFORMATION

STANDARDS / NORMES D'ESSAI:

LISTED SOLID FUEL BURNING APPLIANCE

POÊLE À COMBUSTIBLE SOLIDE HOMOLOGUÉ

MODEL / MODÈLE :

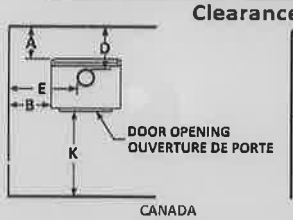
BLUE RIDGE 500

Intertek
March/Mars 2022
Control number: 4002461

Certified to/Certifié selon CSA B415.1-10
Certified to/Certifié selon ASTM E3053-17
Certified to/Certifié selon ASTM E2515-11 (R2017)

Serial Number / No. de Série: 1

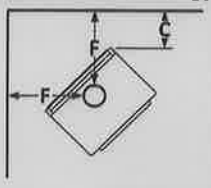
Clearances to combustibles / Dégagements aux combustibles



CANADA

Single wall connector / Tuyau à paroi simple		Double wall connector / Tuyau à paroi double	
A: 13.75 in./po.	(349 mm)	A: 8 in./po.	(203 mm)
B: 22 in./po.	(559 mm)	B: 19 in./po.	(483 mm)
C: 12 in./po.	(305 mm)	C: 12 in./po.	(305 mm)
D: 18.5 in./po.	(470 mm)	D: 12.75 in./po.	(324 mm)
E: 32.875 in./po	(835 mm)	E: 29.875 in./po	(759 mm)
F: 22.75 in./po.	(578 mm)	F: 22.75 in./po.	(578 mm)

Floor-ceiling/plancher-plafond: 84 in./po. (213cm)



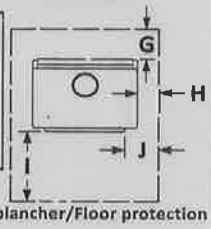
U.S.A.

Single wall connector / Tuyau à paroi simple		Double wall connector / Tuyau à paroi double	
A: 13.75 in./po.	(349 mm)	A: 8 in./po.	(203 mm)
B: 22 in./po.	(559 mm)	B: 19 in./po.	(483 mm)
C: 12 in./po.	(305 mm)	C: 12 in./po.	(305 mm)
D: 18.5 in./po.	(470 mm)	D: 12.75 in./po.	(324 mm)
E: 32.875 in./po	(835 mm)	E: 29.875 in./po.	(759 mm)
F: 22.75 in./po.	(578 mm)	F: 22.75 in./po.	(578 mm)

MOBILE HOME
MAISONS MOBILES
Double wall connector
Tuyau à paroi double

A: 10 in./po.	(254 mm)	D: 14.75 in./po.	(375 mm)
B: 25 in./po.	(635 mm)	E: 35.875 in./po.	(911 mm)
C: 12 in./po.	(305 mm)	F: 22.75 in./po.	(578 mm)

Back / Arrière



Protection de plancher/Floor protection

CANADA		U.S.A.	
G: 8 in./po.	(203 mm)	I: 16 in./po.	(406 mm)
H: 8 in./po	(203 mm)	J: 8 in./po.	(203 mm)
I: 18 in./po.	(457 mm)	K: 36 in./po.	(914 mm)
K: 48 in./po.	(1219 mm)		

* See owner's manual for other clearances with lowered ceiling/
voir manuel d'installation pour autres dégagements avec plafond abaissé

PREVENT HOUSE FIRES

- Install and use only in accordance with the manufacturer's installation and operating instructions.
- Contact local building or fire officials about restrictions and installation inspection in your area.
- Use listed 152 mm /6 in. diameter single or double wall connectors with prefabricated chimneys approved UL 103 HT (US) and ULC S629 (CAN) suitable for solid fuels or lined masonry chimneys.
- See local building code and manufacturer's instructions for precautions required for passing a chimney through a combustible wall or ceiling.
- Do not pass connector through combustible wall or ceiling.
- Do not connect this unit to a chimney serving another appliance.
- Use with wood only. Do not use other fuels.
- Operate only with door closed or door open with firescreen installed. Open door or remove firescreen to feed the stove only.
- Do not obstruct the space underneath the stove.
- Do not use grate or elevate fire. Build fire directly on hearth.
- Do not overfire. If heater or chimney connector glows, you are overfiring.
- Inspect and clean chimney frequently. Under certain condition of use, creosote buildup may occur rapidly.
- Replace glass with ceramic type only.
- Install unit on a non-combustible material extending as shown above on this label.
- Suitable for mobile-home installation. Floor protection may vary from pedestal to legs version refer to owner's manual.
- Combustion air openings shall not be obstructed.
- This wood heater needs periodic inspection and repair for proper operation. Consult the owner's manual for further information. It is against US federal regulations to operate this wood heater in a manner inconsistent with the operating instructions in the owner's manual.

PRÉVENEZ LES INCENDIES

- Installer et utiliser conformément au manuel d'utilisation du fabricant.
- Contacter les autorités de votre localité ayant juridiction concernant les restrictions et inspections d'installation.
- Utiliser des tuyaux d'évacuation à parois simple ou double homologués d'un diamètre de 6 po. (152 mm) avec une cheminée préfabriquée approuvée UL 103 HT (US) et ULC S629 (CAN) pour utilisation au bois ou une cheminée de maçonnerie gainée.
- Voir les codes locaux et le manuel d'installation du manufacturier pour le passage de la cheminée à travers un mur ou un plafond combustible.
- Ne pas traverser un plafond ou un mur combustible avec un tuyau d'évacuation.
- Ne pas raccorder cet appareil à une cheminée déservant un autre appareil.
- Brûler du bois seulement. Ne pas utiliser d'autres combustibles.
- Garder la porte fermée ou le pare-étincelle en place en tout temps. Ouvrir la porte ou retirer le pare-étincelle que lors du chargement.
- Ne rien entreposer sous l'appareil.
- Ne pas utiliser de grilles ou de chenets pour surélever le feu. Préparer le feu directement sur l'âtre.
- Ne pas surchauffer. Si l'appareil ou le tuyau rougit, il y a surchauffe.
- Inspecter et nettoyer la cheminée fréquemment. Sous certaines conditions, l'accumulation de créosote peut être rapide.
- Remplacer la vitre seulement avec un verre de céramique.
- Installer l'appareil sur une plaque non combustible tel qu'indiqué sur l'étiquette.
- Poêle approuvé pour maison mobile. La protection de plancher peut varier entre la version piédestal et sur pattes. Voir le manuel d'instructions.
- Les entrées d'air servant à la combustion ne doivent pas être obstruées.
- Cet appareil de chauffage requiert des inspections et réparations périodiques. Consulter le manuel de l'utilisateur pour plus d'information. Opérer cet appareil de chauffage de façon inconsistente par rapport au manuel de l'utilisateur consiste une violation de la loi fédérale (USA).

Optional blower: (115V, 0.8A, 60Hz) — Option ventilateur: (115V, 0.8A, 60Hz)

U.S. ENVIRONMENTAL PROTECTION AGENCY Certified to comply with 2020 particulate emission standards using cordwood.
AGENCE DE PROTECTION DE L'ENVIRONNEMENT DES É.-U. Conforme aux normes d'émission de particules de 2020 avec bûche de bois.

Weighted average emission rate / Moyenne pondérée des émissions : 1.6 g/h
Tested and certified in compliance with CFR 40 part 60, subpart AAA, section 60.534(a)(1(ii))

WARNING: This product can expose you to carbon monoxide, which is known to the State of California to cause cancer, birth defects or other reproductive harm. (For more information go to www.p65warnings.ca.gov)

CAUTION

- HOT WHILE IN OPERATION.
- DO NOT TOUCH. KEEP CHILDREN, CLOTHING AND FURNITURE AWAY.
- CONTACT MAY CAUSE SKIN BURNS. SEE NAME-PLATE AND INSTRUCTIONS.

ATTENTION

- CHAUD EN FONCTIONNEMENT.
- NE PAS TOUCHER. GARDER LES ENFANTS, LES VÊTEMENTS ET LES MEUBLES ÉLOIGNÉS.
- UN CONTACT AVEC LA PEAU PEUT OCCASIONNER DES BRÛLURES. VOIR LES INSTRUCTIONS.

Made in St-Augustin-de-Desmaures (Qc), Canada
14/03/2022 (# test)

Englander

Fabriqué à St-Augustin-de-Desmaures (Qc), Canada
14/03/2022 (# test)

27900

REFER TO INTERTEK'S DIRECTORY OF BUILDING PRODUCTS FOR DETAILED INFORMATION
SE RÉFÉRER AU RÉPERTOIRE DES PRODUITS HOMOLOGUÉS D'INTERTEK POUR PLUS D'INFORMATION

STANDARDS / NORMES D'ESSAI:

Certified to/Certifié selon CSA B415.1-10
Control number: 4002461
(March/Mars 2022)

LISTED SOLID FUEL BURNING INSERT APPLIANCE

APPAREIL ENCASTRABLE À COMBUSTIBLE SOLIDE HOMOLOGUÉ

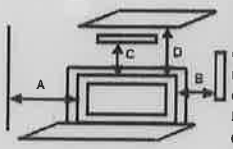
MODEL / MODÈLE :

BLUE RIDGE 500-I

Serial Number / No. de Série: 1

Clearances to combustibles / Dégagements aux combustibles

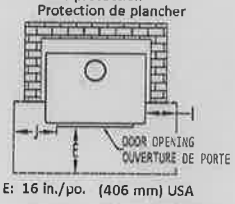
Measured from insert body
Mesuré à partir de la chemise de l'encastrable



Combustible side wall
Mur côté adjacent
Combustible side surround [1]
Parement latéral combustible (1)
Combustible top surround [1]
Parement supérieur combustible (1)
Combustible mantle shelf [1]
Tablette combustible (1)

A: 19 in./po. (483 mm)
B: 9 in./po. (229 mm)
C: 27 in./po. (686 mm)
D: 27 in./po. (686 mm)

Floor protection
Protection de plancher



E: 16 in./po. (406 mm) USA
18 in./po. (457 mm) CANADA
I: 8 in./po. (203 mm) CANADA
J: 8 in./po. (203 mm) USA

Blower / Ventilateur:
115VOLTS, 0.8 AMPS, 60Hz

[1] Subject to a maximum protrusion (consult owner's manual) / Sujet à une saillie maximale (consultez le manuel d'instructions)

PREVENT HOUSE FIRES

- Install and use only in accordance with the manufacturer's installation and operating instructions.
- Contact local building or fire officials about restrictions and installation inspection in your area.
- Use with solid wood fuel only. Do not use other fuels.
- Risk of smoke and flame spillage. Operate only with door closed or door open with screen door installed. Open door or remove screen door only to feed the stove.
- Do not connect this unit to a chimney serving another appliance.
- Install only in masonry fireplaces. Do not remove bricks or mortar from masonry fireplace.
- The non-combustible floor protection in front of the unit should have an R value equal or greater than 2.00 extending 27 inches (686 mm) in front of the insert if the hearth elevation is lower than 6 inches (152 mm) or extend 16 inches (406 mm) (USA), 18 inches (457 mm) (CANADA) without a R value if the hearth elevation is higher than 6 inches (152 mm).
- Connect to a code-approved masonry chimney or listed factory-built fireplace chimney with a direct flue connector into the first chimney liner section.
- Do not overfire. If stove or chimney connector glows, your are overfiring.
- Inspect and clean chimney frequently. Under certain conditions of use, creosote buildup may occur rapidly.
- Do not use grate or elevate fire. Build wood fire directly on hearth.
- Replace glass only with ceramic glass 3/16 in. (5mm).
- This wood heater needs periodic inspection and repair for proper operation. Consult the owner's manual for further information. It is against US federal regulations to operate this wood heater in a manner inconsistent with the operating instructions in the owner's manual.

PRÉVENEZ LES INCENDIES

- Installer et utiliser conformément au manuel d'utilisation du fabricant.
- Contacter les autorités de votre localité ayant juridiction concernant les restrictions et inspections d'installation.
- Utiliser avec le bois seulement. Ne pas utiliser d'autres combustibles.
- Risque de fuite de fumée et de flammes. Utiliser l'appareil la porte fermée ou ouverte avec le pare-étincelle en place uniquement. Ouvrir la porte ou retirer le pare-étincelle seulement lors du chargement.
- Ne pas raccorder à un conduit de fumée servant déjà pour un autre appareil.
- Installer seulement dans un foyer de maçonnerie. Ne pas enlever les briques ou le mortier du foyer de maçonnerie.
- La protection de plancher incombustible au devant de l'encastrable devrait avoir un facteur d'isolation R égal ou supérieure à 2.00 et se prolonger 27 pouces (686 mm) au devant de l'appareil lorsque l'âtre possède moins de 6 pouces (152 mm) d'élévation et se prolonger 16 pouces (406 mm) (USA), 18 pouces (457 mm) (CANADA), sans facteur d'isolation R au devant de l'encastrable lorsque l'âtre possède plus de 6 pouces (152 mm) d'élévation.
- Raccorder à une cheminée de maçonnerie respectant les codes ou à une cheminée préfabriquée homologuée, directement à la première section de cheminée gainée.
- Ne pas surchauffer. Si l'appareil ou le tuyau rougit, il y a surchauffe.
- Inspecter et nettoyer la cheminée fréquemment. Dans certaines conditions, la formation de créosote peut être rapide.
- Ne pas utiliser de chenets ou de grilles pour élever le feu. Préparer le feu directement sur l'âtre.
- Remplacer la vitre avec un verre de céramique de 3/16 po. (5mm).
- Cet appareil de chauffage requiert des inspections et réparations périodiques. Consulter le manuel de l'utilisateur pour plus d'information. Opérer cet appareil de chauffage de façon inconsistente par rapport au manuel de l'utilisateur consiste une violation de la loi fédérale (USA).

U.S. ENVIRONMENTAL PROTECTION AGENCY Certified to comply with 2020 particulate emission standards using cordwood.
AGENCE DE PROTECTION DE L'ENVIRONNEMENT DES É.-U. Conforme aux normes d'émission de particules de 2020 avec bûche de bois.
Weighted average emission rate / Moyenne pondérée des émissions: 1.6 g/h
When tested in accordance with / Lorsque testé selon: ASTM E2515
Tested and certified in compliance with CFR 40 part 60, subpart AAA, section 60.534(a)(1(III)

WARNING This product can expose you to carbon monoxide, which is known to the State of California to cause cancer, birth defects or other reproductive harm. (For more information go to www.p65warnings.ca.gov)

CAUTION

- HOT WHILE IN OPERATION.
- DO NOT TOUCH. KEEP CHILDREN, CLOTHING AND FURNITURE AWAY.
- CONTACT MAY CAUSE SKIN BURNS. SEE NAME-PLATE AND INSTRUCTIONS.

ATTENTION

- CHAUD EN FONCTIONNEMENT.
- NE PAS TOUCHER. GARDER LES ENFANTS, LES VÊTEMENTS ET LES MEUBLES ÉLOIGNÉS.
- UN CONTACT AVEC LA PEAU PEUT OCCASIONNER DES BRÛLURES. VOIR LES INSTRUCTIONS.

Made in St-Augustin-de-Desmaures (Qc), Canada
14/03/2022 (# test)

Englander

Fabriqué à St-Augustin-de-Desmaures (Qc), Canada
14/03/2022 (# test)

27898

REFER TO INTERTEK'S DIRECTORY OF BUILDING PRODUCTS FOR DETAILED INFORMATION
SE RÉFÉRER AU RÉPERTOIRE DES PRODUITS HOMOLOGUÉS D'INTERTEK POUR PLUS D'INFORMATION

C ETL US

Intertek
May/Mai 2019
Control number: 4002461

STANDARDS / NORMES D'ESSAI:
Certified to/Certifié selon ULC S627
Certified to/Certifié selon UL 1482
Certified to/Certifié selon UL 737
Certified to/Certifié selon CSA B415.1-10
Certified to/Certifié selon ASTM E3053-17
Certified to/Certifié selon ASTM E2515-11 (R2017)

LISTED SOLID FUEL BURNING APPLIANCE

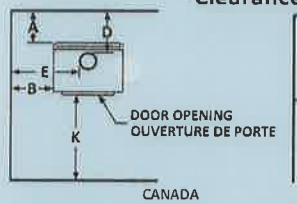
POÊLE À COMBUSTIBLE SOLIDE HOMOLOGUÉ

MODEL / MODÈLE :

OSBURN 3500

Serial Number / No. de Série: 0

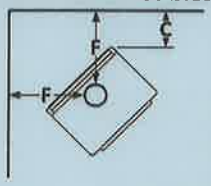
Clearances to combustibles / Dégagements aux combustibles



CANADA

Single wall connector / Tuyau à paroi simple		Double wall connector / Tuyau à paroi double	
A: 13.25 in./po.	(337 mm)	A: 6 in./po.	(152 mm)
B: 14 in./po.	(356 mm)	B: 14 in./po.	(356 mm)
C: 7.25 in./po.	(184 mm)	C: 7 in./po.	(178 mm)
D: 18 in./po.	(457 mm)	D: 10.75 in./po.	(273 mm)
E: 24.875 in./po	(632 mm)	E: 24.875 in./po	(632 mm)
F: 18 in./po.	(457 mm)	F: 17.75 in./po.	(451 mm)

Floor-ceiling/plancher-plafond: 84 in./po. (213cm)



U.S.A.

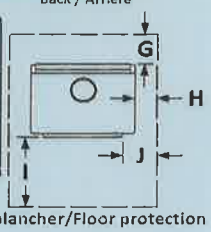
MOBILE HOME
MAISONS MOBILES
Double wall connector
Tuyau à paroi double

A: 9 in./po.	(229 mm)	D: 13.75 in./po.	(349 mm)
B: 19 in./po.	(483 mm)	E: 29.875 in./po.	(759 mm)
C: 10 in./po.	(254 mm)	F: 20.75 in./po.	(527 mm)

Single wall connector / Tuyau à paroi simple		Double wall connector / Tuyau à paroi double	
A: 13 in./po.	(330 mm)	A: 6 in./po.	(152 mm)
B: 14 in./po.	(356 mm)	B: 14 in./po.	(356 mm)
C: 7.25 in./po.	(184 mm)	C: 7 in./po.	(178 mm)
D: 17.75 in./po.	(451 mm)	D: 10.75 in./po.	(273 mm)
E: 24.875 in./po	(632 mm)	E: 24.875 in./po.	(632 mm)
F: 18 in./po.	(457 mm)	F: 17.75 in./po.	(451 mm)

* See owner's manual for other clearances with lowered ceiling/
voir manuel d'installation pour autres dégagements avec plafond abaissé

Back / Arrière



Protection de plancher/Floor protection

CANADA		U.S.A.	
G: 8 in./po.	(203 mm)	I: 16 in./po.	(406 mm)
H: 8 in./po	(203 mm)	J: 8 in./po.	(203 mm)
I: 18 in./po.	(457 mm)	K: 36 in./po.	(914 mm)
K: 48 in./po.	(1219 mm)		

PREVENT HOUSE FIRES

- Install and use only in accordance with the manufacturer's installation and operating instructions.
- Contact local building or fire officials about restrictions and installation inspection in your area.
- Use listed 152 mm /6 in. diameter single or double wall connectors with prefabricated chimneys approved UL 103 HT (US) and ULC S629 (CAN) suitable for solid fuels or lined masonry chimneys.
- See local building code and manufacturer's instructions for precautions required for passing a chimney through a combustible wall or ceiling.
- Do not pass connector through combustible wall or ceiling.
- Do not connect this unit to a chimney serving another appliance.
- Use with wood only. Do not use other fuels.
- Operate only with door closed or door open with firescreen installed. Open door or remove firescreen to feed the stove only.
- Do not obstruct the space underneath the stove.
- Do not use grate or elevate fire. Build fire directly on hearth.
- Do not overfire. If heater or chimney connector glows, you are overfiring.
- Inspect and clean chimney frequently. Under certain condition of use, creosote buildup may occur rapidly.
- Replace glass with ceramic type only.
- Install unit on a non-combustible material extending as shown above on this label.
- Suitable for mobile-home installation. Floor protection may vary from pedestal to legs version refer to owner's manual.
- Combustion air openings shall not be obstructed.
- This wood heater needs periodic inspection and repair for proper operation. Consult the owner's manual for further information. It is against US federal regulations to operate this wood heater in a manner inconsistent with the operating instructions in the owner's manual.

PRÉVENEZ LES INCENDIES

- Installer et utiliser conformément au manuel d'utilisation du fabricant.
- Contacter les autorités de votre localité ayant juridiction concernant les restrictions et inspections d'installation.
- Utiliser des tuyaux d'évacuation à parois simple ou double homologués d'un diamètre de 6 po. (152 mm) avec une cheminée préfabriquée approuvée UL 103 HT (US) et ULC S629 (CAN) pour utilisation au bois ou une cheminée de maçonnerie gainée.
- Voir les codes locaux et le manuel d'installation du manufacturier pour le passage de la cheminée à travers un mur ou un plafond combustible.
- Ne pas traverser un plafond ou un mur combustible avec un tuyau d'évacuation.
- Ne pas raccorder cet appareil à une cheminée déservant un autre appareil.
- Brûler du bois seulement. Ne pas utiliser d'autres combustibles.
- Garder la porte fermée ou le pare-étincelle en place en tout temps. Ouvrir la porte ou retirer le pare-étincelle que lors du chargement.
- Ne rien entreposer sous l'appareil.
- Ne pas utiliser de grilles ou de chenets pour surélever le feu. Préparer le feu directement sur l'âtre.
- Ne pas surchauffer. Si l'appareil ou le tuyau rougit, il y a surchauffe.
- Inspecter et nettoyer la cheminée fréquemment. Sous certaines conditions, l'accumulation de créosote peut être rapide.
- Remplacer la vitre seulement avec un verre de céramique.
- Installer l'appareil sur une plaque non combustible tel qu'indiqué sur l'étiquette.
- Poêle approuvé pour maison moblie. La protection de plancher peut varier entre la version plédestal et sur pattes. Voir le manuel d'instructions.
- Les entrées d'air servant à la combustion ne doivent pas être obstruées.
- Cet appareil de chauffage requiert des inspections et réparations périodiques. Consulter le manuel de l'utilisateur pour plus d'information. Opérer cet appareil de chauffage de façon inconsistente par rapport au manuel de l'utilisateur consiste une violation de la loi fédérale (USA).

Optional blower: (115V, 0.8A, 60Hz) — Option ventilateur: (115V, 0.8A, 60Hz)

U.S. ENVIRONMENTAL PROTECTION AGENCY Certified to comply with 2020 particulate emission standards using cordwood.
AGENCE DE PROTECTION DE L'ENVIRONNEMENT DES É.-U. Conforme aux normes d'émission de particules de 2020 avec bûche de bois.

Weighted average emission rate / Moyenne pondérée des émissions : 1.6 g/h

Tested and certified in compliance with CFR 40 part 60, subpart AAA, section 60.534(a)(1(ii))

WARNING: This product can expose you to carbon monoxide, which is known to the State of California to cause cancer, birth defects or other reproductive harm.
(For more information go to www.p65warnings.ca.gov)

CAUTION

- HOT WHILE IN OPERATION.
- DO NOT TOUCH. KEEP CHILDREN, CLOTHING AND FURNITURE AWAY.
- CONTACT MAY CAUSE SKIN BURNS. SEE NAME-PLATE AND INSTRUCTIONS

ATTENTION

- CHAUD EN FONCTIONNEMENT.
- NE PAS TOUCHER. GARDER LES ENFANTS, LES VÊTEMENTS ET LES MEUBLES ÉLOIGNÉS.
- UN CONTACT AVEC LA PEAU PEUT OCCASIONNER DES BRÛLURES. VOIR LES INSTRUCTIONS.

Made in St-Augustin-de-Desmaures (Qc), Canada
14/03/2022 (# test)

SBI
Fabricant de poêles international
Stove Builder International

Fabriqué à St-Augustin-de-Desmaures (Qc), Canada
14/03/2022 (# test)

27778

REFER TO INTERTEK'S DIRECTORY OF BUILDING PRODUCTS FOR DETAILED INFORMATION
SE RÉFÉRER AU RÉPERTOIRE DES PRODUITS HOMOLOGUÉS D'INTERTEK POUR PLUS D'INFORMATION

Intertek

Control number: 4002461
(July/Juillet 2020)

STANDARDS / NORMES D'ESSAI:

Certified to / Certifié selon ULC S628
Certified to / Certifié selon UL 1482
Certified to / Certifié selon UL 737
Certified to/Certifié selon CSA B415.1-10
Certified to/Certifié selon ASTM E3053-17
Certified to/Certifié selon ASTM E2515-11 (R2017)

LISTED SOLID FUEL BURNING INSERT APPLIANCE

APPAREIL ENCASTRABLE À COMBUSTIBLE SOLIDE HOMOLOGUÉ

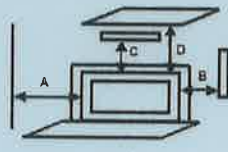
MODEL / MODÈLE :

OSBURN 3500-I

Serial Number / No. de Série: 0

Clearances to combustibles / Dégagements aux combustibles

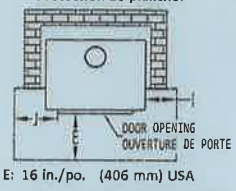
Measured from insert body
Mesuré à partir de la chemise de l'encastrable



Combustible side wall
Mur côté adjacent
Combustible side surround [1]
Parement latéral combustible [1]
Combustible top surround [1]
Parement supérieur combustible [1]
Combustible mantle shelf [1]
Tablette combustible [1]

A: 19 in./po. (483 mm)
B: 9 in./po. (229 mm)
C: 27 in./po. (686 mm)
D: 27 in./po. (686 mm)

Floor protection
Protection de plancher



E: 16 in./po. (406 mm) USA
18 in./po. (457 mm) CANADA
I: 8 in./po. (203 mm) CANADA
J: 8 in./po. (203 mm) USA

Blower / Ventilateur:
115VOLTS, 0.8 AMPS, 60Hz

[1] Subject to a maximum protrusion (consult owner's manual) / Sujet à une saillie maximale (consultez le manuel d'instructions)

PREVENT HOUSE FIRES

- Install and use only in accordance with the manufacturer's installation and operating instructions.
- Contact local building or fire officials about restrictions and installation inspection in your area.
- Use with solid wood fuel only. Do not use other fuels.
- Risk of smoke and flame spillage. Operate only with door closed or door open with screen door installed. Open door or remove screen door only to feed the stove.
- Do not connect this unit to a chimney serving another appliance.
- Install only in masonry fireplaces. Do not remove bricks or mortar from masonry fireplace.
- The non-combustible floor protection in front of the unit should have an R value equal or greater than 2.00 extending 27 inches (686 mm) in front of the insert if the hearth elevation is lower than 6 inches (152 mm) or extend 16 inches (406 mm) (USA), 18 inches (457 mm) (CANADA) without a R value if the hearth elevation is higher than 6 inches (152 mm).
- Connect to a code-approved masonry chimney or listed factory-built fireplace chimney with a direct flue connector into the first chimney liner section.
- Do not overfire. If stove or chimney connector glows, your are overfiring.
- Inspect and clean chimney frequently. Under certain conditions of use, creosote buildup may occur rapidly.
- Do not use grate or elevate fire. Build wood fire directly on hearth.
- Replace glass only with ceramic glass.
- This wood heater needs periodic inspection and repair for proper operation. Consult the owner's manual for further information. It is against US federal regulations to operate this wood heater in a manner inconsistent with the operating instructions in the owner's manual.

