

# STOVE BUILDER INTERNATIONAL INC. TEST REPORT

## SCOPE OF WORK

EPA EMISSIONS TESTING/3.3 SERIES (OSBURN 3300, AUSTRAL III, MYRIAD III, LEGEND III (LÉGENDE III), ESCAPE 1900, BLACK STAG II, SOLUTION 3.3, GATEWAY 3300)/ WOOD FUEL ROOM HEATER

## REPORT NUMBER

103994967MTL-001

## TEST DATE(S)

06/03/19 - 06/06/19

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## TEST REPORT FOR STOVE BUILDER INTERNATIONAL INC.

Report No.: 103994967MTL-001

Date: 09/17/19

### REPORT ISSUED TO

#### STOVE BUILDER INTERNATIONAL, INC.

250 de Copenhague

ST-Augustin-de-Desmaures, Qc, G3A 2H3

### SECTION 1

#### SCOPE

Intertek Testing Services NA (Intertek) has conducted testing for Stove Builder International Inc., on model Osburn 3300 Wood Burning Room Heater to evaluate all applicable performance requirements included in "Determination of particulate matter emissions from wood heaters." Osburn 3300 is a representative model of the 3.3 Series. This series includes the following models: Austral III, Myriad III, Legend III (Légende III for french market), Escape 1900, Black Stag II, Solution 3.3 and Gateway 3300. See PEV # 10399496MTL-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 June 3rd to June 6th 2019. 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.

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: 0.95 g/hr

Carbon Monoxide Emissions: 1.02 g/min

Heating Efficiency: 71% (Higher Heating Value Basis)

For INTERTEK B&C:

<b>COMPLETED BY:</b>	Claude Pelland, P.E. Manager B&C, Intertek, Quebec	<b>REVIEWED BY:</b>	Brian Ziegler Technical Team Leader - Hearth
<b>TITLE:</b>		<b>TITLE:</b>	
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### SECTION 3

#### TEST METHOD(S)

The 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 28<sup>th</sup>, 2018.

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

### 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 beginning 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

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of pre-burning were conducted from May 21<sup>st</sup> to May 28<sup>th</sup>, 2019. The fuel used for the break-in process was beech cordwood.

Following the pre-burn break-in process the unit was allowed to cool and ash and residue were removed from the firebox. The unit's chimney system and laboratory dilution tunnels were cleaned using standard wire brush chimney cleaning equipment. On May 29<sup>th</sup>, 2019, the unit was set-up for testing.

**SECTION 5  
EQUIPMENT**

Equipment	INV Number	Calibration Due	MU
Handheld Thermocouple Thermometer	SBI-132	February 22, 2020	±0.5°F
Floor scale	SBI-014	March 31, 2020	± 0.020 kg
DGM system 1	SBI-046	November 22, 2019	±2% F.S.
DGM System 2	SBI-047	November 21, 2019	±2% F.S.
Reference DGM	SBI-103	October 26, 2019	±2% F.S.
5 kg weight	SBI-190	October 02, 2023	±0.2 g
Temperature acquisition	SBI-197	October 26, 2019	±0.5°F
Pitot tube type S	SBI-104	June 26, 2019	±0.58
Analytical scale	SBI-206	March 31, 2020	±0.13 mg
Table scale	SBI-222	March 31, 2020	±0.88 g
100 mg weight	SBI-237	October 09, 2023	±0.0025 mg
10 g weight	SBI-238	October 09, 2023	±0.012 mg
Anemometer	SBI-097	June 26, 2019	±15 ft/min
Magnesense (tunnel)	SBI-253	June 27, 2019	±0.00015" H2O
Magnesense (draft)	SBI-254	October 10, 2019	±0.00015" H2O
DGM system 3	SBI-276	November 25, 2019	±2% F.S.
Pressure transmitter	SBI-293	June 26, 2019	±9.4e-003 psi
Pressure transmitter	SBI-298	October 15, 2019	±9.5e-003 psi
Vacuum transmitter	SBI-302	June 27, 2019	±5.8e-003 in.HG
Vacuum transmitter	SBI-305	October 12, 2019	±6.1e-003 in.HG



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Relative humidity temperature meter	SBI-212	June 19, 2019	±3%
200 g weight	SBI-312	October 09, 2023	±0.06 mg

### SECTION 6

#### LIST OF OFFICIAL OBSERVERS

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

### SECTION 7

#### TEST PROCEDURE

From June 3<sup>rd</sup> to June 6<sup>th</sup>, 2019, the unit was tested for EPA emissions. For Wood stoves, 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 1 – 2015 – 4.5 grams per hour.

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

#### MANUFACTURER LOADING PROCEDURE

Kindling (13.5 lbs) - Split the start-up fuel log into 8 pieces. Crisscross the 8 pieces on the brick, leaving some space between each wood pieces (3 in the bottom, 3 in the middle, 2 on the top). Crisscross the kindling on the top of the start-up fuel. The kindling is made of between 10-12 finely split piece of wood that are 10% of moisture content. Place crumbled newspaper on top of the kindling (5 full sheets). Light up the paper and let the door ajar at 90° until the flue temperature reaches 500°F, then close the door. The fan is always OFF.

Low&Medium Pre-load (high fire) (27.9 lbs) - When there is coal bed of 3.5 lbs left, break ashes and level coal bed, then add pre-load. Place the two smallest pieces in the back, East-West orientation, one over the other. Then put the biggest piece in middle and front (6 pieces in total). Leave tree inches or air space between the rear bricks and one inch between all the pieces column. Let the door ajar until flue temperature is around 575°F. Close the door and let burn until the

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weight is down to target. When coal bed weight is around 10.5 lbs, stir logs. At 6.7 lbs, slightly level the coal bed. Let the door ajar by one inch for one minute. There should be approximately 6.5 lbs of coal bed.

Low fire load (33.5 lbs) - Place the two smallest pieces in the back, East-West orientation, one over the other. Then put the biggest piece in middle and front (6 pieces in total). Leave tree inches or air space between the rear bricks and one inch between all the pieces column. Let the door ajar until flue temperature is around 575°F. Close the door and let burn until the weight is down to initial coal bed weight. When the oxygen falls below 7%, close the primary air control to 50%. Close the primary air control completely at 16 min from beginning. Start the fan at minimum speed at 30 minutes.

Medium fire load (33.5 lbs) - Same as for low fire load, but close the primary air control on a rod of ¼" of outside diameter at 16 min. Remove the rod. Start the fan at minimum speed at 30 minutes.

High fire load (27.9 lbs) – Same as Low&Medium Pre-load. Stop the test when 90% of the high fire load has been consumed.

**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 at 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 mainly beech. The fuel was split cordwood of nominal length of 16 inches. The fuel was dried in air to an 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 tunnel has two elbows and two mixing baffles in the system ahead of the sampling section. (See Figure 3.) The sampling section is a continuous 13-foot section of 8-inch diameter pipe straight over its entire length. Tunnel velocity pressure is determined by a type

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"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 1.)

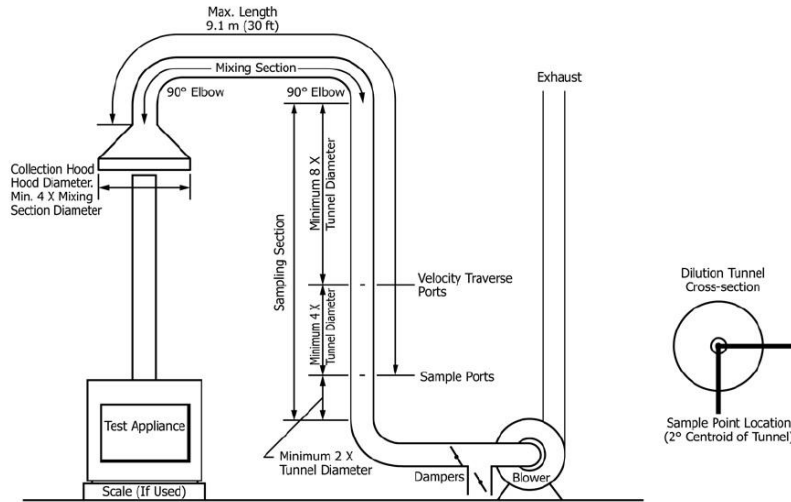
Stack gas samples are collected from the steel chimney section 8 feet  $\pm$  6 inches above the scale platform.

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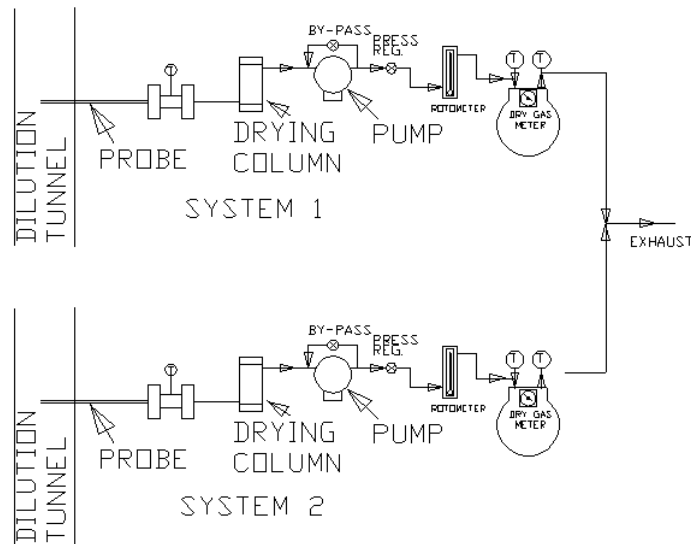
**FIGURE 1 – DILUTION TUNNEL**



**FIGURE 2 – STACK GAS SAMPLE TRAIN**

### SAMPLING METHODS

#### PARTICULATE SAMPLING



**Figure 2**

Particulates were sampled in strict accordance with ASTM E2515-2011. This method uses two identical sampling systems with Gelman A/E 61631 binder free, 47-mm diameter filters. The dryers used in the sample systems are filled with “Drierite” before each test run. In order to measure first-hour emissions rates, a third filter set is prepared at one hour into the test run, the

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filter sets are changed in one of the two sample trains. The two filter sets used for this train are analyzed individually to determine the first hour and total emissions rate.

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 ft<sup>3</sup>, 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 10 inches of mercury. Vacuum is monitored during each test and the highest vacuum reached is then used for the post test vacuum value. If leakage limits are not met, the test run is rejected. During, these tests the vacuum was typically less than 2 inches of mercury. Thus, leakage rates reported are expected to be much higher than actual leakage during the tests.

**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 PROPORTIONALITY**

Proportionality was calculated in accordance with ASTM E2515-11. The data and results are included in Appendix B.

**DEVIATIONS FROM STANDARD METHOD:**

The following deviations were requested by EPA:

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

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### SECTION 8

#### TEST CALCULATIONS

##### Weight of test fuel load, dry basis

ASTM E3053

$$M_{FLdb} = \sum((M_{FLwb})(100)/(100+MC_{FLn}))$$

where:

- $M_{FLdb}$  = weight of test fuel load, dry basis, lb (kg);
- $M_{FLwb}$  = 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

$$V_{iWA} = 0.4(V_{iLAve}) + 0.4(V_{iMAve}) + 0.2(V_{iHAve})$$

where:

- $V_{iWA}$  = Weighted average for variable  $i$ ;
- $V_i$  = Test result variable (Particulate Matter: g/h, g/kg, lb/MMBtu; % Overall Efficiency: HHV, LHV; Carbon Monoxide: g/h, etc.)
- $V_{iLAve}$  = Arithmetic average for variable  $V_i$  for all test runs (except per 8.6.13 or 8.9) that are included in the low fire burn rate category
- $V_{iMAve}$  = Arithmetic average for variable  $V_i$  for all test runs (except per 8.6.13 or 8.9) that are included in the medium fire burn rate category;
- $V_{iHAve}$  = Arithmetic average for variable  $V_i$  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 m<sup>2</sup> (ft<sup>2</sup>).
- $B_{ws}$  = 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.
- $F_p = V_{strav}/V_{scent}$

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

or

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

$L_a$  = Maximum acceptable leakage rate for either a pretest or post-test leak-check, equal to 0.0003 m<sup>3</sup>/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, m<sup>3</sup>/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.

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

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).

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

$T_{si}$  = 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

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



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- $V_m$  = 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:

$V_{mc}$  =  $V_m - (L_p - L_a)u$

$V_{mr}$  = 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.

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

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.

$\Delta H$  = 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).

$\Delta P_{avg}$  = Average velocity pressure in the dilution tunnel, mm water (in. water).

$\Delta P_i$  = 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).

$\theta$  = Total sampling time, min.

10 = ten min, length of first sampling period.

13.6 = Specific gravity of mercury.

100 = Conversion to percent.

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### TOTAL PARTICULATE WEIGHT – ASTM E2515

$$M_n = m_p + m_f + m_g$$

### PARTICULATE CONCENTRATION – ASTM E2515

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

where:

$$K_2 = 0.001 \text{ g/mg}$$

### 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

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

### GENERAL FORMULA – ASTM E2515

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

Where:

$\delta Y / \delta x_i$  = Partial derivative of the combining formula with respect to individual measurement  $x_i$ ,

$u_i$  = 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

$\theta$  = sampling time, minutes.

### MU OF $c_s$

$$C_s = F_c / (Q_{sample} \times \theta) = 0.025 / (0.25 \times 180) = 0.0005555$$

$$\delta C_s / \delta F_c = 1 / Q_{sample} \cdot \theta = 1 / 0.25 \cdot 180 = 0.0222$$

$$\delta C_s / \delta Q_{sample} = -F_c / Q_{sample}^2 \cdot \theta = -0.025 / 0.25^2 \cdot 180 = -0.00222$$

$$\delta C_s / \delta \theta = -F_c / Q_{sample} \cdot \theta^2 = -0.025 / 0.25 \cdot 180^2 = -0.000003$$

$$MU_{C_s} = \sqrt{(0.00027 \cdot 0.0222)^2 + (0.0025 \cdot -0.00222)^2}$$

$$\sqrt{+ (0.1 \cdot -0.000003)^2} = 0.0000091g$$

Thus,  $c_s$  would be 0.555 mg/dscf  $\pm$  0.0081 mg/dscf at 95% confidence level.

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### MU OF $c_r$

$$c_r = BG_c / (QB_G \times \theta) = 0.002 / (0.15 \times 180) = 0.000074$$

$$\delta c_r / \delta BG_c = 1 / QB_G \cdot \theta = 1 / 0.15 \cdot 180 = 0.03704$$

$$\delta c_r / \delta QB_G = -BG_c / Q_{BG}^2 \cdot \theta = -0.002 / 0.15^2 \cdot 180 = -0.0004938$$

$$\delta c_r / \delta \theta = -BG_c / QB_G \cdot \theta^2 = -0.002 / 0.15 \cdot 180^2 = -0.0000004$$

$$MU_{c_r} = \sqrt{(0.00027 \cdot 0.03704)^2 + (0.0015 \cdot -0.0004938)^2 + (0.1 \cdot -0.0000004)^2} = 0.00001g$$

Thus,  $c_r$  would be 0.074 mg/dscf  $\pm$  0.01 mg/dscf at 95% confidence level.

### $E_T$ AND $MU_{ET}$

$$E_T = (c_s - c_r) Q_{std} \theta = (0.000555 - 0.000074) \times 150 \times 180 = 13.00g$$

$$\delta E_T / \delta c_s = Q_{std} \cdot \theta = 150 \cdot 180 = 27,000$$

$$\delta E_T / \delta c_r = Q_{std} \cdot \theta = 150 \cdot 180 = 27,000$$

$$\delta E_T / \delta Q_{std} = c_s \cdot \theta - c_r \cdot \theta = 0.000555 \cdot 180 - 0.000074 \cdot 180 = 0.08667$$

$$\delta E_T / \delta \theta = c_s \cdot Q_{std} - c_r \cdot Q_{std} = 0.000555 \cdot 180 - 0.000074 \cdot 180 = 0.07222$$

$$MU_{ET} = \sqrt{(27,000 \cdot 0.0000081)^2 + (27,000 \cdot 0.00001)^2 + (0.08667 \cdot 3)^2 + (0.07222 \cdot 0.1)^2} = 0.436$$

Thus the result in this example would be:

$E_T = 13.00g \pm 0.44 g$  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:

$\Delta h$  = change in enthalpy, kJ/kg

$\Delta t$  = 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:

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

Where:

ED = equivalent duct diameter

H = duct height, m

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W = duct width, m

The air flow velocity shall be calculated as follows:

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

where

V = velocity, m/s

F<sub>p</sub> = Pitot tube calibration factor determined from vane anemometer measurements

C<sub>p</sub> = 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:

$$\text{m/s}[\text{g/g mole (mm Hg)/(K)(mm H}_2\text{O)}]^{0.5}$$

ΔP = velocity pressure, mm H<sub>2</sub>O

T = temperature, K

28.56 = molecular weight of air

P<sub>Baro</sub> = barometric pressure, mm Hg

P<sub>s</sub> = duct static pressure, mm Hg

The mass flow rate shall be calculated as follows:

$$m = 3600VA\rho$$

where:

m = mass flow rate, kg/h

V = air flow velocity, m/s

3600 = number of seconds per hour

A = duct cross-sectional area, m<sup>2</sup>

ρ = density of air at standard temperature and pressure (use 1.204 kg/m<sup>3</sup>)

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

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:

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

Where:

 $E_t$  = 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:

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

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 from the 3.3 Series (Osburn 3300) Wood Fuel Room Heater is constructed of sheet steel. The outer dimensions are 33 5/8-inches deep, 34-inches high, and 24 1/4-inches wide. The unit has a door located on the front with a viewing glass.

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**SECTION 10**

**TEST RESULTS**

**DESCRIPTION OF TEST RUNS:**

RUN #1 (June 3rd 2019) Air control set fully opened, burn time was 200 minutes with a category High burn rate of 4.3 kg/hr. The door was open for 4 minutes after kindling, then closed. Loading occurred at 1 hour 5 minutes. Door was open for 3 minutes. The air control was fully opened. Start the fan at full speed.

RUN #2 (June 4<sup>th</sup> 2019) Air control set at the lowest burn rate, burn time was 630 minutes with a category "Low burn rate" of 1.2 kg/hr. Let the door ajar for 2 minutes, and then closed. The air control was opened for 15 minutes after loading time, and then set at the lowest burn rate. The fan was turned on at low speed at 30 minutes.

RUN #3 (June 5<sup>th</sup> 2019) - Invalid test run. Air control set at the targeted burn rate for medium burn rate. Let the door ajar for 3 minutes, and then closed. The air control was opened for 12 minutes and then set at the targeted burn rate (1/4" open). The fan was turned on at medium speed at 30 minutes. Flame disappeared after 2h19 of run time. Sampling system pump bypass were adjusted until maximum. Filters plugged at 3h25 run time. Proportionality was violated as per "Only one point is allowed outside the +/- 10% proportionality range per test run.". Sampling system 1 was at 90.01% at 210 minutes, 80.01% at 220 minute and 74.88% at 230 minutes. Pump stopped at 230 minutes.

RUN #4 (June 6<sup>th</sup> 2019) Air control set at the targeted burn rate, burn time was 510 minutes with a category "Medium burn rate" of 1.5 kg/hr. Let the door ajar for 4 minutes, and then closed. The air control was opened for 9 minutes and then set at the targeted burn rate (1/4" open). The fan was turned on at medium speed at 30 minutes.

**TABLE 1 – EMISSIONS**

RUN#	TEST DATE	BURN RATES (kg/hr)(Dry)	PARTICULATE EMISSION RATE (g/hr)	1 <sup>st</sup> HOUR EMISSIONS (g)	CO EMISSIONS (g/min)	HEATING EFFICIENCY (%HHV)
1	June 3rd 2019	4.3	2.86	3.54	1.3	70%
2	June 4th 2019	1.2	0.39	1.83	1.1	70%
3	June 5th 2019	3.3	11.44	2.65	-	-
4	June 6th 2019	1.5	0.55	2.20	0.8	73%

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**TABLE 2 – TEST FACILITY CONDITIONS**

RUN #	ROOM TEMP BEFORE (°F)	ROOM TEMP AFTER (°F)	BARO PRES BEFORE (in/Hg)	BARO PRES AFTER (in/Hg)	R. H. BEFORE (%)	R. H. AFTER (%)	AIR VEL BEFORE (ft/min)	AIR VEL AFTER (ft/min)
1	72	88	29.6	29.7	42	22	0	0
2	84	81	29.9	29.9	19	24	0	0
3	89	88	29.8	29.8	22	20	0	0
4	84	89	29.8	29.8	28	21	0	0

**TABLE 3 – DILUTION TUNNEL FLOW RATE MEASUREMENTS AND SAMPLING DATA**

RUN #	BURN TIME (min)	VELOCITY (ft/sec)	VOLUMETRIC FLOW RATE (dscf/min)	AVG TEMP (°R)	SAMPLE VOLUME (dscf)		PARTICULATE CATCH (mg)	
					1	2	1	2
1	200	17.02	314.92	580	31.166	31.049	4.6	4.8
2	630	17.37	339.34	554	102.302	100.717	2.1	1.8
3	230	17.18	325.39	570	35.626	36.052	20.9	21.1
4	510	17.34	331.19	565	85.229	83.884	2.3	2.4

**TABLE 4 - DILUTION TUNNEL DUAL TRAIN PRECISION**

RUN #	SAMPLE RATIOS		TOTAL EMISSIONS (g)		DEVIATION (%)	DEVIATION (g/kg)
	TRAIN 1	TRAIN 2	TRAIN 1	TRAIN 2		
1	2021	2029	9.296	9.737	2.32%	0.58%
2	2090	2123	4.388	3.821	6.92%	1.73%
3	2101	2076	43.906	43.802	0.12%	0.03%
4	1982	2014	4.558	4.833	2.92%	0.73%

**TABLE 5 - GENERAL SUMMARY OF RESULTS**

RUN #	BURN RATE (kg/hr)(dry) (OVERALL)	Change in Surface Temp (°F)	INITIAL DRAFT (in/H <sub>2</sub> O)	RUN TIME (min)	AVERAGE DRAFT (in/H <sub>2</sub> O)
1	4.3	376	0.003	200	0.079
2	1.2	174	0.069	630	0.053
4	1.5	204	0.075	510	0.061

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**TABLE 6 - CSA B415.1 RESULTS**

<b>BURN RATE (kg/hr)(dry)</b>	<b>CO EMISSIONS (g/min)</b>	<b>HEATING EFFICIENCY (% HHV)</b>	<b>Heating Efficiency (% LHV)</b>	<b>HEAT OUTPUT (Btu/hr)</b>
<b>Low – 1.2</b>	1.1	70%	75%	15,841
<b>Medium – 1.5</b>	0.8	73%	78%	20,376
<b>High – 4.3</b>	1.3	70%	76%	57,041

**TABLE 7 – WEIGHTED AVERAGE CALCULATION**

Test No.	Burn Rate	(E) Average Emission Rate g/hr	(CO) Average Emission Rate g/hr	Heat Output (Btu/hr)	HHV	LHV	(K) Weighting Factor	(KxE) g/hr	(K x CO) g/hr	(K x CO) g/min	(K x HHV)	(K x LHV)
2	1.2	0.39	64	15841	70	75	40%	0.16	25.6	0.43	28.0	30.2
4	1.5	0.55	50	20376	73	78	40%	0.22	19.8	0.33	29.0	31.2
1	4.3	2.86	80	57041	70	76	20%	0.57	15.9	0.27	14.1	15.2
<b>TOTALS:</b>							<b>100%</b>	<b>0.95</b>	<b>61.3</b>	<b>1.02</b>	<b>71.1</b>	<b>76.6</b>

**SECTION 11  
CONCLUSION**

This test demonstrates that this unit is an affected facility under the definition given in the regulation. The emission rate of 0.95 g/hr meets the EPA requirements for the Step 2 limits.



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### SECTION 12 PHOTOGRAPHS



**Photo No. 1**  
**Isometric view of unit**



**Photo No. 2**  
**Typical load**



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**SECTION 13**  
**REVISION LOG**

REVISION #	DATE	PAGES	REVISION
0	09/17/19	N/A	Original Report Issue



# Manuel d'installation et d'utilisation

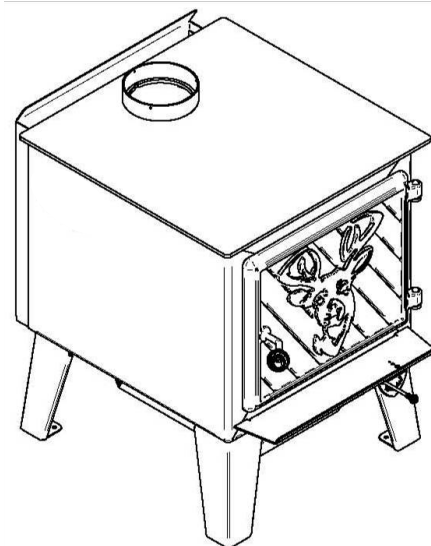
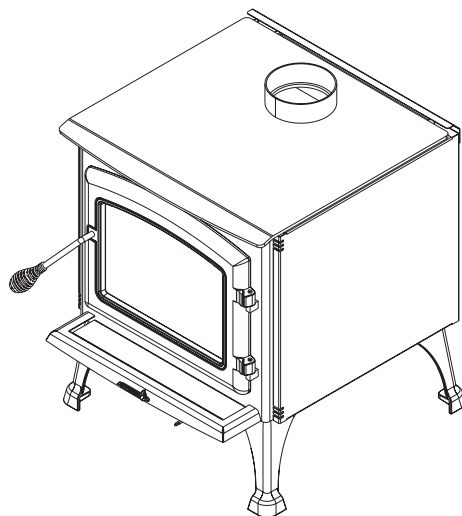
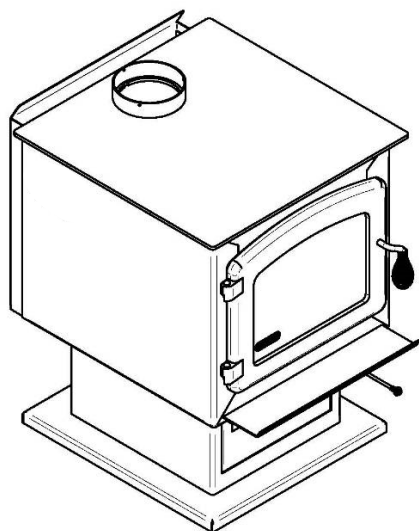
## SÉRIE 3.3

Austral III  
Myriad III  
Légende III

Escape 1900  
Black Stag II  
Osburn 3300

Solution 3.3  
Gateway 3300

FRANÇAIS



Poêle à bois homologué conformément à la phase II de l'agence de protection de l'environnement EPA et certifié conforme à la norme 2020 bois de corde.

EPA  
 $\leq 2.5$  g/h

CONSULTER LE CODE DU BÂTIMENT LOCAL OU CONTACTER LE SERVICE MUNICIPAL DES INCENDIES POUR CONNAÎTRE LES RESTRICTIONS ET LES EXIGENCES D'INSPECTION ET D'INSTALLATION DE LA RÉGION.

LIRE CE MANUEL AU COMPLET AVANT L'INSTALLATION DE CE POÊLE À BOIS. IL EST IMPORTANT DE RESPECTER INTÉGRALEMENT LES DIRECTIVES D'INSTALLATION. SI LE POÊLE N'EST PAS INSTALLÉ CORRECTEMENT, IL PEUT EN RÉSULTER UN INCENDIE, DES BLESSURES CORPORELLES OU MÊME LE DÉCÈS.

**LIRE LE PRÉSENT MANUEL ET LE CONSERVER POUR CONSULTATION**



# MERCI D'AVOIR CHOISI CE POÊLE À BOIS.

**Lorsque l'appareil n'est pas installé correctement, les matériaux combustibles à proximité peuvent surchauffer et s'enflammer.**

**Pour réduire les risques d'incendie, suivre les instructions d'installation de ce manuel.**

Fabricant de poêles international est l'un des plus importants et des plus réputés fabricants de poêles à bois et de foyers en Amérique du Nord et est fière de la qualité et du rendement de tous ses produits.

Dans les pages qui suivent se trouvent des conseils d'ordre général sur le chauffage au bois, des instructions détaillées pour une installation sûre et efficace et des indications sur la façon d'obtenir le meilleur rendement de ce poêle.

Il est fortement recommandé que cet appareil de chauffage au bois soit installé et entretenu par des professionnels certifiés par une agence qualifiée tels que NFI (National Fireplace Institute®) ou CSIA (Chimney Safety Institute of America) aux États-Unis, au Canada par WETT (Wood Energy Technology Transfer) ou au Québec par l'APC (Association des Professionnels du Chauffage).

Consulter le code du bâtiment local ou contacter le service des incendies pour connaître les restrictions et les exigences d'inspection et d'installation de la région.

Il se peut qu'un permis soit requis pour l'installation du poêle et de la cheminée à laquelle il est branché. Il est également recommandé d'aviser sa compagnie d'assurance habitation.

Lire ce manuel au complet avant l'installation et l'utilisation du poêle.

Une source de chauffage primaire doit être disponible dans la résidence. Cet appareil de chauffage doit être utilisé comme chauffage d'appoint. En cas de bris, le fabricant ne peut être tenu responsable des coûts de chauffage additionnels pouvant être engendrés par une source de chauffage alternative.

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# PARTIE A – UTILISATION ET ENTRETIEN

## 1. Sécurité

- **BRÛLANT LORSQU'EN FONCTION, ÉLOIGNER LES ENFANTS, LES VÊTEMENTS ET LES MEUBLES. TOUT CONTACT AVEC LA PEAU PEUT CAUSER DES BRÛLURES. DES GANTS PEUVENT ÊTRE NÉCESSAIRES LORS DE L'UTILISATION DU POÊLE.**
- Le fait d'utiliser un appareil dont des éléments comme la vitre, les briques réfractaires ou le coupe-feu sont fissurés ou brisés peut être dangereux et peut endommager l'appareil.
- Ouvrir complètement l'admission d'air avant d'ouvrir la porte de chargement.
- **NE JAMAIS UTILISER D'ESSENCE, DE COMBUSTIBLE À LANTERNE (NAPHTA), DE MAZOUT, D'HUILE À MOTEUR, DE KÉROSÈNE, DE LIQUIDE D'ALLUMAGE POUR CHARBON DE BOIS, DE LIQUIDES SIMILAIRES OU D'AÉROSOLS POUR ALLUMER UN FEU. GARDER TOUS CES LIQUIDES OU AÉROSOLS LOIN DE L'APPAREIL LORSQU'IL EST EN FONCTION.**
- Ne pas entreposer de carburant en deçà des dégagements minimums de l'appareil.
- Brûler seulement du bois de chauffage naturel sec.
- L'appareil doit être entretenu et utilisé en tout temps conformément aux présentes directives.
- Ne pas surélever le feu en plaçant un chenet dans le poêle.
- Ne pas utiliser de matériaux de fortune et ne faites aucun compromis lors de l'installation de cet appareil.
- Cet appareil de chauffage nécessite des inspections et réparations périodiques pour une utilisation optimale. Il est contre la réglementation fédérale d'utiliser cet appareil de façon incohérente avec les instructions de ce manuel.
- Un détecteur de fumée, un détecteur de monoxyde de carbone ainsi qu'un extincteur devraient être installés dans la maison. L'emplacement des détecteurs doit être choisi judicieusement pour éviter les fausses alertes lors du rechargement de l'appareil. L'emplacement de l'extincteur devrait être connu de tous les membres de la famille.



Ce produit peut vous exposer à des agents chimiques, y compris du monoxyde de carbone, identifié par l'État de la Californie comme pouvant causer le cancer ou des malformations congénitales et autres troubles de l'appareil reproducteur. Pour de plus amples informations, prière de consulter le [www.P65warnings.ca.gov/](http://www.P65warnings.ca.gov/)



## 2. Informations générales

### 2.1 Performances

Valeurs telles qu'obtenues en test, à l'exception du volume de la chambre à combustion et la puissance thermique maximale.

Modèles	Austral III, Myriad III, Légende III, Escape 1900, Black Stag II, Osburn 3300, Solution 3.3, Gateway 3300	
Type de combustible	Bûches de bois sec	
Technologie de combustion	Non-catalytique	
Volume nominal de la chambre à combustion	3.4 ft <sup>3</sup> (0.096 m <sup>3</sup> )	
Puissance thermique maximale (bûches de bois sec) <sup>2</sup>	90,000 BTU/h (26.4 kW)	
Puissance thermique globale (min. à max.) <sup>1 2</sup>	15,841 BTU/h à 57,041 BTU/h (4.64 kW à 16.72 kW)	
Rendement moyen global <sup>3</sup> (Bûches de bois sec)	71.1 % (PCS) <sup>3</sup>	76.6 % (PCI) <sup>4</sup>
Rendement optimal <sup>5</sup>	78 %	
Taux moyen d'émission de particules <sup>6</sup>	0.95 g/h (EPA / CSA B415.1-10) <sup>7</sup>	
Taux moyen de CO <sup>8</sup>	61.3 g/h	

<sup>1</sup> La puissance thermique maximale (bûches de bois sec) tient compte d'une densité de chargement variant entre 15 lb/pi<sup>3</sup> et 20 lb/pi<sup>3</sup>. Les autres données de performance sont basées sur une charge d'essai prescrite par la norme. La densité de chargement spécifiée varie entre 7 lb/pi<sup>3</sup> et 12 lb/pi<sup>3</sup>. L'humidité varie entre 19% et 25%.

<sup>2</sup> Telle que mesurée selon CSA B415.1-10.

<sup>3</sup> Pouvoir calorifique supérieur du combustible.

<sup>4</sup> Pouvoir calorifique inférieur du combustible.

<sup>5</sup> Rendement optimal à un taux de combustion donné (PCI).

<sup>6</sup> Cet appareil est officiellement testé et certifié par un organisme indépendant.

<sup>7</sup> Testé et certifié selon CFR 40 part 60, subpart AAA, section 60.534(a)(1)(ii) et ASTM E3053-17.

<sup>8</sup> Monoxyde de carbone.

## 2.2 Spécifications

Longueur maximale des bûches <sup>9</sup>	20 po (508 mm) Nord-Sud
Diamètre de la buse de raccordement	6 po (150 mm)
Diamètre du tuyau de raccordement recommandé	6 po (150 mm)
Type de cheminée	ULC-S629, UL 103 HT (2100 °F)
Matériau du coupe-feu	C-Cast ou Vermiculite
Type de porte	Simple, vitrée ou non, avec cadre en fonte
Type de vitre	Verre céramique
Ventilateur	Inclus ou Optionnel (jusqu'à 100 PCM)
Normes d'émissions de particules <sup>10</sup>	EPA / CSA B415.1-10

## 2.3 Matériaux

Le **caisson** du poêle, qui représente la plus grande partie de son poids, est fait d'acier. Si cela devenait nécessaire dans plusieurs années, presque tout le poêle peut être recyclé en nouveaux produits, ce qui évite d'avoir à extraire du nouveau minerai.

La couche de **peinture** est très mince et sa teneur en COV (composés organiques volatils) est très basse. Les COV peuvent provoquer du smog, de sorte que toute la peinture utilisée pendant la fabrication est conforme aux plus récentes exigences sur la qualité de l'air, en ce qui a trait à la réduction ou l'élimination des COV.

Les **tubes d'air** sont faits d'acier inoxydable, qui peut aussi être recyclé.

Le **coupe-feu** est fait d'un matériau en fibres d'aluminosilicate comprimées avec un liant pour former une planche rigide. Le C-Cast peut résister à des températures de plus de 2000 °F. Il n'est pas considéré comme un déchet dangereux. Il est recommandé de l'envoyer à l'écocentre.

La **brique réfractaire** est surtout composée de dioxyde de silicium, aussi appelé silice, un produit transformé à partir d'un minerai extrait. On le trouve communément dans la nature sous forme de sable ou d'argile. Il est recommandé de l'envoyer à l'écocentre.

Les **joint d'étanchéité** de la porte et de la vitre sont faits de fibre de verre qui est tissée à partir de sable fondu. Les joints d'étanchéité noirs ont été trempés dans une solution sans solvants. Il est recommandé de les envoyer à l'écocentre.

La **vitre** de la porte est faite de céramique de 5/32" (4 mm) d'épais qui ne contient aucun produit chimique toxique. Elle est faite de matières premières provenant du sol comme le sable et le quartz qui sont fusionnées de façon à former de la vitre à haute température. Le verre céramique ne peut être recyclé de la même façon que le verre ordinaire, de sorte qu'il ne doit pas être recyclé avec les produits domestiques courants. Il est recommandé de l'envoyer à l'écocentre.

<sup>9</sup> Orientation est-ouest : côté longitudinal des bûches visible; orientation nord-sud : extrémité des bûches visible.

<sup>10</sup> Testé et certifié selon CFR 40 part 60, subpart AAA, section 60.534(a)(1)(ii) et ASTM E3053-17.

## 2.4 Chauffage par zone

Ce poêle au bois sert au chauffage local, ce qui signifie qu'il est prévu pour chauffer le secteur où il est installé, de même que les pièces qui y sont reliées, bien qu'à une température inférieure. Cela s'appelle le chauffage par zone et c'est une façon de plus en plus répandue de chauffer des résidences ou des espaces à l'intérieur des résidences.

Le chauffage par zone peut être utilisé comme appoint pour un autre système de chauffage, en chauffant un espace de la résidence en particulier, comme une salle familiale au sous-sol ou un agrandissement qui n'a pas d'autre système de chauffage.