PRÉVENEZ LES INCENDIES

- Installer et utiliser conformément au manuel d'utilisation du fabricant.
- Contacter les autorités de votre localité ayant juridiction concernant les restrictions et inspections d'installation.
- Utiliser avec le bois seulement. Ne pas utiliser d'autres combustibles.
- Risque de fuite de fumée et de flammes. Utiliser l'appareil la porte fermée ou ouverte avec le pare-étincelle en place uniquement. Ouvrir la porte ou retirer le pare-étincelle seulement lors du chargement.
- Ne pas raccorder à un conduit de fumée servant déjà pour un autre appareil.
- Installer seulement dans un foyer de maçonnerie. Ne pas enlever les briques ou le mortier du foyer de maçonnerie.
- La protection de plancher incombustible au devant de l'encastrable devrait avoir un facteur d'isolation R égal ou supérieure à 2.00 et se prolonger 27 pouces (686 mm) au devant de l'appareil lorsque l'âtre possède moins de 6 pouces (152 mm) d'élévation et se prolonger 16 pouces (406 mm) (USA), 18 pouces (457 mm) (CANADA), sans facteur d'isolation R au devant de l'encastrable lorsque l'âtre possède plus de 6 pouces (152 mm) d'élévation.
- Raccorder à une cheminée de maçonnerie respectant les codes ou à une cheminée préfabriquée homologuée, directement à la première section de cheminée gainée.
- Ne pas surchauffer. Si l'appareil ou le tuyau rougit, il y a surchauffe.
- Inspecter et nettoyer la cheminée fréquemment. Dans certaines conditions, la formation de créosote peut être rapide.
- Ne pas utiliser de chenets ou de grilles pour élever le feu. Préparer le feu directement sur l'âtre.
- Remplacer la vitre avec un verre de céramique.
- Cet appareil de chauffage requiert des inspections et réparations périodiques. Consulter le manuel de l'utilisateur pour plus d'information. Opérer cet appareil de chauffage de façon inconsistente par rapport au manuel de l'utilisateur consiste une violation de la loi fédérale (USA).

U.S. ENVIRONMENTAL PROTECTION AGENCY Certified to comply with 2020 particulate emission standards using cordwood.
AGENCE DE PROTECTION DE L'ENVIRONNEMENT DES É.-U. Conforme aux normes d'émission de particules de 2020 avec bûche de bois.
Weighted average emission rate: / Moyenne pondérée des émissions: 1.6 g/h
Tested and certified in compliance with CFR 40 part 60, subpart AAA, section 60.534(a)(1(ii))

WARNING: This product can expose you to carbon monoxide, which is known to the State of California to cause cancer, birth defects or other reproductive harm. (For more information go to www.p65warnings.ca.gov)

CAUTION

- HOT WHILE IN OPERATION.
- DO NOT TOUCH. KEEP CHILDREN, CLOTHING AND FURNITURE AWAY.
- CONTACT MAY CAUSE SKIN BURNS. SEE NAME-PLATE AND INSTRUCTIONS.

ATTENTION

- CHAUD EN FONCTIONNEMENT.
- NE PAS TOUCHER. GARDER LES ENFANTS, LES VÊTEMENTS ET LES MEUBLES ÉLOIGNÉS.
- UN CONTACT AVEC LA PEAU PEUT OCCASIONNER DES BRÛLURES. VOIR LES INSTRUCTIONS.

Made in St-Augustin-de-Desmaures (Qc), Canada
14/03/2022 (# test)

SBI
Fabricant de poêles international
Stove Builder International

Fabriqué à St-Augustin-de-Desmaures (Qc), Canada
14/03/2022 (# test)

27835

REFER TO INTERTEK'S DIRECTORY OF BUILDING PRODUCTS FOR DETAILED INFORMATION
SE RÉFÉRER AU RÉPERTOIRE DES PRODUITS HOMOLOGUÉS D'INTERTEK POUR PLUS D'INFORMATION

Intertek
May/Mai 2019
Control number: 4002461

STANDARDS / NORMES D'ESSAI:
Certified to/Certifié selon ULC S627
Certified to/Certifié selon UL 1482
Certified to/Certifié selon UL 737
Certified to/Certifié selon CSA B415.1-10
Certified to/Certifié selon ASTM E3053-17
Certified to/Certifié selon ASTM E2515-11 (R2017)

LISTED SOLID FUEL BURNING APPLIANCE

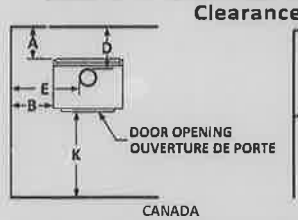
POÊLE À COMBUSTIBLE SOLIDE HOMOLOGUÉ

MODEL / MODÈLE :

GATEWAY 3500

Serial Number / No. de Série: 1

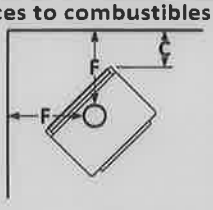
Clearances to combustibles / Dégagements aux combustibles



CANADA

	Single wall connector / Tuyau à paroi simple	Double wall connector / Tuyau à paroi double
A:	13.25 in./po. (337 mm)	7 in./po. (178 mm)
B:	14 in./po. (356 mm)	14 in./po. (356 mm)
C:	7.25 in./po. (184 mm)	7 in./po. (178 mm)
D:	18 in./po. (457 mm)	11.75 in./po. (298 mm)
E:	24.875 in./po (632 mm)	24.875 in./po (632 mm)
F:	18 in./po. (457 mm)	17.75 in./po. (451 mm)

Floor-ceiling/plancher-plafond: 84 in./po. (213cm)



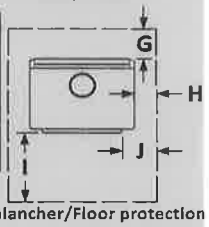
U.S.A.

	Single wall connector / Tuyau à paroi simple	Double wall connector / Tuyau à paroi double
A:	13 in./po. (330 mm)	7 in./po. (152 mm)
B:	14 in./po. (356 mm)	14 in./po. (356 mm)
C:	7.25 in./po. (184 mm)	7 in./po. (178 mm)
D:	17.75 in./po. (451 mm)	11.75 in./po. (273 mm)
E:	24.875 in./po (632 mm)	24.875 in./po. (632 mm)
F:	18 in./po. (457 mm)	17.75 in./po. (451 mm)

MOBILE HOME
MAISONS MOBILES
Double wall connector
Tuyau à paroi double

A:	9 in./po. (229 mm)	D:	13.75 in./po. (349 mm)
B:	19 in./po. (483 mm)	E:	29.875 in./po. (759 mm)
C:	10 in./po. (254 mm)	F:	20.75 in./po. (527 mm)

Back / Arrière



Protection de plancher/Floor protection

CANADA	U.S.A.
G: 8 in./po. (203 mm)	I: 16 in./po. (406 mm)
H: 8 in./po (203 mm)	J: 8 in./po. (203 mm)
I: 18 in./po. (457 mm)	K: 36 in./po. (914 mm)
K: 48 in./po. (1219 mm)	

* See owner's manual for other clearances with lowered ceiling/
voir manuel d'installation pour autres dégagements avec plafond abaissé

PREVENT HOUSE FIRES

- Install and use only in accordance with the manufacturer's installation and operating instructions.
- Contact local building or fire officials about restrictions and installation inspection in your area.
- Use listed 152 mm /6 in. diameter single or double wall connectors with prefabricated chimneys approved UL 103 HT (US) and ULC S629 (CAN) suitable for solid fuels or lined masonry chimneys.
- See local building code and manufacturer's instructions for precautions required for passing a chimney through a combustible wall or ceiling.
- Do not pass connector through combustible wall or ceiling.
- Do not connect this unit to a chimney serving another appliance.
- Use with wood only. Do not use other fuels.
- Operate only with door closed or door open with firescreen installed. Open door or remove firescreen to feed the stove only.
- Do not obstruct the space underneath the stove.
- Do not use grate or elevate fire. Build fire directly on hearth.
- Do not overfire. If heater or chimney connector glows, you are overfiring.
- Inspect and clean chimney frequently. Under certain condition of use, creosote buildup may occur rapidly.
- Replace glass with ceramic type only.
- Install unit on a non-combustible material extending as shown above on this label.
- Suitable for mobile-home installation. Floor protection may vary from pedestal to legs version refer to owner's manual.
- Combustion air openings shall not be obstructed.
- This wood heater needs periodic inspection and repair for proper operation. Consult the owner's manual for further information. It is against US federal regulations to operate this wood heater in a manner inconsistent with the operating instructions in the owner's manual.

PRÉVENEZ LES INCENDIES

- Installer et utiliser conformément au manuel d'utilisation du fabricant.
- Contacter les autorités de votre localité ayant juridiction concernant les restrictions et inspections d'installation.
- Utiliser des tuyaux d'évacuation à parois simple ou double homologués d'un diamètre de 6 po. (152 mm) avec une cheminée préfabriquée approuvée UL 103 HT (US) et ULC S629 (CAN) pour utilisation au bois ou une cheminée de maçonnerie gainée.
- Voir les codes locaux et le manuel d'installation du manufacturier pour le passage de la cheminée à travers un mur ou un plafond combustible.
- Ne pas traverser un plafond ou un mur combustible avec un tuyau d'évacuation.
- Ne pas raccorder cet appareil à une cheminée déservant un autre appareil.
- Brûler du bois seulement. Ne pas utiliser d'autres combustibles.
- Garder la porte fermée ou le pare-étincelle en place en tout temps. Ouvrir la porte ou retirer le pare-étincelle que lors du chargement.
- Ne rien entreposer sous l'appareil.
- Ne pas utiliser de grilles ou de chenets pour surélever le feu.Préparer le feu directement sur l'âtre.
- Ne pas surchauffer. Si l'appareil ou le tuyau rougit, il y a surchauffe.
- Inspecter et nettoyer la cheminée fréquemment. Sous certaines conditions, l'accumulation de créosote peut être rapide.
- Remplacer la vitre seulement avec un verre de céramique.
- Installer l'appareil sur une plaque non combustible tel qu'indiqué sur l'étiquette.
- Poêle approuvé pour maison mobile.La protection de plancher peut varier entre la version plédestal et sur pattes. Voir le manuel d'instructions.
- Les entrées d'air servant à la combustion ne doivent pas être obstruées.
- Cet appareil de chauffage requiert des inspections et réparations périodiques. Consulter le manuel de l'utilisateur pour plus d'information. Opérer cet appareil de chauffage de façon inconsistente par rapport au manuel de l'utilisateur consiste une violation de la loi fédérale (USA).

Optional blower: (115V, 0.8A, 60Hz) — Option ventilateur: (115V, 0.8A, 60Hz)

U.S. ENVIRONMENTAL PROTECTION AGENCY Certified to comply with 2020 particulate emission standards using cordwood.
AGENCE DE PROTECTION DE L'ENVIRONNEMENT DES É.-U. Conforme aux normes d'émission de particules de 2020 avec bûche de bois.

Weighted average emission rate / Moyenne pondérée des émissions : 1.6 g/h

Tested and certified in compliance with CFR 40 part 60, subpart AAA, section 60.534(a)(1(ii))

WARNING: This product can expose you to carbon monoxide, which is known to the State of California to cause cancer, birth defects or other reproductive harm. (For more information go to www.p65warnings.ca.gov)

CAUTION

- HOT WHILE IN OPERATION.
- DO NOT TOUCH. KEEP CHILDREN, CLOTHING AND FURNITURE AWAY.
- CONTACT MAY CAUSE SKIN BURNS. SEE NAME-PLATE AND INSTRUCTIONS.

ATTENTION

- CHAUD EN FONCTIONNEMENT.
- NE PAS TOUCHER. GARDER LES ENFANTS, LES VÊTEMENTS ET LES MEUBLES ÉLOIGNÉS.
- UN CONTACT AVEC LA PEAU PEUT OCCASIONNER DES BRÛLURES. VOIR LES INSTRUCTIONS.

Made in St-Augustin-de-Desmaures (Qc), Canada
14/03/2022 (# test)

EMPIRE
SINCE 1932

Fabriqué à St-Augustin-de-Desmaures (Qc), Canada
14/03/2022 (# test)

27777

REFER TO INTERTEK'S DIRECTORY OF BUILDING PRODUCTS FOR DETAILED INFORMATION
SE RÉFÉRER AU RÉPERTOIRE DES PRODUITS HOMOLOGUÉS D'INTERTEK POUR PLUS D'INFORMATION

Intertek
Jan/Jan 2021
Control number: 4002461

STANDARDS / NORMES D'ESSAI:
Certified to/Certifié selon ULC S627
Certified to/Certifié selon UL 1482
Certified to/Certifié selon UL 737
Certified to/Certifié selon CSA B415.1-10
Certified to/Certifié selon ASTM E3053-17
Certified to/Certifié selon ASTM E2515-11 (R2017)

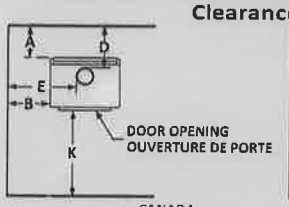
LISTED SOLID FUEL BURNING APPLIANCE

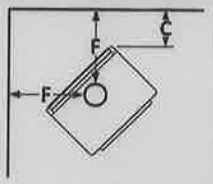
POÊLE À COMBUSTIBLE SOLIDE HOMOLOGUÉ

MODEL / MODÈLE : HES350

Serial Number / No. de Série: 1

Clearances to combustibles / Dégagements aux combustibles

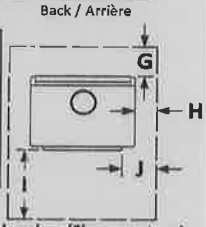




MOBILE HOME
MAISONS MOBILES
Double wall connector
Tuyau à paroi double

A: 9 in./po. (229 mm) D: 13.75 in./po. (349 mm)
B: 19 in./po. (483 mm) E: 29.875 in./po. (759 mm)
C: 10 in./po. (254 mm) F: 20.75 in./po. (527 mm)

Back / Arrière



CANADA

	Single wall connector / Tuyau à paroi simple	Double wall connector / Tuyau à paroi double
A:	13.25 in./po. (337 mm)	7 in./po. (178 mm)
B:	14 in./po. (356 mm)	14 in./po. (356 mm)
C:	7.25 in./po. (184 mm)	7 in./po. (178 mm)
D:	18 in./po. (457 mm)	11.75 in./po. (298 mm)
E:	24.875 in./po (632 mm)	24.875 in./po (632 mm)
F:	18 in./po. (457 mm)	17.75 in./po. (451 mm)

Floor-ceiling/plancher-plafond: 84 in./po. (213cm)

U.S.A.

	Single wall connector / Tuyau à paroi simple	Double wall connector / Tuyau à paroi double
A:	13 in./po. (330 mm)	7 in./po. (178 mm)
B:	14 in./po. (356 mm)	14 in./po. (356 mm)
C:	7.25 in./po. (184 mm)	7 in./po. (178 mm)
D:	17.75 in./po. (451 mm)	11.75 in./po. (298 mm)
E:	24.875 in./po (632 mm)	24.875 in./po. (632 mm)
F:	18 in./po. (457 mm)	17.75 in./po. (451 mm)

* See owner's manual for other clearances with lowered ceiling/
voir manuel d'installation pour autres dégagements avec plafond abaissé

Protection de plancher/Floor protection

CANADA	U.S.A.
G: 8 in./po. (203 mm)	I: 16 in./po. (406 mm)
H: 8 in./po (203 mm)	J: 8 in./po. (203 mm)
I: 18 in./po. (457 mm)	K: 36 in./po. (914 mm)
K: 48 in./po. (1219 mm)	

PREVENT HOUSE FIRES

- Install and use only in accordance with the manufacturer's installation and operating instructions.
- Contact local building or fire officials about restrictions and installation inspection in your area.
- Use listed 152 mm /6 in. diameter single or double wall connectors with prefabricated chimneys approved UL 103 HT (US) and ULC S629 (CAN) suitable for solid fuels or lined masonry chimneys.
- See local building code and manufacturer's instructions for precautions required for passing a chimney through a combustible wall or ceiling.
- Do not pass connector through combustible wall or ceiling.
- Do not connect this unit to a chimney serving another appliance.
- Use with wood only. Do not use other fuels.
- Operate only with door closed or door open with firescreen installed. Open door or remove firescreen to feed the stove only.
- Do not obstruct the space underneath the stove.
- Do not use grate or elevate fire. Build fire directly on hearth.
- Do not overfire. If heater or chimney connector glows, you are overfiring.
- Inspect and clean chimney frequently. Under certain condition of use, creosote buildup may occur rapidly.
- Replace glass with ceramic type only.
- Install unit on a non-combustible material extending as shown above on this label.
- Suitable for mobile-home installation. Floor protection may vary from pedestal to legs version refer to owner's manual.
- Combustion air openings shall not be obstructed.
- This wood heater needs periodic inspection and repair for proper operation. Consult the owner's manual for further information. It is against US federal regulations to operate this wood heater in a manner inconsistent with the operating instructions in the owner's manual.

PRÉVENEZ LES INCENDIES

- Installer et utiliser conformément au manuel d'utilisation du fabricant.
- Contacter les autorités de votre localité ayant juridiction concernant les restrictions et inspections d'installation.
- Utiliser des tuyaux d'évacuation à parois simple ou double homologués d'un diamètre de 6 po. (152 mm) avec une cheminée préfabriquée approuvée UL 103 HT (US) et ULC S629 (CAN) pour utilisation au bois ou une cheminée de maçonnerie gainée.
- Voir les codes locaux et le manuel d'installation du manufacturier pour le passage de la cheminée à travers un mur ou un plafond combustible.
- Ne pas traverser un plafond ou un mur combustible avec un tuyau d'évacuation.
- Ne pas raccorder cet appareil à une cheminée déservant un autre appareil.
- Brûler du bois seulement. Ne pas utiliser d'autres combustibles.
- Garder la porte fermée ou le pare-étincelle en place en tout temps. Ouvrir la porte ou retirer le pare-étincelle que lors du chargement.
- Ne rien entreposer sous l'appareil.
- Ne pas utiliser de grilles ou de chenets pour surélever le feu. Préparer le feu directement sur l'âtre.
- Ne pas surchauffer. Si l'appareil ou le tuyau rougit, il y a surchauffe.
- Inspecter et nettoyer la cheminée fréquemment. Sous certaines conditions, l'accumulation de créosote peut être rapide.
- Remplacer la vitre seulement avec un verre de céramique.
- Installer l'appareil sur une plaque non combustible tel qu'indiqué sur l'étiquette.
- Poêle approuvé pour maison mobile. La protection de plancher peut varier entre la version plédestal et sur pattes. Voir le manuel d'instructions.
- Les entrées d'air servant à la combustion ne doivent pas être obstruées.
- Cet appareil de chauffage requiert des inspections et réparations périodiques. Consulter le manuel de l'utilisateur pour plus d'information. Opérer cet appareil de chauffage de façon inconsistente par rapport au manuel de l'utilisateur consiste une violation de la loi fédérale (USA).

Optional blower: (115V, 0.8A, 60Hz) — Option ventilateur: (115V, 0.8A, 60Hz)

U.S. ENVIRONMENTAL PROTECTION AGENCY Certified to comply with 2020 particulate emission standards using cordwood.
AGENCE DE PROTECTION DE L'ENVIRONNEMENT DES É.-U. Conforme aux normes d'émission de particules de 2020 avec bûche de bois.

Weighted average emission rate / Moyenne pondérée des émissions : 1.6 g/h
Tested and certified in compliance with CFR 40 part 60, subpart AAA, section 60.534(a)(1(ii))

WARNING: This product can expose you to carbon monoxide, which is known to the State of California to cause cancer, birth defects or other reproductive harm.
(For more information go to www.p65warnings.ca.gov)

CAUTION

- HOT WHILE IN OPERATION.
- DO NOT TOUCH. KEEP CHILDREN, CLOTHING AND FURNITURE AWAY.
- CONTACT MAY CAUSE SKIN BURNS. SEE NAME-PLATE AND INSTRUCTIONS.

ATTENTION

- CHAUD EN FONCTIONNEMENT.
- NE PAS TOUCHER. GARDER LES ENFANTS, LES VÊTEMENTS ET LES MEUBLES ÉLOIGNÉS.
- UN CONTACT AVEC LA PEAU PEUT OCCASIONNER DES BRÛLURES. VOIR LES INSTRUCTIONS.

Made in St-Augustin-de-Desmaures (Qc), Canada
14/03/2022 (# test)

VENTIS

Fabriqué à St-Augustin-de-Desmaures (Qc), Canada
14/03/2022 (# test)

27872

REFER TO INTERTEK'S DIRECTORY OF BUILDING PRODUCTS FOR DETAILED INFORMATION
SE RÉFÉRER AU RÉPERTOIRE DES PRODUITS HOMOLOGUÉS D'INTERTEK POUR PLUS D'INFORMATION

Intertek
Control number: 4002461
(July/Juillet 2020)

STANDARDS / NORMES D'ESSAI:

Certified to / Certifié selon ULC S628
Certified to / Certifié selon UL 1482
Certified to / Certifié selon UL 737
Certified to/Certifié selon CSA B415.1-10
Certified to/Certifié selon ASTM E3053-17
Certified to/Certifié selon ASTM E2515-11 (R2017)

LISTED SOLID FUEL BURNING INSERT APPLIANCE

APPAREIL ENCASTRABLE À COMBUSTIBLE SOLIDE HOMOLOGUÉ

MODEL / MODÈLE :

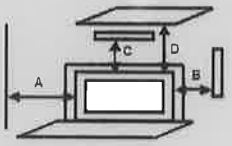
HEI350

Serial Number / No. de Série: 1

Clearances to combustibles / Dégagements aux combustibles

Measured from insert body

Mesuré à partir de la chemise de l'encastrable

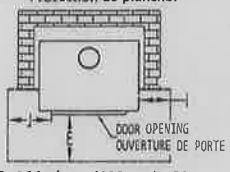


Blower / Ventilateur:
115VOLTS, 0.8 AMPS, 60Hz

Combustible side wall
Mur côté adjacent
Combustible side surround [1]
Parement latéral combustible [1]
Combustible top surround [1]
Parement supérieur combustible [1]
Combustible mantle shelf [1]
Tablette combustible [1]

A: 19 in./po. (483 mm)
B: 9 in./po. (229 mm)
C: 27 in./po. (686 mm)
D: 27 in./po. (686 mm)

Floor protection
Protection de plancher



E: 16 in./po. (406 mm) USA
18 in./po. (457 mm) CANADA
I: 8 in./po. (203 mm) CANADA
J: 8 in./po. (203 mm) USA

Floor - Ceiling / Plancher - Plafond: 84 in./po. (213 cm)

[1] Subject to a maximum protrusion (consult owner's manual) / Sujet à une saillie maximale (consultez le manuel d'instructions)

PREVENT HOUSE FIRES

- Install and use only in accordance with the manufacturer's installation and operating instructions.
- Contact local building or fire officials about restrictions and installation inspection in your area.
- Use with solid wood fuel only. Do not use other fuels.
- Risk of smoke and flame spillage. Operate only with door closed or door open with screen door installed. Open door or remove screen door only to feed the stove.
- Do not connect this unit to a chimney serving another appliance.
- Install only in masonry fireplaces. Do not remove bricks or mortar from masonry fireplace.
- The non-combustible floor protection in front of the unit should have an R value equal or greater than 2.00 extending 27 inches (686 mm) in front of the insert if the hearth elevation is lower than 6 inches (152 mm) or extend 16 inches (406 mm) (USA), 18 inches (457 mm) (CANADA) without a R value if the hearth elevation is higher than 6 inches (152 mm).
- Connect to a code-approved masonry chimney or listed factory-built fireplace chimney with a direct flue connector into the first chimney liner section.
- Do not overfire. If stove or chimney connector glows, your are overfiring.
- Inspect and clean chimney frequently. Under certain conditions of use, creosote buildup may occur rapidly.
- Do not use grate or elevate fire. Build wood fire directly on hearth.
- Replace glass only with ceramic glass.
- This wood heater needs periodic inspection and repair for proper operation. Consult the owner's manual for further information. It is against US federal regulations to operate this wood heater in a manner inconsistent with the operating instructions in the owner's manual.

PRÉVENEZ LES INCENDIES

- Installer et utiliser conformément au manuel d'utilisation du fabricant.
- Contacter les autorités de votre localité ayant juridiction concernant les restrictions et inspections d'installation.
- Utiliser avec le bois seulement. Ne pas utiliser d'autres combustibles.
- Risque de fuite de fumée et de flammes. Utiliser l'appareil la porte fermée ou ouverte avec le pare-étincelle en place uniquement. Ouvrir la porte ou retirer le pare-étincelle seulement lors du chargement.
- Ne pas raccorder à un conduit de fumée servant déjà pour un autre appareil.
- Installer seulement dans un foyer de maçonnerie. Ne pas enlever les briques ou le mortier du foyer de maçonnerie.
- La protection de plancher incombustible au devant de l'encastrable devrait avoir un facteur d'isolation R égal ou supérieure à 2.00 et se prolonger 27 pouces (686 mm) au devant de l'appareil lorsque l'âtre possède moins de 6 pouces (152 mm) d'élévation et se prolonger 16 pouces (406 mm) (USA), 18 pouces (457 mm) (CANADA), sans facteur d'isolation R au devant de l'encastrable lorsque l'âtre possède plus de 6 pouces (152 mm) d'élévation.
- Raccorder à une cheminée de maçonnerie respectant les codes ou à une cheminée préfabriquée homologuée, directement à la première section de cheminée gainée.
- Ne pas surchauffer. Si l'appareil ou le tuyau rougit, il y a surchauffe.
- Inspecter et nettoyer la cheminée fréquemment. Dans certaines conditions, la formation de créosote peut être rapide.
- Ne pas utiliser de chenets ou de grilles pour élever le feu. Préparer le feu directement sur l'âtre.
- Remplacer la vitre avec un verre de céramique.
- Cet appareil de chauffage requiert des inspections et réparations périodiques. Consulter le manuel de l'utilisateur pour plus d'information. Opérer cet appareil de chauffage de façon inconsistente par rapport au manuel de l'utilisateur consiste une violation de la loi fédérale (USA).

U.S. ENVIRONMENTAL PROTECTION AGENCY Certified to comply with 2020 particulate emission standards using cordwood.
AGENCE DE PROTECTION DE L'ENVIRONNEMENT DES É.-U. Conforme aux normes d'émission de particules de 2020 avec bûche de bois.
Weighted average emission rate: / Moyenne pondérée des émissions: 1.6 g/h
Tested and certified in compliance with CFR 40 part 60, subpart AAA, section 60.534(a)(1(ii))

WARNING: This product can expose you to carbon monoxide, which is known to the State of California to cause cancer, birth defects or other reproductive harm.
(For more information go to www.p65warnings.ca.gov)

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- UN CONTACT AVEC LA PEAU PEUT OCCASIONNER DES BRÛLURES. VOIR LES INSTRUCTIONS.

Made in St-Augustin-de-Desmaures (Qc), Canada
14/03/2022 (# test)

VENTIS

Fabriqué à St-Augustin-de-Desmaures (Qc), Canada
14/03/2022 (# test)

27873

POLYCONTROLS
INTEGRATION • CALIBRATION • INSTRUMENTATION

CLAS 2009-02

#655

CERTIFICAT D'ÉTALONNAGE # 15508

Date d'étalonnage : 2021-11-16
Date d'émission du certificat : 2021-11-16

Stove Builder International
250, rue de Copenhague
Saint-Augustin-de-Desmaures, Québec, Canada
G3A 2H3

Étalonnage d'un
Débitmètre volumétrique American Meter Company DTM-200A S/N : 07J264834

CONFORMITÉ AU PROGRAMME DE QUALITÉ

Tous les étalonnages sont effectués conformément au manuel d'assurance qualité de Polycontrols qui est conforme à la norme ISO/IEC 17025: 2017, à la norme ISO 9001 – 2015 ainsi qu'à toutes autres exigences de qualité définies dans la description d'achat des clients. Les résultats ne sont valides que pour l'objet soumis à l'essai ou à l'étalonnage. Si applicable, la règle de décision est décrite au certificat.

TRAÇABILITÉ

La traçabilité des étalons de débit au National Institute of Standards and Technology, NIST, est maintenue par les laboratoires de Fluke Corporation de Phoenix, Arizona et est conforme aux normes ISO/IEC 17025, ANSI/NCSL Z540-1-1994, ISO-10012-1, MIL-STD 45662A.

Le Service d'évaluation des laboratoires d'étalonnage (CLAS) du Conseil national de recherches du Canada (CNRC) a évalué et certifié la capacité d'étalonnage du laboratoire et la traçabilité au Système international d'unités (SI) ou à des étalons acceptables selon le CLAS. Le présent certificat d'étalonnage est délivré conformément aux conditions de certification du CLAS et aux conditions d'accréditation du Conseil canadien des normes (CCN). Le CLAS et le CCN ne garantissent pas l'exactitude des étalonnages individuels effectués par les laboratoires accrédités.