Les maisons de grandeur moyenne et relativement neuve peuvent être chauffées à l'aide d'un poêle au bois bien situé et de la bonne grosseur. Le chauffage par zone de toute une maison fonctionne mieux lorsque le poêle est placé dans la partie de la maison où la famille passe le plus de temps. Il s'agit généralement du secteur principal où se trouvent la cuisine, la salle à manger et le salon.

En plaçant le poêle dans ce secteur, il sera possible de profiter au maximum de la chaleur qu'il produit, de retirer le maximum de confort et d'obtenir le rendement énergétique le plus élevé. La pièce la plus occupée sera plus chaude, alors que les chambres et le sous-sol (s'il y en a un) resteront plus frais. De cette façon, moins de bois est brûlé qu'avec les autres formes de chauffage.

Bien que le poêle soit capable de chauffer les secteurs principaux de la maison à une température adéquate, il est fortement recommandé d'avoir aussi un système de chauffage conventionnel au mazout, au gaz ou à l'électricité comme source de chauffage complémentaire.

Plusieurs facteurs feront en sorte que le chauffage par zone réussira, y compris le bon emplacement et la bonne grosseur du poêle, la dimension, la disposition et l'âge de la résidence, de même que la zone climatique. Les résidences secondaires utilisées trois saisons par année peuvent généralement être chauffées par des poêles plus petits que les maisons qui sont chauffées tout l'hiver.

## 2.5 Émissions et rendement

Les faibles émissions de particules qui résultent de la technologie utilisée dans ce poêle signifient que la maisonnée rejettera jusqu'à 90% moins de particules fines dans l'environnement que si un ancien poêle conventionnel était utilisé. Mais la technologie du contrôle des rejets signifie plus que la protection de l'environnement.

La fumée qui provient du bois lorsqu'il est chauffé contient environ la moitié de l'énergie contenue dans ce combustible. En brûlant le bois complètement, le poêle libère toute l'énergie calorifique du bois, plutôt que de la gaspiller en fumée qui s'échappe par la cheminée. De plus, les caractéristiques de la chambre à combustion permettent de réduire l'arrivée d'air afin de contrôler le rendement calorifique, tout en maintenant une flamme de combustion propre et efficace, ce qui augmente la distribution efficace de chaleur dans la maison.

Le contrôle des rejets et la technologie de combustion évoluée de ce poêle ne peuvent bien fonctionner que si le combustible utilisé contient un taux d'humidité moyen convenable de 15% à 20%. Voir la section suivante pour des suggestions sur la préparation du bois de chauffage et l'évaluation de son taux d'humidité.

### 3. Combustibles

Le bon bois de chauffage est celui qui a été coupé à la bonne longueur pour le poêle, fendu en différentes grosseurs et cordé à l'extérieur jusqu'à ce que sa teneur en humidité ne soit plus que de 15% à 20%.

#### NE PAS BRÛLER:

- DES ORDURES;
- DE LA PELOUSE OU DES DÉCHETS DE JARDIN;
- DES MATÉRIAUX CONTENANT DU CAOUTCHOUC, Y COMPRIS LES PNEUS;
- DES MATÉRIAUX CONTENANT DU PLASTIQUE;
- DES DÉCHETS CONTENANT DU PÉTROLE, DE LA PEINTURE, DU DILUANT À PEINTURE OU DES PRODUITS À BASE D'ASPHALTE;
- DES MATÉRIAUX CONTENANT DE L'AMIANTE;
- DES DÉBRIS DE CONSTRUCTION OU DE DÉMOLITION;
- DES TRAVERS DE CHEMIN DE FER OU DU BOIS TRAITÉ;
- DU FUMIER OU DES CARCASSES D'ANIMAUX;
- DU BOIS D'ÉPAVE OU AUTRES MATÉRIAUX SATURÉS À L'EAU SALÉE;
- DU BOIS VERT; OU
- DES PRODUITS DU PAPIER, DU CARTON, DU CONTREPLAQUÉ OU DES PANNEAUX DE PARTICULES. L'INTERDICTION DE BRÛLER CES MATÉRIAUX N'INTERDIT PAS L'UTILISATION D'ALLUME FEU FABRIQUÉ À PARTIR DE PAPIER, DE CARTON, DE SCIURE DE BOIS, DE CIRE ET DE SUBSTANCES SIMILAIRES POUR ALLUMER UN FEU.

**BRÛLER CES MATÉRIAUX POURRAIT PRODUIRE UNE ÉMANATION DE FUMÉE TOXIQUE, RENDRE L'APPAREIL INEFFICACE ET CAUSER DE LA FUMÉE.**

#### 3.1 Essences d'arbres

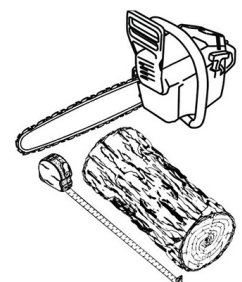
Les essences d'arbres d'où provient le bois de chauffage sont moins importantes que sa teneur en humidité. La principale différence entre les différentes essences d'arbres est la densité du bois. Le bois franc est plus dense que le bois mou.

Les propriétaires de maison qui peuvent obtenir à la fois du bois franc et du bois mou utilisent les deux sortes de bois à différentes fins. Le bois mou est un bon combustible par temps relativement doux au printemps et à l'automne parce qu'il s'enflamme rapidement et produit moins de chaleur. Le bois mou n'est pas aussi dense que le bois franc, de sorte qu'un volume donné de bois contient moins d'énergie. L'utilisation du bois mou évite de surchauffer la maison, ce qui peut être un problème répandu avec le chauffage au bois par temps doux. Le bois franc est meilleur pour les temps froids d'hiver lorsqu'il faut plus de chaleur et un cycle de combustion plus long.

Le bois franc comme le chêne, l'érable, le frêne et le hêtre prend plus de temps à pousser et vit plus longtemps que le bois mou comme le peuplier et le bouleau. Cela donne plus de valeurs aux essences de bois franc. Le conseil voulant que seul le bois franc soit bon à brûler est dépassé. Les vieux poêles à bois de fonte qui fuyaient n'auraient pas pu chauffer toute la nuit à moins qu'on ne les alimente avec de grosses bûches de bois franc.

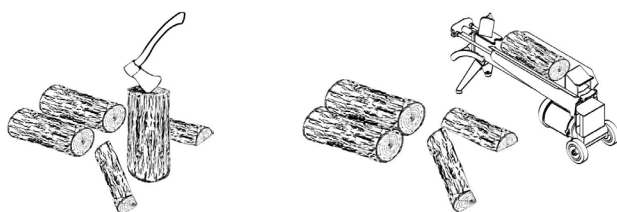
#### 3.2 Longueur des bûches

Les bûches devraient être coupées pour avoir au moins 1" (25 mm) de moins que la chambre à combustion, de façon à y pénétrer facilement. Il est très difficile d'alimenter le poêle avec des bûches qui sont juste un peu trop longues. La longueur la plus commune pour le bois de chauffage est de 16" (400 mm.)



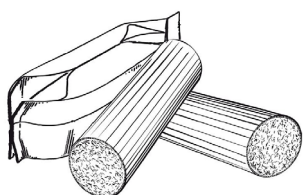
### 3.3 Grosseur des bûches

Le bois de chauffage sèche plus rapidement lorsqu'il est fendu. Les gros rondins qui ne sont pas fendus peuvent mettre des années à sécher suffisamment pour qu'on puisse les brûler. Même lorsqu'elles sont sèches, les bûches non fendues sont difficiles à allumer parce qu'elles n'ont pas d'arêtes vives où les flammes prennent en premier.



Le bois devrait être fendu de différentes grosseurs, allant de 3" à 6" (75 mm à 150 mm) d'épaisseur. Il est beaucoup plus facile d'allumer et de raviver un feu avec des bûches de différentes grosseurs.

### 3.4 Bûches densifiées



Les bûches densifiées faites à 100 % de sciure comprimée peuvent être brûlées, à condition de ne pas brûler trop de ces bûches à la fois. Ne pas brûler de bûches densifiées contenant de la sciure imprégnée de cire ou de bûches contenant des additifs chimiques. Suivre les instructions et les mises en garde du fabricant.

FRANÇAIS

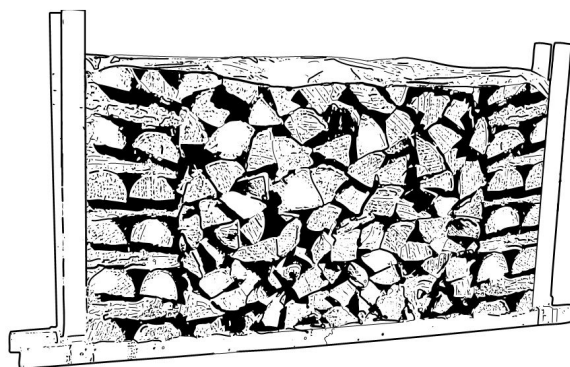
### 3.5 Séchage du bois

Le bois de chauffage qui n'est pas suffisamment sec est la cause de la plupart des plaintes concernant les appareils de chauffage au bois. Brûler constamment du bois vert produit plus de créosote et implique généralement un manque de chaleur et des vitres de porte sales.

Du bois de chauffage avec une teneur en humidité de 15% à 20% permettra au poêle d'atteindre son rendement le plus élevé.

*Voici quelques faits à retenir sur le processus de séchage du bois:*

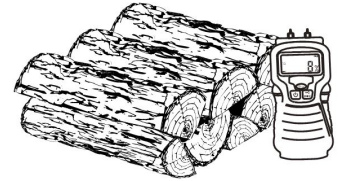
- Le bois de chauffage acheté d'un vendeur est rarement suffisamment sec pour être brûlé, il est donc conseillé d'acheter le bois au printemps et de le faire sécher soi-même;
- Le séchage est plus rapide dans un climat sec que dans un climat maritime humide;
- Le séchage est plus rapide l'été par temps chaud que l'hiver;
- Les bûches fendues sèchent plus rapidement que le bois rond;
- Le bois mou sèche comme le pin, l'épinette, le peuplier et le tremble plus rapidement que le bois franc. Il peut être suffisamment sec pour faire du feu après avoir été cordé à l'extérieur seulement pendant les mois d'été;



- Le bois franc comme le chêne, l'érable et le frêne peut mettre un ou même deux ans à sécher complètement, surtout s'il s'agit de grosses bûches;
- Le bois de chauffage sèche plus rapidement lorsqu'il est cordé à l'extérieur où il est exposé au soleil et au vent; il prend beaucoup plus de temps à sécher lorsqu'il est cordé dans une remise à bois;

*Le bois de chauffage est suffisamment sec pour brûler, lorsque :*

- des fissures apparaissent à l'extrémité des bûches;
- le bois passe d'une coloration blanche ou crèmeuse à gris ou jaune;
- deux morceaux de bois frappés ensemble sonnent creux;
- la face mise à jour d'une bûche fraîchement coupée semble chaude et sèche au toucher;
- le taux d'humidité lu sur un humidimètre est entre 15% à 20%.



## 4. Utilisation du poêle

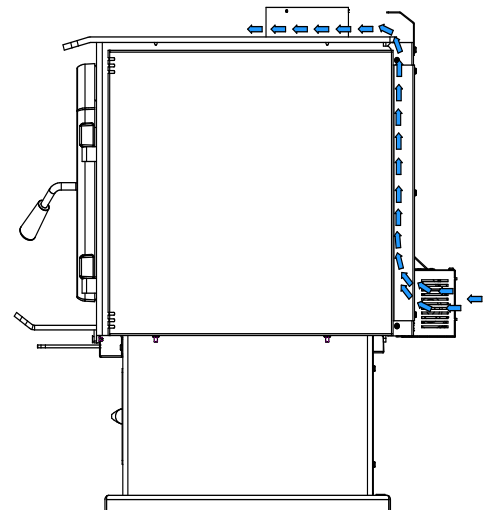


**Le taux de combustion minimum de ce poêle à bois a été défini par le fabricant et ne doit pas être modifié. Il est contre la réglementation fédérale de modifier ce réglage ou d'utiliser ce poêle à bois d'une manière non conforme aux instructions d'utilisation de ce manuel.**

### 4.1 Fonctionnement du ventilateur

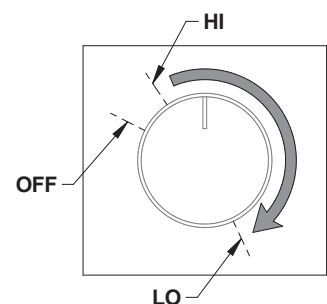
Un ventilateur est inclus avec cet appareil. Le ventilateur se trouve dans la chambre à combustion et s'installe à l'arrière du poêle pour accroître la circulation d'air dans l'échangeur de chaleur et améliorer la circulation d'air chaud dans la pièce. Voir "[Annexe 1: Installation du ventilateur](#)".

S'il est utilisé sur une base régulière, le ventilateur peut accroître le rendement jusqu'à 2%. Cependant, le ventilateur ne doit pas servir à augmenter le rendement d'un poêle trop petit pour l'espace à chauffer.



Le cordon électrique du ventilateur ne doit toucher à aucune des surfaces du poêle de façon à éviter les décharges électriques ou les incendies. Ne faites pas passer le cordon électrique sous le poêle.

Le ventilateur est muni d'un contrôle de vitesse variable comprenant trois différentes positions d'ajustement; soit de élevé (HI) à faible (LO), ou fermé (OFF). Il est recommandé de laisser le poêle atteindre sa température de fonctionnement (environ une heure) avant d'actionner le ventilateur. L'augmentation du courant d'air produit par le ventilateur refroidit la chambre à combustion et peut nuire au rendement d'un début de combustion si le ventilateur démarre trop tôt.





Un capteur de chaleur qui fonctionne avec le ventilateur est aussi inclus avec le poêle. Il se trouve dans la chambre à combustion et il s'installe à l'arrière du poêle. Lorsque le ventilateur est en marche (position entre LO et HI), le capteur de chaleur mettra le ventilateur en marche automatiquement lorsque le poêle sera assez chaud et l'arrêtera lorsque le poêle aura refroidi. Par conséquent, le contrôle de vitesse variable peut être laissé à la vitesse désirée.

## 5. Combustion efficace du bois

### 5.1 Première utilisation

Deux choses se produisent lors des premières attisées: la peinture durcit et les composantes intérieures se conditionnent. Au fur et à mesure que la peinture durcit, certains éléments chimiques se vaporisent. Les vapeurs ne sont pas nocives, mais elles sentent mauvais. Les vapeurs de peinture fraîche peuvent aussi déclencher de fausses alarmes dans les détecteurs de fumée. Par conséquent, lors du premier allumage, il peut être judicieux d'ouvrir les portes et les fenêtres pour ventiler la maison.

Faire deux ou trois petits feux pour amorcer le processus de durcissement et de conditionnement. Faire ensuite des feux plus gros et plus chauds jusqu'à ce que l'appareil ne dégage plus d'odeur de peinture. Plus les feux sont chauds, plus les surfaces peintes atteignent le point de durcissement de la peinture. L'odeur de la peinture qui durcit ne disparaîtra qu'après avoir fait un ou deux feux très chauds.

### 5.2 Allumer un feu

Chaque personne qui chauffe au bois développe sa façon préférée de faire du feu. Peu importe la méthode choisie, le but devrait être d'avoir un feu chaud, rapidement. Un feu qui prend rapidement produit moins de fumée et crée moins de crésote dans la cheminée.



**Ne pas utiliser de liquides inflammables comme l'essence, le naphte, le mazout, l'huile à moteur ou des aérosols pour allumer ou raviver le feu. Tenir ces liquides éloignés du poêle lors de son utilisation.**

*Voici trois façons répandues et efficaces pour faire un feu de bois.*

#### 5.2.1 Méthode traditionnelle

La méthode traditionnelle pour faire un feu de bois est de chiffonner 5 à 10 feuilles de papier journal, les placer dans la chambre à combustion et les maintenir en place avec une dizaine de morceaux de bois d'allumage. Le bois d'allumage devrait être placé sur et derrière le papier journal.

Ajouter ensuite deux ou trois petits morceaux de bois de chauffage. Ouvrir le contrôle d'admission d'air complètement et allumer le papier journal. Laisser la porte légèrement entrouverte.

Lorsque le feu est allumé, fermer la porte en conservant le contrôle d'admission d'air ouvert. Lorsque le bois d'allumage est presque entièrement brûlé, ajouter des morceaux de bois jusqu'à ce que le feu soit bien parti.

***L'appareil ne doit pas être laissé sans surveillance lorsque la porte est légèrement ouverte. Toujours fermer et verrouiller la porte lorsque le feu est allumé.***

### 5.2.2 *Méthode du feu descendant*

Cette méthode procède à l'inverse de la méthode traditionnelle et ne fonctionne que si du bois très sec est utilisé.

Placer trois ou quatre petites bûches fendues et sèches dans la chambre à combustion. Disposer le bois d'allumage sur les bûches en deux couches à angles droits et placer une dizaine d'éclats fins sur la deuxième rangée.

Il est possible d'utiliser du papier chiffonné, mais il risque de ne pas tenir en place puisqu'il a tendance à rouler pendant qu'il brûle. Le mieux est d'enrouler une feuille sur elle-même, de saisir les extrémités du rouleau et de faire un noeud. Utiliser quatre ou cinq feuilles de papier ainsi nouées et les mettre sur le dessus et autour du bois d'allumage. Ouvrir complètement le contrôle d'admission d'air, mettre le feu au papier et refermer la porte.

La méthode du feu descendant présente deux avantages par rapport à la méthode traditionnelle: tout d'abord, le feu ne s'effondre pas sur lui-même, et il n'est pas nécessaire de grossir le feu graduellement puisque la chambre à combustion est pleine avant que le feu soit allumé.

### 5.2.3 *Deux bûches parallèles*

Placer deux bûches fendues dans la chambre à combustion, avec quelques feuilles de papier journal tordu entre les bûches. Placer quelques éclats fins de travers sur les bûches et des éclats plus gros par-dessus, comme une cabane en bois rond. Allumer le papier journal.

### 5.2.4 *Utilisation des allume-feu*

Des allume-feu commerciaux peuvent être utilisés plutôt que du papier journal. Certains de ces allume-feu sont faits de sciure et de cire et d'autres sont faits de produits chimiques spéciaux inflammables. Toujours suivre les instructions sur l'emballage lors de l'utilisation. Un allume-feu en gel peut aussi être utilisé, mais seulement pour allumer un feu, dans une chambre à combustion froide et sans braises chaudes à l'intérieur.

## 5.3 **Cycle de combustion**

Le chauffage au bois par zone est très différent des autres types de chauffage. Il y aura des différences de température dans différents endroits de la maison et il y aura des variations de température le jour et la nuit. Cela est normal et pour les gens qui ont de l'expérience dans le chauffage au bois, ce sont les avantages du chauffage au bois par zones.

Un appareil au bois ne produit pas une chaleur stable. Il est normal que la température augmente après qu'une nouvelle charge de bois soit allumée et que la température diminue graduellement tout au long du cycle de combustion. L'augmentation et la diminution de la température peuvent être synchronisées avec la routine domestique. Par exemple, la température de la zone peut être plus fraîche lorsque la maison est active et plus chaude lorsqu'elle est inactive.

Le bois brûle mieux en cycles. Un cycle commence lorsqu'une nouvelle charge de bois est allumée par les braises chaudes et se termine lorsque celle-ci est consommée et qu'il n'en reste que des braises de la grosseur de celles qui se trouvaient dans le feu lorsque le bois a été rajouté.



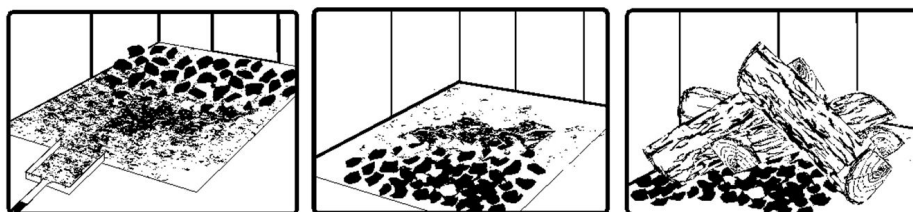
Il est déconseillé d'essayer d'obtenir un dégagement de chaleur stable en plaçant une seule bûche dans le feu à intervalles réguliers. Mettre au moins trois bûches à la fois et plus de préférence, de sorte que la chaleur produite par une bûche aide à allumer ses voisines. Chaque charge de bois devrait fournir plusieurs heures de chauffage. La grosseur de chaque charge peut varier selon la quantité de chaleur nécessaire.

En alimentant le feu par cycles, la porte est ouverte moins souvent durant la combustion du bois. Ceci est un avantage puisqu'il évite que de la fumée s'échappe de l'appareil lors de l'ouverture de la porte durant un cycle de combustion. Ceci est particulièrement vrai si la cheminée est fixée au mur extérieur de la maison.

*Si la porte doit être ouverte durant un cycle de combustion, ouvrir le contrôle d'admission d'air complètement, puis ouvrir la porte lentement.*

## 5.4 Raviver un feu

Lorsque la température de la pièce est plus basse et qu'il ne reste que des braises, il est temps de remettre une charge de bois. La plupart des braises restantes seront situées au fond de la chambre à combustion. Retirer l'excès de cendres à l'avant de la chambre à combustion, puis déplacer les braises vers l'avant avant de remettre du bois. Placer la nouvelle charge de bois sur, et à l'arrière des braises. Ouvrir le contrôle d'air complètement et fermer la porte.



Le déplacement des braises est utile pour deux raisons. Tout d'abord, cela les rassemble près de l'endroit où la plus grande partie de l'air entre dans la chambre à combustion. Elles enflammeront donc la nouvelle charge rapidement. Deuxièmement, les braises ne seront pas étouffées par la nouvelle charge de bois. Lorsque les braises sont simplement étalées, la nouvelle charge brûle en amortissant longtemps avant de s'enflammer.

Fermer le contrôle d'air seulement lorsque les flammes envahissent toute la chambre à combustion, que le bois est noirci et que ses rebords sont rougeoyants.

*L'appareil ne doit pas être laissé sans surveillance lors de l'allumage et le feu ne devrait pas brûler à pleine intensité plus de quelques minutes.*

Lors de l'allumage d'une nouvelle charge, l'appareil produit une poussée de chaleur. Cette poussée de chaleur est agréable lorsque la température de la pièce est fraîche, mais peut être désagréable lorsque la pièce est déjà chaude. Par conséquent, il est préférable de laisser chaque charge de bois brûler complètement afin que la pièce refroidisse avant de remettre une charge de bois.

## 5.5 Retirer la cendre

La cendre doit être retirée de la chambre à combustion tous les deux ou trois jours environ en période de chauffage à temps plein. La cendre ne doit pas s'accumuler de façon excessive dans la chambre à combustion puisqu'elle nuira au bon fonctionnement de l'appareil.

Le meilleur moment pour retirer la cendre est le matin, après avoir chauffé toute la nuit lorsque l'appareil est relativement froid, mais qu'il y a encore un peu de tirage pour aspirer la poussière de cendres vers l'intérieur de l'appareil et l'empêcher de sortir dans la pièce.

*La cendre doit être placée dans un contenant métallique avec un couverct étanche. Le contenant doit être déposé sur un plancher non combustible ou sur le sol loin de tout matériau inflammable.*

*Les cendres peuvent contenir des braises brûlantes qui peuvent rester chaudes pendant plusieurs jours et qui libèrent du monoxyde de carbone. Si les cendres sont disposées par enfouissement dans le sol ou dispersées sur place, elles devraient être maintenues dans le contenant métallique fermé, jusqu'à ce qu'elles soient complètement refroidies. Aucun autre déchet ne doit être placé dans ce contenant.*



**LES CENDRES NE DEVRAIENT JAMAIS ÊTRE CONSERVÉES À L'INTÉRIEUR, NI DANS UN CONTENANT NON MÉTALLIQUE NI SUR UNE GALERIE EN BOIS.**

## 5.6 Contrôle de l'admission d'air

Lorsque le bois de chauffage, la chambre à combustion et la cheminée sont chauds, l'admission d'air peut être réduite pour obtenir une combustion stable.

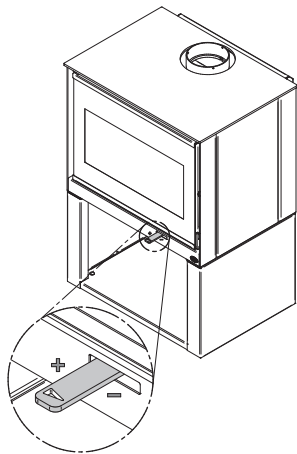


Figure 1: Air Intake Control

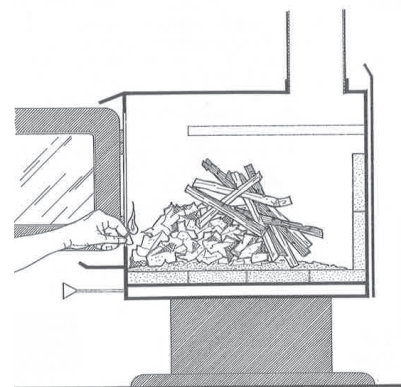
Lorsque l'admission d'air est réduite, le taux de combustion diminue. Ceci a pour effet de répartir l'énergie thermique du combustible sur une plus grande période de temps. De plus, le taux d'évacuation de l'appareil et de la cheminée ralentit, ce qui augmente la durée du transfert d'énergie des gaz évacués. Plus l'admission d'air est réduite, plus les flammes diminuent. Si les flammes diminuent au point de disparaître, c'est que l'air a été réduit trop tôt dans le cycle de combustion ou que le bois utilisé est trop humide. Si le bois est sec et que le contrôle d'air est utilisé correctement, les flammes devraient diminuer, mais rester vives et stables.

D'un autre côté, une trop grande admission d'air peut rendre le feu incontrôlable, créant des températures très élevées dans l'appareil ainsi que dans la cheminée et les endommager sérieusement. Une lueur rougeâtre sur l'appareil ainsi que sur les composants de la cheminée indique une surchauffe. Des températures excessives peuvent provoquer un feu de cheminée.

## 5.7 Types de feux

L'utilisation du contrôle de l'admission d'air n'est pas la seule façon de synchroniser le rendement thermique de l'appareil et les besoins en chauffage. Une maison nécessite beaucoup moins de chauffage en octobre qu'en janvier pour conserver une température confortable. Une chambre à combustion remplie en automne surchauffera la pièce. Sinon, la combustion devra être réduite au minimum et le feu brûlera en amortissant et sera inefficace.

*Voici quelques suggestions pour faire des feux convenant à différents besoins de chauffage.*



### 5.7.1 Feu éclair

Pour faire un petit feu qui produira peu de chaleur et qui chassera l'humidité de la maison, utiliser de petits morceaux de bois, placés en croisé dans la chambre à combustion. Les morceaux ne devraient avoir que 3" (80 mm) ou 4" (100 mm) de diamètre. Lorsque les braises sont ramenées à l'avant, placer deux morceaux l'un à côté de l'autre, en diagonale dans la chambre à combustion, puis deux autres par-dessus en croisé. Ouvrir le contrôle d'air complètement et ne réduire l'air qu'une fois le bois totalement enflammé.

Ce type de feu est bon pour les températures modérées et devrait fournir suffisamment de chaleur pendant environ quatre heures. C'est le bon moment pour utiliser du bois mou et éviter de surchauffer la maison.

### 5.7.2 Feu de longue durée

Pour avoir un feu qui durera jusqu'à huit heures, mais qui ne produira pas de chaleur intense, utiliser du bois mou et placer les bûches de façon compacte dans la chambre à combustion. Avant de réduire l'admission d'air, la charge devra brûler à pleine chaleur pendant assez longtemps pour que la surface des bûches devienne complètement noircie. La flamme doit être vive avant de laisser le feu brûler par lui-même.

### 5.7.3 Feu par temps froid

Lorsque les besoins de chauffage sont élevés par temps froid, le feu devra être stable et vif. C'est le temps de brûler de grosses bûches de bois franc. Placer les plus grosses bûches au fond de la chambre à combustion et placer le reste des bûches de façon compacte. Un feu aussi dense produira la combustion la plus longue que le poêle peut donner. Une attention particulière doit être apportée en faisant ce type de feu, puisque si l'admission d'air est réduite trop vite, le feu brûlera en amortissant. La flamme doit être vive avant de laisser le feu brûler par lui-même.

### 5.7.4 Temps de combustion

Le temps de combustion est la période entre l'ajout de bois sur un lit de braises et la combustion de ce bois en braises de même dimension. La phase des flammes du feu est la première partie du cycle de combustion et la deuxième partie est la phase des braises, pendant laquelle il y a peu ou pas de flamme.

La durée de combustion dont est capable ce poêle, comprenant les deux phases, variera selon des éléments comme :

- la dimension de la chambre à combustion;
- la dimension de la pièce à chauffer;
- la quantité de bois;
- la zone climatique où se trouve l'habitation; et
- l'essence du bois de chauffage;
- la période de l'année.
- la teneur en humidité du bois;

Le tableau suivant donne un temps approximatif de combustion maximum, selon le volume de la chambre à combustion.

**Tableau 1 : Temps approximatif de combustion maximum**

VOLUME DE LA CHAMBRE À COMBUSTION	TEMPS DE COMBUSTION MAXIMUM
< 1.5 pi. cu.	3 à 5 heures
1.5 pi. cu. à 2 pi. cu	5 à 6 heures
2 pi. cu. à 2.5 pi. cu.	6 à 8 heures
2.5 pi. cu. à 3.0 pi. cu.	8 à 9 heures
>3.0 pi. cu	9 à 10 heures

Un temps de combustion plus long n'indique pas nécessairement que le rendement de l'appareil est bon. Il est préférable de faire de petits feux qui fourniront de trois à quatre heures de chaleur, plutôt que de remplir la chambre à combustion pour avoir une combustion plus longue. Il est plus facile d'ajuster la quantité de chaleur nécessaire au besoin de chauffage de la pièce avec des cycles de combustion plus courts.

### 5.7.5 Orientation des bûches

Dans une chambre à combustion relativement carrée, le bois peut être placé droit (extrémité des bûches visible) ou sur le côté (côté des bûches visible).

Les charges placées droites permettent une plus grande quantité de bois à la fois. Par contre, elles se brisent en petits morceaux plus rapidement. Ce type de chargement est utile pour des feux à haut rendement qui durent longtemps par temps froid.

Les charges sur le côté permettent une quantité limitée de bois puisqu'une trop grande quantité de bûches risquerait de les faire tomber sur la vitre. Placées de façon compacte, elles mettent longtemps avant de se défaire. Elles sont excellentes pour des feux à basse intensité, qui durent longtemps par temps relativement doux.

### 5.7.6 Monoxyde de carbone

Lorsqu'il reste des bûches non brûlées dans la chambre à combustion et que la flamme disparaît, sortir à l'extérieur et regarder la sortie de la cheminée. S'il y a de la fumée visible, cela signifie qu'il reste du combustible à brûler, mais que le feu manque d'air pour brûler correctement. Dans cette situation, le taux de CO augmentera. Il est donc important de réagir. Ouvrir légèrement la porte et déplacer la bûche avec un tisonnier. Retournez-la et créer un passage pour l'air en dessous, en faisant une tranchée avec le lit de charbon. Ajouter de petits morceaux de bois pour redémarrer la combustion.

## 6. Entretien

Cet appareil donnera des années de bon service s'il est utilisé et entretenu correctement. Les composants internes de la chambre à combustion, comme les briques réfractaires, le coupe-feu et les tubes d'air s'useront avec le temps. Les pièces défectueuses devraient toujours être remplacées par des pièces d'origine.

Pour éviter la détérioration prématurée, suivre les directives d'allumage et de recharge présentée à la section "[5. Combustion efficace du bois](#)" et éviter de faire fonctionner l'appareil avec le contrôle d'air complètement ouvert durant des cycles de combustion complets.

### 6.1 Nettoyage et peinture

Les surfaces peintes ou plaquées peuvent être essuyées avec un linge doux et humide. Si la peinture est rayée ou endommagée, il est possible de repeindre l'appareil à l'aide d'une peinture résistante à la chaleur. **Ne pas nettoyer ou peindre l'appareil lorsqu'il est chaud.** Avant de peindre, la surface doit être poncée légèrement à l'aide de papier sablé et par la suite essuyée pour enlever la poussière. Appliquer deux minces couches de peinture.

### 6.2 Matériaux réfractaires et coupe-feu

Inspecter les briques ou les pierres réfractaires et le coupe-feu périodiquement. Remplacer ce qui est cassé ou endommagé.

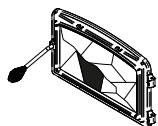
*L'utilisation de l'appareil avec un coupe-feu endommagé ou manquant pourrait créer des températures et des conditions dangereuses et annulera la garantie.*

### 6.3 Vitre

#### 6.3.1 Nettoyage

Dans des conditions normales, la vitre devrait rester relativement propre. Si le bois de chauffage est suffisamment sec et que les instructions d'utilisation de ce manuel sont suivies, il se formera un dépôt blanchâtre et poussiéreux sur la surface intérieure de la vitre après environ une semaine d'utilisation. Cela est normal et s'enlève facilement lorsque l'appareil est froid, en essuyant la vitre à l'aide d'un linge humide ou d'un essuie-tout, puis en l'asséchant. Lorsque le poêle fonctionne à bas régime, il se peut qu'il se forme des taches brun pâle, surtout dans les coins inférieurs de la vitre. Cela indique que le bois brûle en fumant et qu'une partie de la fumée s'est condensée sur la vitre. Ces taches indiquent aussi une combustion incomplète du bois, ce qui signifie aussi plus de rejets de fumée et une formation plus rapide de crésote dans la cheminée. Les dépôts qui se forment sur la vitre sont la meilleure indication de la qualité du combustible et de la réussite à bien utiliser le poêle. Ces taches peuvent être nettoyées à l'aide d'un nettoyant spécial pour vitre de poêle à bois. **Ne pas utiliser de produits abrasifs pour nettoyer la vitre.**

Le but devrait être d'avoir une vitre propre, sans taches brunes. Si des taches brunes se forment régulièrement sur la vitre, quelque chose doit être changé soit dans la façon d'opérer l'appareil soit dans le combustible. Lorsque les traces brunes proviennent du rebord de la vitre, il est temps de changer le joint d'étanchéité autour de la vitre. Le joint d'étanchéité doit être auto-adhésif. Toujours remplacer le joint d'étanchéité par un autre d'origine.



**Ne pas nettoyer la vitre lorsque le poêle est chaud.**

**Ne jamais faire un usage abusif de la porte en la frappant ou en la claquant.**

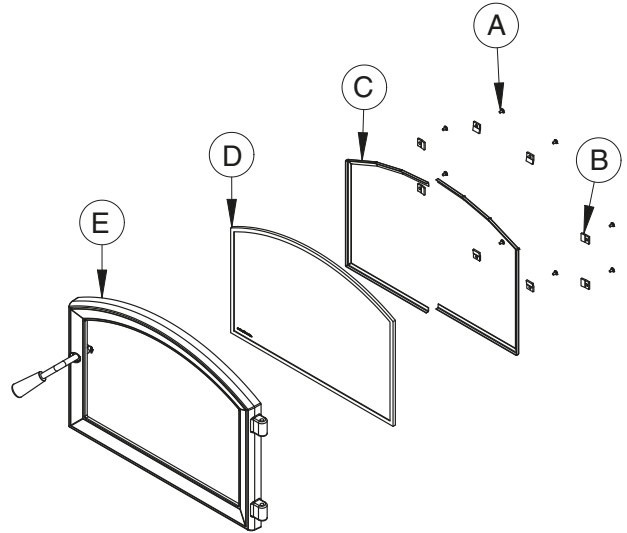
**Ne pas utiliser l'appareil si la vitre est craquée ou brisée.**

### 6.3.2 Remplacement

La vitre utilisée est un verre céramique 5/32" (4 mm) d'épaisseur, 18 ¾" x 12 ½" (476 mm x 318 mm), testée pour des températures pouvant atteindre 1400 °F. Si la vitre se brise, il faudra la remplacer avec un verre céramique ayant les mêmes spécifications.

Pour retirer ou remplacer la vitre **(D)**:

1. Soulever la porte **(E)** pour la retirer de ses pentures et la déposer sur une surface douce et plane.
2. Retirer les vis **(A)**, les dispositifs de retenue de vitre **(B)**, ainsi que les cadres retiens vitre en métal **(C)**.
3. Retirer la vitre. Si elle est endommagée, installer une nouvelle vitre en place. La nouvelle vitre doit avoir un joint d'étanchéité tout le tour. Voir la procédure d'installation.
4. Réinstaller la vitre, en prenant soin de bien la centrer dans la porte. Ne pas trop serrer les vis.

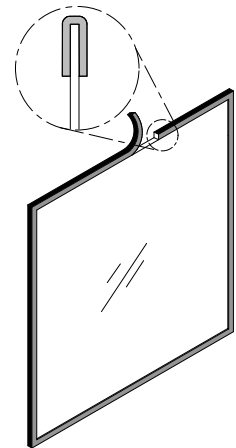


*Les deux principales causes de bris de vitre sont un positionnement inégal dans la porte et des vis de rétention trop serrées.*

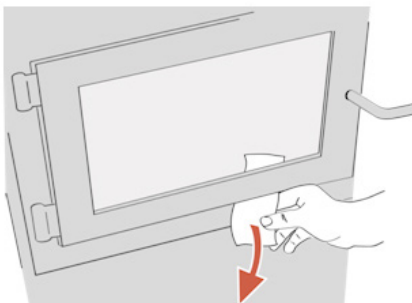
### 6.3.3 Joint d'étanchéité

Le nouveau joint est plat, encollé et est fait de fibre de verre tressée. Le joint doit être centré sur la vitre.