APTITUDE EN MATIÈRE DE MESURE ET D'ÉTALONNAGE - CMC

Les rendements métrologiques d'étalonnage ont une incertitude de ±0.2% de la lecture pour les mesures entre 5 SCCM à 10 SLPM, ±0.3% de la lecture pour les mesures entre 10 SLPM à 30 SLPM, ±0.2% de la lecture pour les mesures entre 30 SLPM à 3000 SLPM, ±0.3% de la lecture pour les mesures supérieures à 3000 SLPM jusqu'à 6000 SLPM et ±0.5% pour les mesures inférieures à 5 SCCM jusqu'à concurrence de 1 SCCM, équivalent air ou azote. Les incertitudes exprimées sont élargies avec un facteur d'élargissement k = 2, et ce, pour un niveau de confiance d'environ 95 %, dans l'hypothèse d'une distribution normale incluant la résolution de l'instrument. Le rapport d'incertitude des essais (RIE) de cet étalonnage respecte un ratio de 4:1 à moins d'indication contraire.

SOMMAIRE DES CONDITIONS DE L'INSTRUMENT EN TEST

Conditions initiales	En bon état
Travail Effectué	Étalonnage de l'instrument
	Lectures Initiales = Lectures finales, aucun ajustement
Résultats	Lectures finales dans les tolérances
Remarques	Fréquence d'étalonnage aux 12 mois

B Poirier
Bernard Poirier
Métrologiste

Olivier Duchesne Bamber
Responsable du laboratoire

POLYCONTROLS
INTEGRATION • CALIBRATION • INSTRUMENTATION

CLAS NRC-CNRC
CLAS 2009-02

SCC Accredited LAB
LAB Accrédité CCN
#655

Certificat d'étalonnage # 15508

Numéro de série:	07J264834	Station de mesure:	3
Date d'étalonnage:	2021-11-16	Procédure:	POS-CAL-005
Identification de l'instrument:	SBI-103	Règle de décision:	Méthode #3

Instrument de mesure de référence utilisé pour l'étalonnage final

Description	Modèle	# Série	Traçabilité	Date dû
Fluke molbloc_30 slpm	3E4-VCR-V-Q	2403	1500308202	2022-06-03
Fluke molbox1	Molbox1	755	1500311473	2022-07-02
RTD Mist	M22	3061002	2021004861	2022-06-21
Module 44.5 PSI avec Baro 163671	Module 30	160659	2021003409	2022-05-04

Spécifications finales de l'appareil

Gaz	Air
Température d'opération	
Pression à l'entrée	
Pression à la sortie	
Température de référence	
Pression de référence	
Étendue d'échelle	0-200 ACFH
Signaux Entrée/Sortie	-
Alimentation	
Tolérance	±2 %F.S.

Condition d'étalonnage

Gaz	Air
Température ambiante	21 °C
Pression ambiante	1011.43 mbar
Orientation	Horizontale
Élastomère	
Valve	

Lectures finales

Débit du test ACFH	Instrument en test ft³	Valeurs mesurées Pression PSIA	Température °C	Référence ft³	Référence calculée ft³	Erreur calculée ft³	Tolérance acceptable ft³	Incertitude k = 2 ft³	TUR
5.0186	0.8420	14.682	21.02	0.8338	0.8343	0.0077	0.6650	0.0034	>4
10.0496	1.6810	14.681	20.98	1.6724	1.6733	0.0077	0.6660	0.0056	>4
15.0522	2.5230	14.680	20.95	2.5036	2.5049	0.0181	0.6657	0.0083	>4
24.9227	4.1870	14.682	20.92	4.1549	4.1561	0.0309	0.6670	0.0138	>4
39.7734	6.6830	14.687	20.92	6.6241	6.6237	0.0593	0.6661	0.0220	>4

POLYCONTROLS
INTEGRATION • CALIBRATION • INSTRUMENTATION

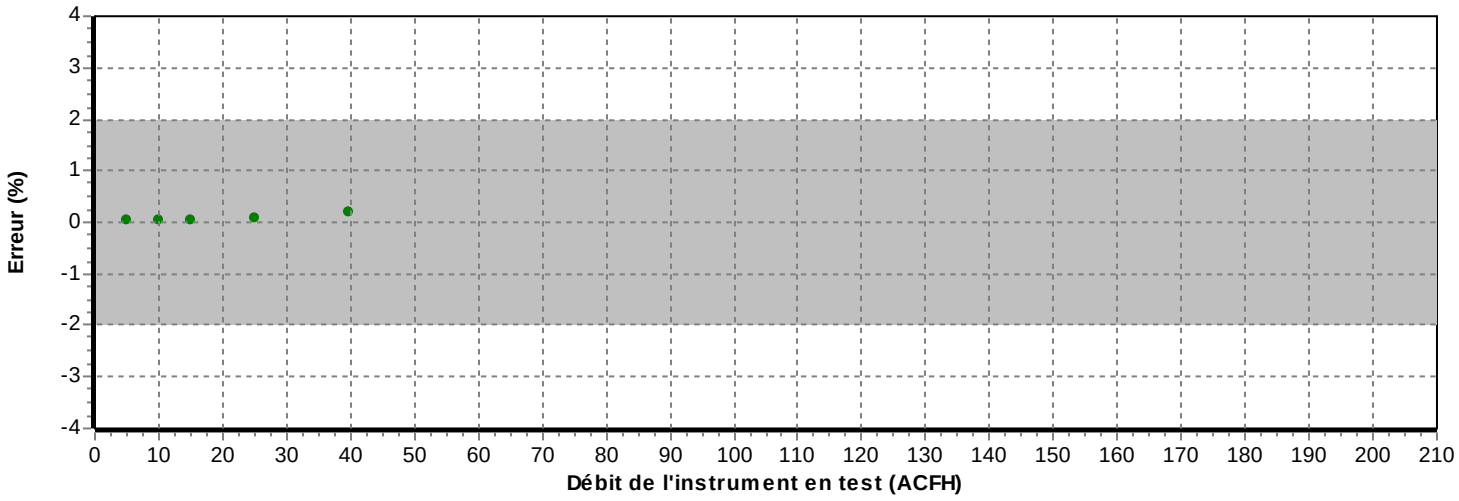
CLAS 2009-02

#655

Certificat d'étalonnage # 15508

Numéro de série:	07J264834	Station de mesure:	3
Date d'étalonnage:	2021-11-16	Procédure:	POS-CAL-005
Identification de l'instrument:	SBI-103	Règle de décision:	Méthode #3

Résultats finaux



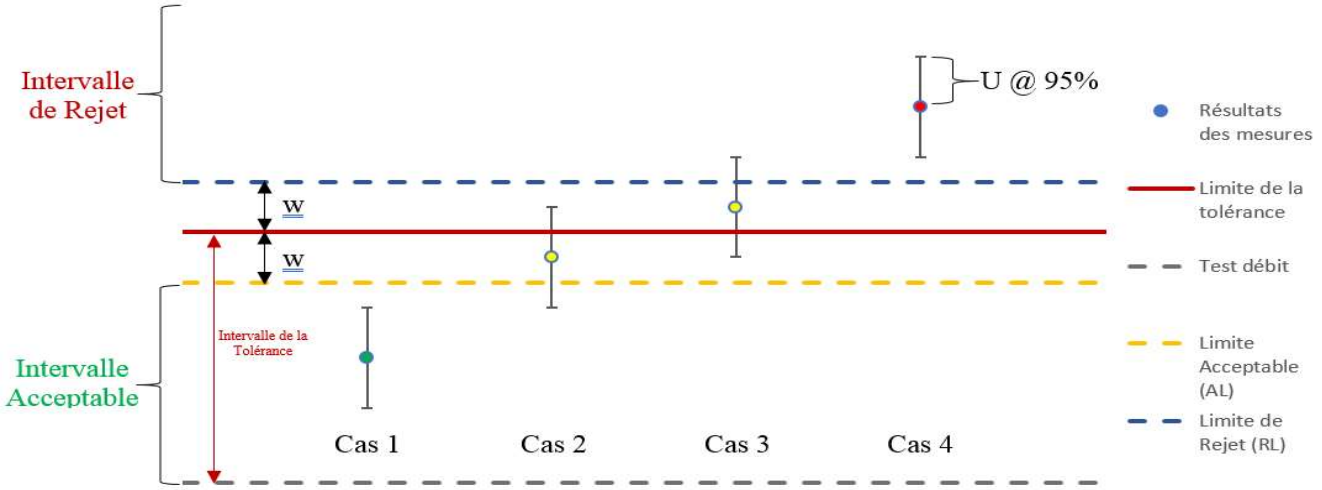
Voir l'annexe pour la règle de décision

Annexe pour la règle de décision

Méthode 3 Statut de Conformité Non-binaire avec Bande de Garde en considérant l'incertitude de la mesure directement

Cette méthode tient compte d'une bande de garde pour définir l'intervalle acceptable et de rejet. La limite acceptable du résultat de la mesure est calculée selon la méthode mathématique suivante AL = TL – w et de rejet RL = TL + w, dont w = rU. Le multiple r de l'incertitude combiné élargie U peut être défini selon la table 1 section 5.2 du document ILAC G8 : 2019. L'incertitude de la mesure U est une incertitude combinée élargie ayant un niveau de confiance de 95% (k = 2). La règle de conformité non-binaire avec bande de garde est définie lorsqu'il y a quatre choix sur le statut de l'essai : dans la tolérance, acceptation conditionnelle, rejet conditionnel, et hors tolérance.

Les conformités de l'essai sont définies telles que :



Explication de la règle Non-Binaire avec Bande de Garde

Cas 1 – *Inférieur à la limite acceptable AL*, ***Statut*** *:* ***Dans les tolérances (In tolerance)****.*

- Le résultat de la mesure est à l'intérieur de l'intervalle acceptable. Cependant, l'estimation du risque en assumant la probabilité d'une distribution normale d'être à l'extérieur de la limite de la tolérance est < 2.5%. L'incertitude de l'essai est directement prise en considération. Couleur verte.

Cas 2 – *Inférieur à la limite de la tolérance TL, supérieur à la limite acceptable AL*, ***Statut*** *:* ***Dans les tolérances-Conditionnel****.*

- Le résultat de la mesure est à l'extérieur de l'intervalle acceptable mais inférieur à la limite de la tolérance. Cependant, la valeur observée est située dans la bande de garde w = TL-AL et le statut du résultat est conditionnel à l'évaluation du risque du client. L'incertitude de la mesure est directement prise en considération. Couleur jaune.

Cas 3 – *Supérieur à la limite de la tolérance, inférieur à RL*, ***Statut*** *:* ***Hors tolérance-Conditionnel****.*

- Le résultat de la mesure est supérieur à la limite de la tolérance mais à l'extérieur de l'intervalle de rejet. Cependant, la valeur observée est située dans la bande de garde w = TL-RL et le statut du résultat est conditionnel à l'évaluation du risque du client. L'incertitude de la mesure est directement prise en considération. Couleur jaune.

Cas 4 – *Supérieur à la limite de rejet RL*, ***Statut*** *:* ***Hors-tolérance (Out of tolerance)****.*

- Le résultat de la mesure est à l'intérieur de l'intervalle de rejet. L'incertitude de l'essai est directement prise en considération. Couleur rouge.

Thermal Metering System Calibration
Y factor for Method 5G sampling

Manufacturer:	American Meter Company
Model:	DTM-200A
Serial Number:	SBI-046 (90R054300)

Previous Calibration Comparision

Date	2020-10-01	Acceptable	
		Deviation (5%)	Deviation
y Factor	1.011	0.05055	0.004
Acceptance	Acceptable		

Average Gas Meter y Factor	**1.007**

Current Calibration

Acceptable y Deviation	0.050
Maximum y Deviation	0.005
Acceptance	Acceptable

Calibration Date:	2021-10-12
Calibrated by:	Claude Paré
Calibration Frequency:	6-month
Next Calibration Due:	2022-04-12
Instrument Range:	1.000 cfm
Standard Temp.:	72.2 oF
Standard Press.:	29.92 "Hg
Barometric Press.:	30.2 "Hg
Signature/Date:	2021-10-12

Reference Standard *			
Standard Calibrator	Model	Standard Test Meter	
	S/N	07J264834	
	Calib. Date	13-oct-20	
	Calib. Value	0.990	y factor (ref)

Calibration Parameters	Run 1	Run 2	Run 3
Vacuum ("Hg)	0.00	0.00	0.00
dH ("H2O)	0.00	0.00	0.00
Initial Reference Meter	924.1	930.7	936.8
Final Reference Meter	930.228	935.862	942.713
Initial DGM	683.687	690.215	696.214
Final DGM	689.734	695.288	701.991
Temp. Ref. Meter (°F), Tr	72.7	73.3	73.5
Temperature DGM (°F), Td	72.5	72.6	73.1
Time (Minutes)	52.0	32.0	30.0
Net Volume Ref. Meter, Vr	6.128	5.162	5.913
Net Volume DGM, Vd	6.047	5.073	5.777
Gas Meter y Factor =	**1.003**	**1.006**	**1.013**
Gas Meter y Factor Deviation (from avg.)	0.004	0.001	0.005
Orifice dH@	**0.00**	**0.00**	**0.00**
Orifice dH@ Deviation (from avg.)	0.000	0.000	0.000

where: 0.116288462

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

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

Thermal Metering System Calibration
Y factor for Method 5G sampling

Manufacturer:	American Meter Company
Model:	DTM-200A
Serial Number:	SBI-047 (98Z332226)

Previous Calibration Comparision

Date	2021-05-27	Acceptable	
		Deviation (5%)	Deviation
y Factor	1.007	0.05035	0.003
Acceptance	Acceptable		

Average Gas Meter y Factor	**1.010**

Current Calibration

Acceptable y Deviation	0.050
Maximum y Deviation	0.005
Acceptance	Acceptable

Calibration Date:	2021-10-07
Calibrated by:	Claude Paré
Calibration Frequency:	6-month
Next Calibration Due:	2022-04-07
Instrument Range:	1.000 cfm
Standard Temp.:	71 oF
Standard Press.:	29.92 "Hg
Barometric Press.:	30.45 "Hg
Signature/Date:	2021-10-07

Reference Standard *			
Standard Calibrator	Model	Standard Test Meter	
	S/N	07J264834	
	Calib. Date	13-oct-20	
	Calib. Value	0.990	y factor (ref)

Calibration Parameters	Run 1	Run 2	Run 3
Vacuum ("Hg)	0.00	0.00	0.00
dH ("H2O)	0.00	0.00	0.00
Initial Reference Meter	904.8	911.7	918.1
Final Reference Meter	910.911	917.527	923.387
Initial DGM	702.947	709.745	716.022
Final DGM	708.955	715.446	721.175
Temp. Ref. Meter (°F), Tr	71.7	72.7	73.1
Temperature DGM (°F), Td	70.8	71.8	72.7
Time (Minutes)	52.0	37.0	27.0
Net Volume Ref. Meter, Vr	6.111	5.827	5.287
Net Volume DGM, Vd	6.008	5.701	5.153
Gas Meter y Factor =	**1.005**	**1.010**	**1.015**
Gas Meter y Factor Deviation (from avg.)	0.005	0.000	0.005
Orifice dH@	**0.00**	**0.00**	**0.00**
Orifice dH@ Deviation (from avg.)	0.000	0.000	0.000

where: 0.115538462

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

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

Thermal Metering System Calibration
Y factor for Method 5G sampling

Manufacturer:	American Meter Company
Model:	DTM-200A
Serial Number:	SBI-290 (88N515612)

Previous Calibration Comparision

Date	2021-05-26	Acceptable	
		Deviation (5%)	Deviation
y Factor	0.993	0.04965	0.010
Acceptance	Acceptable		

Average Gas Meter y Factor	**0.983**

Current Calibration

Acceptable y Deviation	0.050
Maximum y Deviation	0.002
Acceptance	Acceptable

Calibration Date:	2021-10-06
Calibrated by:	Claude Paré
Calibration Frequency:	6-month
Next Calibration Due:	2022-04-06
Instrument Range:	1.000 cfm
Standard Temp.:	72.3 oF
Standard Press.:	29.92 "Hg
Barometric Press.:	30.5 "Hg
Signature/Date:	2021-10-06

Reference Standard *			
Standard Calibrator	Model	Standard Test Meter	
	S/N	07J264834	
	Calib. Date	13-oct-20	
	Calib. Value	0.990	y factor (ref)

Calibration Parameters	Run 1	Run 2	Run 3
Vacuum ("Hg)	0.00	0.00	0.00
dH ("H2O)	0.00	0.00	0.00
Initial Reference Meter	884.3	889.9	896.4
Final Reference Meter	889.376	895.848	903.595
Initial DGM	203.298	208.948	215.529
Final DGM	208.389	214.93	222.77
Temp. Ref. Meter (°F), Tr	73.0	73.2	73.5
Temperature DGM (°F), Td	72.0	72.2	72.5
Time (Minutes)	31.0	26.0	23.0
Net Volume Ref. Meter, Vr	5.076	5.948	7.195
Net Volume DGM, Vd	5.091	5.982	7.241
Gas Meter y Factor =	**0.985**	**0.983**	**0.982**
Gas Meter y Factor Deviation (from avg.)	0.002	0.001	0.001
Orifice dH@	**0.00**	**0.00**	**0.00**
Orifice dH@ Deviation (from avg.)	0.000	0.000	0.000

where: 0.164225806

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

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

Thermal Metering System Calibration
Y factor for Method 5G sampling

Manufacturer:	American Meter Company
Model:	DTM-200A
Serial Number:	SBI-046 (90R054300)

Previous Calibration Comparision

Date	2021-10-12	Acceptable Deviation (5%)	Deviation
y Factor	1.007	0.05035	0.006
Acceptance	Acceptable		

Average Gas Meter y Factor
1.001

Current Calibration

Acceptable y Deviation	0.050
Maximum y Deviation	0.001
Acceptance	Acceptable

Calibration Date:	2022-02-23
Calibrated by:	Claude Paré
Calibration Frequency:	Post test calibration
Next Calibration Due:	
Instrument Range:	1.000 cfm
Standard Temp.:	67.9 oF
Standard Press.:	29.92 "Hg
Barometric Press.:	29.9 "Hg
Signature/Date:	2022-02-23

Reference Standard *			
Standard Calibrator	Model	Standard Test Meter	
	S/N	07J264834	
	Calib. Date	2021-11-16	
	Calib. Value	0.990	y factor (ref)

Calibration Parameters	Run 1	Run 2	Run 3
Vacuum ("Hg)	0.00	0.00	0.00
dH ("H2O)	0.00	0.00	0.00
Initial Reference Meter	99.6	105.3	110.702
Final Reference Meter	104.979	110.474	116.353
Initial DGM	497.215	502.87	508.224
Final DGM	502.547	507.995	513.831
Temp. Ref. Meter (°F), Tr	61.3	61.5	61.5
Temperature DGM (°F), Td	63.1	62.8	62.7
Time (Minutes)	42.0	41.0	45.0
Net Volume Ref. Meter, Vr	5.379	5.174	5.651
Net Volume DGM, Vd	5.332	5.125	5.607
Gas Meter y Factor =	**1.002**	**1.002**	**1.000**
Gas Meter y Factor Deviation (from avg.)	0.001	0.001	0.001
Orifice dH@	**0.00**	**0.00**	**0.00**
Orifice dH@ Deviation (from avg.)	0.000	0.000	0.000

where: 0.126952381

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

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

Thermal Metering System Calibration
Y factor for Method 5G sampling

Manufacturer:	American Meter Company
Model:	DTM-200A
Serial Number:	SBI-047 (98Z332226)

Previous Calibration Comparision

Date	2021-10-07	Acceptable Deviation (5%)	Deviation
y Factor	1.01	0.0505	0.007
Acceptance	Acceptable		

Average Gas Meter y Factor
1.003

Calibration Date:	2022-02-22
Calibrated by:	Claude Paré
Calibration Frequency:	Post test calibration
Next Calibration Due:	
Instrument Range:	1.000 cfm
Standard Temp.:	61 oF
Standard Press.:	29.92 "Hg
Barometric Press.:	30.5 "Hg
Signature/Date:	2022-02-22

Current Calibration

Acceptable y Deviation	0.050
Maximum y Deviation	0.001
Acceptance	Acceptable

Reference Standard *			
Standard Calibrator	Model	Standard Test Meter	
	S/N	07J264834	
	Calib. Date	2021-11-16	
	Calib. Value	0.990	y factor (ref)

Calibration Parameters	Run 1	Run 2	Run 3
Vacuum ("Hg)	0.00	0.00	0.00
dH ("H2O)	0.00	0.00	0.00
Initial Reference Meter	81.6	87.1	92.5
Final Reference Meter	86.939	92.27	98.231
Initial DGM	674.441	679.871	685.207
Final DGM	679.714	684.979	690.859
Temp. Ref. Meter (°F), Tr	59.2	59.4	59.6
Temperature DGM (°F), Td	59.3	59.4	59.7
Time (Minutes)	38.0	37.0	41.0
Net Volume Ref. Meter, Vr	5.339	5.170	5.731
Net Volume DGM, Vd	5.273	5.108	5.652
Gas Meter y Factor =	**1.003**	**1.002**	**1.004**
Gas Meter y Factor Deviation (from avg.)	0.000	0.001	0.001
Orifice dH@	**0.00**	**0.00**	**0.00**
Orifice dH@ Deviation (from avg.)	0.000	0.000	0.000

where: 0.138763158

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

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

Thermal Metering System Calibration
Y factor for Method 5G sampling

Manufacturer:	American Meter Company
Model:	DTM-200A
Serial Number:	SBI-290 (88N515612)

Previous Calibration Comparision

Date	2021-10-06	Acceptable	
		Deviation (5%)	Deviation
y Factor	0.983	0.04915	0.013
Acceptance	Acceptable		

Average Gas Meter y Factor	**0.996**

Current Calibration

Acceptable y Deviation	0.050
Maximum y Deviation	0.001
Acceptance	Acceptable

Calibration Date:	2022-02-23	
Calibrated by:	Claude Paré	
Calibration Frequency:	Post test calibration	
Next Calibration Due:		
Instrument Range:	1.000	cfm
Standard Temp.:	63.5	oF
Standard Press.:	29.92	"Hg
Barometric Press.:	29.9	"Hg
Signature/Date:		2022-02-23

Reference Standard *			
Standard Calibrator	Model	Standard Test Meter	
	S/N	07J264834	
	Calib. Date	2021-11-16	
	Calib. Value	0.990	y factor (ref)

Calibration Parameters	Run 1	Run 2	Run 3
Vacuum ("Hg)	0.00	0.00	0.00
dH ("H2O)	0.00	0.00	0.00
Initial Reference Meter	117.3	123.2	134.7
Final Reference Meter	122.967	134.442	143.156
Initial DGM	379.035	384.899	396.355
Final DGM	384.67	396.096	404.769
Temp. Ref. Meter (°F), Tr	62.0	62.2	62.2
Temperature DGM (°F), Td	62.6	62.8	63.0
Time (Minutes)	40.0	80.0	60.0
Net Volume Ref. Meter, Vr	5.667	11.242	8.456
Net Volume DGM, Vd	5.635	11.197	8.414
Gas Meter y Factor =	**0.997**	**0.995**	**0.996**
Gas Meter y Factor Deviation (from avg.)	0.001	0.001	0.000
Orifice dH@	**0.00**	**0.00**	**0.00**
Orifice dH@ Deviation (from avg.)	0.000	0.000	0.000

where: 0.140875

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

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

Unit break-in period

Total conditionning time (h)	57.53

Model tested: HES350 (3.5 Series)

Identification number: QC20220120-HES350

Date	Burn cycle	Test run (#)	Duration (min)	Av. Flue (°F)	Load type (-)	Fuel added (lbs)	Moisture (DB%)
2022-01-20	Preload	NA	44	622	Kindling & SUF	13.60	14.7
	Condition		99	822	High fire	30.90	19.2
	Load		439	424	Medium fire	36.09	19.5
2022-01-24	Preload	NA	36	689	Kindling & SUF	14.06	14.7
	Condition		134	699	High fire	28.89	19
	Load		519	377	Medium fire	36.14	19
2022-01-25	Preload	NA	46	646	Kindling & SUF	13.82	14.75
	Condition		167	633	High fire	29.83	19
	Load		549	347	Medium fire	35.56	19.1
2022-01-26	Preload	NA	39	669	Kindling & SUF	13.49	14.6
	Condition		195	598	High fire	29.40	19.5
	Load		509	376	Medium fire	35.20	19.2
2022-02-17	Preload	NA	41	658	Kindling & SUF	14.00	14.75
	Condition		135	704	High fire	28.86	19.2
	Load		500	346	Medium fire	33.22	19.1
	Preload	NA			Kindling & SUF		
	Condition				High fire		
	Load				Medium fire		

3.5 Series Pre-burn Data 2022-01-20 Total time (h) 9.70

Load time	Load type	Fuel added	Moisture		Time	Flue Temp
(-)	(-)	(lbs)	(DB %)		(min)	(°F)
2022-01-20 12:31	Kindling & SUF	13.60	14.65	**Pre-Charge (min)**	44	621.9
2022-01-20 13:16	High fire	30.90	19.2	**Conditioning (min)**	99	822.4
2022-01-20 14:55	Medium fire	36.09	19.5	**Load (min)**	439	424.3

	Average Tflue (°F)	**621.9**		**822.4**		**424.3**
	Pre-Charge (min)	**44**	**Conditioning (min)**	**99**	**Load (min)**	**439**
Index	**Date & Time**	**Flue (F)**	**Date & Time**	**Flue (F)**	**Date & Time**	**Flue (F)**
0	2022-01-20 12:31	149.4	2022-01-20 13:16	741.9	2022-01-20 14:55	524.8
1	2022-01-20 12:32	174.2	2022-01-20 13:17	854.7	2022-01-20 14:56	376.5
2	2022-01-20 12:33	217.5	2022-01-20 13:18	890.5	2022-01-20 14:57	349.4
3	2022-01-20 12:34	333.0	2022-01-20 13:19	906.7	2022-01-20 14:58	395.5
4	2022-01-20 12:35	433.7	2022-01-20 13:20	902.7	2022-01-20 14:59	474.2
5	2022-01-20 12:36	503.0	2022-01-20 13:21	908.1	2022-01-20 15:00	676.4
6	2022-01-20 12:37	533.6	2022-01-20 13:22	918.4	2022-01-20 15:01	769.3
7	2022-01-20 12:38	558.4	2022-01-20 13:23	925.4	2022-01-20 15:02	773.9
8	2022-01-20 12:39	561.7	2022-01-20 13:24	932.2	2022-01-20 15:03	775.0
9	2022-01-20 12:40	597.9	2022-01-20 13:25	942.5	2022-01-20 15:04	700.8
10	2022-01-20 12:41	645.0	2022-01-20 13:26	955.4	2022-01-20 15:05	665.5
11	2022-01-20 12:42	662.6	2022-01-20 13:27	958.2	2022-01-20 15:06	655.6
12	2022-01-20 12:43	665.0	2022-01-20 13:28	960.1	2022-01-20 15:07	650.1
13	2022-01-20 12:44	685.6	2022-01-20 13:29	962.7	2022-01-20 15:08	646.7
14	2022-01-20 12:45	693.3	2022-01-20 13:30	964.8	2022-01-20 15:09	645.3
15	2022-01-20 12:46	690.4	2022-01-20 13:31	965.9	2022-01-20 15:10	642.3
16	2022-01-20 12:47	691.1	2022-01-20 13:32	972.5	2022-01-20 15:11	638.6
17	2022-01-20 12:48	691.2	2022-01-20 13:33	976.2	2022-01-20 15:12	616.6
18	2022-01-20 12:49	693.5	2022-01-20 13:34	979.1	2022-01-20 15:13	600.0
19	2022-01-20 12:50	702.2	2022-01-20 13:35	980.5	2022-01-20 15:14	594.2
20	2022-01-20 12:51	687.6	2022-01-20 13:36	980.9	2022-01-20 15:15	592.0
21	2022-01-20 12:52	675.4	2022-01-20 13:37	978.0	2022-01-20 15:16	590.5
22	2022-01-20 12:53	671.0	2022-01-20 13:38	977.8	2022-01-20 15:17	590.7
23	2022-01-20 12:54	661.5	2022-01-20 13:39	974.8	2022-01-20 15:18	587.1
24	2022-01-20 12:55	662.8	2022-01-20 13:40	967.4	2022-01-20 15:19	581.7
25	2022-01-20 12:56	669.1	2022-01-20 13:41	964.6	2022-01-20 15:20	579.0
26	2022-01-20 12:57	666.7	2022-01-20 13:42	957.6	2022-01-20 15:21	579.1
27	2022-01-20 12:58	652.6	2022-01-20 13:43	953.2	2022-01-20 15:22	579.5
28	2022-01-20 12:59	645.0	2022-01-20 13:44	947.4	2022-01-20 15:23	578.2
29	2022-01-20 13:00	652.0	2022-01-20 13:45	942.4	2022-01-20 15:24	578.2
30	2022-01-20 13:01	667.4	2022-01-20 13:46	935.6	2022-01-20 15:25	575.2
31	2022-01-20 13:02	675.9	2022-01-20 13:47	932.2	2022-01-20 15:26	569.1
32	2022-01-20 13:03	681.1	2022-01-20 13:48	927.9	2022-01-20 15:27	563.3
33	2022-01-20 13:04	683.1	2022-01-20 13:49	924.2	2022-01-20 15:28	559.6
34	2022-01-20 13:05	683.7	2022-01-20 13:50	922.7	2022-01-20 15:29	556.1
35	2022-01-20 13:06	694.1	2022-01-20 13:51	924.0	2022-01-20 15:30	552.1
36	2022-01-20 13:07	701.4	2022-01-20 13:52	919.8	2022-01-20 15:31	550.9
37	2022-01-20 13:08	698.6	2022-01-20 13:53	917.7	2022-01-20 15:32	548.1
38	2022-01-20 13:09	687.1	2022-01-20 13:54	913.5	2022-01-20 15:33	546.9
39	2022-01-20 13:10	683.5	2022-01-20 13:55	911.7	2022-01-20 15:34	546.0
40	2022-01-20 13:11	689.4	2022-01-20 13:56	910.3	2022-01-20 15:35	547.5
41	2022-01-20 13:12	694.6	2022-01-20 13:57	911.7	2022-01-20 15:36	548.6
42	2022-01-20 13:13	702.2	2022-01-20 13:58	920.5	2022-01-20 15:37	551.2
43	2022-01-20 13:14	713.0	2022-01-20 13:59	914.5	2022-01-20 15:38	554.4
44	2022-01-20 13:15	802.3	2022-01-20 14:00	915.3	2022-01-20 15:39	559.2
45			2022-01-20 14:01	916.4	2022-01-20 15:40	567.1
46			2022-01-20 14:02	916.4	2022-01-20 15:41	568.2
47			2022-01-20 14:03	915.6	2022-01-20 15:42	569.8
48			2022-01-20 14:04	913.2	2022-01-20 15:43	572.8
49			2022-01-20 14:05	904.6	2022-01-20 15:44	575.6