1. Suivre les instructions de la section précédente pour retirer la vitre. Retirer le vieux joint d'étanchéité et laver la vitre soigneusement.
2. Retirer une partie du papier qui recouvre l'adhésif et placer le joint sur une table, adhésif vers le haut.
3. Coller l'extrémité du joint au milieu d'un des côtés de la vitre, puis presser la vitre sur le joint, en prenant soin de bien la centrer sur le joint.
4. Retirer une plus grande partie du papier et tourner la vitre. Le joint ne doit pas être étiré durant l'installation.
5. Couper le joint à la longueur nécessaire. Pincer le joint sur la vitre en faisant chevaucher le rebord, sur tout le pourtour.



## 6.4 Porte



Afin d'obtenir un rendement optimal, la porte doit être parfaitement étanche avec la chambre à combustion. L'étanchéité de la porte peut être vérifiée en fermant et en verrouillant la porte sur un bout de papier.

Le tour complet de la porte doit être vérifié. Si le papier glisse facilement à n'importe quel endroit, il faut soit ajuster la porte ou remplacer le joint d'étanchéité.



### 6.4.1 Ajustement

L'étanchéité de la porte peut être améliorée avec un ajustement simple du mécanisme de verrouillage :

1. Retirer la goupille de retenue fendue en tirant et tournant à l'aide d'une pince.
2. Tourner la poignée d'un tour dans le sens contraire des aiguilles d'une montre afin d'augmenter la pression entre le cadrage de la porte et la structure du poêle.
3. Réinstaller la goupille de retenue fendue en utilisant un petit marteau.

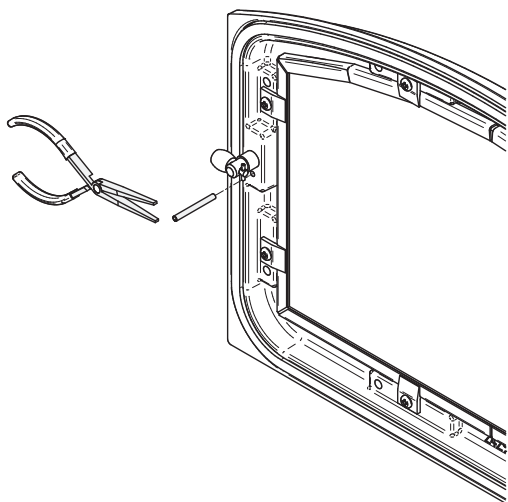


Figure 2: Retrait de la goupille de retenue

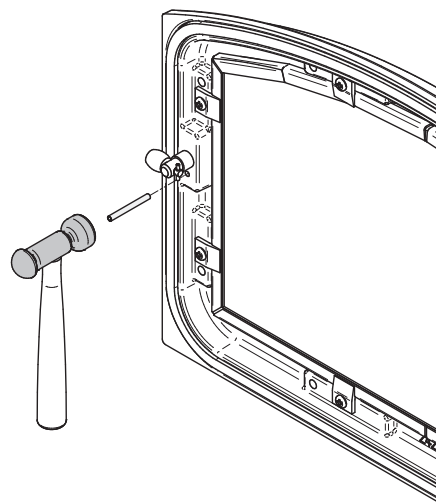
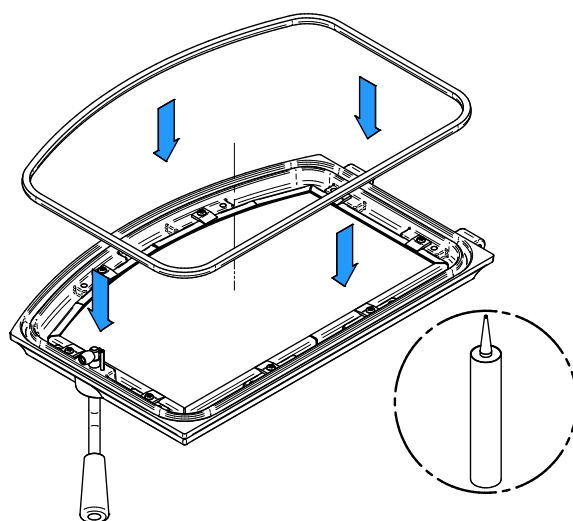


Figure 3: Installation de la goupille de retenue

### 6.4.2 Joint d'étanchéité

Il est important de remplacer le joint d'étanchéité avec un autre ayant le même diamètre et la même densité afin de conserver une bonne étanchéité.

1. Retirer la porte et la placer face vers le bas sur une surface douce comme un torchon ou un morceau de tapis.
2. Retirer le vieux joint d'étanchéité de la porte. Utiliser un tournevis pour gratter la vieille colle à joint qui se trouve dans la rainure de la porte.
3. Appliquer un cordon d'environ 3/16" (5 mm) de silicone haute température dans la rainure de la porte. En partant du centre, côté charnières, installer le joint dans la rainure. Le joint ne doit pas être étiré lors de l'installation.
4. Laisser environ 1/2" (10 mm) de joint dépasser au moment de le couper et pousser l'extrémité dans la rainure. Repousser les fibres qui dépassent sous le joint vers le silicone.
5. Fermer la porte. Ne pas utiliser le poêle pendant 24 heures.



## 6.5 Système d'évacuation

La fumée de bois se condense à l'intérieur de la cheminée, formant un dépôt inflammable appelé crésote. Lorsque la crésote s'accumule dans le système d'évacuation, elle peut s'enflammer lorsqu'un feu très chaud est fait dans le poêle. Un feu extrêmement chaud peut progresser jusqu'à l'extrémité de la cheminée. De graves feux de cheminée peuvent endommager même les meilleures cheminées. Des feux fumants peuvent rapidement causer la formation d'une épaisse couche de crésote. Lors d'une bonne combustion, les gaz sortant de la cheminée sont presque transparents, donc la crésote se forme plus lentement.

### *Crésote - Formation et nécessité de la retirer*

*Lorsque le bois brûle lentement, il produit du goudron et d'autres vapeurs organiques qui se combinent à la vapeur d'eau évacuée pour former de la crésote. Ces vapeurs se condensent dans un conduit de cheminée relativement froid d'un appareil qui brûle lentement. Par conséquent, les résidus de crésote s'accumulent dans le conduit. Lorsqu'elle prend feu, la crésote produit un feu extrêmement chaud.*

*Le raccord de cheminée et la cheminée doivent être inspectés au moins une fois tous les deux mois pendant la saison de chauffage pour déterminer si une accumulation de crésote s'est produite. Si la crésote s'est accumulée ( $\frac{1}{8}$ " [3mm] ou plus), il faut l'enlever pour réduire le risque de feu de cheminée »*

### 6.5.1 Fréquence de nettoyage

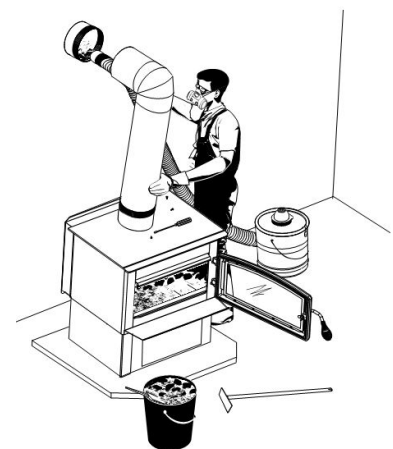
Il n'est pas possible de prédire en combien de temps ou combien de crésote se formera dans la cheminée. Il est important, par conséquent, de vérifier mensuellement s'il y a des dépôts dans la cheminée, jusqu'à ce que le taux de formation de la crésote soit connu. Même si la crésote se forme lentement dans le système, la cheminée devrait être inspectée et nettoyée au moins une fois par année.

Établir une routine pour le bois, le poêle à bois et la technique d'allumage. Vérifier quotidiennement l'accumulation de crésote jusqu'à ce que l'expérience montre à quelle fréquence le nettoyage doit être fait. Plus le feu est chaud, moins de crésote est déposée. Un nettoyage hebdomadaire peut être nécessaire par temps doux, bien qu'un nettoyage mensuel puisse être suffisant pendant les mois les plus froids. Contacter les services d'incendie municipaux ou provinciaux de la région pour savoir comment gérer un feu de cheminée. Avoir un plan bien compris pour gérer un feu de cheminée.

### 6.5.2 Ramonage de la cheminée

Le ramonage de la cheminée peut être difficile et dangereux. Les personnes n'ayant pas d'expérience dans le ramonage de cheminées préféreront souvent engager un ramoneur professionnel pour inspecter et nettoyer le système pour la première fois. Après avoir vu comment se déroule le ramonage, certains choisiront de le faire eux-mêmes. La cheminée devrait être vérifiée régulièrement afin d'éviter une accumulation de crésote.

L'inspection et le nettoyage de la cheminée peuvent être facilités en retirant le coupe-feu. Voir "[Annexe 3: Installation des tubes d'air et du coupe-feu](#)" pour plus de détails.





### 6.5.3 Feu de cheminée

L'entretien et l'inspection régulière du système de cheminée peuvent éviter les feux de cheminée. Si un feu de cheminée se déclare, procéder comme suit :

1. Fermer la porte et le contrôle d'admission d'air du poêle;
2. Alerter les occupants de la maison du danger;
3. Si vous avez besoin d'aide, appeler le service d'incendies;
4. Si possible, utiliser un extincteur chimique à poudre, du soda à pâte ou du sable pour maîtriser le feu. *Ne pas utiliser d'eau*, car il pourrait se produire une explosion de vapeur;

**L'inspection et le nettoyage du poêle par un ramoneur qualifié ou le service des incendies sont obligatoires avant la remise en service de l'appareil.**

## PARTIE B - INSTALLATION

### 7. Sécurité et normes

- Les informations inscrites sur la plaque d'homologation de l'appareil ont toujours préséance sur les informations contenues dans tout autre média publié (manuels, catalogues, circulaires, revues et les sites web).
- Le fait de mélanger des composantes provenant de diverses sources ou de modifier des éléments peut amener des situations dangereuses. Lorsque de tels changements sont prévus, Fabricant de poêle international inc. doit être contacté à l'avance.
- Toute modification de l'appareil qui n'a pas été approuvée par écrit par l'autorité d'homologation ou le fabricant viole les normes CSA B365 (Canada) et ANSI NFPA 211 (É.-U.).
- **NE PAS RELIER À UN SYSTÈME OU À UN CONDUIT DE DISTRIBUTION D'AIR SAUF SI APPROUVÉ EXPRESSÉMENT POUR UNE TELLE INSTALLATION.**
- **NE PAS RACCORDER CET APPAREIL À UN CONDUIT DE CHEMINÉE DESSERVANT UN AUTRE APPAREIL.**
- Brancher le poêle seulement à une cheminée préfabriquée homologuée pour utilisation avec du combustible solide ou à une cheminée de maçonnerie conforme aux codes du bâtiment national et local.
- Si nécessaire, un apport d'air de combustion doit être apporté à la pièce.

#### 7.1 Maison mobile

- Cet appareil peut être installé dans une maison mobile. Son installation requiert l'installation d'un ensemble d'entrée d'air frais, vendu séparément.
- **AVERTISSEMENT : NE PAS INSTALLER DANS UNE CHAMBRE À COUCHER.**
- **LE POÊLE DOIT ÊTRE FIXÉ À LA STRUCTURE DE LA MAISON MOBILE.**
- **ATTENTION : L'INTÉGRITÉ STRUCTURALE DU PLANCHER, DES MURS, DU PLAFOND ET DU TOIT DE LA MAISON MOBILE DOIT ÊTRE MAINTENUE.**

## 7.2 Règlements régissant l'installation d'un poêle

Lorsqu'il est installé et utilisé tel que décrit dans les présentes instructions, ce poêle à bois convient comme appareil de chauffage autoportant pour installation résidentielle.

Au Canada, il faut respecter le CSA B365 Installation des appareils de chauffage à combustible solide et du matériel connexe et le CSA C22.1 Code canadien de l'électricité en l'absence de code local. Aux États-Unis, il faut suivre le ANSI NFPA 211 Standard for Chimneys, Fireplaces, Vents and Solid Fuel-Burning Appliances et le ANSI NFPA 70 National Electrical Code en l'absence de code local.

Ce poêle doit être raccordé à une cheminée conforme aux exigences de cheminées de type HT dans la norme pour cheminées préfabriquées de type résidentiel et appareils de chauffage de bâtiment, UL 103 et ULC S629 ou à une cheminée de maçonnerie approuvée selon le code avec une gaine de cheminée.

## 7.3 Localisation de la plaque d'homologation

Puisque les informations inscrites sur la plaque d'homologation de l'appareil ont toujours préséance sur les informations contenues dans tout autre média publié (manuels, catalogues, circulaires, revues et sites web) il est important de s'y référer afin d'avoir une installation sécuritaire et conforme. De plus, des informations importantes concernant l'appareil s'y trouvent (modèle, numéro de série, etc.). La plaque d'homologation est située au dos de l'appareil.

Il est recommandé de noter le numéro de série de l'appareil car il sera nécessaire pour identifier précisément la version de l'appareil, dans le cas où des pièces de rechange ou une assistance technique seraient nécessaires.

## 8. Le système d'évacuation

Le système d'évacuation, composé de la cheminée et du tuyau qui raccorde le poêle à la cheminée, agit comme le moteur qui entraîne le système de chauffage au bois. Même le meilleur des poêles ne fonctionnera pas de façon aussi sécuritaire et efficace s'il n'est pas raccordé à une cheminée adéquate.

La chaleur contenue dans les gaz d'évacuation qui passent du poêle au raccord de cheminée, puis à la cheminée, n'est pas de la chaleur perdue. Cette chaleur est utilisée par la cheminée pour créer le tirage qui aspire l'air de combustion, garde la fumée dans le poêle et évacue les gaz de façon sécuritaire vers l'air libre. La chaleur contenue dans les gaz d'évacuation peut être vue comme le combustible dont se sert la cheminée pour créer le tirage.

### 8.1 Des cheminées appropriées

Ce poêle à bois a une performance et une efficacité optimale lorsqu'il est raccordé à une cheminée ayant un conduit de fumée de 6" (150 mm) de diamètre. Le raccordement à une cheminée ayant un diamètre au minimum de 5" (130 mm) (Canada seulement) ou d'au plus 7" (180 mm) est toléré, s'il permet l'évacuation adéquate des gaz de combustion et que cette application est vérifiée et autorisée par un installateur qualifié. Autrement, le diamètre du conduit de fumée doit être de 6" (150 mm).

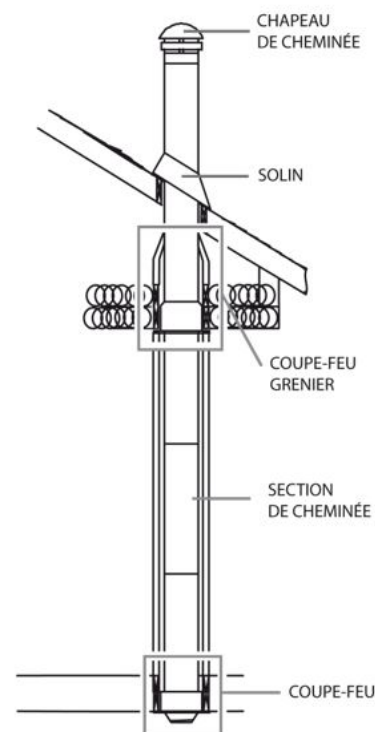
Pour être appropriée, une cheminée de métal préfabriquée doit être conforme aux normes UL 103 HT (É.-U.) ou ULC S629 (Canada).

### 8.1.1 Cheminée de métal préfabriquée

Ces cheminées sont souvent appelées cheminées «à haute température», parce qu'elles possèdent des caractéristiques spéciales pour supporter les températures qui peuvent être générées par les poêles à bois. Les cheminées préfabriquées subissent des essais en tant que système comportant tous les éléments nécessaires pour l'installation.

Les instructions fournies avec la cheminée par le fabricant sont les seules sources de directives d'installation fiables. Pour être sécuritaire et efficace, la cheminée doit être installée exactement selon les instructions du fabricant. Seulement des éléments conçus pour la marque et le modèle de cheminée doivent être utilisés.

Aucun composant de la cheminée ne devrait être fabriqué ou remplacé par d'autres provenant de marques de cheminée différentes. La cheminée doit être d'un type approprié pour les combustibles solides.

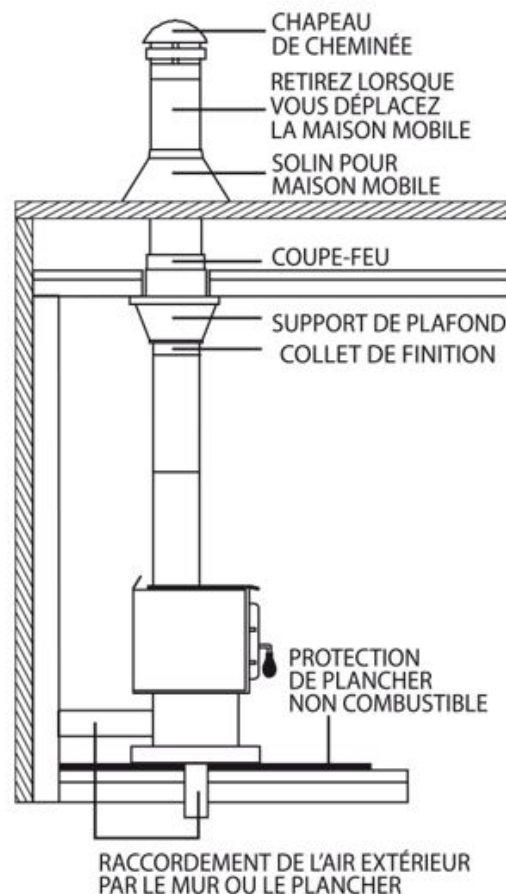


### 8.1.2 Cheminée de métal préfabriquée pour maison mobile

Pour une utilisation dans une maison mobile, ce poêle doit être raccordé à un tuyau préfabriqué à double paroi de 6" (150 mm) de diamètre conforme à la norme ULC S629 ou UL 103HT, pour les cheminées préfabriquées pour des températures n'excédant pas 650°C.

La longueur totale du système de cheminée, incluant les coudes, doit être au moins 12' (3,6 m) à partir du dessus poêle.

Pour maintenir une barrière efficace contre la vapeur, une bonne isolation et l'imperméabilité, à la cheminée et aux ouvertures par lesquelles entrent les sections de cheminées extérieures, un solin de toit pour maison mobile doit être installé et scellé avec un adhésif à base de silicone.