50			2022-01-20 14:06	899.1	2022-01-20 15:45	577.3
51			2022-01-20 14:07	893.0	2022-01-20 15:46	578.8
52			2022-01-20 14:08	885.7	2022-01-20 15:47	582.1
53			2022-01-20 14:09	883.1	2022-01-20 15:48	584.3
54			2022-01-20 14:10	880.0	2022-01-20 15:49	588.0
55			2022-01-20 14:11	876.4	2022-01-20 15:50	591.5
56			2022-01-20 14:12	872.4	2022-01-20 15:51	593.0
57			2022-01-20 14:13	863.4	2022-01-20 15:52	596.2
58			2022-01-20 14:14	857.9	2022-01-20 15:53	601.2
59			2022-01-20 14:15	852.7	2022-01-20 15:54	605.2
60			2022-01-20 14:16	843.9	2022-01-20 15:55	604.6
61			2022-01-20 14:17	837.2	2022-01-20 15:56	606.8
62			2022-01-20 14:18	828.9	2022-01-20 15:57	606.3
63			2022-01-20 14:19	817.0	2022-01-20 15:58	608.7
64			2022-01-20 14:20	803.7	2022-01-20 15:59	610.0
65			2022-01-20 14:21	785.9	2022-01-20 16:00	609.0
66			2022-01-20 14:22	770.5	2022-01-20 16:01	608.4
67			2022-01-20 14:23	760.9	2022-01-20 16:02	608.2
68			2022-01-20 14:24	745.1	2022-01-20 16:03	607.0
69			2022-01-20 14:25	728.5	2022-01-20 16:04	610.0
70			2022-01-20 14:26	711.5	2022-01-20 16:05	610.2
71			2022-01-20 14:27	700.2	2022-01-20 16:06	611.7
72			2022-01-20 14:28	691.6	2022-01-20 16:07	614.9
73			2022-01-20 14:29	682.4	2022-01-20 16:08	621.7
74			2022-01-20 14:30	671.3	2022-01-20 16:09	625.8
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79			2022-01-20 14:35	651.2	2022-01-20 16:14	656.3
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82			2022-01-20 14:38	642.1	2022-01-20 16:17	672.8
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85			2022-01-20 14:41	634.1	2022-01-20 16:20	692.4
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87			2022-01-20 14:43	628.9	2022-01-20 16:22	701.0
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93			2022-01-20 14:49	606.2	2022-01-20 16:28	712.5
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324					2022-01-20 20:19	302.6
325					2022-01-20 20:20	302.4
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367					2022-01-20 21:02	284.0
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438					2022-01-20 22:13	279.9
439					2022-01-20 22:14	279.4
440						

3.5 Series Pre-burn Data 2022-01-24 Total time (h) 11.48

Load time	Load type	Fuel added	Moisture		Time	Flue Temp
(-)	(-)	(lbs)	(DB %)		(min)	(°F)
2022-01-24 12:54	Kindling & SUF	14.06	14.7	**Pre-Charge (min)**	36	689.4
2022-01-24 13:31	High fire	28.89	19.0	**Conditioning (min)**	134	698.9
2022-01-24 15:45	Medium fire	36.14	19.0	**Load (min)**	519	377.1

	Average Tflue (°F)	**689.4**		**698.9**		**377.1**
	Pre-Charge (min)	**36**	**Conditioning (min)**	**134**	**Load (min)**	**519**
Index	**Date & Time**	**Flue (F)**	**Date & Time**	**Flue (F)**	**Date & Time**	**Flue (F)**
0	2022-01-24 12:54	152.6	2022-01-24 13:31	675.1	2022-01-24 15:45	502.4
1	2022-01-24 12:55	178.1	2022-01-24 13:32	717.8	2022-01-24 15:46	424.0
2	2022-01-24 12:56	263.3	2022-01-24 13:33	776.7	2022-01-24 15:47	515.8
3	2022-01-24 12:57	390.8	2022-01-24 13:34	825.4	2022-01-24 15:48	851.2
4	2022-01-24 12:58	446.3	2022-01-24 13:35	846.4	2022-01-24 15:49	1001.7
5	2022-01-24 12:59	489.6	2022-01-24 13:36	818.7	2022-01-24 15:50	1101.3
6	2022-01-24 13:00	504.5	2022-01-24 13:37	795.5	2022-01-24 15:51	903.9
7	2022-01-24 13:01	532.3	2022-01-24 13:38	787.9	2022-01-24 15:52	885.8
8	2022-01-24 13:02	581.5	2022-01-24 13:39	787.2	2022-01-24 15:53	819.1
9	2022-01-24 13:03	639.5	2022-01-24 13:40	782.0	2022-01-24 15:54	784.5
10	2022-01-24 13:04	665.1	2022-01-24 13:41	775.4	2022-01-24 15:55	748.6
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353					2022-01-24 21:38	269.9
354					2022-01-24 21:39	269.6

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356					2022-01-24 21:41	270.4
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359					2022-01-24 21:44	270.5
360					2022-01-24 21:45	270.2
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362					2022-01-24 21:47	271.1
363					2022-01-24 21:48	270.9
364					2022-01-24 21:49	270.9
365					2022-01-24 21:50	271.0
366					2022-01-24 21:51	271.5
367					2022-01-24 21:52	271.0
368					2022-01-24 21:53	271.0
369					2022-01-24 21:54	270.9
370					2022-01-24 21:55	271.2
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373					2022-01-24 21:58	271.0
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399					2022-01-24 22:24	263.2
400					2022-01-24 22:25	263.0
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402					2022-01-24 22:27	262.5
403					2022-01-24 22:28	262.2
404					2022-01-24 22:29	261.4
405					2022-01-24 22:30	261.2
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444					2022-01-24 23:09	256.3
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446					2022-01-24 23:11	256.0
447					2022-01-24 23:12	256.2
448					2022-01-24 23:13	256.2
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451					2022-01-24 23:16	255.9
452					2022-01-24 23:17	256.0
453					2022-01-24 23:18	255.6
454					2022-01-24 23:19	256.0
455					2022-01-24 23:20	256.0
456					2022-01-24 23:21	256.1
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458					2022-01-24 23:23	255.4
459					2022-01-24 23:24	255.4
460					2022-01-24 23:25	255.1
461					2022-01-24 23:26	255.0
462					2022-01-24 23:27	255.2
463					2022-01-24 23:28	255.2
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465					2022-01-24 23:30	255.6
466					2022-01-24 23:31	255.3
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472					2022-01-24 23:37	254.6
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493					2022-01-24 23:58	250.1
494					2022-01-24 23:59	250.3
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497					2022-01-25 00:02	250.3
498					2022-01-25 00:03	250.0
499					2022-01-25 00:04	249.7
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501					2022-01-25 00:06	249.0
502					2022-01-25 00:07	248.3
503					2022-01-25 00:08	248.8
504					2022-01-25 00:09	249.5
505					2022-01-25 00:10	248.9
506					2022-01-25 00:11	248.4
507					2022-01-25 00:12	247.9
508					2022-01-25 00:13	248.3
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513					2022-01-25 00:18	248.2
514					2022-01-25 00:19	247.8
515					2022-01-25 00:20	247.4
516					2022-01-25 00:21	247.1
517					2022-01-25 00:22	247.1
518					2022-01-25 00:23	247.2
519					2022-01-25 00:24	246.4
520						

3.5 Series Pre-burn Data 2022-01-25 Total time (h) 12.70

Load time	Load type	Fuel added	Moisture		Time	Flue Temp
(-)	(-)	(lbs)	(DB %)		(min)	(°F)
2022-01-25 11:19	Kindling & SUF	13.82	14.75	**Pre-Charge (min)**	46	646.4
2022-01-25 12:06	High fire	29.83	19.0	**Conditioning (min)**	167	633.4
2022-01-25 14:54	Medium fire	35.56	19.1	**Load (min)**	549	347.4

	Average Tflue (°F)	**646.4**		**633.4**		**347.4**
	Pre-Charge (min)	**46**	**Conditioning (min)**	**167**	**Load (min)**	**549**
Index	**Date & Time**	**Flue (F)**	**Date & Time**	**Flue (F)**	**Date & Time**	**Flue (F)**
0	2022-01-25 11:19	134.4	2022-01-25 12:06	661.7	2022-01-25 14:54	400.4
1	2022-01-25 11:20	168.1	2022-01-25 12:07	598.1	2022-01-25 14:55	337.5
2	2022-01-25 11:21	210.9	2022-01-25 12:08	654.3	2022-01-25 14:56	311.3
3	2022-01-25 11:22	316.6	2022-01-25 12:09	701.0	2022-01-25 14:57	425.8
4	2022-01-25 11:23	378.8	2022-01-25 12:10	706.4	2022-01-25 14:58	538.5
5	2022-01-25 11:24	412.3	2022-01-25 12:11	709.5	2022-01-25 14:59	708.5
6	2022-01-25 11:25	457.4	2022-01-25 12:12	712.5	2022-01-25 15:00	922.2
7	2022-01-25 11:26	501.4	2022-01-25 12:13	704.7	2022-01-25 15:01	811.2
8	2022-01-25 11:27	547.1	2022-01-25 12:14	707.4	2022-01-25 15:02	767.4
9	2022-01-25 11:28	563.0	2022-01-25 12:15	698.0	2022-01-25 15:03	752.8
10	2022-01-25 11:29	561.8	2022-01-25 12:16	699.2	2022-01-25 15:04	737.8
11	2022-01-25 11:30	604.9	2022-01-25 12:17	692.5	2022-01-25 15:05	740.4
12	2022-01-25 11:31	636.7	2022-01-25 12:18	694.5	2022-01-25 15:06	731.8
13	2022-01-25 11:32	658.2	2022-01-25 12:19	692.7	2022-01-25 15:07	729.0
14	2022-01-25 11:33	670.5	2022-01-25 12:20	692.2	2022-01-25 15:08	735.6
15	2022-01-25 11:34	681.4	2022-01-25 12:21	699.1	2022-01-25 15:09	685.0
16	2022-01-25 11:35	704.0	2022-01-25 12:22	700.8	2022-01-25 15:10	648.2
17	2022-01-25 11:36	703.6	2022-01-25 12:23	703.2	2022-01-25 15:11	627.5
18	2022-01-25 11:37	731.5	2022-01-25 12:24	701.7	2022-01-25 15:12	616.9
19	2022-01-25 11:38	755.4	2022-01-25 12:25	703.3	2022-01-25 15:13	613.4
20	2022-01-25 11:39	768.6	2022-01-25 12:26	704.8	2022-01-25 15:14	607.5
21	2022-01-25 11:40	776.7	2022-01-25 12:27	705.7	2022-01-25 15:15	609.8
22	2022-01-25 11:41	780.2	2022-01-25 12:28	714.0	2022-01-25 15:16	615.9
23	2022-01-25 11:42	797.2	2022-01-25 12:29	715.2	2022-01-25 15:17	624.7
24	2022-01-25 11:43	809.4	2022-01-25 12:30	718.1	2022-01-25 15:18	629.8
25	2022-01-25 11:44	821.4	2022-01-25 12:31	722.1	2022-01-25 15:19	632.2
26	2022-01-25 11:45	798.9	2022-01-25 12:32	726.5	2022-01-25 15:20	631.1
27	2022-01-25 11:46	791.4	2022-01-25 12:33	729.8	2022-01-25 15:21	628.0
28	2022-01-25 11:47	779.5	2022-01-25 12:34	736.0	2022-01-25 15:22	624.6
29	2022-01-25 11:48	761.5	2022-01-25 12:35	741.4	2022-01-25 15:23	621.9
30	2022-01-25 11:49	752.3	2022-01-25 12:36	745.0	2022-01-25 15:24	616.1
31	2022-01-25 11:50	738.0	2022-01-25 12:37	748.4	2022-01-25 15:25	610.7
32	2022-01-25 11:51	734.8	2022-01-25 12:38	749.0	2022-01-25 15:26	601.7
33	2022-01-25 11:52	728.7	2022-01-25 12:39	750.2	2022-01-25 15:27	594.9
34	2022-01-25 11:53	731.5	2022-01-25 12:40	751.5	2022-01-25 15:28	585.5
35	2022-01-25 11:54	736.1	2022-01-25 12:41	751.4	2022-01-25 15:29	579.4
36	2022-01-25 11:55	739.7	2022-01-25 12:42	755.2	2022-01-25 15:30	575.6
37	2022-01-25 11:56	742.3	2022-01-25 12:43	759.2	2022-01-25 15:31	578.8
38	2022-01-25 11:57	741.0	2022-01-25 12:44	761.8	2022-01-25 15:32	590.5
39	2022-01-25 11:58	728.2	2022-01-25 12:45	772.1	2022-01-25 15:33	588.7
40	2022-01-25 11:59	711.5	2022-01-25 12:46	778.1	2022-01-25 15:34	584.8
41	2022-01-25 12:00	692.6	2022-01-25 12:47	785.8	2022-01-25 15:35	587.9
42	2022-01-25 12:01	683.4	2022-01-25 12:48	790.4	2022-01-25 15:36	591.2
43	2022-01-25 12:02	670.1	2022-01-25 12:49	796.1	2022-01-25 15:37	593.1
44	2022-01-25 12:03	664.1	2022-01-25 12:50	800.6	2022-01-25 15:38	593.5
45	2022-01-25 12:04	659.5	2022-01-25 12:51	806.0	2022-01-25 15:39	594.0
46	2022-01-25 12:05	642.4	2022-01-25 12:52	806.0	2022-01-25 15:40	594.4
47			2022-01-25 12:53	807.8	2022-01-25 15:41	593.9
48			2022-01-25 12:54	808.0	2022-01-25 15:42	593.2
49			2022-01-25 12:55	809.6	2022-01-25 15:43	591.4

50			2022-01-25 12:56	809.2	2022-01-25 15:44	587.2
51			2022-01-25 12:57	812.0	2022-01-25 15:45	577.1
52			2022-01-25 12:58	808.9	2022-01-25 15:46	568.6
53			2022-01-25 12:59	811.1	2022-01-25 15:47	567.9
54			2022-01-25 13:00	814.7	2022-01-25 15:48	570.2
55			2022-01-25 13:01	814.4	2022-01-25 15:49	568.5
56			2022-01-25 13:02	813.0	2022-01-25 15:50	567.4
57			2022-01-25 13:03	813.7	2022-01-25 15:51	567.6
58			2022-01-25 13:04	813.7	2022-01-25 15:52	571.8
59			2022-01-25 13:05	813.9	2022-01-25 15:53	576.5
60			2022-01-25 13:06	813.1	2022-01-25 15:54	579.2
61			2022-01-25 13:07	813.4	2022-01-25 15:55	573.4
62			2022-01-25 13:08	815.6	2022-01-25 15:56	570.6
63			2022-01-25 13:09	817.2	2022-01-25 15:57	569.3
64			2022-01-25 13:10	816.6	2022-01-25 15:58	572.0
65			2022-01-25 13:11	819.4	2022-01-25 15:59	575.0
66			2022-01-25 13:12	819.0	2022-01-25 16:00	574.6
67			2022-01-25 13:13	817.3	2022-01-25 16:01	579.5
68			2022-01-25 13:14	814.7	2022-01-25 16:02	577.6
69			2022-01-25 13:15	815.4	2022-01-25 16:03	579.9
70			2022-01-25 13:16	816.3	2022-01-25 16:04	578.1
71			2022-01-25 13:17	815.0	2022-01-25 16:05	579.1
72			2022-01-25 13:18	800.2	2022-01-25 16:06	582.0
73			2022-01-25 13:19	789.1	2022-01-25 16:07	581.3
74			2022-01-25 13:20	779.2	2022-01-25 16:08	584.4
75			2022-01-25 13:21	772.8	2022-01-25 16:09	583.6
76			2022-01-25 13:22	768.6	2022-01-25 16:10	585.2
77			2022-01-25 13:23	763.9	2022-01-25 16:11	581.9
78			2022-01-25 13:24	759.4	2022-01-25 16:12	573.6
79			2022-01-25 13:25	754.1	2022-01-25 16:13	566.8
80			2022-01-25 13:26	749.2	2022-01-25 16:14	561.8
81			2022-01-25 13:27	746.7	2022-01-25 16:15	559.0
82			2022-01-25 13:28	739.1	2022-01-25 16:16	553.8
83			2022-01-25 13:29	720.7	2022-01-25 16:17	553.7
84			2022-01-25 13:30	701.9	2022-01-25 16:18	553.3
85			2022-01-25 13:31	683.6	2022-01-25 16:19	555.2
86			2022-01-25 13:32	673.6	2022-01-25 16:20	556.2
87			2022-01-25 13:33	665.6	2022-01-25 16:21	555.8
88			2022-01-25 13:34	658.4	2022-01-25 16:22	550.8
89			2022-01-25 13:35	650.7	2022-01-25 16:23	551.6
90			2022-01-25 13:36	648.4	2022-01-25 16:24	552.2
91			2022-01-25 13:37	645.0	2022-01-25 16:25	550.3
92			2022-01-25 13:38	640.7	2022-01-25 16:26	550.9
93			2022-01-25 13:39	639.4	2022-01-25 16:27	547.6
94			2022-01-25 13:40	638.0	2022-01-25 16:28	538.9
95			2022-01-25 13:41	634.9	2022-01-25 16:29	531.8
96			2022-01-25 13:42	630.4	2022-01-25 16:30	533.0
97			2022-01-25 13:43	621.5	2022-01-25 16:31	531.7
98			2022-01-25 13:44	614.8	2022-01-25 16:32	534.1
99			2022-01-25 13:45	609.6	2022-01-25 16:33	532.5
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103			2022-01-25 13:49	592.1	2022-01-25 16:37	542.2
104			2022-01-25 13:50	586.5	2022-01-25 16:38	545.7
105			2022-01-25 13:51	584.6	2022-01-25 16:39	546.0
106			2022-01-25 13:52	584.7	2022-01-25 16:40	548.2
107			2022-01-25 13:53	584.2	2022-01-25 16:41	551.6
108			2022-01-25 13:54	577.2	2022-01-25 16:42	548.8
109			2022-01-25 13:55	569.2	2022-01-25 16:43	545.8
110			2022-01-25 13:56	565.0	2022-01-25 16:44	545.8

111			2022-01-25 13:57	560.9	2022-01-25 16:45	542.9
112			2022-01-25 13:58	558.1	2022-01-25 16:46	540.5
113			2022-01-25 13:59	550.9	2022-01-25 16:47	535.8
114			2022-01-25 14:00	547.2	2022-01-25 16:48	533.7
115			2022-01-25 14:01	542.0	2022-01-25 16:49	530.8
116			2022-01-25 14:02	536.2	2022-01-25 16:50	527.7
117			2022-01-25 14:03	526.3	2022-01-25 16:51	525.7
118			2022-01-25 14:04	516.9	2022-01-25 16:52	524.3
119			2022-01-25 14:05	509.1	2022-01-25 16:53	523.9
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121			2022-01-25 14:07	496.4	2022-01-25 16:55	520.5
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123			2022-01-25 14:09	486.1	2022-01-25 16:57	514.5
124			2022-01-25 14:10	481.0	2022-01-25 16:58	510.3
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546					2022-01-26 00:00	211.8
547					2022-01-26 00:01	211.5
548					2022-01-26 00:02	211.3
549					2022-01-26 00:03	210.8
550						

3.5 Series Pre-burn Data 2022-01-26 Total time (h) 12.38

Load time	Load type	Fuel added	Moisture		Time	Flue Temp
(-)	(-)	(lbs)	(DB %)		(min)	(°F)
2022-01-26 10:34	Kindling & SUF	13.49	14.6	**Pre-Charge (min)**	39	669.2
2022-01-26 11:14	High fire	29.40	19.5	**Conditioning (min)**	195	597.6
2022-01-26 14:30	Medium fire	35.20	19.2	**Load (min)**	509	376.3

	Average Tflue (°F)	**669.2**		**597.6**		**376.3**
	Pre-Charge (min)	**39**	**Conditioning (min)**	**195**	**Load (min)**	**509**
Index	**Date & Time**	**Flue (F)**	**Date & Time**	**Flue (F)**	**Date & Time**	**Flue (F)**
0	2022-01-26 10:34	175.0	2022-01-26 11:14	707.9	2022-01-26 14:30	399.2
1	2022-01-26 10:35	248.1	2022-01-26 11:15	685.0	2022-01-26 14:31	339.1
2	2022-01-26 10:36	369.2	2022-01-26 11:16	691.5	2022-01-26 14:32	379.8
3	2022-01-26 10:37	523.5	2022-01-26 11:17	729.4	2022-01-26 14:33	478.7
4	2022-01-26 10:38	587.4	2022-01-26 11:18	753.3	2022-01-26 14:34	682.5
5	2022-01-26 10:39	628.9	2022-01-26 11:19	763.6	2022-01-26 14:35	710.1
6	2022-01-26 10:40	621.9	2022-01-26 11:20	764.5	2022-01-26 14:36	679.6
7	2022-01-26 10:41	646.3	2022-01-26 11:21	763.5	2022-01-26 14:37	656.2
8	2022-01-26 10:42	662.3	2022-01-26 11:22	761.7	2022-01-26 14:38	641.7
9	2022-01-26 10:43	688.1	2022-01-26 11:23	761.4	2022-01-26 14:39	630.0
10	2022-01-26 10:44	716.7	2022-01-26 11:24	759.8	2022-01-26 14:40	622.3
11	2022-01-26 10:45	739.0	2022-01-26 11:25	756.5	2022-01-26 14:41	617.0
12	2022-01-26 10:46	725.4	2022-01-26 11:26	756.9	2022-01-26 14:42	612.6
13	2022-01-26 10:47	731.3	2022-01-26 11:27	753.5	2022-01-26 14:43	582.2
14	2022-01-26 10:48	738.4	2022-01-26 11:28	749.5	2022-01-26 14:44	567.3
15	2022-01-26 10:49	731.4	2022-01-26 11:29	747.3	2022-01-26 14:45	562.5
16	2022-01-26 10:50	729.4	2022-01-26 11:30	744.7	2022-01-26 14:46	557.0
17	2022-01-26 10:51	727.7	2022-01-26 11:31	737.8	2022-01-26 14:47	557.8
18	2022-01-26 10:52	737.1	2022-01-26 11:32	736.4	2022-01-26 14:48	559.5
19	2022-01-26 10:53	735.4	2022-01-26 11:33	732.2	2022-01-26 14:49	567.2
20	2022-01-26 10:54	744.6	2022-01-26 11:34	728.3	2022-01-26 14:50	571.8
21	2022-01-26 10:55	748.6	2022-01-26 11:35	727.7	2022-01-26 14:51	573.1
22	2022-01-26 10:56	747.7	2022-01-26 11:36	724.0	2022-01-26 14:52	574.9
23	2022-01-26 10:57	744.1	2022-01-26 11:37	720.6	2022-01-26 14:53	570.1
24	2022-01-26 10:58	733.7	2022-01-26 11:38	718.2	2022-01-26 14:54	566.7
25	2022-01-26 10:59	730.6	2022-01-26 11:39	719.0	2022-01-26 14:55	566.6
26	2022-01-26 11:00	727.9	2022-01-26 11:40	720.9	2022-01-26 14:56	566.5
27	2022-01-26 11:01	729.5	2022-01-26 11:41	720.9	2022-01-26 14:57	568.3
28	2022-01-26 11:02	723.7	2022-01-26 11:42	718.8	2022-01-26 14:58	571.6
29	2022-01-26 11:03	718.7	2022-01-26 11:43	716.4	2022-01-26 14:59	573.1
30	2022-01-26 11:04	713.9	2022-01-26 11:44	718.4	2022-01-26 15:00	576.0
31	2022-01-26 11:05	711.6	2022-01-26 11:45	719.1	2022-01-26 15:01	576.9
32	2022-01-26 11:06	705.5	2022-01-26 11:46	719.6	2022-01-26 15:02	572.8
33	2022-01-26 11:07	697.3	2022-01-26 11:47	719.8	2022-01-26 15:03	569.8
34	2022-01-26 11:08	692.6	2022-01-26 11:48	721.8	2022-01-26 15:04	567.8
35	2022-01-26 11:09	689.8	2022-01-26 11:49	724.1	2022-01-26 15:05	565.5
36	2022-01-26 11:10	697.1	2022-01-26 11:50	728.0	2022-01-26 15:06	563.8
37	2022-01-26 11:11	691.0	2022-01-26 11:51	733.5	2022-01-26 15:07	563.2
38	2022-01-26 11:12	680.3	2022-01-26 11:52	741.9	2022-01-26 15:08	562.8
39	2022-01-26 11:13	675.5	2022-01-26 11:53	749.1	2022-01-26 15:09	563.1
40			2022-01-26 11:54	755.2	2022-01-26 15:10	564.2
41			2022-01-26 11:55	757.8	2022-01-26 15:11	563.7
42			2022-01-26 11:56	762.1	2022-01-26 15:12	565.2
43			2022-01-26 11:57	763.5	2022-01-26 15:13	567.6
44			2022-01-26 11:58	765.0	2022-01-26 15:14	569.8
45			2022-01-26 11:59	765.7	2022-01-26 15:15	570.5
46			2022-01-26 12:00	768.1	2022-01-26 15:16	573.9
47			2022-01-26 12:01	767.7	2022-01-26 15:17	575.0
48			2022-01-26 12:02	770.6	2022-01-26 15:18	574.3
49			2022-01-26 12:03	773.2	2022-01-26 15:19	572.6