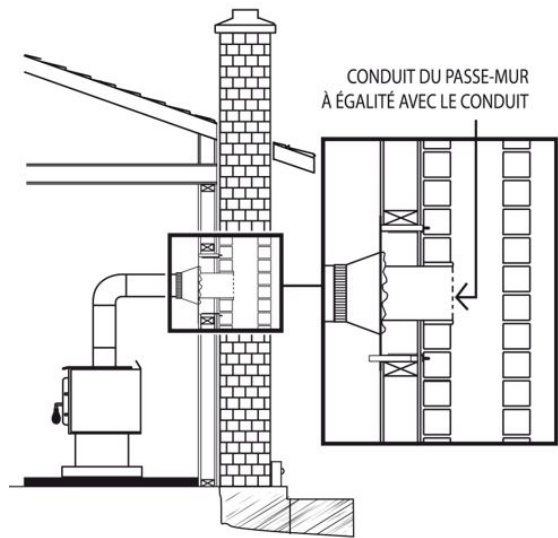


### 8.1.3 Cheminée de maçonnerie

Le poêle peut aussi être raccordé à une cheminée de maçonnerie, pourvu que la cheminée soit conforme aux règles de construction du code du bâtiment local.

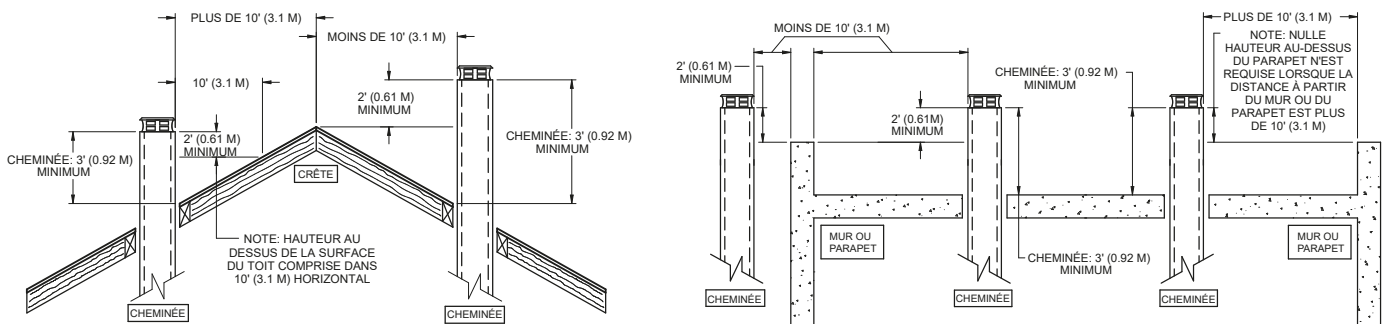
La cheminée doit être munie d'un conduit d'argile ou d'une chemise d'acier inoxydable (gaine) homologuée appropriée. Si la cheminée de maçonnerie a une chemise carrée ou rectangulaire dont la section transversale est supérieure à celle d'une cheminée ronde de 6" (150 mm), il faut y insérer une chemise d'acier inoxydable (gaine) de 6" (150 mm) homologuée appropriée.

Le conduit de fumée ne doit pas être réduit à moins de 6" (150 mm) à moins que le système d'évacuation ne soit droit et excède 25' (7,6 m) de hauteur. Si un mur combustible doit être traversé, un coupe-feu isolé homologué est obligatoire.



## 8.2 Hauteur minimale de la cheminée

L'extrémité de la cheminée doit être suffisamment haute pour dépasser la turbulence d'air causée par le vent contre la maison et le toit. La cheminée doit dépasser d'au moins 3' (1 m) au-dessus de son point de sortie du toit le plus haut et d'au moins 2' (60 cm) toute portion du toit ou d'un obstacle situé à une distance horizontale de moins de 10 pi. (3 m). La hauteur totale du système, à partir de la base de l'appareil jusqu'au sommet de la cheminée, ne doit jamais être inférieure à 15 pieds (4,6 m).



## 8.3 Emplacement de la cheminée

L'emplacement de la cheminée est crucial pour le bon fonctionnement de l'appareil. La cheminée doit être installée à l'intérieur plutôt que sur un mur extérieur et doit monter directement à travers la partie la plus haute de la maison. Cette installation profite de l'environnement chaud pour produire une tire plus puissante, accumule moins de dépôts de crésote et ne sera pas affectée par les températures froides ou les vents violents.

Les cheminées extérieures conduiront à des courants d'air froids lorsqu'il n'y a pas de feu dans le poêle, à l'allumage lent des nouveaux feux et au dégagement de fumée lorsque la porte est ouverte pour le chargement.

D'un autre côté, un tirage excessif peut rendre le feu incontrôlable, créant des températures très élevées dans l'appareil ainsi que dans la cheminée et les endommager gravement. Une lueur rougeâtre sur l'appareil et sur les composants de la cheminée indique une surchauffe. Des températures excessives peuvent provoquer un feu de cheminée.

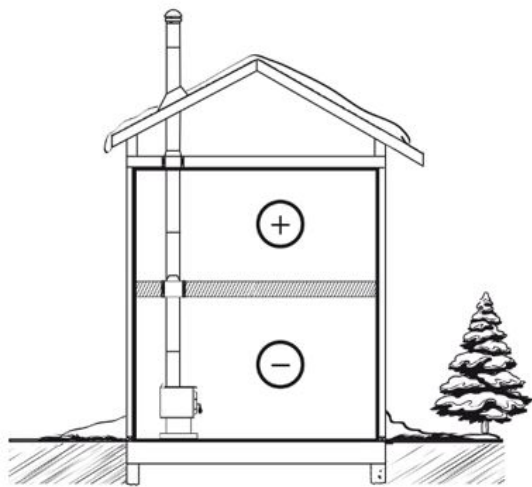


Figure 4: Bonne conception du système

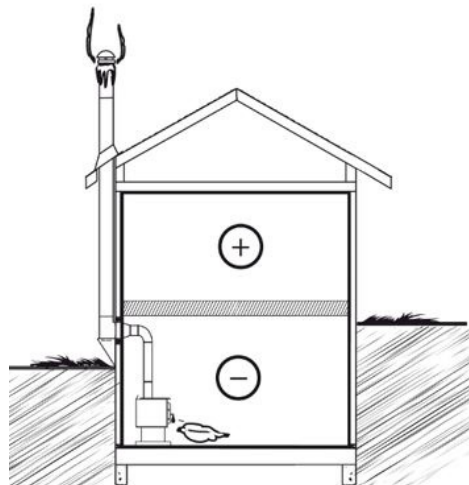


Figure 5: Conception de système inférieure

## 8.4 Apport d'air de combustion

### 8.4.1 Maisons mobile

Ce poêle est homologué pour être installé dans une maison mobile. Il doit donc avoir un apport d'air de combustion provenant de l'extérieur. Il est interdit de puiser l'air du sous-sol, du grenier, d'un garage ou de tout espace clos. L'air doit être puisé à partir d'un vide sanitaire ventilé sous le plancher ou directement à l'extérieur. Installer un conduit isolé, souple ou rigide, de type HVAC (doit être conforme aux normes ULC S110 ou UL 181, classe 0 ou classe 1) sur l'adaptateur d'air frais. L'extrémité extérieure devrait être munie d'un capuchon contre les intempéries avec grillage. Lorsqu'une maison mobile a été transformée en maison standard en l'installant sur une fondation permanente, l'approvisionnement en air extérieur n'est pas obligatoire.

### 8.4.2 Maisons conventionnelle

L'apport d'air de combustion le plus sûr et le plus fiable pour le poêle à bois provient de la pièce dans laquelle il est installé. L'air de la pièce est déjà préchauffé de sorte qu'il ne refroidira pas le feu et sa disponibilité n'est pas affectée par la pression du vent sur la maison. La plupart des maisons ont suffisamment de fuites naturelles pour fournir la petite quantité d'air dont le poêle a besoin. Le seul cas où le poêle à bois peut ne pas avoir suffisamment d'apport d'air de combustion est lorsqu'un puissant appareil de ventilation (comme une hotte de cuisinière) rend la pression d'air de la maison négative par rapport à l'air extérieur.

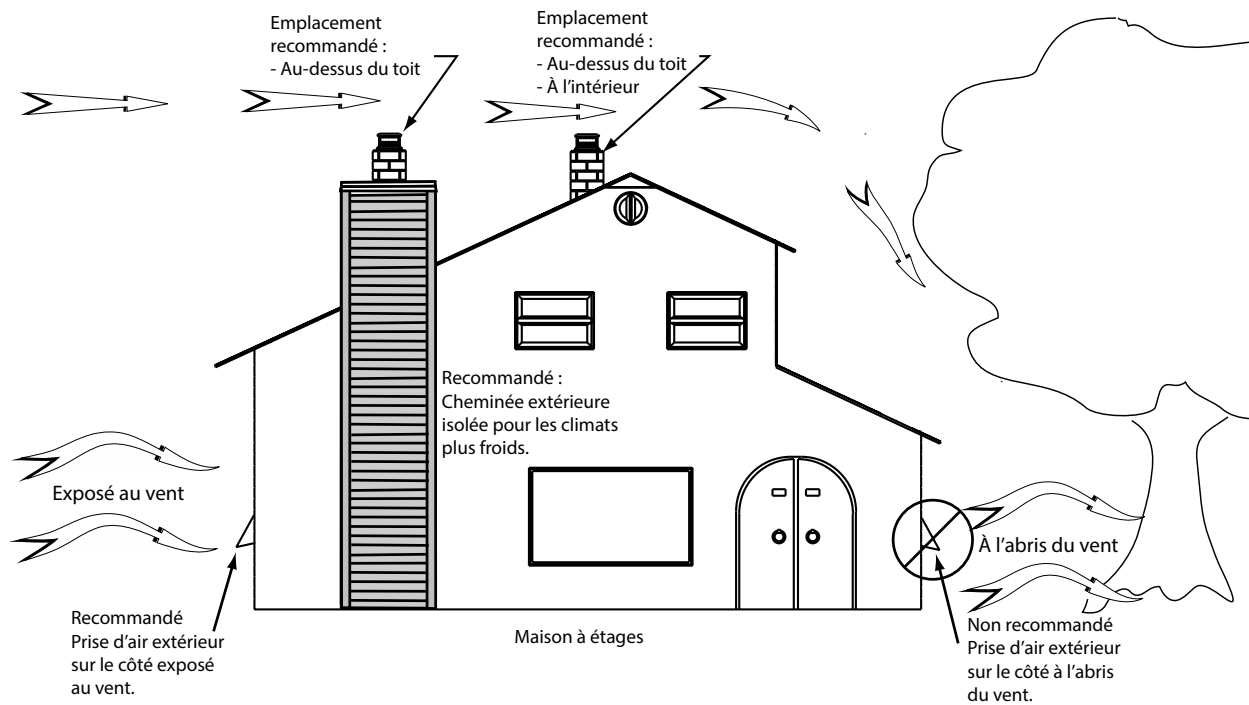


Figure 6: Apport d'air dans les maisons conventionnelles

Si une entrée d'air est installée sur le mur extérieur de la maison, sa pression peut varier par temps venteux. Si des bouffées de fumée sortent du poêle, le conduit d'apport d'air devrait être débranché afin de vérifier si ce dernier constitue la cause du problème.

Dans certaines conditions venteuses, la pression négative près de la grille peut aspirer la fumée chaude du poêle dans le conduit, vers l'extérieur. Vérifier s'il n'y a pas de dépôts de suie sur le conduit d'apport d'air extérieur lors du nettoyage et de l'inspection du système, une fois l'an.

## 8.5 Installation du raccord de cheminée

Le raccord de cheminée est le tuyau à paroi simple ou double, installé entre la buse du poêle et la bague de cheminée.

Les raccords de cheminée à paroi double ont subi des essais et sont homologués. Les règles concernant l'installation se trouvent dans les instructions d'installation du fabricant.

Les raccords de tuyau à paroi simple se vendent dans la plupart des quincailleries et magasins de matériaux de construction. Ils n'ont généralement pas subi d'essais selon une norme précise, ni été homologués. Par conséquent, une série de règles que l'on retrouve dans les codes d'installation pour appareil de chauffage au combustible solide s'appliquent à l'installation de tuyau à paroi simple.

### 8.5.1 Configuration d'installation

La meilleure configuration d'installation est celle qui monte directement du poêle jusqu'à la base de la cheminée sans aucun coude. Les installations droites causeront moins de problèmes, comme les retours de fumée, lorsque la porte est ouverte pour recharger le poêle. Elles sont aussi plus stables et plus faciles à entretenir que les installations comportant des coudes. Il faut éviter autant que possible les sections horizontales de tuyau de fumée parce qu'elles réduisent le tirage de la cheminée.

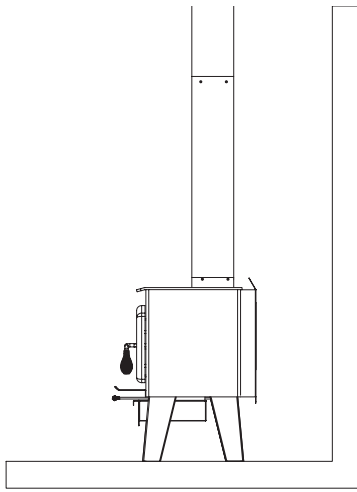


Figure 7: Meilleure

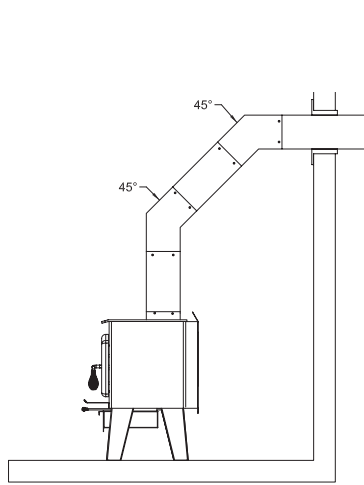


Figure 8: Acceptable

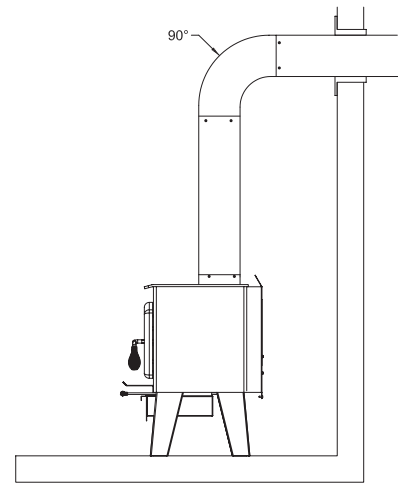


Figure 9: Éviter

### 8.5.2 Règles d'installation

Une mauvaise installation du raccord de cheminée peut provoquer un incendie. Les règles ci-dessous sont basées sur celles que l'on retrouve dans le code d'installation CSA B365. Suivre soigneusement ces instructions d'installation ou celles en vigueur dans la région.

- Longueur maximum de tuyau horizontal : 10' (3 m) incluant les coudes.
- Dégagement minimum par rapport aux matériaux inflammables : 18" (450 mm). Le dégagement minimum peut être réduit de 50%, à 9" (225 mm), si un écran approprié est installé, soit sur le tuyau, soit sur la surface inflammable.
- L'installation doit être aussi courte et droite que possible entre le poêle et la cheminée. Il est préférable d'utiliser deux coudes à 45° plutôt qu'un seul coude à 90°.
- La hauteur minimale hors tout du système de cheminée, mesurée du dessus du poêle au chapeau de la cheminée, doit être d'au moins 12' (3,66 m). Une cheminée trop courte peut ne pas avoir «l'effet de cheminée» nécessaire pour obtenir un tirage adéquat.
- Nombre maximal de coudes à 90° : 2.
- Longueur horizontale maximum sans support : 3' (1 m)
- Les tuyaux de fumée galvanisés ne doivent pas être utilisés parce que leur enduit se vaporise à haute température et produit des gaz dangereux. Utiliser des tuyaux de fumée noirs.
- Les tuyaux de fumée doivent avoir une épaisseur de 24ga au moins.
- Les raccords des tuyaux de fumée doivent se chevaucher sur au moins 1 ¼". (30 mm)
- Chaque raccord de l'installation doit être fixé à l'aide d'au moins trois vis.
- L'installation doit pouvoir prendre de l'expansion : les coudes d'une installation permettent l'expansion; les installations droites doivent comporter un tuyau d'accouplement dont une extrémité doit être sans attache ou encore une section télescopique.
- Pente ascendante minimum vers la cheminée : 1/4" /pieds. (20 mm/m).
- L'une des extrémités de l'installation doit être fixée solidement à la buse du poêle à l'aide de trois vis à métaux et l'autre extrémité fixée solidement à la cheminée.

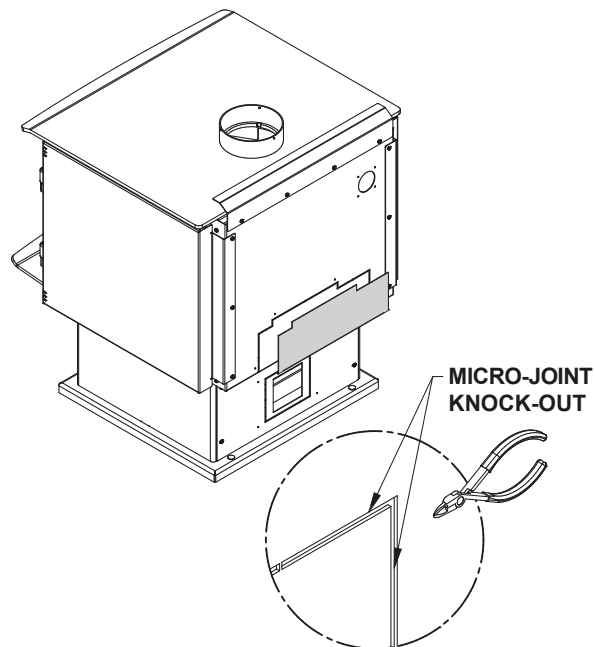


- Il doit être possible de nettoyer les tuyaux, soit par un regard ou en enlevant les tuyaux. L'enlèvement des tuyaux ne doit pas exiger le déplacement du poêle.
- Les parties mâles des sections de tuyau doivent être orientées vers l'appareil de sorte que la cendre et la condensation restent à l'intérieur du tuyau.
- Un tuyau de fumée ne doit jamais traverser un plancher ou un plafond inflammable ou traverser un grenier, un faux comble, un placard ou un vide dissimulé. Lorsque le passage à travers un mur ou une cloison en matériaux combustibles est souhaité, l'installation doit être conforme à la norme CSA B365, code d'installation des appareils à combustibles solides et du matériel connexe.
- Le raccord de cheminée doit être propre et en bon état.