50			2022-01-26 12:04	778.4	2022-01-26 15:20	569.4
51			2022-01-26 12:05	780.3	2022-01-26 15:21	567.6
52			2022-01-26 12:06	787.1	2022-01-26 15:22	565.6
53			2022-01-26 12:07	784.4	2022-01-26 15:23	562.7
54			2022-01-26 12:08	782.9	2022-01-26 15:24	558.2
55			2022-01-26 12:09	784.4	2022-01-26 15:25	556.6
56			2022-01-26 12:10	789.4	2022-01-26 15:26	556.3
57			2022-01-26 12:11	787.8	2022-01-26 15:27	554.2
58			2022-01-26 12:12	791.2	2022-01-26 15:28	552.7
59			2022-01-26 12:13	792.0	2022-01-26 15:29	552.1
60			2022-01-26 12:14	795.6	2022-01-26 15:30	555.0
61			2022-01-26 12:15	797.7	2022-01-26 15:31	556.8
62			2022-01-26 12:16	796.3	2022-01-26 15:32	558.5
63			2022-01-26 12:17	791.8	2022-01-26 15:33	560.0
64			2022-01-26 12:18	791.0	2022-01-26 15:34	562.9
65			2022-01-26 12:19	793.7	2022-01-26 15:35	565.5
66			2022-01-26 12:20	800.4	2022-01-26 15:36	569.7
67			2022-01-26 12:21	798.6	2022-01-26 15:37	571.3
68			2022-01-26 12:22	789.0	2022-01-26 15:38	574.8
69			2022-01-26 12:23	786.5	2022-01-26 15:39	576.4
70			2022-01-26 12:24	785.5	2022-01-26 15:40	578.3
71			2022-01-26 12:25	781.8	2022-01-26 15:41	580.8
72			2022-01-26 12:26	772.7	2022-01-26 15:42	582.5
73			2022-01-26 12:27	761.3	2022-01-26 15:43	584.0
74			2022-01-26 12:28	751.6	2022-01-26 15:44	583.9
75			2022-01-26 12:29	741.5	2022-01-26 15:45	587.6
76			2022-01-26 12:30	729.5	2022-01-26 15:46	590.0
77			2022-01-26 12:31	717.9	2022-01-26 15:47	590.8
78			2022-01-26 12:32	708.1	2022-01-26 15:48	590.7
79			2022-01-26 12:33	700.3	2022-01-26 15:49	591.9
80			2022-01-26 12:34	692.3	2022-01-26 15:50	592.4
81			2022-01-26 12:35	684.5	2022-01-26 15:51	592.6
82			2022-01-26 12:36	674.3	2022-01-26 15:52	592.2
83			2022-01-26 12:37	658.8	2022-01-26 15:53	592.9
84			2022-01-26 12:38	648.5	2022-01-26 15:54	584.8
85			2022-01-26 12:39	639.7	2022-01-26 15:55	581.5
86			2022-01-26 12:40	631.8	2022-01-26 15:56	578.9
87			2022-01-26 12:41	624.4	2022-01-26 15:57	578.1
88			2022-01-26 12:42	617.5	2022-01-26 15:58	574.7
89			2022-01-26 12:43	609.6	2022-01-26 15:59	574.1
90			2022-01-26 12:44	604.9	2022-01-26 16:00	575.0
91			2022-01-26 12:45	595.9	2022-01-26 16:01	569.8
92			2022-01-26 12:46	591.6	2022-01-26 16:02	570.2
93			2022-01-26 12:47	586.2	2022-01-26 16:03	567.2
94			2022-01-26 12:48	583.1	2022-01-26 16:04	570.7
95			2022-01-26 12:49	579.1	2022-01-26 16:05	567.8
96			2022-01-26 12:50	575.8	2022-01-26 16:06	569.7
97			2022-01-26 12:51	571.2	2022-01-26 16:07	568.8
98			2022-01-26 12:52	568.1	2022-01-26 16:08	565.1
99			2022-01-26 12:53	565.5	2022-01-26 16:09	567.7
100			2022-01-26 12:54	564.2	2022-01-26 16:10	565.3
101			2022-01-26 12:55	561.6	2022-01-26 16:11	563.1
102			2022-01-26 12:56	559.9	2022-01-26 16:12	563.6
103			2022-01-26 12:57	557.5	2022-01-26 16:13	571.2
104			2022-01-26 12:58	557.3	2022-01-26 16:14	573.7
105			2022-01-26 12:59	555.5	2022-01-26 16:15	573.6
106			2022-01-26 13:00	554.4	2022-01-26 16:16	566.5
107			2022-01-26 13:01	553.0	2022-01-26 16:17	560.1
108			2022-01-26 13:02	553.0	2022-01-26 16:18	556.3
109			2022-01-26 13:03	553.0	2022-01-26 16:19	547.4
110			2022-01-26 13:04	551.9	2022-01-26 16:20	544.3

111			2022-01-26 13:05	550.6	2022-01-26 16:21	538.4
112			2022-01-26 13:06	547.9	2022-01-26 16:22	534.3
113			2022-01-26 13:07	545.8	2022-01-26 16:23	530.4
114			2022-01-26 13:08	541.6	2022-01-26 16:24	530.4
115			2022-01-26 13:09	539.5	2022-01-26 16:25	529.3
116			2022-01-26 13:10	538.6	2022-01-26 16:26	525.7
117			2022-01-26 13:11	535.5	2022-01-26 16:27	528.0
118			2022-01-26 13:12	533.9	2022-01-26 16:28	527.8
119			2022-01-26 13:13	534.9	2022-01-26 16:29	524.9
120			2022-01-26 13:14	531.1	2022-01-26 16:30	527.6
121			2022-01-26 13:15	531.0	2022-01-26 16:31	529.4
122			2022-01-26 13:16	528.8	2022-01-26 16:32	531.6
123			2022-01-26 13:17	527.7	2022-01-26 16:33	532.6
124			2022-01-26 13:18	526.2	2022-01-26 16:34	532.3
125			2022-01-26 13:19	525.8	2022-01-26 16:35	529.7
126			2022-01-26 13:20	527.5	2022-01-26 16:36	524.1
127			2022-01-26 13:21	527.4	2022-01-26 16:37	517.7
128			2022-01-26 13:22	525.6	2022-01-26 16:38	511.4
129			2022-01-26 13:23	518.4	2022-01-26 16:39	508.4
130			2022-01-26 13:24	514.5	2022-01-26 16:40	505.3
131			2022-01-26 13:25	508.8	2022-01-26 16:41	501.4
132			2022-01-26 13:26	505.0	2022-01-26 16:42	499.5
133			2022-01-26 13:27	497.9	2022-01-26 16:43	495.2
134			2022-01-26 13:28	494.5	2022-01-26 16:44	490.0
135			2022-01-26 13:29	493.6	2022-01-26 16:45	483.4
136			2022-01-26 13:30	488.3	2022-01-26 16:46	478.5
137			2022-01-26 13:31	487.9	2022-01-26 16:47	475.7
138			2022-01-26 13:32	483.1	2022-01-26 16:48	472.7
139			2022-01-26 13:33	479.6	2022-01-26 16:49	471.3
140			2022-01-26 13:34	473.5	2022-01-26 16:50	468.6
141			2022-01-26 13:35	469.0	2022-01-26 16:51	467.1
142			2022-01-26 13:36	465.0	2022-01-26 16:52	463.5
143			2022-01-26 13:37	461.6	2022-01-26 16:53	461.5
144			2022-01-26 13:38	455.6	2022-01-26 16:54	460.8
145			2022-01-26 13:39	451.8	2022-01-26 16:55	458.2
146			2022-01-26 13:40	450.0	2022-01-26 16:56	455.9
147			2022-01-26 13:41	446.5	2022-01-26 16:57	453.4
148			2022-01-26 13:42	442.3	2022-01-26 16:58	451.7
149			2022-01-26 13:43	434.6	2022-01-26 16:59	449.2
150			2022-01-26 13:44	429.6	2022-01-26 17:00	447.8
151			2022-01-26 13:45	426.5	2022-01-26 17:01	445.3
152			2022-01-26 13:46	428.7	2022-01-26 17:02	442.5
153			2022-01-26 13:47	433.8	2022-01-26 17:03	440.7
154			2022-01-26 13:48	432.0	2022-01-26 17:04	439.5
155			2022-01-26 13:49	431.5	2022-01-26 17:05	437.8
156			2022-01-26 13:50	424.0	2022-01-26 17:06	434.7
157			2022-01-26 13:51	423.5	2022-01-26 17:07	433.7
158			2022-01-26 13:52	422.6	2022-01-26 17:08	431.7
159			2022-01-26 13:53	422.2	2022-01-26 17:09	428.8
160			2022-01-26 13:54	420.6	2022-01-26 17:10	427.1
161			2022-01-26 13:55	418.5	2022-01-26 17:11	424.1
162			2022-01-26 13:56	416.9	2022-01-26 17:12	422.8
163			2022-01-26 13:57	415.0	2022-01-26 17:13	419.9
164			2022-01-26 13:58	414.2	2022-01-26 17:14	417.9
165			2022-01-26 13:59	412.8	2022-01-26 17:15	417.0
166			2022-01-26 14:00	411.3	2022-01-26 17:16	414.8
167			2022-01-26 14:01	410.5	2022-01-26 17:17	413.5
168			2022-01-26 14:02	410.0	2022-01-26 17:18	411.8
169			2022-01-26 14:03	409.0	2022-01-26 17:19	409.8
170			2022-01-26 14:04	408.4	2022-01-26 17:20	408.2
171			2022-01-26 14:05	406.2	2022-01-26 17:21	407.6

172			2022-01-26 14:06	405.2	2022-01-26 17:22	407.4
173			2022-01-26 14:07	403.3	2022-01-26 17:23	405.7
174			2022-01-26 14:08	401.9	2022-01-26 17:24	404.5
175			2022-01-26 14:09	400.2	2022-01-26 17:25	402.6
176			2022-01-26 14:10	398.7	2022-01-26 17:26	401.5
177			2022-01-26 14:11	398.7	2022-01-26 17:27	399.4
178			2022-01-26 14:12	400.4	2022-01-26 17:28	399.0
179			2022-01-26 14:13	403.2	2022-01-26 17:29	397.2
180			2022-01-26 14:14	405.3	2022-01-26 17:30	394.9
181			2022-01-26 14:15	404.9	2022-01-26 17:31	393.2
182			2022-01-26 14:16	404.9	2022-01-26 17:32	391.7
183			2022-01-26 14:17	404.3	2022-01-26 17:33	390.3
184			2022-01-26 14:18	401.3	2022-01-26 17:34	389.4
185			2022-01-26 14:19	400.5	2022-01-26 17:35	387.6
186			2022-01-26 14:20	399.5	2022-01-26 17:36	387.1
187			2022-01-26 14:21	399.2	2022-01-26 17:37	386.0
188			2022-01-26 14:22	398.8	2022-01-26 17:38	384.6
189			2022-01-26 14:23	397.9	2022-01-26 17:39	383.8
190			2022-01-26 14:24	397.7	2022-01-26 17:40	383.9
191			2022-01-26 14:25	396.1	2022-01-26 17:41	383.1
192			2022-01-26 14:26	396.3	2022-01-26 17:42	382.9
193			2022-01-26 14:27	395.6	2022-01-26 17:43	383.6
194			2022-01-26 14:28	395.5	2022-01-26 17:44	383.1
195			2022-01-26 14:29	375.9	2022-01-26 17:45	382.8
196					2022-01-26 17:46	384.1
197					2022-01-26 17:47	384.0
198					2022-01-26 17:48	385.1
199					2022-01-26 17:49	385.1
200					2022-01-26 17:50	387.3
201					2022-01-26 17:51	387.8
202					2022-01-26 17:52	381.9
203					2022-01-26 17:53	373.9
204					2022-01-26 17:54	367.9
205					2022-01-26 17:55	363.0
206					2022-01-26 17:56	360.5
207					2022-01-26 17:57	357.7
208					2022-01-26 17:58	357.0
209					2022-01-26 17:59	355.0
210					2022-01-26 18:00	353.1
211					2022-01-26 18:01	352.3
212					2022-01-26 18:02	350.6
213					2022-01-26 18:03	349.3
214					2022-01-26 18:04	347.7
215					2022-01-26 18:05	349.3
216					2022-01-26 18:06	351.2
217					2022-01-26 18:07	351.4
218					2022-01-26 18:08	351.5
219					2022-01-26 18:09	351.6
220					2022-01-26 18:10	350.6
221					2022-01-26 18:11	349.8
222					2022-01-26 18:12	348.9
223					2022-01-26 18:13	348.4
224					2022-01-26 18:14	348.9
225					2022-01-26 18:15	346.5
226					2022-01-26 18:16	346.2
227					2022-01-26 18:17	346.9
228					2022-01-26 18:18	346.8
229					2022-01-26 18:19	346.2
230					2022-01-26 18:20	346.1
231					2022-01-26 18:21	344.6
232					2022-01-26 18:22	344.8

233					2022-01-26 18:23	345.1
234					2022-01-26 18:24	345.5
235					2022-01-26 18:25	346.5
236					2022-01-26 18:26	345.9
237					2022-01-26 18:27	346.3
238					2022-01-26 18:28	346.2
239					2022-01-26 18:29	346.0
240					2022-01-26 18:30	345.6
241					2022-01-26 18:31	345.5
242					2022-01-26 18:32	343.2
243					2022-01-26 18:33	340.7
244					2022-01-26 18:34	339.9
245					2022-01-26 18:35	338.7
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247					2022-01-26 18:37	337.1
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262					2022-01-26 18:52	328.6
263					2022-01-26 18:53	329.0
264					2022-01-26 18:54	328.3
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354					2022-01-26 20:24	280.3

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393					2022-01-26 21:03	260.4
394					2022-01-26 21:04	260.8
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442					2022-01-26 21:52	248.1
443					2022-01-26 21:53	247.7
444					2022-01-26 21:54	247.4
445					2022-01-26 21:55	247.0
446					2022-01-26 21:56	246.7
447					2022-01-26 21:57	246.4
448					2022-01-26 21:58	246.0
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452					2022-01-26 22:02	243.1
453					2022-01-26 22:03	242.2
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477					2022-01-26 22:27	230.0
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480					2022-01-26 22:30	229.2
481					2022-01-26 22:31	228.5
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483					2022-01-26 22:33	227.8
484					2022-01-26 22:34	227.4
485					2022-01-26 22:35	227.0
486					2022-01-26 22:36	226.4
487					2022-01-26 22:37	226.0
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493					2022-01-26 22:43	223.5
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504					2022-01-26 22:54	217.9
505					2022-01-26 22:55	217.3
506					2022-01-26 22:56	216.9
507					2022-01-26 22:57	216.4
508					2022-01-26 22:58	216.1
509					2022-01-26 22:59	215.3
510						

3.5 Series Pre-burn Data 2022-02-17 Total time (h) 11.27

Load time	Load type	Fuel added	Moisture		Time	Flue Temp
(-)	(-)	(lbs)	(DB %)		(min)	(°F)
2022-02-17 10:08	Kindling & SUF	14.00	14.75	**Pre-Charge (min)**	41	657.7
2022-02-17 10:50	High fire	28.86	19.2	**Conditioning (min)**	135	703.5
2022-02-17 13:19	Medium fire	33.22	19.1	**Load (min)**	500	345.6

	Average Tflue (°F)	657.7		703.5		345.6
	Pre-Charge (min)	41	Conditioning (min)	135	Load (min)	500
Index	Date & Time	Flue (F)	Date & Time	Flue (F)	Date & Time	Flue (F)
0	2022-02-17 10:08	68.4	2022-02-17 10:50	649.2	2022-02-17 13:19	430.1
1	2022-02-17 10:09	136.4	2022-02-17 10:51	607.3	2022-02-17 13:20	361.8
2	2022-02-17 10:10	237.4	2022-02-17 10:52	657.1	2022-02-17 13:21	389.9
3	2022-02-17 10:11	330.9	2022-02-17 10:53	724.0	2022-02-17 13:22	637.1
4	2022-02-17 10:12	395.1	2022-02-17 10:54	747.3	2022-02-17 13:23	786.0
5	2022-02-17 10:13	479.9	2022-02-17 10:55	756.7	2022-02-17 13:24	781.7
6	2022-02-17 10:14	556.0	2022-02-17 10:56	754.6	2022-02-17 13:25	799.2
7	2022-02-17 10:15	614.1	2022-02-17 10:57	752.6	2022-02-17 13:26	741.5
8	2022-02-17 10:16	674.1	2022-02-17 10:58	746.6	2022-02-17 13:27	724.2
9	2022-02-17 10:17	712.5	2022-02-17 10:59	739.2	2022-02-17 13:28	720.6
10	2022-02-17 10:18	741.6	2022-02-17 11:00	750.6	2022-02-17 13:29	719.0
11	2022-02-17 10:19	775.0	2022-02-17 11:01	749.0	2022-02-17 13:30	714.4
12	2022-02-17 10:20	788.9	2022-02-17 11:02	747.5	2022-02-17 13:31	699.2
13	2022-02-17 10:21	791.9	2022-02-17 11:03	747.8	2022-02-17 13:32	664.7
14	2022-02-17 10:22	780.5	2022-02-17 11:04	743.8	2022-02-17 13:33	624.9
15	2022-02-17 10:23	767.0	2022-02-17 11:05	743.2	2022-02-17 13:34	598.8
16	2022-02-17 10:24	754.3	2022-02-17 11:06	749.6	2022-02-17 13:35	578.3
17	2022-02-17 10:25	757.9	2022-02-17 11:07	753.4	2022-02-17 13:36	560.5
18	2022-02-17 10:26	768.5	2022-02-17 11:08	758.2	2022-02-17 13:37	544.7
19	2022-02-17 10:27	770.2	2022-02-17 11:09	762.5	2022-02-17 13:38	531.9
20	2022-02-17 10:28	766.0	2022-02-17 11:10	765.0	2022-02-17 13:39	520.8
21	2022-02-17 10:29	765.1	2022-02-17 11:11	765.6	2022-02-17 13:40	513.0
22	2022-02-17 10:30	765.3	2022-02-17 11:12	766.5	2022-02-17 13:41	505.0
23	2022-02-17 10:31	764.4	2022-02-17 11:13	766.0	2022-02-17 13:42	498.4
24	2022-02-17 10:32	753.7	2022-02-17 11:14	765.1	2022-02-17 13:43	494.5
25	2022-02-17 10:33	750.3	2022-02-17 11:15	764.3	2022-02-17 13:44	494.3
26	2022-02-17 10:34	746.2	2022-02-17 11:16	764.7	2022-02-17 13:45	495.9
27	2022-02-17 10:35	733.9	2022-02-17 11:17	764.9	2022-02-17 13:46	498.2
28	2022-02-17 10:36	727.4	2022-02-17 11:18	761.9	2022-02-17 13:47	501.8
29	2022-02-17 10:37	726.5	2022-02-17 11:19	760.1	2022-02-17 13:48	505.5
30	2022-02-17 10:38	716.6	2022-02-17 11:20	757.5	2022-02-17 13:49	508.5
31	2022-02-17 10:39	715.3	2022-02-17 11:21	755.1	2022-02-17 13:50	512.1
32	2022-02-17 10:40	706.7	2022-02-17 11:22	752.1	2022-02-17 13:51	512.8
33	2022-02-17 10:41	696.4	2022-02-17 11:23	754.2	2022-02-17 13:52	516.2
34	2022-02-17 10:42	688.4	2022-02-17 11:24	755.1	2022-02-17 13:53	515.3
35	2022-02-17 10:43	682.8	2022-02-17 11:25	756.6	2022-02-17 13:54	514.3
36	2022-02-17 10:44	678.6	2022-02-17 11:26	756.2	2022-02-17 13:55	512.3
37	2022-02-17 10:45	674.0	2022-02-17 11:27	757.9	2022-02-17 13:56	509.7
38	2022-02-17 10:46	674.6	2022-02-17 11:28	758.0	2022-02-17 13:57	508.5
39	2022-02-17 10:47	668.7	2022-02-17 11:29	760.3	2022-02-17 13:58	507.2
40	2022-02-17 10:48	665.2	2022-02-17 11:30	760.3	2022-02-17 13:59	507.9
41	2022-02-17 10:49	657.9	2022-02-17 11:31	760.8	2022-02-17 14:00	506.3
42			2022-02-17 11:32	758.7	2022-02-17 14:01	506.5
43			2022-02-17 11:33	758.7	2022-02-17 14:02	506.9
44			2022-02-17 11:34	755.6	2022-02-17 14:03	506.5
45			2022-02-17 11:35	752.2	2022-02-17 14:04	506.0
46			2022-02-17 11:36	751.0	2022-02-17 14:05	504.4
47			2022-02-17 11:37	749.1	2022-02-17 14:06	505.5
48			2022-02-17 11:38	750.0	2022-02-17 14:07	504.7
49			2022-02-17 11:39	749.6	2022-02-17 14:08	504.8

50			2022-02-17 11:40	750.8	2022-02-17 14:09	506.0
51			2022-02-17 11:41	752.2	2022-02-17 14:10	507.0
52			2022-02-17 11:42	753.8	2022-02-17 14:11	507.9
53			2022-02-17 11:43	750.5	2022-02-17 14:12	507.3
54			2022-02-17 11:44	750.5	2022-02-17 14:13	508.6
55			2022-02-17 11:45	749.6	2022-02-17 14:14	509.2
56			2022-02-17 11:46	752.5	2022-02-17 14:15	509.4
57			2022-02-17 11:47	751.8	2022-02-17 14:16	509.7
58			2022-02-17 11:48	753.5	2022-02-17 14:17	509.0
59			2022-02-17 11:49	783.6	2022-02-17 14:18	509.4
60			2022-02-17 11:50	805.9	2022-02-17 14:19	509.7
61			2022-02-17 11:51	826.7	2022-02-17 14:20	511.8
62			2022-02-17 11:52	836.1	2022-02-17 14:21	511.8
63			2022-02-17 11:53	838.4	2022-02-17 14:22	513.4
64			2022-02-17 11:54	833.3	2022-02-17 14:23	513.1
65			2022-02-17 11:55	829.1	2022-02-17 14:24	513.5
66			2022-02-17 11:56	826.1	2022-02-17 14:25	516.0
67			2022-02-17 11:57	822.1	2022-02-17 14:26	516.9
68			2022-02-17 11:58	818.1	2022-02-17 14:27	518.7
69			2022-02-17 11:59	813.0	2022-02-17 14:28	519.0
70			2022-02-17 12:00	808.8	2022-02-17 14:29	521.3
71			2022-02-17 12:01	805.4	2022-02-17 14:30	522.1
72			2022-02-17 12:02	799.1	2022-02-17 14:31	523.6
73			2022-02-17 12:03	794.7	2022-02-17 14:32	526.1
74			2022-02-17 12:04	789.9	2022-02-17 14:33	526.5
75			2022-02-17 12:05	784.0	2022-02-17 14:34	527.8
76			2022-02-17 12:06	782.5	2022-02-17 14:35	528.5
77			2022-02-17 12:07	778.0	2022-02-17 14:36	531.0
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485					2022-02-17 21:24	219.6
486					2022-02-17 21:25	219.4
487					2022-02-17 21:26	219.6
488					2022-02-17 21:27	219.4
489					2022-02-17 21:28	219.6
490					2022-02-17 21:29	219.3
491					2022-02-17 21:30	219.1
492					2022-02-17 21:31	219.0
493					2022-02-17 21:32	219.3
494					2022-02-17 21:33	219.2
495					2022-02-17 21:34	218.6
496					2022-02-17 21:35	218.3
497					2022-02-17 21:36	217.2
498					2022-02-17 21:37	217.1
499					2022-02-17 21:38	216.9
500					2022-02-17 21:39	216.6
501						

VERSION: 2.4 2010-04-15

Manufacturer: SBI
Model: 3.5 Series
Date: 2022-02-20
Run: 1
Control #: G104981354
Test Duration: 135
Output Category: High

Appliance Type: Non-Cat (Cat, Non

Temp. Units F (F or C)
Weight Units lb (kg or lb)

Fuel Data

	Beech	
HHV	18,800	kJ/kg
%C	48.7	
%H	5.8	
%O	44.9	
%Ash	0.6	

Wood Moisture (% wet): 17.86
Load Weight (lb wet): 25.43
Burn Rate (dry kg/h): 4.21
Total Particulate Emissions: 8.818 g

Averages		**0.12**	**11.53**	**8.80**	**690.26**	**85.93**
					Temp. (ºF)	
Elapsed Time (min)	**Fuel Weight Remaining (lb)**	**Flue Gas Composition (%) CO**	**CO_2**	**O_2**	**Flue Gas**	**Room Temp**
0	25.43	0.31	15.42	4.45	710.9	75.9
1	25.29	0.19	9.22	10.81	736.6	78.1
2	25.14	0.23	8.44	11.76	815.2	79.3
3	24.70	0.23	15.10	5.51	836.8	79.4
4	24.32	0.36	18.29	2.64	843.1	80.0
5	23.95	0.3532	18.61	2.34	842.984	79.4326
6	23.59	0.2422	18.26	2.74	841.004	79.3526
7	23.23	0.1703	17.88	3.14	833.288	79.7682
8	22.89	0.1323	17.48	3.6	826.382	79.3262
9	22.56	0.1018	16.83	4.19	816.945	79.9455
10	22.25	0.0824	16.14	4.76	809.236	80.039
11	21.94	0.0676	15.66	5.3	802.061	80.2809
12	21.64	0.0556	15.22	5.83	792.881	81.0275
13	21.34	0.0526	14.7	6.3	783.44	81.4794
14	21.05	0.0454	14.24	6.75	775.704	83.1517
15	20.75	0.0399	13.86	7.12	765.849	83.6366
16	20.46	0.0392	13.4	7.47	760.139	83.6614
17	20.17	0.036	13.13	7.79	756.489	84.2272
18	19.89	0.0287	13.01	7.86	753.09	84.2107
19	19.64	0.0281	12.98	7.83	749.367	82.5947
20	19.39	0.0274	13.02	7.92	743.88	82.3982
21	19.17	0.0325	12.8	8.05	733.508	82.488
22	18.90	0.0465	12.79	8.15	727.43	83.2279
23	18.66	0.0692	12.7	8.21	719.291	84.1292

24	18.40	0.0821	12.59	8.22	716.807	84.4813
25	18.13	0.099	12.66	8.15	715.469	81.9434
26	17.89	0.1065	12.67	8.16	714.337	82.8874
27	17.65	0.1124	12.61	8.15	712.944	82.8288
28	17.39	0.1155	12.61	8.12	705.285	82.7228
29	17.15	0.1314	12.61	8.15	703.738	82.9133
30	16.90	0.1465	12.55	8.17	701.574	82.2391
31	16.67	0.159	12.53	8.14	701.763	81.6774
32	16.42	0.1712	12.59	8.01	701.926	82.839
33	16.15	0.1837	12.77	7.85	703.911	83.8447
34	15.89	0.186	12.94	7.69	706.961	84.0916
35	15.61	0.1877	12.99	7.58	708.783	84.8447
36	15.35	0.1853	13.06	7.51	711.248	85.1329
37	15.08	0.1869	13.21	7.43	712.318	85.4851
38	14.83	0.1854	13.29	7.27	717.922	85.1035
39	14.55	0.2021	13.53	7.05	722.112	85.6148
40	14.29	0.1921	13.73	6.84	726.073	85.5455
41	14.01	0.2103	13.96	6.69	731.523	86.4425
42	13.74	0.2139	14	6.56	734.554	86.7153
43	13.46	0.1973	14.18	6.42	735.857	86.3065
44	13.18	0.2049	14.32	6.29	744.261	86.6267
45	12.92	0.1844	14.44	6.14	749.02	86.4854
46	12.64	0.1804	14.56	6	752.71	86.9498
47	12.37	0.1758	14.72	5.85	755.357	86.6146
48	12.09	0.171	14.82	5.76	759.393	87.3
49	11.82	0.1822	14.81	5.66	761.827	87.8613
50	11.55	0.1826	14.98	5.57	766.085	87.6897
51	11.28	0.1771	15.03	5.46	767.384	87.6198
52	10.99	0.1777	15.13	5.34	770.968	87.4515
53	10.72	0.1766	15.18	5.28	771.348	87.2381
54	10.46	0.1731	15.16	5.29	773.838	88.1869
55	10.20	0.1652	15.21	5.27	775.421	88.3184
56	9.94	0.1732	15.23	5.21	775.575	88.3311
57	9.66	0.1829	15.2	5.17	775.93	88.4057
58	9.41	0.1696	15.08	5.24	777.369	88.802
59	9.14	0.1593	15.04	5.27	778.349	87.4177
60	8.90	0.1658	15.14	5.22	778.659	87.508
61	8.61	0.1779	15.23	5.04	777.538	87.8387
62	8.33	0.2028	15.42	4.85	778.023	88.1025
63	8.04	0.2035	15.5	4.79	778.104	88.2513
64	7.76	0.2144	15.51	4.78	778.39	88.3352
65	7.48	0.2225	15.4	4.78	779.399	88.3783
66	7.20	0.2451	15.43	4.77	779.358	88.4212
67	6.89	0.2424	15.38	4.84	783.926	88.6252