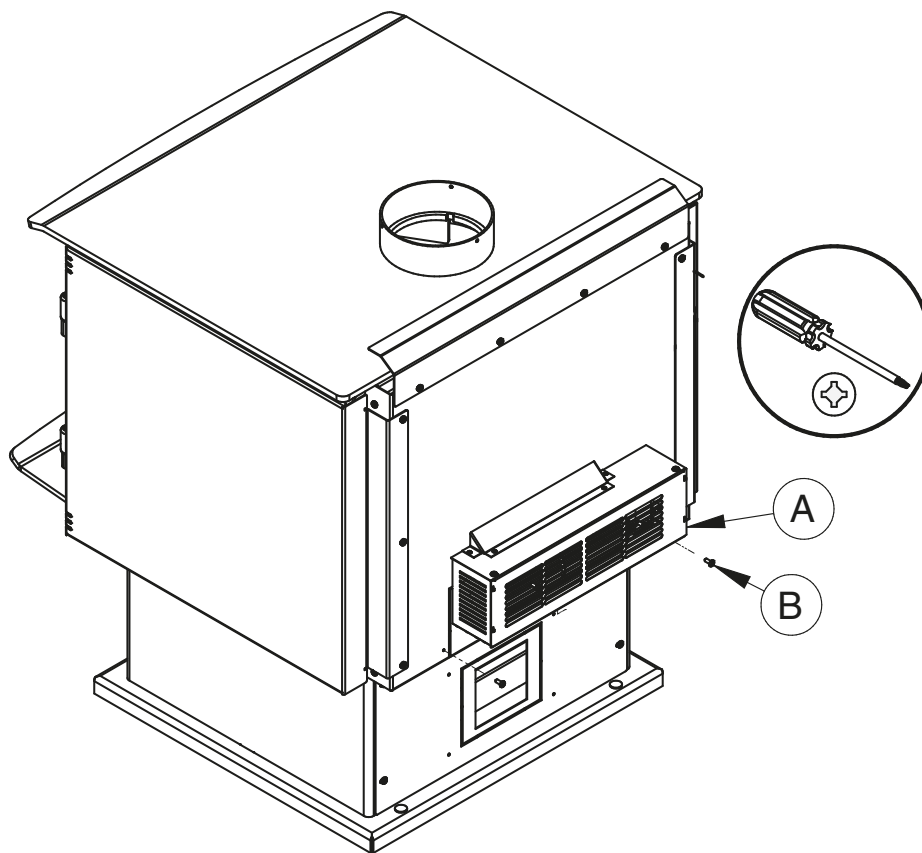


## ANNEXE 1: INSTALLATION DU VENTILATEUR

1. Retirer la plaque à l'arrière du poêle en coupant les microjoints avec des pinces.



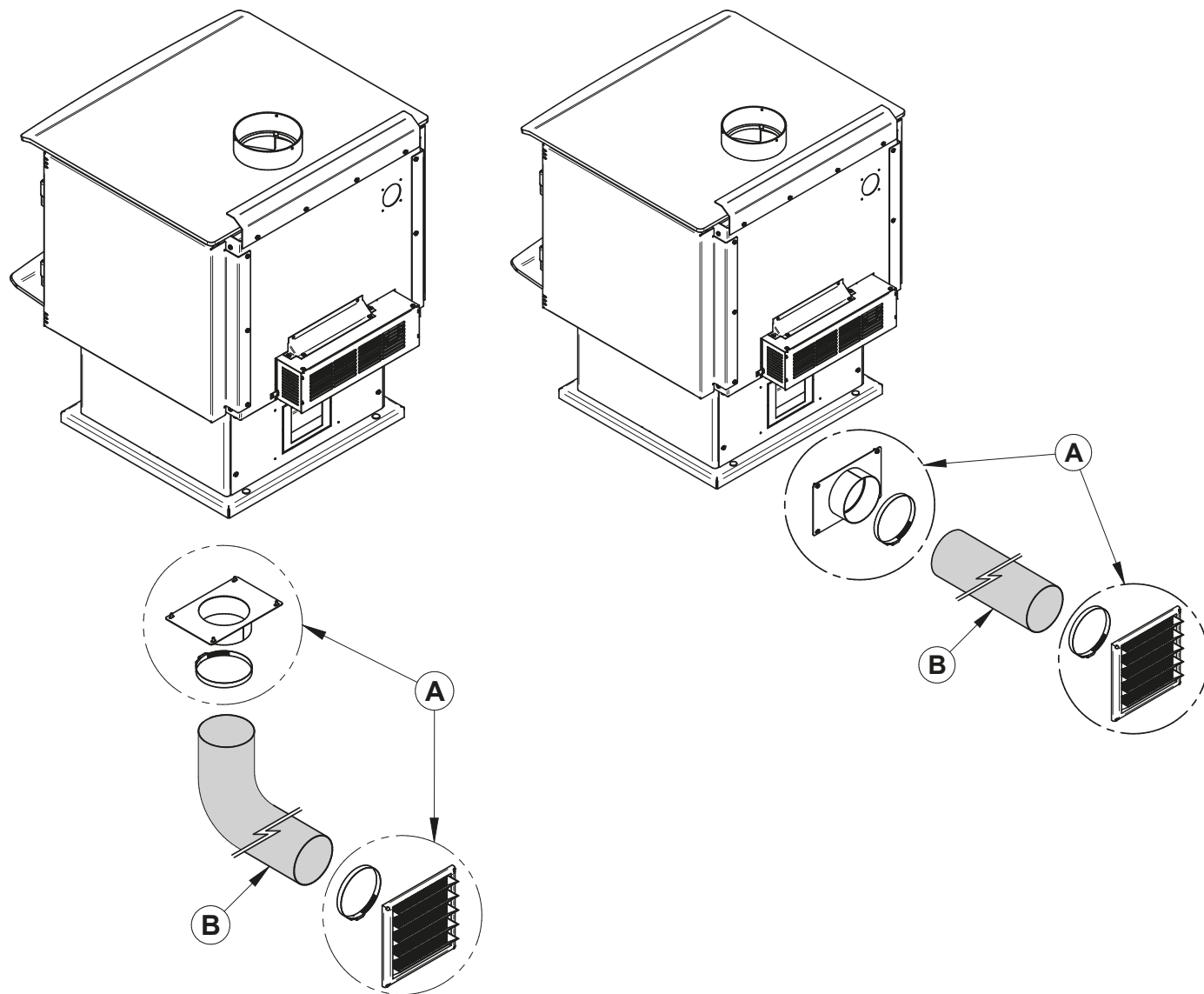
2. Visser le ventilateur **(A)** en place en utilisant les vis **(B)** incluses dans le manuel d'installation. **Le cordon électrique du ventilateur ne doit pas toucher à aucune surface du poêle de façon à éviter les décharges électriques ou les incendies. Le cordon électrique ne doit pas passer sous le poêle.**



## ANNEXE 2: INSTALLATION DE L'ENTRÉE D'AIR FRAIS OPTIONNEL

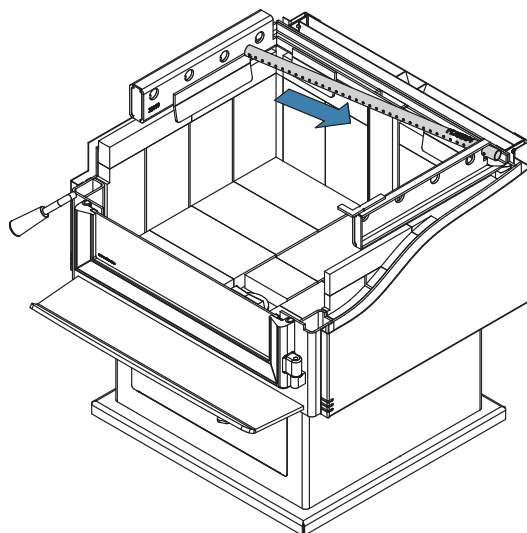
Ce poêle, approuvé maison mobile, requiert l'installation d'un ensemble d'entrée d'air frais (**A**) et d'un tuyau isolé flexible (**B**) de type HVAC (doit être conforme aux normes ULC S110 ou UL 181, classe 0 ou classe 1), vendu séparément. Voir le manuel d'installation de l'ensemble d'entrée d'air frais pour plus de détails.

FRANÇAIS

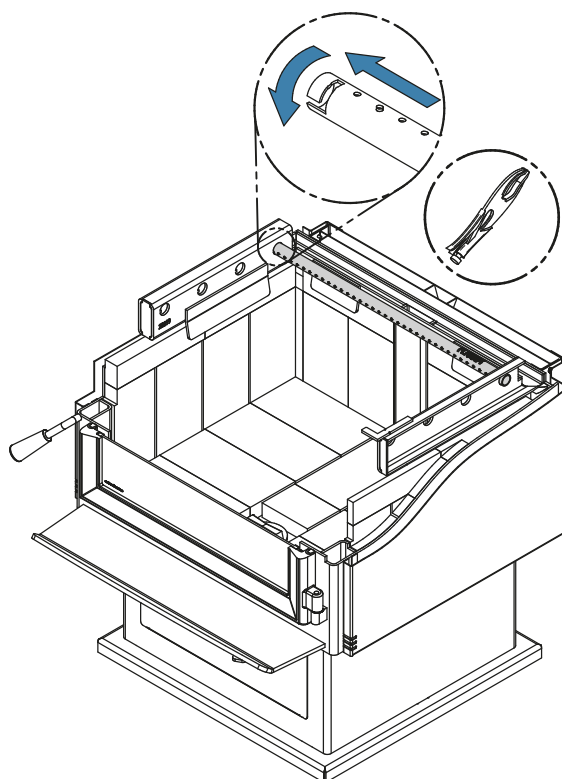


## ANNEXE 3: INSTALLATION DES TUBES D'AIR ET DU COUPE-FEU

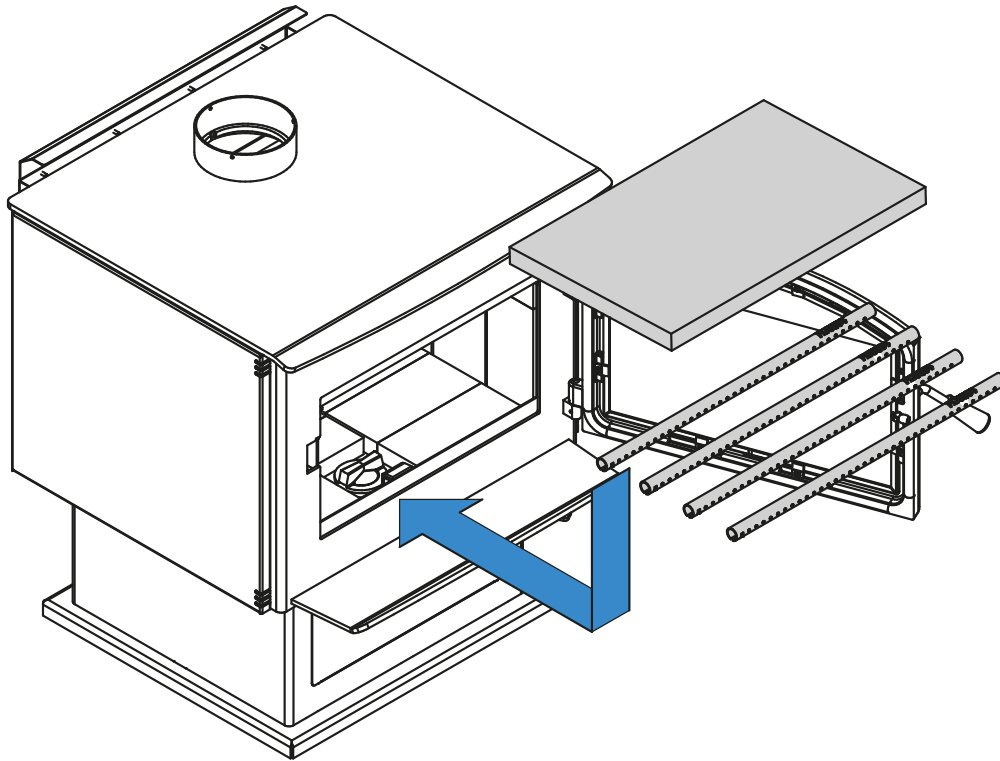
1. En commençant vers l'arrière, incliner et insérer le tube d'air secondaire arrière dans le trou du fond de la canalisation droite. Ensuite, lever et pousser le tube vers la gauche dans le trou correspondant de la canalisation de gauche.



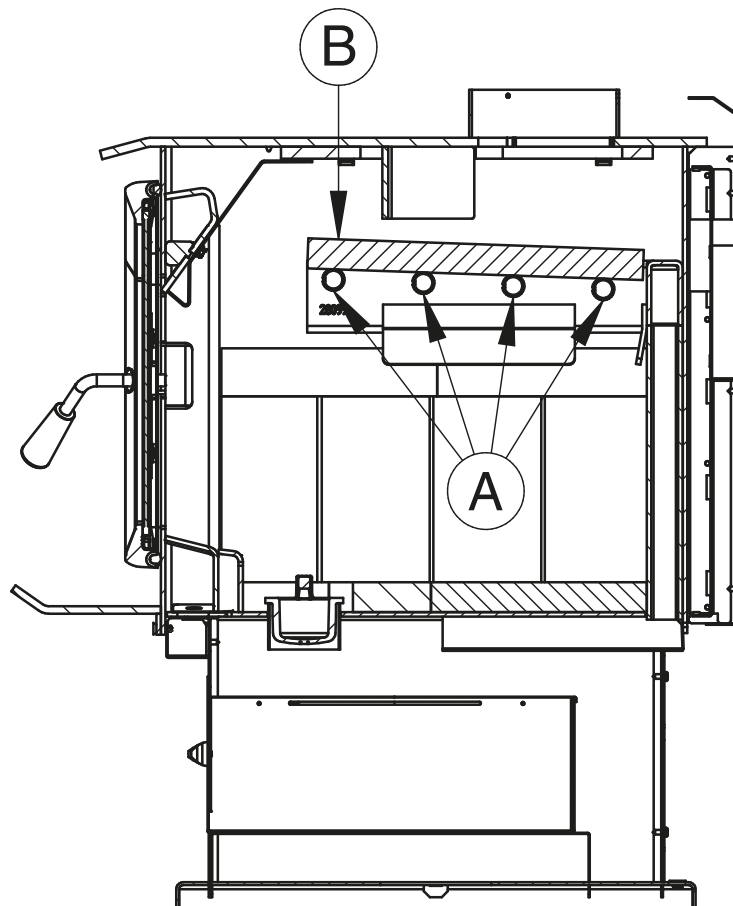
2. Aligner le chemin du tube et la dent dans le trou de la canalisation. Tenir le tube à l'aide d'une pince de serrage et suivre le mouvement décrit dans la figure ci-contre, pour le sécuriser en place. S'assurer que la dent touche le fond du chemin du tube.
3. Installer le coupe-feu
4. Répéter les étapes 1 et 2 pour les autres tubes d'air secondaire.
5. Retirer dans l'ordre inverse.



Prendre note que n'importe quel tube (A) peut être remplacé sans retirer le coupe-feu (B) et que les tubes sont tous identiques.



FRANÇAIS



# GARANTIE À VIE LIMITÉE SBI

La garantie du fabricant ne s'applique qu'à l'acheteur au détail original et n'est pas transférable. La présente garantie ne couvre que les produits neufs qui n'ont pas été modifiés, altérés ou réparés depuis leur expédition de l'usine. Il faut fournir une preuve d'achat (facture datée), le nom du modèle et le numéro de série au détaillant lors d'une réclamation sous garantie.

La présente garantie ne s'applique que pour un usage résidentiel normal. Cette garantie devient invalide si l'appareil est utilisé pour brûler du matériel autre que du bois de chauffage (pour lequel l'appareil n'est pas certifié par l'EPA) et s'il n'est pas utilisé conformément aux instructions du manuel d'utilisation. Les dommages provenant d'une mauvaise utilisation, d'un usage abusif, d'une mauvaise installation, d'un manque d'entretien, d'une surchauffe, d'une négligence, d'un accident pendant le transport, d'une panne de courant, d'un manque de tirage, d'un retour de fumée ou d'une sous-évaluation de la surface de chauffage ne sont pas couverts par la présente garantie. La surface de chauffage recommandée pour un appareil est définie par le fabricant comme sa capacité à conserver une température minimale acceptable dans l'espace désigné en cas de panne de courant.

La présente garantie ne couvre pas les égratignures, la corrosion, la déformation ou la décoloration. Tout défaut ou dommage provenant de l'utilisation de pièces non autorisées ou autres que des pièces originales, annule la garantie. Un technicien qualifié autorisé doit procéder à l'installation en conformité avec les instructions fournies avec le produit et avec les codes du bâtiment locaux et nationaux. Tout appel de service relié à une mauvaise installation n'est pas couvert par la présente garantie.

Le fabricant peut exiger que les produits défectueux lui soient retournés ou que des photos numériques lui soient fournies pour appuyer la réclamation. Les produits retournés doivent être expédiés port payé au fabricant pour étude. Les frais de transport pour le retour du produit à l'acheteur seront payés par le fabricant. Tout travail de réparation couvert par la garantie et fait au domicile de l'acheteur par un technicien qualifié autorisé doit d'abord être approuvé par le fabricant. Tous les frais de pièces et main-d'œuvre couverts par la présente garantie sont limités au tableau ci-dessous.

Le fabricant peut, à sa discrétion, décider de réparer ou remplacer toute pièce ou unité après inspection et étude du défaut. Le fabricant peut, à sa discrétion, se décharger de toutes ses obligations en ce qui concerne la présente garantie en remboursant le prix de gros de toute pièce défectueuse garantie. Le fabricant ne peut, en aucun cas, être tenu responsable de tout dommage extraordinaire, indirect ou consécutif, quelle qu'en soit la nature, qui dépasserait le prix d'achat original du produit. Les pièces couvertes par une garantie à vie sont sujettes à une limite d'un seul remplacement sur la durée de vie utile du produit. Cette garantie s'applique aux produits achetés après le 1<sup>er</sup> mars 2019.

DESCRIPTION	APPLICATION DE LA GARANTIE*	
	PIÈCES	MAIN-D'OEUVRE
Chambre à combustion (soudures seulement) et cadrage de porte en acier coulé (fonte).	À vie	5 ans
Verre céramique (bris thermique seulement**), placage (défaut de fabrication**) et échangeur de chaleur supérieur.	À vie	S.O.
Habillage, écran coupe-chaleur, tiroir à cendres, pattes en acier, piédestal, moulures décoratives (extrusions), coupe-feu en C-Cast**, coupe-feu en vermiculite**, tubes d'air secondaire**, déflecteurs et supports amovibles de la chambre à combustion en acier inoxydable.	7 ans	S.O.
Ensemble de poignée, moulures de vitre et mécanisme de contrôle d'air.	5 ans	3 ans
Pièces amovibles de la chambre à combustion en acier.	5 ans	S.O.
Ventilateur standard ou optionnel, capteurs thermiques, interrupteurs, rhéostats, câblage et électroniques.	2 ans	1 an
Peinture (écaillage**), joints d'étanchéité, isolants, laines céramiques, briques réfractaires et autres options.	1 an	S.O.
Toutes les pièces remplacées au titre de la garantie.	90 jours	S.O.