68	6.72	0.2596	15.26	5.01	782.237	88.892
69	6.56	0.2515	14.81	5.38	777.536	89.0554
70	6.40	0.2075	14.65	5.55	772.153	89.1139
71	6.23	0.1238	14.14	5.98	765.082	88.9196
72	6.04	0.0617	13.66	6.58	760.433	87.9027
73	5.87	0.0315	13.33	6.94	755.96	87.8597
74	5.68	0.0228	13.18	7.08	753.367	87.3319
75	5.49	0.0209	13.08	7.16	748.131	87.5375
76	5.31	0.0217	12.93	7.22	745.555	88.1237
77	5.12	0.021	12.97	7.28	742.02	87.8876
78	4.94	0.0184	12.82	7.34	737.517	88.0758
79	4.76	0.0156	12.53	7.59	735.629	87.7041
80	4.59	0.0123	12.27	7.8	733.159	87.4922
81	4.41	0.0126	12.22	7.89	729.522	87.2486
82	4.26	0.0142	12.12	8.05	724.112	87.4259
83	4.11	0.0111	11.81	8.35	717.479	87.3545
84	3.93	0.0096	11.34	8.73	712.606	86.4924
85	3.74	0.0094	11.11	8.98	706.823	87.0529
86	3.57	0.0116	10.94	9.17	701.679	87.894
87	3.40	0.0124	10.69	9.37	696.343	86.5608
88	3.25	0.0131	10.7	9.48	691.028	87.1221
89	3.10	0.0144	10.49	9.61	686.376	87.6544
90	2.96	0.0145	10.25	9.85	681.571	87.2479
91	2.84	0.0154	10.07	10.06	674.006	86.3816
92	2.71	0.0178	9.82	10.29	668.555	86.9178
93	2.60	0.0203	9.47	10.54	661.63	87.9382
94	2.48	0.0228	9.17	10.85	655.536	87.9928
95	2.38	0.025	8.92	11.08	649.475	87.7342
96	2.28	0.0281	8.72	11.35	642.499	88.4404
97	2.17	0.0318	8.53	11.52	638.118	89.3428
98	2.05	0.0329	8.42	11.6	631.897	89.2842
99	1.93	0.034	8.37	11.65	627.7	89.0473
100	1.89	0.0351	8.26	11.74	625.219	88.2404
101	1.83	0.0387	8.15	11.88	621.069	87.7544
102	1.76	0.0408	8.03	11.98	614.431	87.4465
103	1.69	0.0425	7.9	12.1	609.363	87.8456
104	1.61	0.044	7.79	12.21	603.996	87.6751
105	1.54	0.0494	7.74	12.29	600.282	87.3616
106	1.47	0.0501	7.66	12.38	593.929	87.7571
107	1.40	0.053	7.54	12.48	592.819	86.8171
108	1.34	0.0543	7.46	12.57	586.159	87.4962
109	1.26	0.0549	7.36	12.64	582.119	88.9826
110	1.17	0.0585	7.19	12.79	576.337	89.7246
111	1.09	0.0665	6.93	13	574.004	88.6734

112	1.05	0.0732	6.86	13.05	571.166	87.1564
113	1.00	0.0796	6.73	13.15	566.633	86.9524
114	0.96	0.0826	6.58	13.29	562.727	86.8633
115	0.93	0.0871	6.45	13.41	560.06	86.7741
116	0.88	0.0948	6.28	13.56	553.89	88.8152
117	0.82	0.1035	6.02	13.78	545.459	89.6158
118	0.62	0.1214	5.82	14	539.654	87.7654
119	0.62	0.1364	5.58	14.22	537.367	82.1139
120	0.60	0.1556	5.43	14.43	530.437	84.1773
121	0.55	0.1617	5.37	14.49	525.541	85.793
122	0.52	0.1643	5.36	14.51	520.642	85.6687
123	0.48	0.1657	5.33	14.53	517.068	85.2338
124	0.45	0.1686	5.32	14.57	512.454	85.4951
125	0.42	0.1787	5.29	14.62	508.371	85.5014
126	0.40	0.1857	5.26	14.67	504.465	86.3238
127	0.35	0.1949	5.26	14.72	500.464	86.8183
128	0.30	0.206	5.21	14.75	496.511	86.8948
129	0.25	0.2098	5.29	14.77	492.47	87.6476
130	0.21	0.2166	5.32	14.77	490.538	87.6286
131	0.16	0.2173	5.31	14.78	485.959	87.6898
132	0.12	0.2274	5.33	14.8	483.953	87.9956
133	0.08	0.228	5.3	14.81	481.101	87.7602
134	0.03	0.2362	5.33	14.81	478.648	86.8862
135	0.00	0.2366	5.33	14.88	474.844	88.115

Stove Builder International Inc.

Manufacturer:	SBI
Model:	3.5 Series
Date:	02-20-22
Run:	1
Control #:	G104981354
Test Duration:	135
Output Category:	High

Technicians: Claude Pelland, P.Eng.

Test Results in Accordance with CSA B415.1-10

	HHV Basis	LHV Basis
Overall Efficiency	67.6%	72.4%
Combustion Efficiency	99.3%	99.3%
Heat Transfer Efficiency	68%	72.9%

Output Rate (kJ/h)	53,514	50,764	**(Btu/h)**
Burn Rate (kg/h)	4.21	9.28	**(lb/h)**
Input (kJ/h)	79,178	75,109	**(Btu/h)**

Test Load Weight (dry kg)	9.48	20.89	**dry lb**
MC wet (%)	17.86		
MC dry (%)	21.74		
Particulate (g)	8.818		
CO (g)	106		
Test Duration (h)	2.25		

Emissions	**Particulate**	**CO**
g/MJ Output	0.07	0.88
g/kg Dry Fuel	0.93	11.16
g/h	3.92	47.01
lb/MM Btu Output	0.17	2.04

Air/Fuel Ratio (A/F)	9.39

VERSION: **2.4** **2010-04-15**

VERSION: 2.4 2010-04-15

Manufacturer: SBI
Model: 3.5 Series
Date: 2022-02-20
Run: 1
Control #: G104981354
Test Duration: 461
Output Category: MED

Appliance Type: Non-Cat (Cat, Non

Temp. Units F (F or C)
Weight Units lb (kg or lb)

Wood Moisture (% wet): 17.00
Load Weight (lb wet): 34.60
Burn Rate (dry kg/h): 1.70
Total Particulate Emissions: 7.645 g

Fuel Data

	Beech	
HHV	18,800	kJ/kg
%C	48.7	
%H	5.8	
%O	44.9	
%Ash	0.6	

Averages	**0.38**	**7.49**	**12.76**	**402.36**	**84.94**	
					Temp. (ºF)	
Elapsed Time (min)	**Fuel Weight Remaining (lb)**	**Flue Gas Composition (%) CO**	**CO_2**	**O_2**	**Flue Gas**	**Room Temp**
0	34.60	0.22	5.26	15.16	456.2	85.0
10	31.08	0.27	17.05	3.84	713.6	88.4
20	29.06	0.27	11.59	9.13	580.6	89.2
30	27.51	0.62	9.00	11.61	525.4	87.3
40	25.92	0.40	10.32	10.36	541.5	87.7
50	24.28	0.1647	11.6	9.24	565.657	87.1636
60	22.51	0.1796	12.22	8.68	574.186	86.7592
70	20.66	0.0867	12.81	8.09	587.403	87.9572
80	18.64	0.0696	14.64	6.31	615.102	88.4188
90	16.52	0.1013	15.84	4.94	641.947	85.6968
100	14.37	0.29	16.05	4.23	655.304	85.8449
110	12.44	0.0937	13.72	6.43	614.797	86.127
120	10.92	0.0784	12.32	7.76	575.495	85.8934
130	9.66	0.0799	10.87	9.24	545.554	85.6785
140	8.60	0.0583	10.42	9.4	528.254	84.479
150	7.71	0.0625	9.78	9.93	504.693	86.4164
160	7.00	0.1406	8.8	11.03	478.092	88.3025
170	6.47	0.2447	8.26	11.67	446.303	87.6311
180	5.98	0.3089	8.21	11.81	428.17	88.0725
190	5.54	0.318	8.13	11.94	420.358	86.9946
200	5.17	0.4922	7.54	12.3	406.858	86.6392
210	4.82	0.5245	7.21	12.76	392.783	87.8716
220	4.49	0.504	7.29	12.74	386.669	88.9957
230	4.19	0.5461	6.88	13.18	376.698	88.7097

240	3.92	0.5501	6.14	13.96	361.989	85.7164
250	3.74	0.5128	5.74	14.29	348.585	84.4956
260	3.53	0.5179	5.55	14.54	335.476	86.3356
270	3.29	0.5272	5.26	14.81	326.479	86.5548
280	3.08	0.5419	5.17	14.91	320.028	86.284
290	2.91	0.4955	4.73	15.43	310.851	83.8197
300	2.72	0.4972	4.67	15.46	302.386	83.4941
310	2.54	0.4986	4.5	15.66	295.522	83.2221
320	2.37	0.4968	4.39	15.76	288.877	82.4545
330	2.19	0.4714	4.11	16.08	279.327	81.9401
340	2.02	0.4784	4.08	16.13	273.725	81.3628
350	1.85	0.4802	3.99	16.21	269.339	81.6751
360	1.67	0.4809	3.91	16.3	264.776	81.3186
370	1.50	0.5278	3.87	16.32	259.932	81.045
380	1.33	0.5243	3.85	16.36	257.348	80.9894
390	1.18	0.5115	3.8	16.38	255.132	80.9733
400	1.00	0.4982	3.81	16.41	253.304	80.6235
410	0.85	0.5126	3.82	16.38	252.989	80.4089
420	0.66	0.4898	3.81	16.4	250.437	81.4137
430	0.47	0.4784	3.75	16.48	249.654	82.1591
440	0.31	0.4688	3.71	16.53	247.719	82.2983
450	0.16	0.4701	3.76	16.49	248.498	82.5156
460	0.01	0.4633	3.65	16.6	249.77	82.4938
461	0.00	0.4608	3.65	16.61	249.62	82.3978

Stove Builder International Inc.

Manufacturer:	SBI
Model:	3.5 Series
Date:	02-20-22
Run:	1
Control #:	G104981354
Test Duration:	461
Output Category:	MED

Technicians: Claude Pelland, P.Eng.

Test Results in Accordance with CSA B415.1-10

	HHV Basis	LHV Basis
Overall Efficiency	71.8%	76.9%
Combustion Efficiency	97.8%	97.8%
Heat Transfer Efficiency	73%	78.6%

Output Rate (kJ/h)	22,880	21,704	**(Btu/h)**
Burn Rate (kg/h)	1.70	3.74	**(lb/h)**
Input (kJ/h)	31,884	30,246	**(Btu/h)**

Test Load Weight (dry kg)	13.03	28.72	**dry lb**
MC wet (%)	17		
MC dry (%)	20.48		
Particulate (g)	7.645		
CO (g)	427		
Test Duration (h)	7.68		

Emissions	Particulate	CO
g/MJ Output	0.04	2.43
g/kg Dry Fuel	0.59	32.77
g/h	1.00	55.57
lb/MM Btu Output	0.10	5.64

Air/Fuel Ratio (A/F)	13.24

VERSION: **2.4** **2010-04-15**

VERSION: 2.4 2010-04-15

Manufacturer: SBI
Model: 3.5 Series
Date: 2022-02-21
Run: 2
Control #: G104981354
Test Duration: 122
Output Category: High

Appliance Type: Non-Cat (Cat, Non

Temp. Units F (F or C)
Weight Units lb (kg or lb)

Fuel Data

	Beech	
HHV	18,800	kJ/kg
%C	48.7	
%H	5.8	
%O	44.9	
%Ash	0.6	

Wood Moisture (% wet): 17.01
Load Weight (lb wet): 25.75
Burn Rate (dry kg/h): 4.77
Total Particulate Emissions: 10.023 g

Averages		**0.13**	**12.93**	**7.21**	**746.23**	**86.38**

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%) CO	CO_2	O_2	Temp. (ºF) Flue Gas	Room Temp
0	25.75	0.02	11.45	8.62	667.7	74.7
1	25.72	0.04	7.13	13.39	677.2	75.1
2	25.68	0.12	6.66	13.48	744.9	76.2
3	25.28	0.12	11.93	8.54	809.5	76.5
4	24.90	0.15	16.04	4.64	849.0	76.4
5	24.48	0.273	18.11	2.67	867.987	77.0862
6	24.07	0.4884	18.87	1.84	878.835	77.6895
7	23.65	0.4285	18.91	1.77	882.89	79.1213
8	23.23	0.4041	18.9	1.76	884.45	79.3805
9	22.80	0.3659	18.89	1.84	881.179	79.3976
10	22.44	0.2918	18.5	2.15	881.176	79.0209
11	22.07	0.2359	18.33	2.39	877.989	80.394
12	21.68	0.2017	18.11	2.58	872.588	81.1632
13	21.31	0.184	17.99	2.77	869.222	81.3013
14	20.95	0.18	17.75	2.91	865.107	81.7946
15	20.59	0.1848	17.62	3.05	863.085	82.5068
16	20.23	0.1884	17.43	3.27	856.803	82.5422
17	19.87	0.1767	17.27	3.45	848.84	82.9553
18	19.53	0.1713	17.07	3.64	844.239	83.9475
19	19.19	0.1657	16.88	3.83	848.004	83.8112
20	18.85	0.1647	16.78	3.89	845.305	84.1442
21	18.51	0.1608	16.66	3.97	840.877	85.2721
22	18.19	0.1549	16.57	4.08	841.112	85.1184
23	17.86	0.1449	16.44	4.25	838.453	85.495

24	17.54	0.1235	16.25	4.41	835.397	85.3519
25	17.23	0.1054	15.99	4.65	828.104	85.8227
26	16.91	0.0964	15.74	4.9	827.193	86.0774
27	16.59	0.0939	15.64	5.05	823.306	86.0457
28	16.28	0.1011	15.48	5.18	821.239	84.7871
29	16.00	0.109	15.4	5.32	819.356	84.7054
30	15.70	0.119	15.25	5.34	819.047	85.0268
31	15.42	0.1388	15.22	5.29	815.975	85.2799
32	15.11	0.166	15.36	5.2	816.193	86.4894
33	14.80	0.1766	15.41	5.11	815.046	87.3833
34	14.47	0.1841	15.38	5.09	813.555	88.15
35	14.17	0.1966	15.41	5.05	810.649	88.106
36	13.87	0.1982	15.46	5.05	810.949	88.5466
37	13.57	0.1896	15.46	5.06	809.198	88.9473
38	13.26	0.1837	15.33	5.09	807.388	88.7544
39	12.98	0.1815	15.26	5.13	804.028	89.2726
40	12.68	0.1763	15.36	5.16	803.028	89.2074
41	12.39	0.1763	15.3	5.2	802.036	89.5231
42	12.11	0.1704	15.25	5.24	800.415	89.7919
43	11.82	0.1617	15.11	5.28	797.383	89.9087
44	11.51	0.1596	15.06	5.32	796.694	89.7642
45	11.25	0.157	15.05	5.37	797.862	88.2443
46	11.01	0.1479	14.95	5.46	798.729	87.6392
47	10.77	0.1348	14.89	5.47	798.491	86.2216
48	10.50	0.139	14.89	5.43	797.191	87.4514
49	10.23	0.1459	14.91	5.42	795.374	86.6198
50	9.95	0.1412	14.87	5.48	794.209	87.2966
51	9.71	0.1318	14.81	5.57	788.176	87.9172
52	9.44	0.1185	14.66	5.69	787.298	86.9179
53	9.18	0.113	14.66	5.7	789.978	87.1861
54	8.91	0.1309	14.8	5.42	792.956	87.4222
55	8.64	0.1442	15.05	5.18	791.775	87.4685
56	8.39	0.1514	15.09	5.03	793.728	87.4197
57	8.12	0.1373	15.1	4.93	795.63	87.034
58	7.85	0.1341	15.25	4.82	795.792	88.0552
59	7.60	0.1402	15.33	4.74	796.398	87.7562
60	7.35	0.1488	15.49	4.64	799.234	87.8924
61	7.08	0.1543	15.49	4.57	800.661	87.0208
62	6.87	0.1671	15.45	4.57	803.331	84.9573
63	6.59	0.1642	15.54	4.48	802.91	87.0822
64	6.30	0.2326	15.66	4.23	802.26	89.5904
65	5.99	0.2548	15.84	4.06	806.048	89.8122
66	5.72	0.2519	15.93	3.95	806.764	87.5111
67	5.49	0.1662	15.97	4.01	807.189	87.6465

68	5.23	0.1249	15.76	4.13	807.133	88.6246
69	4.99	0.1071	15.77	4.18	804.542	88.0127
70	4.73	0.0985	15.66	4.22	805.042	88.467
71	4.51	0.0846	15.55	4.33	799.049	88.5791
72	4.31	0.0711	15.15	4.72	789.126	88.7825
73	4.09	0.0491	14.37	5.41	779.493	89.3984
74	3.90	0.0413	13.66	6.06	775.294	89.5548
75	3.72	0.0379	13.36	6.27	770.201	89.2102
76	3.53	0.0384	13.21	6.32	766.588	89.0408
77	3.35	0.0382	13.08	6.39	762.136	89.2701
78	3.18	0.0385	12.81	6.64	755.643	89.5248
79	3.04	0.029	12.41	7.01	747.476	89.5792
80	2.86	0.0203	12.1	7.4	743.822	89.5813
81	2.72	0.0149	11.75	7.68	737.9	89.0947
82	2.58	0.0127	11.65	7.86	733.872	89.0866
83	2.45	0.0107	11.52	8	730.343	89.8014
84	2.31	0.0093	11.43	8.01	729.474	88.9549
85	2.19	0.0075	11.45	8.07	728.184	89.092
86	2.07	0.0076	11.29	8.13	724.792	88.854
87	1.96	0.0081	11.12	8.26	716.921	88.6819
88	1.86	0.0097	10.61	8.69	708.761	88.7298
89	1.76	0.0072	10.02	9.26	696.556	88.4894
90	1.66	0.006	9.6	9.72	686.707	88.102
91	1.58	0.0058	8.96	10.27	675.983	88.7774
92	1.51	0.007	8.59	10.72	666.079	88.2755
93	1.44	0.0103	8.15	11.2	656.493	88.2056
94	1.38	0.0146	7.93	11.52	649.399	88.1866
95	1.31	0.0197	7.85	11.71	641.411	87.889
96	1.26	0.0253	7.82	11.85	634.775	87.9748
97	1.19	0.0303	7.79	11.96	629.291	87.7574
98	1.13	0.0348	7.74	12.05	624.332	87.9995
99	1.08	0.0389	7.74	12.13	617.361	88.2051
100	1.02	0.0434	7.63	12.24	613.362	88.1734
101	0.97	0.0468	7.58	12.28	610.767	88.075
102	0.91	0.0478	7.6	12.28	605.552	88.0193
103	0.86	0.0477	7.65	12.29	604.49	87.3156
104	0.80	0.048	7.72	12.27	601.544	87.3681
105	0.74	0.0491	7.66	12.25	600.081	88.037
106	0.68	0.0487	7.68	12.25	600.218	87.742
107	0.63	0.0503	7.63	12.33	596.913	87.5308
108	0.56	0.055	7.59	12.41	595.459	87.4327
109	0.52	0.0594	7.53	12.49	594.418	87.2839
110	0.46	0.0647	7.53	12.54	593.043	87.4231
111	0.42	0.0688	7.47	12.62	579.095	87.469

112	0.36	0.0738	7.14	12.9	572.528	86.8312
113	0.32	0.0886	7.01	13.04	567.165	87.0974
114	0.29	0.0982	6.94	13.14	562.333	86.9795
115	0.25	0.1093	6.86	13.24	551.582	86.7366
116	0.22	0.1313	6.46	13.65	542.621	87.0241
117	0.18	0.1651	6.06	14.07	539.913	86.2163
118	0.15	0.2077	5.84	14.24	534.082	86.7445
119	0.10	0.2641	5.72	14.34	526.699	86.6469
120	0.06	0.2965	5.64	14.43	520.368	86.5267
121	0.03	0.3018	5.58	14.49	514.567	86.4334
122	0.00	0.3152	5.62	14.53	511.267	86.1564

Stove Builder International Inc.

Manufacturer:	SBI
Model:	3.5 Series
Date:	02-21-22
Run:	2
Control #:	G104981354
Test Duration:	122
Output Category:	High

Technicians: Claude Pelland, P.Eng.

Test Results in Accordance with CSA B415.1-10

	HHV Basis	LHV Basis
Overall Efficiency	68.0%	72.8%
Combustion Efficiency	99.3%	99.3%
Heat Transfer Efficiency	68%	73.4%

Output Rate (kJ/h)	60,933	57,801	**(Btu/h)**
Burn Rate (kg/h)	4.77	10.51	**(lb/h)**
Input (kJ/h)	89,648	85,041	**(Btu/h)**

Test Load Weight (dry kg)	9.70	21.37	**dry lb**
MC wet (%)	17.01		
MC dry (%)	20.50		
Particulate (g)	10.023		
CO (g)	110		
Test Duration (h)	2.03		

Emissions	**Particulate**	**CO**
g/MJ Output	0.08	0.89
g/kg Dry Fuel	1.03	11.37
g/h	4.93	54.22
lb/MM Btu Output	0.19	2.07

Air/Fuel Ratio (A/F)	8.47

VERSION: **2.4** **2010-04-15**

VERSION: 2.4 2010-04-15

Manufacturer:	SBI	**Appliance Type:**	Non-Cat (Cat, Non
Model:	3.5 Series		
Date:	2022-02-21	**Temp. Units**	F (F or C)
Run:	2	**Weight Units**	lb (kg or lb)
Control #:	G104981354		
Test Duration:	575		
Output Category:	Low		

		Fuel Data		
			Beech	
Wood Moisture (% wet):	17.27	**HHV**	18,800	kJ/kg
Load Weight (lb wet):	34.62	**%C**	48.7	
Burn Rate (dry kg/h):	1.36	**%H**	5.8	
Total Particulate Emissions:	12.801 g	**%O**	44.9	
		%Ash	0.6	

Averages	**0.72**	**6.89**	**13.15**	**330.88**	**78.59**	
					Temp. (ºF)	
Elapsed Time (min)	**Fuel Weight Remaining (lb)**	**Flue Gas Composition (%) CO**	**CO_2**	**O_2**	**Flue Gas**	**Room Temp**
0	34.62	0.33	5.33	14.87	465.9	86.4
10	30.97	1.18	17.57	2.90	736.4	89.1
20	28.38	0.39	13.80	7.07	575.6	89.7
30	26.69	0.62	11.66	8.95	528.0	86.4
40	25.02	0.50	11.52	9.03	519.5	89.2
50	23.40	0.494	12.47	8.08	537.761	87.5569
60	21.67	0.5331	13.2	7.56	546.826	85.4519
70	19.94	1.3269	14.13	6.38	549.129	83.9282
80	18.02	1.0916	14.14	6.49	546.425	83.8922
90	16.31	0.7837	14.09	6.48	543.979	81.2303
100	14.63	0.5368	14.11	6.44	541.098	80.5266
110	13.02	0.4894	13.54	6.73	531.765	80.3747
120	11.58	0.1722	12.93	7.21	520.689	79.5284
130	10.45	0.2082	10.32	9.73	479.081	79.2486
140	9.34	0.2412	10.17	9.69	463.467	81.6085
150	8.48	0.1715	9.54	10.27	445.992	81.3013
160	7.85	0.3315	8.03	11.81	409.207	80.8252
170	7.32	0.3558	8.12	11.74	394.051	81.2951
180	6.91	1.0494	6.53	13.14	356.882	82.3653
190	6.52	1.1763	6.3	13.38	332.868	80.764
200	6.27	0.9586	5.92	13.73	317.091	79.4697
210	6.08	0.9856	5.67	13.9	301.419	78.4236
220	5.83	0.9578	5.56	14.14	292.199	78.1603
230	5.59	0.9354	5.48	14.25	282.894	80.4194

240	5.37	0.9055	5.53	14.25	278.081	78.8231
250	5.17	0.8502	5.49	14.21	274.774	78.9948
260	4.92	0.8371	5.44	14.29	271.007	80.5033
270	4.73	0.8162	5.32	14.46	267.549	79.678
280	4.52	0.798	5.18	14.64	263.024	80.0365
290	4.31	0.7975	4.97	14.87	257.073	80.5267
300	4.16	0.7968	4.86	14.96	253.959	79.5686
310	4.07	0.7973	4.84	15.02	251.561	76.5709
320	3.91	0.7922	4.86	15.04	249.545	76.372
330	3.72	0.7926	4.8	15.07	247.478	75.9991
340	3.51	0.7873	4.76	15.11	246.039	76.2543
350	3.35	0.7838	4.69	15.22	242.889	76.0224
360	3.19	0.7748	4.66	15.28	240.943	75.9254
370	3.01	0.7782	4.63	15.32	239.965	75.8515
380	2.83	0.7693	4.7	15.28	239.869	75.8245
390	2.66	0.7892	4.68	15.26	239.843	75.86
400	2.48	0.7851	4.65	15.34	238.684	75.4754
410	2.31	0.7632	4.5	15.42	237.39	75.2923
420	2.14	0.7745	4.56	15.43	236.949	75.4159
430	1.98	0.7511	4.47	15.52	235.341	74.9555
440	1.83	0.7475	4.38	15.65	233.671	75.0285
450	1.68	0.7577	4.27	15.72	232.146	74.6316
460	1.52	0.7663	4.28	15.73	230.341	74.8832
470	1.36	0.7531	4.22	15.81	228.135	74.5077
480	1.23	0.748	4.1	15.94	226.327	74.3639
490	1.09	0.7376	4.07	15.95	223.488	73.9587
500	0.95	0.7161	3.98	16.01	221.981	73.6056
510	0.82	0.7151	3.95	16.1	219.162	73.6363
520	0.67	0.7024	3.86	16.16	216.877	73.5818
530	0.54	0.6921	3.8	16.22	215.244	73.3331
540	0.40	0.6708	3.67	16.39	212.904	73.1535
550	0.29	0.6757	3.67	16.38	210.713	73.113
560	0.16	0.6555	3.59	16.48	208.702	72.8192
570	0.05	0.6758	3.45	16.63	206.381	72.6857
575	0.00	0.6528	3.43	16.63	205.951	72.6113

Stove Builder International Inc.

Manufacturer:	SBI
Model:	3.5 Series
Date:	02-21-22
Run:	2
Control #:	G104981354
Test Duration:	575
Output Category:	Low

Technicians: Claude Pelland P.Eng.

Test Results in Accordance with CSA B415.1-10

	HHV Basis	LHV Basis
Overall Efficiency	71.0%	76.0%
Combustion Efficiency	94.5%	94.5%
Heat Transfer Efficiency	75%	80.4%

Output Rate (kJ/h)	18,095	17,165	**(Btu/h)**
Burn Rate (kg/h)	1.36	2.99	**(lb/h)**
Input (kJ/h)	25,494	24,183	**(Btu/h)**

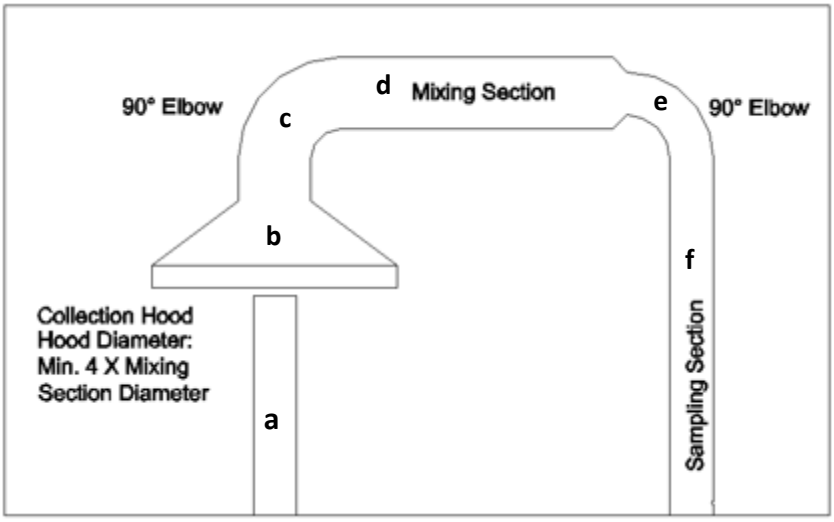
Test Load Weight (dry kg)	13.00	28.64	**dry lb**
MC wet (%)	17.27		
MC dry (%)	20.88		
Particulate (g)	12.801		
CO (g)	977		
Test Duration (h)	9.58		

Emissions	**Particulate**	**CO**
g/MJ Output	0.07	5.63
g/kg Dry Fuel	0.99	75.14
g/h	1.34	101.90
lb/MM Btu Output	0.17	13.09

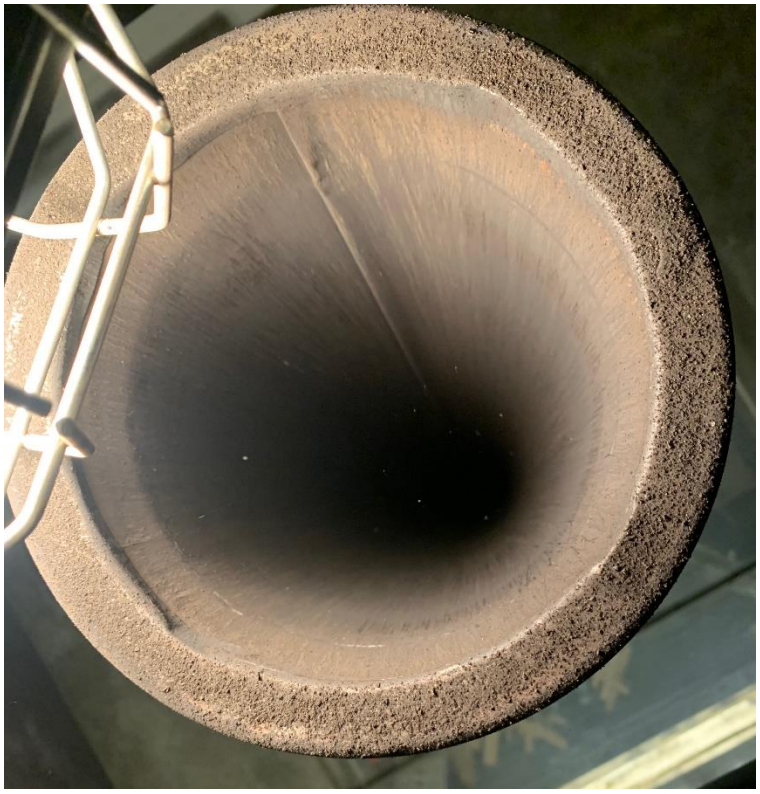
Air/Fuel Ratio (A/F)	13.60

VERSION: **2.4** **2010-04-15**

1. Tunnel cleaning pictures



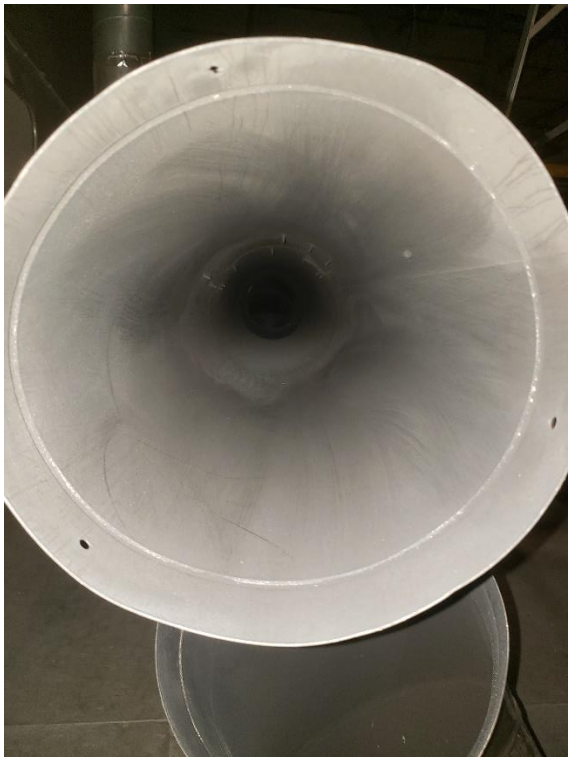
a. Picture of the chimney



b. Picture of the collecting hood

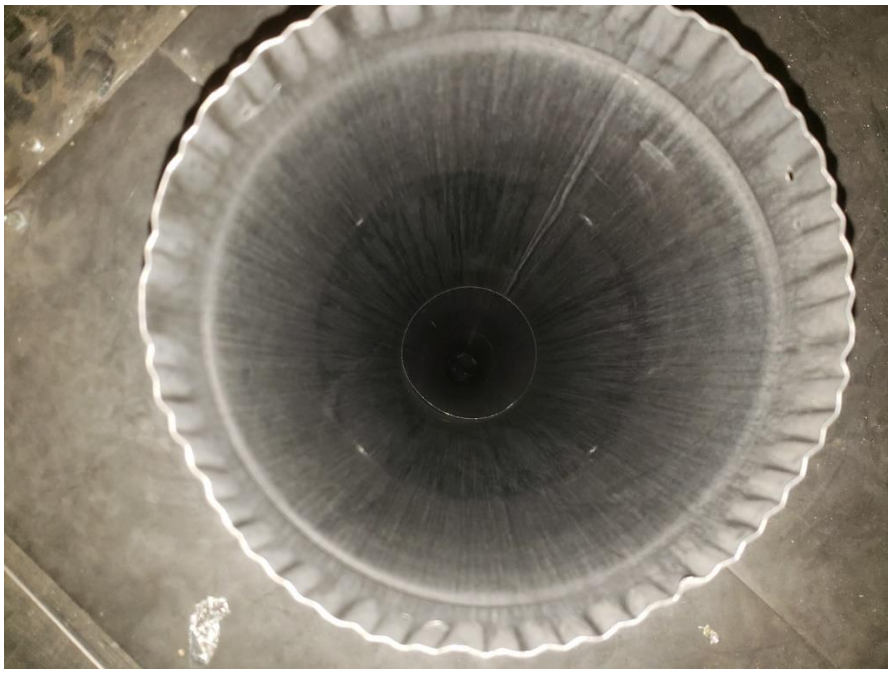
c. Picture of the first elbow

d. Picture of the mixing section

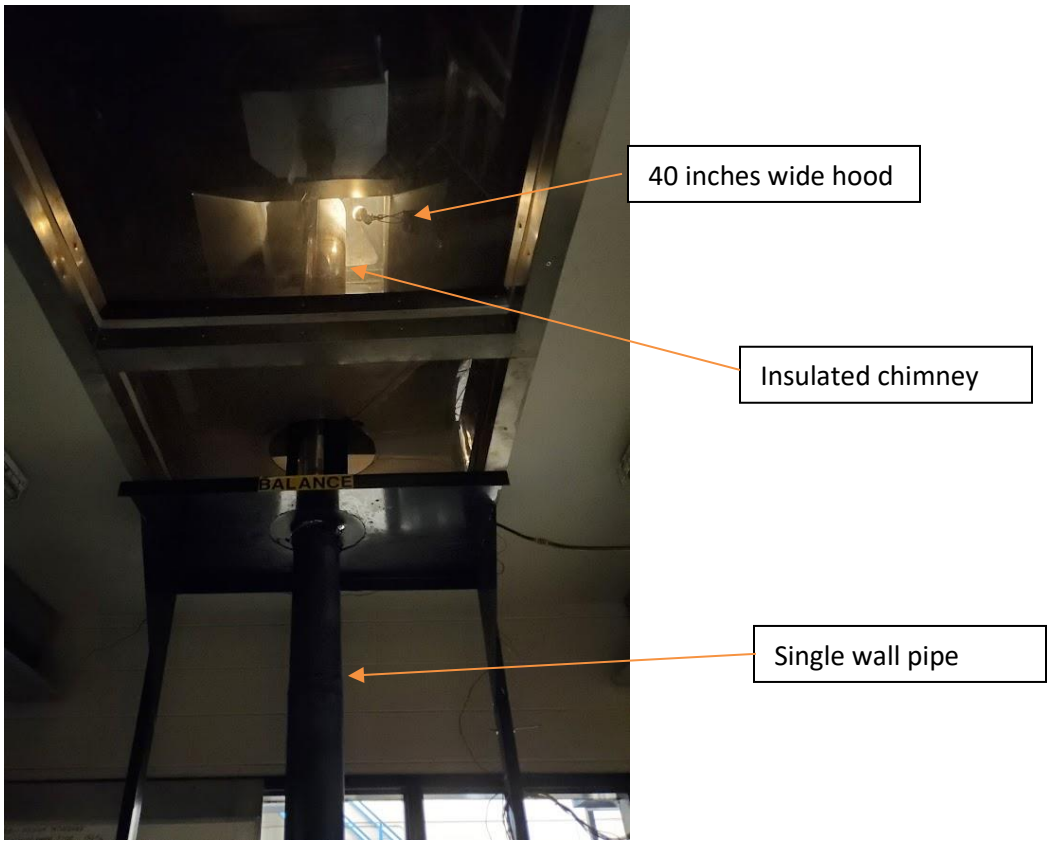


e. Picture of the second elbow

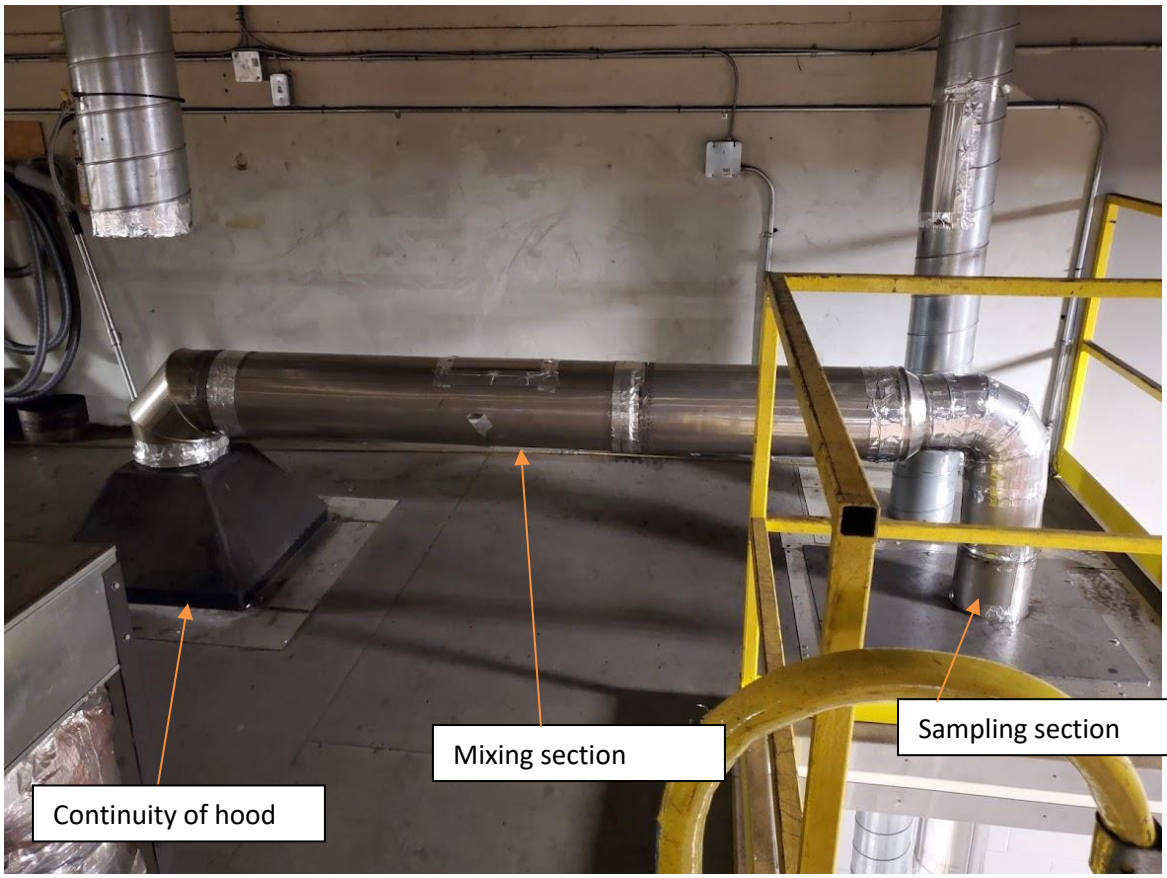
f. Picture of the sampling section



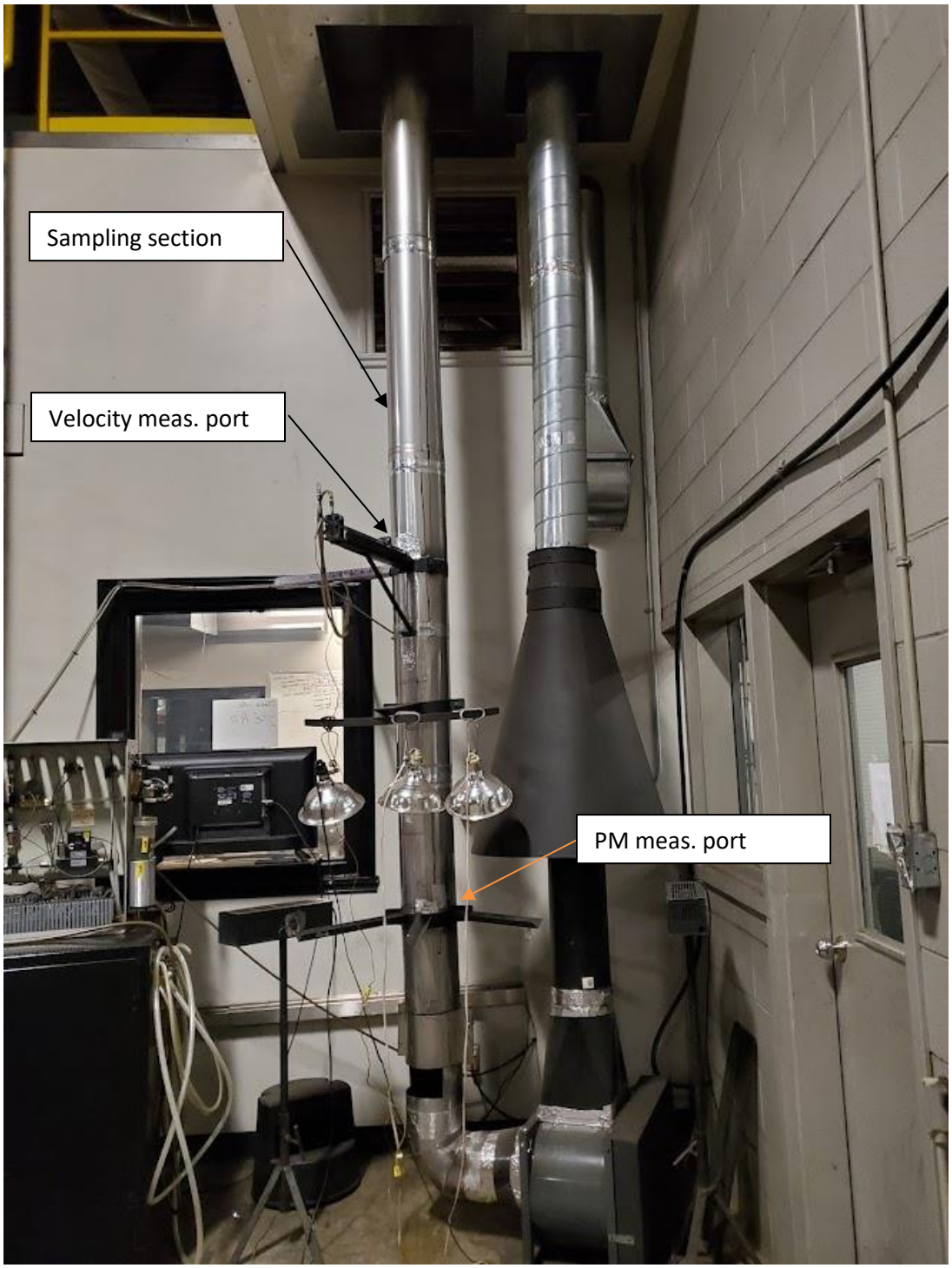
g. Chimney



h. Mixing section



i. Sampling section



2. Identification pictures

a. Front view

b. Rear view

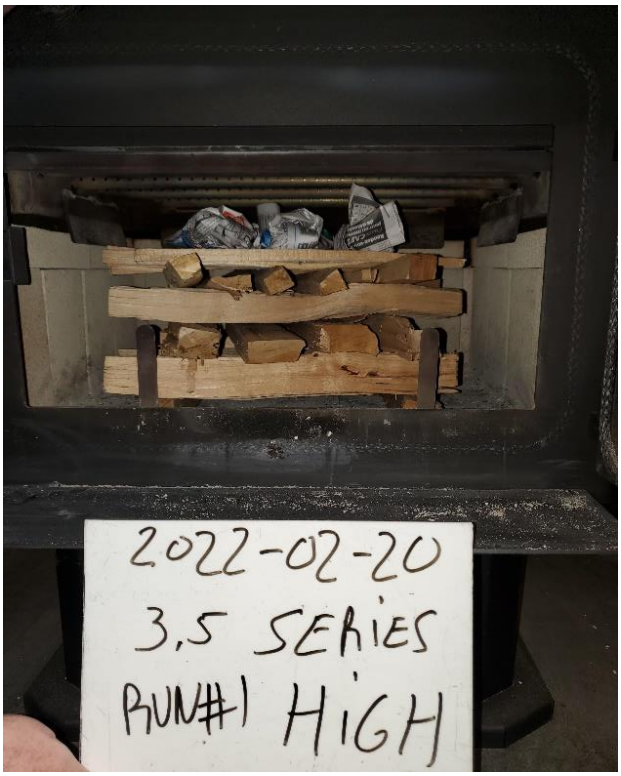
c. Iso view

3. Test run pictures

a. Run #1 High

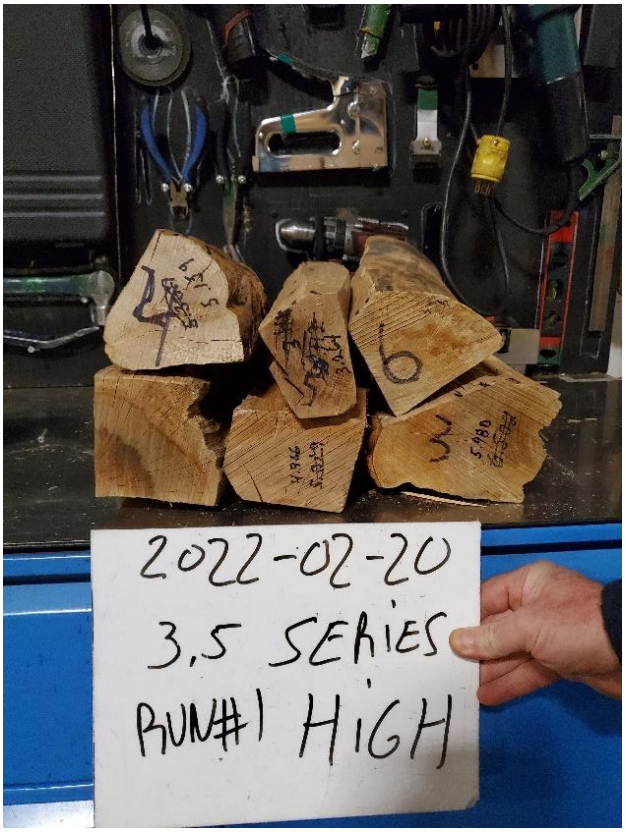
i. Picture of the kindling and Start-Up fuel

ii. Picture of the load inside of the combustion chamber

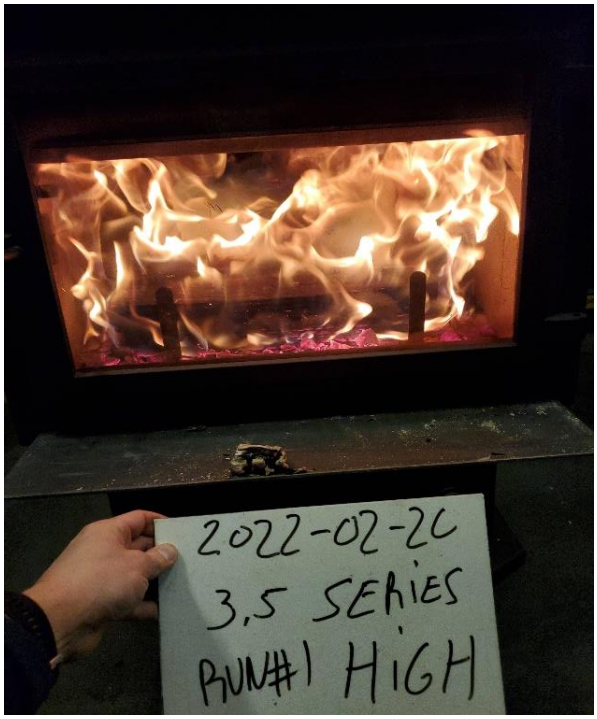


iii. Picture of the coal bed before loading the high fire load

iv. High fire load

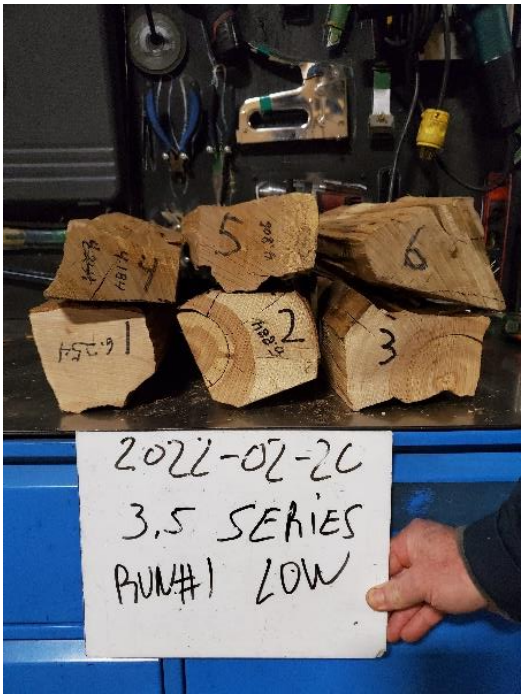


v. High fire load inside the combustion chamber



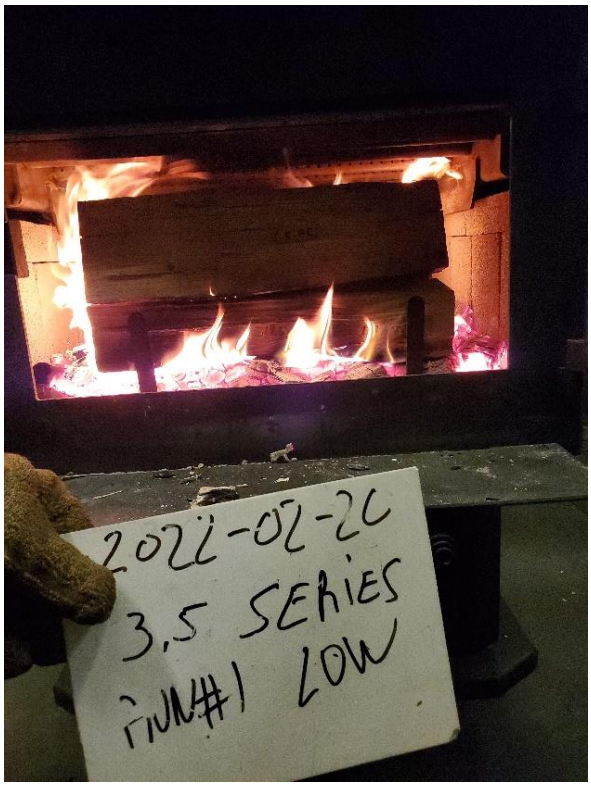
b. Run #1 - Medium (please note that white board says “Low” but the purpose of this test was to perform a “medium” fire

i. Picture of the load

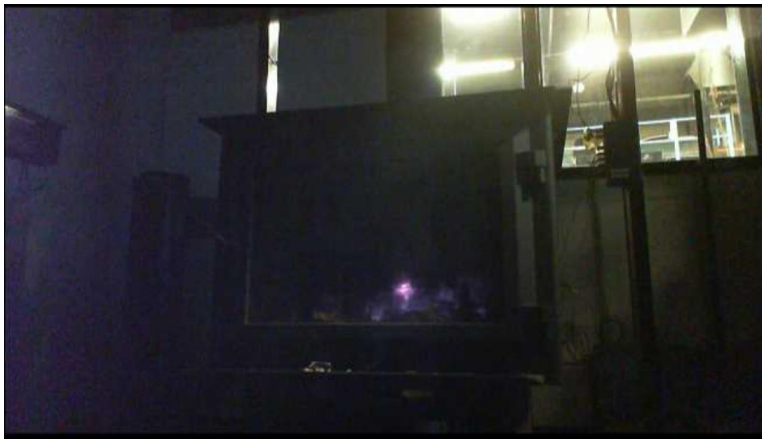


ii. Picture of the coal bed before loading

iii. Picture of the load inside the combustion chamber



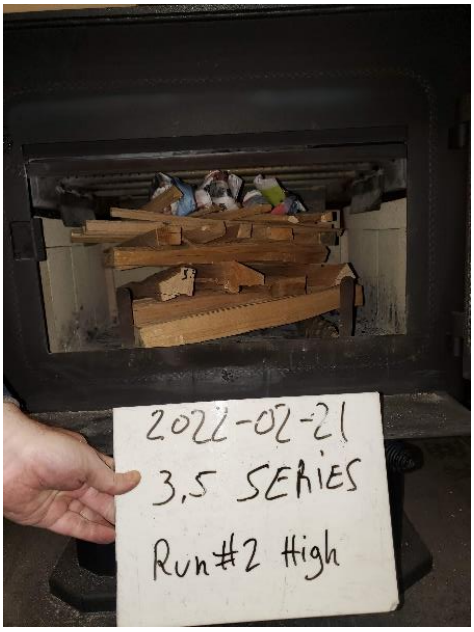
iv. Picture of the coal bed at the end of medium fire test



c. Run #2 High

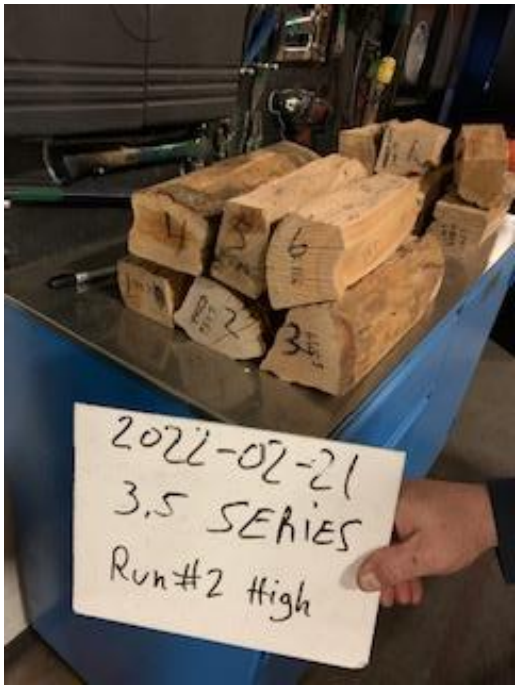
i. Picture of the kindling and Start-Up fuel

ii. Picture of the load inside of the combustion chamber

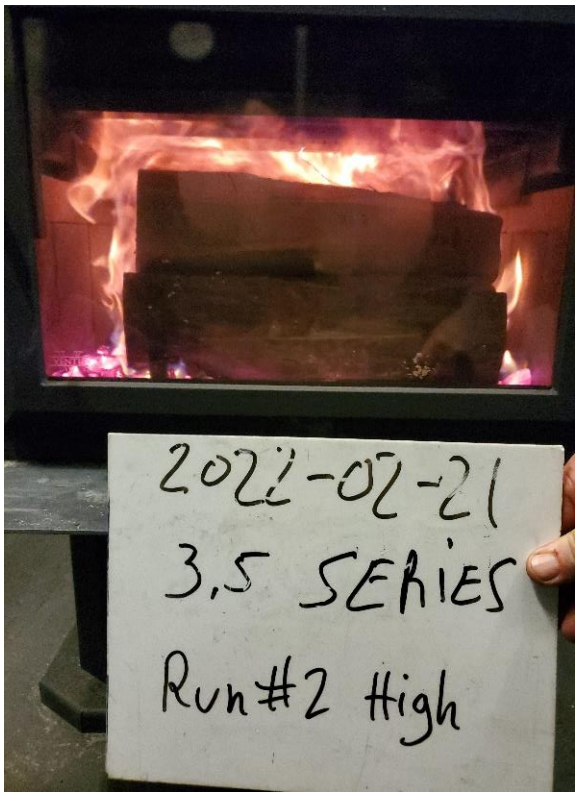


iii. Picture of the coal bed before loading the high fire load

iv. High fire load

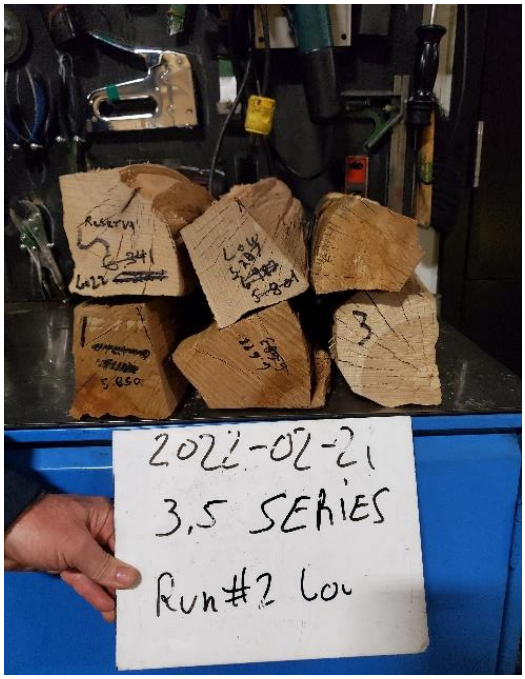


v. High fire load inside the combustion chamber



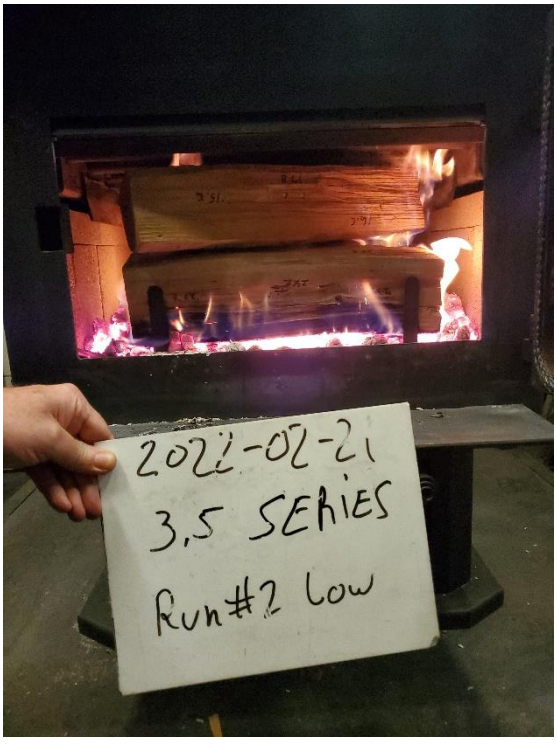
d. Run #2 - Low

i. Picture of the load



ii. Picture of the coal bed before loading

iii. Picture of the load inside the combustion chamber



iv. Picture of the coal bed at the end of Low fire test

4. Picture of the sealed unit

a. Front view

b. Rear View

c. Iso view

United States Environmental Protection Agency

OMB Control No. 2060-0161
Approval expires 03/31/2019

OMB Control No. 2060-0693
Approval expires 03/31/2019

EPA Form 6400-05

Office of Enforcement and Compliance Assurance

30-DAY NOTIFICATION

2015 CLEAN AIR ACT (CAA) STANDARDS OF PERFORMANCE FOR NEW RESIDENTIAL WOOD HEATERS, NEW RESIDENTIAL HYDRONIC HEATERS AND FORCED-AIR FURNACES 40 CFR PART 60 SUBPARTS AAA AND QQQQ

The public reporting and recordkeeping burden for this collection of information is estimated to average 2 hours per response. Send comments on the Agency's need for this information, the accuracy of the provided burden estimates, and any suggested methods for minimizing respondent burden, including through the use of automated collection techniques to the Director, Regulatory Support Division, U.S. Environmental Protection Agency (2822T), 1200 Pennsylvania Ave., NW, Washington, D.C. 20460. Include the OMB control number in any correspondence. Do not send the completed form to this address.

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Instructions: The manufacturer of an affected wood/pellet heater/central heater model line must notify the Administrator of the date that certification testing is scheduled to begin by email to WoodHeaterReports@epa.gov. This notice must be received by the EPA at least 30 days before the start of testing.

GENERAL INFORMATION						
Manufacturer's Name: Stove Builder International						
Heater Type Check one):	☒Adjustable Burn Rate Wood Heater	☐Pellet Stove	☐Single Burn Rate Heater	☐Hydronic Heater	☐Forced Air Furnace	☐Other:
Hydronic Heater Type (Check one):	☐Full Storage	☐Partial Storage	☐Indoor	☐Outdoor	☐Other:	
Forced-Air Furnace Type (Check one):	☐Small (less than 65,000 BTU/hr heat output)		☐Large (greater than 65,000 BTU/hr heat output)			
Fuel Tested (Check one):	☐Crib	☐Pellet	☒Cordwood	☐Wood Chips	☐Other:	
Model Name(s) (as will appear on test report): 3.5 Series						
Model Number(s) (as will appear on test report): Solution 3.5, Escape 2100, HT-3000, Osburn 3500, Gateway 3500, FW3500, Solution 3.5-I, Osburn 3500-I, HEI350, HES350						
Equipped with a catalytic combustor? ☐Yes ☒No						

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Mailing Address: Same as street address		
Street Address: 250 rue de Copenhague		
City: Saint-Augustin-de-Desmaures	**State: Québec**	**ZIP Code: G3A 2H3**
Phone:1-418-878-3040 x5224	**Fax: 1-418-878-3001**	**Web Site:** www.sbi-international.com
Address of Manufacturer: **Same as above.**		
City:	**State**	**ZIP Code:**
EPA APPROVED TEST LABORATORY		
Name and Title of Authorized Representative: Claude Pelland, Project Engineer		
Company: Intertek		
Phone: 1-514-631-3100 x277	**E-mail:** **claude.pelland@intertek.com**	**Fax: 1-514-631-1133**

United States Environmental Protection Agency

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City: Lachine	**State: Québec**	**ZIP Code: H8T 3J1**
EPA APPROVED THIRD-PARTY CERTIFIER		
Name and Title of Authorized Representative: Jean-Philippe Kayl, Director, Product Certification		
Company: Intertek Testing Services NA, Inc.		
Phone: 312-906-7783	**E-mail: jpkayl@intertek.com**	**Fax:**
City: Arlington Heights	**State: IL**	**ZIP Code: 60005**
COMPLIANCE TEST INFORMATION		
Test Method(s): ASTM E3053-17 as per letter the Broadly Applicable Alternative Test Method from EPA of 2/28/2018 (Alt-125)		
Date(s) of Proposed Test: February 21, 2022		

United States
Environmental Protection
Agency

OMB Control No. 2060-0161
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Testing Location (Name and Address): Stove Builder International Laboratory **250 rue de Copenhague, Saint-Augustin-de-Desmaures,** **Québec, Canada, G3A 2H3**	
Contact Name: Guillaume Thibodeau-Fortin	**Title: Engineer**
Phone Number: 1-418-878-3040 x5224	**Email Address:** gthibodeaufortin@sbi-international.com

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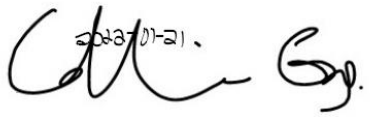
Guillaume Thibodeau-Fortin
_____
Print Name and Title of Authorized Official



_____
Signature

01-21-2022
_____
Date

Telephone Number: 1-418-878-3040 x 5224

Email Address: gthibodeaufortin@sbi-international.com

Remarks:

v1

Fabricant de poêles international inc.
Stove Builder International Inc.

Notre passion devient source d'énergie
We Turn passion Into Energy

March 21, 2022

Air Branch/Wood Heater Program Lead
Monitoring, Assistance, and Media Programs Division
Office of Compliance
U.S. EPA
1200 Pennsylvania Ave., NW
MS:2227A
Washington, DC 20004
Attn: EPA Administrator

Subject: Compliance Statements and Acknowledgements for 3.5 Series

Dear Administrator,
As stated in the application for certificate of compliance, Stove Builder International Inc (SBI) states and acknowledges the 13 items below.

1. SBI provided all engineering drawing (including specifications for each component listed in paragraphs (k)(2), (3) and (4) of 60.533(b) and 60.5475(b) available in Intertek Test Report 104981354MTL-001 at Appendix D. Tolerances are identified on all part draft and cannot reasonably be anticipated to cause wood heater in the model line to exceed the applicable emission limits. The user's manual shows how to replace and inspect emission-critical part such as the secondary tubes.
2. SBI confirm that the firebox or any firebox component (including the materials listed in paragraph (k)(3) of 60.533(b) and 60.5475(b) will be composed of material similar from the material used for the firebox or firebox component in the wood heater on which certification testing was performed. Individual brick size and color may vary but the specification of the material remains the same. The inner firebox brick coverage remains also always the same. If other differences occur over time, a description of any such differences and demonstration that any such differences may not reasonably be anticipated to adversely affect emissions or efficiency will be communicate with Residential Wood Heater Compliance Program Lead.
3. SBI will provide to Residential Wood Heater Compliance Program Lead the Confidential Business Information (CBI) report including all test data and drawings by e-mail to Sanchez.Rafael@epa.gov.
4. SBI provided all documentation that proves that the certification tests were valid. Raw data sheets, laboratory technician notes, calculations and test results were provided to Residential Wood Heater Compliance Program Lead in the appendix of Intertek Test Report 104981354MTL-001. SBI confirms that the burn rate for the low burn rate category is no greater than the rate that an operator can achieve in home use and no greater than is advertised by the manufacturer or retailer.
5. SBI provided in Appendix D of Intertek Test Report 104981354MTL-001 a copy of the warranty that stated: "This warranty is void if the unit is used to burn materials other than cordwood (for which the unit is not certified by the EPA) and void if not operated according to the owner's manual. This warranty applies to normal residential use only. Damages caused by misuse, abuse, improper installation, lack of maintenance, over firing, negligence or accident during transportation, power failures, downdrafts, venting problems or under-estimated heating area are not covered by this warranty. The recommended heated area for a given appliance is defined by the manufacturer as its capacity to maintain a minimum

acceptable temperature in the designated area in case of a power failure."

6. SBI, with the help of the certification laboratory, Intertek, built a Quality Assurance Program. A quality control is performed for each unit produced and 4 times a year, Intertek audits our production line to make sure that the models in production comply with the certification unit.
7. SBI confirms that the certification model was sealed by Intertek as per picture of Appendix H. Permanent straps holds the unit on a wooden palette and prevent the door from opening. Intertek logo is painted over the unit and the strap as a protection. The sealed unit will be store at SBI laboratory as long as the unit is in production, but a least for 5 years after certification test.
8. SBI states that the units produce under this certificate will be:
    a. Similar in all material respects that would affect emissions as defined in § 60.531 to the wood heater submitted for certification testing, and labeled as prescribed in § 60.536 and 60.5478.
    b. Accompanied by an owner's manual that meets the requirements in § 60.536 and 60.5478. A copy of the owner's manual was submitted to the Administrator and will be available to the public on the manufacturer's web site at production launch.
9. SBI has entered into contracts with an approved laboratory and third-party certifier which is Intertek. Intertek Montreal is the approved laboratory and the third-party certifier is the Arlington Heights chapter of Intertek.
10. SBI allows the approved laboratory and approved third-party certifier to submit information to Residential Wood Heater Compliance Program Lead on behalf of SBI, including any claimed to be CBI.
11. SBI will place a copy of the certification test report, summary and all non-CBI on the manufacturer's web site available to the public within 30 days after the Administrator issues a certificate of compliance.
12. SBI acknowledges that the certificate of compliance cannot be transferred to another manufacturer or model line without written approval by the Administrator.
13. SBI acknowledges that it is unlawful to sell, distribute or offer to sell or distribute an affected wood heater without a valid certificate of compliance.

Print name and title : Guillaume Thibodeau-Fortin, P.Eng. Laboratory Engineer Date : 2022-03-21

Signature of responsible representative of the manufacturer certifying the accuracy of the above statements:

2022-03-21

The authorized or responsible party whose signature is above is certifying that the manufacturer has complied with and will continue to comply with all requirements of the 2015 CAA Standards for compliance certification and that the manufacturer remains responsible for compliance regardless of any error by the test laboratory or third-party certifier.

United States
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OMB Control No. 2060-0161
Approval expires 3/31/2019

OMB Control No. 2060-0693
Approval expires 3/31/2019

EPA Form 6400-03

RESIDENTIAL WOOD HEATER CERTIFICATE OF COMPLIANCE APPLICATION

INSTRUCTIONS

Pursuant to the 2015 Clean Air Act Standards of Performance for New Residential Wood Heaters, New Residential Hydronic Heaters and Forced-Air Furnaces, 40 CFR Part 60 Subparts AAA and QQQQ (2015 Wood Heater Rule), any manufacturer of an affected residential wood heater must apply to the EPA for a certificate of compliance for each model line. Without applying for and obtaining a certificate of compliance, a manufacturer may not manufacture, advertise for sale, offer for sale, or sell affected residential wood heaters in the United States.

Under Subpart AAA, affected residential wood-burning room heaters currently include, but are not limited to, adjustable burn rate stoves, catalytic adjustable burn rate stoves; hybrid adjustable burn rate stoves; single burn rate stoves; and pellet stoves.

Under Subpart QQQQ, affected residential wood-burning central heaters currently include, but are not limited to, indoor hydronic heaters ("wood boilers"); outdoor hydronic heaters ("outdoor wood boilers"); and forced-air furnaces ("warm air furnaces").

By completing and submitting this application to EPA, you will satisfy the requirement to apply for a certificate of compliance. To submit a complete application, this application must include the following:

(1) Certification test report prepared by an EPA-approved test laboratory
(2) Certification of conformity by an EPA-approved third party certifier
(3) Quality assurance plan
(4) All required supporting documentation and manufacturer statements pursuant to the 2015 Wood Heater Rule (Sections 60.533 or 60.5475)

This application must be signed by a responsible representative of the manufacturer or an authorized representative. Once completed with all required information/documentation included, this application must be submitted to WoodHeaterReports@epa.gov.

The public reporting and recordkeeping burden for this collection of information is estimated to average 8 hours per response. Send comments on the Agency's need for this information, the accuracy of the provided burden estimates, and any suggested methods for minimizing respondent burden, including through the use of automated collection techniques to the Director, Regulatory Support Division, U.S. Environmental Protection Agency (EPA) (2822T), 1200 Pennsylvania Ave., NW, Washington, D.C. 20460. Include the OMB control number in any correspondence. Do not send the completed application to this address.

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564-7028, Residential Wood Heater Compliance Program Lead, or via email at sanchez.rafael@epa.gov.

MANUFACTURER INFORMATION

Manufacturer's Name: Stove Builder International

Manufacturer's Physical Address:
250 rue de Copenhague
Saint-Augustin-de-Desmaures,
Canada, G3A 2H3

Manufacturer's Mailing Address (if different from physical address):

Name and Title of Manufacturer's Responsible/Authorized Representative Submitting this Application:
Guillaume Thibodeau-Fortin

Manufacturer's Contact E-mail: gthibodeaufortin@sbi-international.com

Manufacturer's Phone Number: 1-418-878-3040 x5224

Manufacturer's Website Address:
www.sbi-international.com

Manufacturer's Website Address where the test report and owner's manual will be posted, if known:
www.enerzone-intl.com www.osburn-mfg.com
www.drolet.ca www.occanada.com
www.empirestove.com
https://heatredefined.com/pages/support#reamaze#1#/kb/stove-support/owners-manuals
www.century-heating.com

AFFECTED WOOD HEATER MODEL INFORMATION

Model Name(s) (as appearing on the certification test report). Please note: the model name and design number must clearly distinguish one model from another. The name and design number cannot include the EPA symbol or logo or name or derivatives such as "EPA": 3.5 Series

Model Number(s) (as appearing on the certification test report): SOLUTION 3.5, OSBURN 3500, GATEWAY 3500, ESCAPE 2100, HT-3000, SOLUTION 3.5-I, FW3500, OSBURN 3500-I, HES350, HEI350, BLUE RIDGE 500, ESCAPE 2100-I, CW3500, BLUE RIDGE 500-I.

Heater Type Check one):	☒Adjustable Burn Rate Wood Stover		☐Pellet Stove	☐Single Burn Rate Wood Stove	☐Hydronic Heater	☐Forced-Air Furnace (FAF)
Hydronic Heater Type (Check one):	☐Full Storage		☐Partial Storage	☐Indoor	☐Outdoor	
Forced-Air Furnace Type (Check one):	☐Small (less than 65,000 BTU/hr heat output)			☐Large (greater than 65,000 BTU/hr heat output)		
Fuel Tested (Check one):	☐Crib		☐Pellet	☒Cordwood	☐Wood Chips	☐Other:
Certification Step:	☐2015	☐2016 (FAFs only)	☐2017 (FAFs only)	☒2020 (ALL HEATERS)		

Was this heater tested using an EPA-approved Alternative Test Method (ATM)? ☒Yes ☐No **If yes, provide date of EPA approval and attach copy of EPA approved ATM letter):** **2/28/2018** **If not, what Test Method(s) did the test laboratory use for the certification test? (List all applicable test methods):**	**Heater equipped with a catalytic combustor? ☐Yes ☒No**

Date of submission of 30-Day Notice to the EPA: 1/21/2022

What was the proposed date(s) of testing? 02/21/2022

What was the actual date(s) of testing? 02/20/2022

Was the compliance test postponed or suspended? ☐Y ☒N If yes, date of EPA notification of postponement or suspension:

Explain reason for postponing or suspending the certification test:

EPA-APPROVED TEST LABORATORY

Name of EPA-Approved Test Laboratory: Intertek		
Name(s) of Person(s) Authorized and/or Responsible for Conducting Certification Test: Claude Pelland, P. Eng.		
Position/Title: Project Engineer		
Address: 1829, 32nd avenue		
City: Lachine	**State: Québec**	**ZIP Code: H8T 3J1**
Phone: 1-514-631-3100 x277	**Email: claude.pelland@intertek.com**	

EPA-APPROVED THIRD PARTY CERTIFIER

Name of EPA-Approved Third-Party Certifier: Intertek		
Name(s) of Person(s) Authorized and/or Responsible for Reviewing Test Report and/or Issuing Certification of Conformity: Jean-Philippe Kayl		
Position/Title: Director, Product Certification		
Address: 545 E Algonquin Rd		
City: Arlington Heights	**State: IL**	**ZIP Code: 60005**
Phone: 312-906-7783	**Email: jpkayl@intertek.com**	

REQUIRED SUPPORTING DOCUMENTATION/MANUFACTURER STATEMENTS

NOTE: TO COMPLETE THIS APPLICATION, ALL REQUIRED DOCUMENTATION AND MANUFACTURER STATEMENTS MUST ACCOMPANY THIS APPLICATION.

1. Engineering Drawings

Engineering drawings and specifications of components that may affect emissions (including specifications for each component listed in paragraphs (k)(2), (3) and (4) of 60.533(b) and 60.5475(b). Manufacturers may use assembly or design drawings that have been prepared for other purposes, but must designate on the drawings the dimensions of each component listed in paragraph (k) of this section. Manufacturers must identify tolerances of components listed in paragraph (k)(2) of 60.533(b) and 60.5475(b) that are different from those specified in that paragraph, and show that such tolerances cannot reasonably be anticipated to cause wood heaters in the model line to exceed the applicable emission limits. The drawings must identify how the emission-critical parts, such as air tubes and catalyst, can be readily inspected and replaced.

2. Firebox Statement Requirement

A statement whether the firebox or any firebox component (including the materials listed in paragraph (k)(3) of 60.533(b) and 60.5475(b) will be composed of material different from the material used for the firebox or firebox component in the wood heater on which certification testing was performed, a description of any such differences and demonstration that any such differences may not reasonably be anticipated to adversely affect emissions or efficiency.

3. Confidential Business Information

Clear identification of any claimed confidential business information (CBI). Submit such information under separate cover to the EPA CBI Office; Attn: Residential Wood Heater Compliance Program Lead, 1200 Pennsylvania Ave., NW, Room 7149-D, MS:2227A, Washington, DC 20460. **Note that all emissions data, including all information necessary to determine emission rates in the format of the standard, cannot be claimed as CBI.**

4. All Documentation Pertaining to a Valid Certification Test

All documentation pertaining to a valid certification test **i**ncluding the complete test report and, for all test runs: Raw data sheets, laboratory technician notes, calculations and test results. Documentation must include the items specified in the applicable test methods. Documentation must include discussion of each test run and its appropriateness and validity, and must include detailed discussion of all anomalies, whether all burn rate categories were achieved, any data not used in the calculations and, for any test runs not completed, the data collected during the test run and the reason(s) that the test run was not completed and why. The burn rate for the low burn rate category must be no greater than the rate that an operator can achieve in home use and no greater than is advertised by the manufacturer or retailer. The test report must include a summary table that clearly presents the individual and overall emission rates, efficiencies and heat outputs. Submit the test report and all associated required information, according to the procedures for electronic reporting specified in § 60.537(f) and 60.5475(f).

5. Warranties

A copy of the warranties for the model line, which must include a statement that the warranties are void if the unit is used to burn materials for which the unit is not certified by the EPA and void if not operated according to the owner's manual.

6. Quality Assurance Program Statement

A statement that the manufacturer will conduct a quality assurance program for the model line that satisfies the requirements of § 60.533(m).

7. Laboratory Sealing of Unit

A statement describing how the tested unit was sealed by the laboratory after the completion of certification testing and asserting that such unit will be stored by the manufacturer in the sealed state until 5 years after the certification test.

8. Statements that the Wood Heaters Manufactured under this Certificate will be:

(i) Similar in all material respects that would affect emissions as defined in § 60.531 to the wood heater submitted for certification testing, and

(ii) Labeled as prescribed in § 60.536 and 60.5478, and

(iii) Accompanied by an owner's manual that meets the requirements in § 60.536 and 60.5478. In addition, a copy of the owner's manual must be submitted to the EPA and be available to the public on the manufacturer's web site.

9. Third Party Certification Statement

A statement that the manufacturer has entered into contracts with an approved laboratory and an approved third-party certifier that satisfy the requirements of § 60.533(f).

10. Approved Laboratory/Third Party Statement

A statement that the approved laboratory and approved third-party certifier are allowed to submit information on behalf of the manufacturer, including any claimed to be CBI.

11. Manufacturer's Website Certification Test Reports Availability Statement

A statement that the manufacturer will place a copy of the certification test report and summary on the manufacturer's web site available to the public within 30 days after the EPA issues a certificate of compliance.

12. Transferability Acknowledgement Statement

A statement of acknowledgment that the certificate of compliance cannot be transferred to another manufacturer or model line without written approval by the EPA.

13. Statement about Selling Wood Heaters without an EPA Certificate

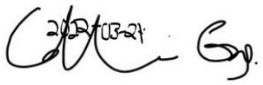
A statement acknowledging that it is unlawful to sell, distribute or offer to sell or distribute an affected wood heater without a valid certificate of compliance.

PLEASE ACKNOWLEDGE THAT ALL REQUIRED SUPPORTING DOCUMENTATION AND MANUFACTURER STATEMENTS ACCOMPANY THIS APPLICATION.

Initials GTF

SIGNATURE OF RESPONSIBLE OFFICER OR AUTHORIZED REPRESENTATIVE OF THE MANUFACTURER CERTIFYING THE ACCURACY AND COMPLETENESS OF THIS APPLICATION:

Signature:



Print Name: Guillaume Thibodeau-Fortin, P. Eng.

Title: Laboratory Engineer

Date: 2022-03-21

The responsible officer or authorized representative of the manufacturer whose signature is above is certifying that the manufacturer has complied with all requirements of the 2015 Wood Heater Rule for compliance certification and will continue to do so. The manufacturer remains responsible for compliance regardless of any error by the EPA-approved test laboratory or third-party certifier.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
RESEARCH TRIANGLE PARK, NC 27711

FEB 2 8 2018

OFFICE OF
AIR QUALITY PLANNING
AND STANDARDS

Mr. Justin White
Hearthstone QHPP, Inc.
#17 Stafford Ave.
Morrisville, VT 05661

Dear Mr. White,

I am writing in response to your letter dated January 12, 2018, regarding wood heaters manufactured by Hearthstone QHPP, Inc. (Hearthstone). This response, dated February 28, 2018, supercedes our previous response (dated February 26, 2018) to correct an inaccuracy regarding required changes to ASTM E3053-17.

You are requesting to use an alternative test method, using cord wood, as referenced in section 60.532(c) of 40 CFR part 60, Subpart AAA, Standards of Performance for New Residential Wood Heaters (Subpart AAA) to meet the 2020 cord wood alternative compliance option. The 2020 cord wood alternative compliance option states that each affected wood heater manufactured or sold at retail for use in the United States on or after May 15, 2020, must not discharge into the atmosphere any gases that contain particulate matter in excess of 2.5 g/hr. Compliance must be determined by a cord wood test method approved by the Administrator along with the procedures in 40 CFR 60.534. You have requested approval to use the procedures and specifications found in ASTM Method E3053-17, a cord wood test method titled, "Standard Test Method for Determining Particulate Matter Emissions from Wood Heaters using Cordwood Test Fuel," in conjunction with ASTM E2515-11 and Canadian Standards Administration (CSA) Method CSA-B415.1-10, which are specified in 40 CFR 60.534.

We understand that Hearthstone is also requesting that the alternative method proposed above be approved to apply broadly to all wood heaters manufactured by Hearthstone meeting the requirements of Subpart AAA, from the approval date of this request until such time that Subpart AAA is revised or replaced to require a different cord wood certification method, providing all requirements of section 60.533 of Subpart AAA are met.

With the caveats set forth below, we approve your alternative test method request for certifying wood heaters using ASTM E3053-17 in conjunction with section 60.534 of Subpart AAA to meet the 2020 cord wood compliance option until such time that Subpart AAA is revised or replaced to require a different cord wood certification method. We also approve application of this alternative method to all wood heaters manufactured by Hearthstone meeting the requirements of Subpart AAA.

As required in Subpart AAA, section 60.354(d), you or your approved test laboratory must also measure the first hour of particulate matter emissions for each test run using a separate filter in one of the two parallel sampling trains. These results must be reported separately and also included in the total particulate matter emissions per run. Also, as required by Subpart AAA, section 60.534(e), you must have your approved laboratory measure the efficiency, heat output, and carbon monoxide emissions of the tested wood heater using CSA-B415.1-10. For measurement of particulate matter emission concentrations, ASTM 2515-11 must be used.

The following change to ASTM E3053-17 must be followed:

1. Coal bed conditions prior to loading test fuel. The coal bed shall be a level plane without valleys or ridges for all test runs in the high, low, and medium burn rate categories.

The following changes to ASTM E2515-11 must be followed:

1. The filter temperature must be maintained between 80 and 90 degrees F during testing.

2. Filters must be weighed in pairs to reduce weighing error propagation; see ASTM 2515-11, Section 10.2.1 Analytical Procedure.

3. Sample filters must be Pall TX-40 or equivalent Teflon-coated glass fiber, and of 47 mm, 90 mm, 100 mm, or 110 mm in diameter.

4. Only one point is allowed outside the +/- 10 percent proportionality range per test run.

A copy of this letter must be included in each certification test report where this alternative test method is utilized.

It is reasonable that this alternative test method approval be broadly applicable to all wood heaters subject to the requirements of 40 CFR part 60, Subpart AAA. For this reason, we will post this letter as ALT-125 on our website at *http://www3.epa.gov/ttn/emc/approalt.html* for use by other interested parties. As noted earlier in this letter, this alternative method approval is valid until such time that Subpart AAA is revised or replaced to require a different cord wood certification method, and at such time, this alternative will be reconsidered and possibly withdrawn.

If you have additional questions regarding this approval, please contact Michael Toney of my staff at 919-541-5247 or toney.mike@epa.gov.

Sincerely,

Steffan M. Johnson, Group Leader
Measurement Technology Group

cc: Amanda Aldridge, EPA/OAQPS/OID
Adam Baumgart-Getz, EPA/OAQPS/OID
Rafael Sanchez, EPA/OECA
Michael Toney, EPA/OAQPS/AQAD