\*Sous réserve des limitations ci-dessus. \*\*Photos exigées. S.O. Sans Objet

Les frais de main-d'œuvre et de réparation portés au compte du fabricant sont basés sur une liste de taux prédéterminés et ne doivent pas dépasser le prix de gros de la pièce de rechange. Si votre appareil ou une pièce sont défectueux, communiquez immédiatement avec votre détaillant. Avant d'appeler, ayez en main les renseignements suivants pour le traitement de votre réclamation sous garantie :

- Votre nom, adresse et numéro de téléphone;
- La facture et le nom du détaillant;
- La configuration de l'installation;
- Le numéro de série et le nom du modèle tel qu'indiqué sur la plaque signalétique de l'appareil;
- La nature du défaut et tout renseignement important.

**Avant d'expédier votre appareil ou une pièce défectueuse à notre usine, vous devez obtenir un numéro d'autorisation de votre détaillant. Toute marchandise expédiée sans autorisation sera automatiquement refusée et retournée à l'expéditeur.**

Ce manuel peut être téléchargé gratuitement à partir du site web du fabricant. Il s'agit d'un document dont les droits d'auteur sont protégés. La revente de ce manuel est formellement interdite. Le fabricant se réserve le droit de modifier ce manuel de temps à autre et ne peut être tenu responsable de tous problèmes, blessures ou dommages subis suite à l'utilisation d'information contenue dans tout manuel obtenu de sources non autorisées.



Fabricant de poêles International inc.  
250, rue de Copenhague,  
St-Augustin-de-Desmaures (Québec) Canada  
G3A 2H3  
418-908-8002



# Installation and Operation Manual

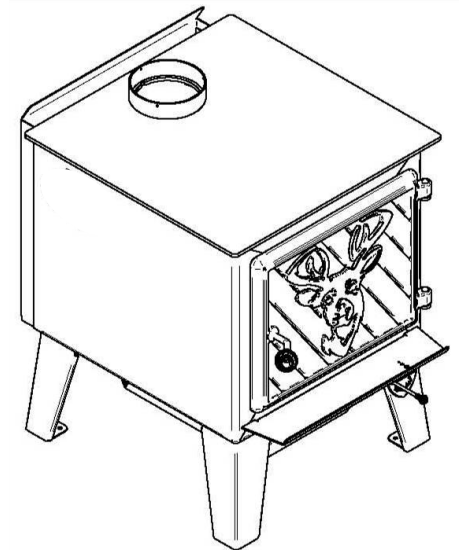
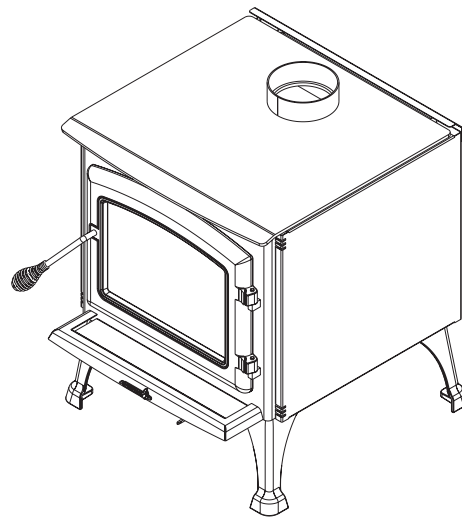
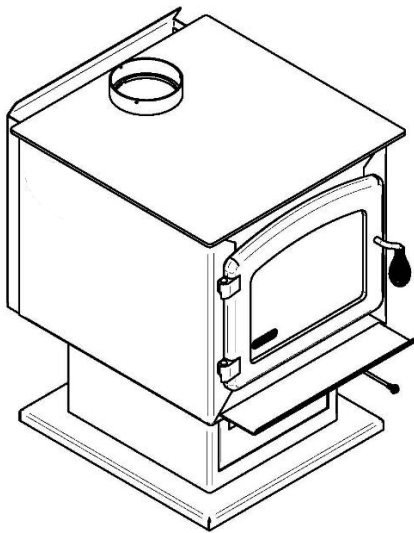
## 3.3 SERIES

Austral III  
Myriad III  
Legend III

Escape 1900  
Black Stag II  
Osburn 3300

Solution 3.3  
Gateway 3300

ENGLISH



US Environmental Protection Agency  
phase II certified wood stove compliant  
with 2020 cord wood standard

**EPA**  
**≤2.5 g/h**

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**





# 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.

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# PART A - OPERATION AND MAINTENANCE

## 1. Safety Information

- **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 manual.
- A smoke detector, a carbon monoxide detector and a fire extinguisher should be installed in the house. Location of detectors should be chosen wisely to avoid false alarm when reloading the appliance. The location of the fire extinguisher should be known by all family members.

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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/](http://www.P65warnings.ca.gov/)

## 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	Austral III, Myriad III, Legend III, Escape 1900, Black Stag II, Osburn 3300, Solution 3.3, Gateway 3300	
Fuel Type	Dry Cordwood	
Combustion Technology	Non-Catalytic	
Nominal firebox volume	3.4 ft <sup>3</sup> (0.096 m <sup>3</sup> )	
Maximum heat output (dry cordwood) <sup>1</sup>	90,000 BTU/h (26.4 kW)	
Overall heat output rate (min. to max.) <sup>2 2</sup>	15,841 BTU/h to 57,041 BTU/h (4.64 kW to 16.72 kW)	
Average overall efficiency <sup>3</sup> Dry cordwood	71.1 % (HHV) <sup>3</sup>	76.6 % (LHV) <sup>4</sup>
Optimum efficiency <sup>5</sup>	78 %	
Average particulate emissions rate <sup>6</sup>	0.95 g/h (EPA / CSA B415.1-10) <sup>7</sup>	
Average CO <sup>8</sup>	61.3 g/h	

<sup>1</sup> The maximum heat output (dry cordwood) is based on a loading density varying between 15 lb/ft<sup>3</sup> and 20 lb/ft<sup>3</sup>. Other performances are based on a fuel load prescribed by the standard. The specified loading density varies between 7 lb/ft<sup>3</sup> and 12 lb/ft<sup>3</sup>. The moisture content is between 19% and 25%.

<sup>2</sup> As measured per CSA B415.1-10 stack loss method.

<sup>3</sup> Higher Heating Value of the fuel.

<sup>4</sup> Lower Heating Value of the fuel.

<sup>5</sup> Optimum overall efficiency at a specific burn rate (LHV).

<sup>6</sup> This appliance is officially tested and certified by an independent agency.

<sup>7</sup> Tested and certified in compliance with CFR 40 part 60, subpart AAA, section 60.534(a)(1)(ii) and ASTM E3053-17

<sup>8</sup> Carbon monoxide.

## 2.2 Specifications

Maximum log length <sup>9</sup>	20 in (508 mm) north-south
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)
Baffle material	C-Cast or Vermiculite
Type of door	Simple, glass with cast iron frame
Type of glass	Ceramic glass
Blower	Included or Optional (up to 100 CFM)
Particulate emission standard <sup>10</sup>	EPA / CSA B415.1-10

## 2.3 Materials

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. It can withstand temperatures above 2,000 °F. It is not considered hazardous waste. Disposal at a waste management center is recommended.

**The 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 waste management center 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 waste management center 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 regular household products. Disposal at a waste management center is recommended.

<sup>9</sup> North-south: ends of the logs visible, East-west: sides of the logs visible.

<sup>10</sup> Tested and certified in compliance with CFR 40 part 60, subpart AAA, section 60.534(a)(1)(ii) and ASTM E3053-17.

## 2.4 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.

## 2.5 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 following section of suggestions on preparing fuelwood and judging its moisture.

### 3. 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.**

#### 3.1 Tree Species

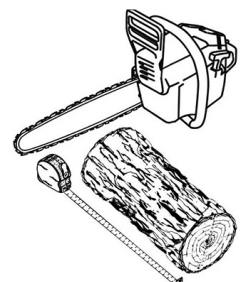
The tree species the firewood is produced from is less important than its moisture content. The main difference in firewood from various tree species is the density of the wood. Hardwoods are denser than softwoods. Homeowners with access to both hardwood and softwood use both types for different purposes.

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. 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.

#### 3.2 Log Length

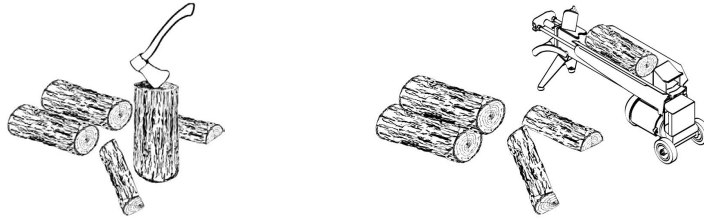
Logs should be cut at least 1" (25 mm) shorter than the firebox so they fit in easily. Pieces that are even slightly too long makes loading the stove very difficult. The most common standard length of firewood is 16" (400 mm).





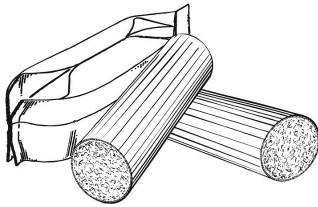
### 3.3 Piece Size

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.

### 3.4 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.

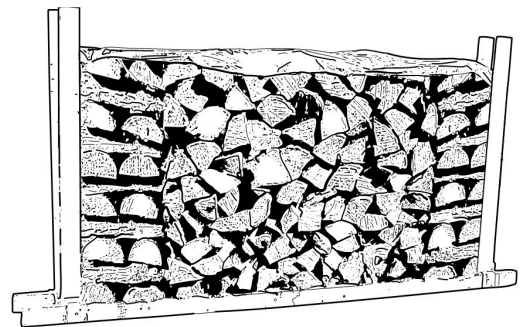
### 3.5 Drying Time

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.

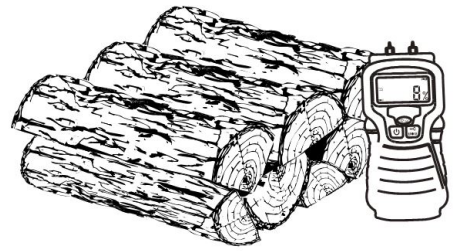
*Here are some facts to consider in estimating drying time:*

- 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;
- 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;
- Firewood with a moisture content of 15% to 20% will allow the stove to reach its highest efficiency.



Firewood is dry enough to burn when:

- Cracks form at the end of logs;
- The wood turns from white or cream colored to grey or yellow;
- Two pieces of wood struck together sounds hollow;
- The face of a fresh cut feels warm and dry;
- The moisture content read by a moisture meter is between 15% to 20%.



## 4. Operating the Stove

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**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 manual.**

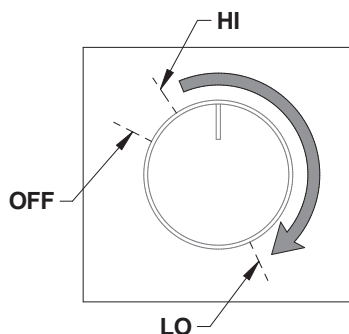
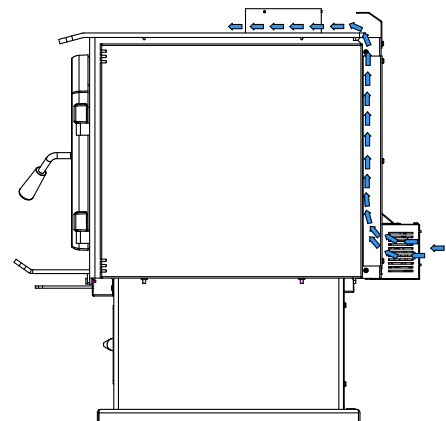
### 4.1 Blower Operation

A blower is included with this stove. The blower can be found in the combustion chamber of the stove and must be installed on the back of the stove. See «[Appendix 1: Blower Installation](#)». The blower is used 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 underneath the stove.



The blower has a variable speed control 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.

A heat sensor is also included. The heat sensor can be found in the combustion chamber of the stove must also be installed at the back of the stove. When the blower is on (position between HI and LO), the heat sensor will make the blower start automatically when the stove is hot enough and will stop it when the stove has cooled down. Therefore, the blower speed control can be left at the desired setting.

## 5. Burning Wood Efficiently

### 5.1 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.

### 5.2 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.

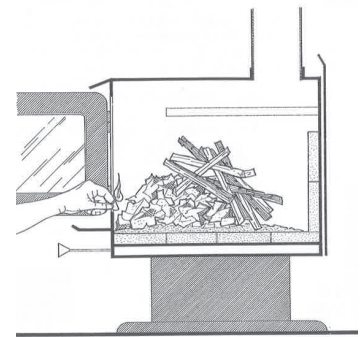


**Never use gasoline, gasoline-type lantern fuel (naphtha), fuel oil, motor oil, kerosene, charcoal lighter fluid, or similar liquids or aerosols to start or 'freshen up' a fire in this wood stove. Keep all such liquids well away from the stove while it is in use.**

*Here are three popular and effective ways to ignite wood fires.*

#### 5.2.1 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.*

#### 5.2.2 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.

### 5.2.3 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.

### 5.2.4 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.

## 5.3 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.

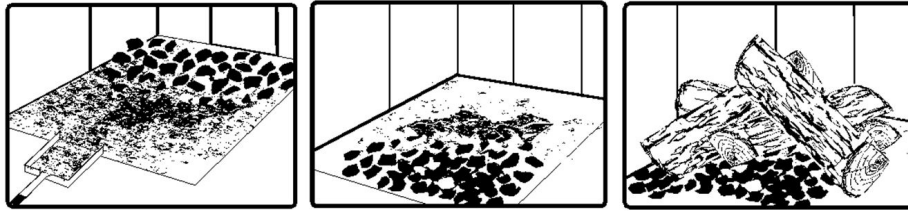
Trying to produce a steady heat output by placing a single log on the fire at regular intervals is not recommended. Always place at least three, and preferably more pieces on the fire at a time so that the heat radiated from one piece helps to ignite the pieces next to it. Each load of wood should provide 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.*

## 5.4 Rekindling a Fire

When the temperature of the room is lower and all that remains is embers, it is time to reload. Most of the remaining embers will be at the back of the firebox. Remove excess ash from the front of the firebox and bring the embers forward before reloading. 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 reloading.

## 5.5 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 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. Ashes almost always contain live embers that can stay hot for days and which release carbon monoxide gas. 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.**

## 5.6 Air Intake Control

Once the firewood, firebox and chimney are hot, air intake can be reduced to achieve a steady burn.

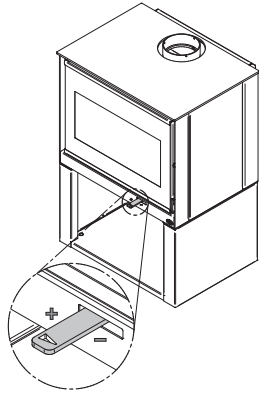


Figure 1: Air Intake Control

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.

## 5.7 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.*

### 5.7.1 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" (80 mm) to 4" (100 mm) 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.



### 5.7.2 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.

### 5.7.3 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.

### 5.7.4 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 space.

### 5.7.5 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.

This kind of load 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. Placed in a compact way, they take a long time before breaking down. They are excellent for low-intensity, long-lasting fires in relatively mild weather.

### 5.7.6 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.

## 6. 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.

To avoid premature deterioration, follow the lighting and reloading procedures in section [«5. Burning Wood Efficiently»](#) and also avoid letting the heater run with the air intake fully open for entire burn cycles.

### 6.1 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. **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.

### 6.2 Refractory Materials and Baffle

Periodically inspect the firebricks or the refractory panels and the baffle for damage. Replace anything that is damaged or broken.

*Operation of the heater with a cracked or missing baffle may cause unsafe temperatures and hazardous conditions and will void the warranty.*

### 6.3 Glass Door

#### 6.3.1 Cleaning

Under normal conditions, the door glass should stay relatively clear. If the firewood is dry enough and the operating instructions in this manual 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.

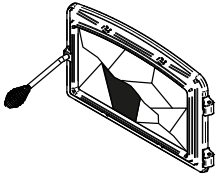
When the stove runs at a low combustion rate, light brown stains may form, especially in the lower corners of the glass. This indicates that the fire has been smoky and some of the smoke has condensed on the glass. It also indicates incomplete combustion of the wood, which also means more smoke emissions 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.**

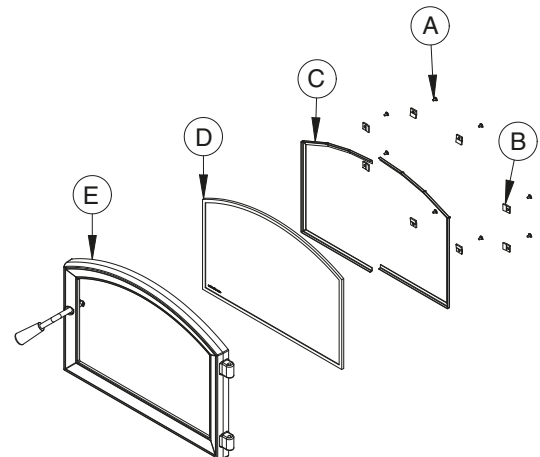
**Do not use the stove if the glass is broken.**

### 6.3.2 Replacement

The glass used is a ceramic glass, 5/32" (4 mm) thick, 18 3/4" x 12 1/2" (476 mm x 248 mm), tested to reach temperatures up to 1400° F. If the glass breaks, it must be replaced with one having the same specification.

To remove or replace the glass **(D)**:

1. Remove the door **(E)** from its hinges and lay it on a soft, flat surface.
2. Remove the screws **(A)**, the 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.

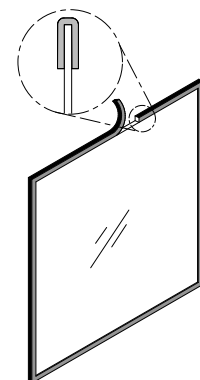


*The two main causes of broken door glass are uneven placement in the door and over-tightening the retaining screws.*

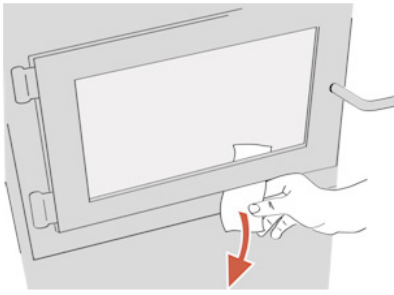
### 6.3.3 Gasket

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. Pinch the gasket onto the glass in a U-shape, all around the glass.



## 6.4 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.

### 6.4.1 Adjustment

The door 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.

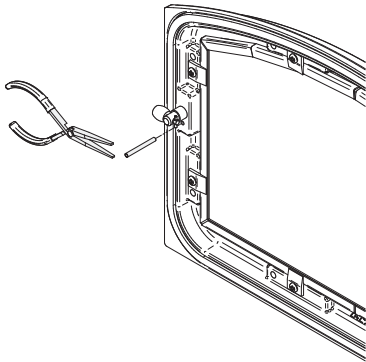


Figure 2: Removing the split pin

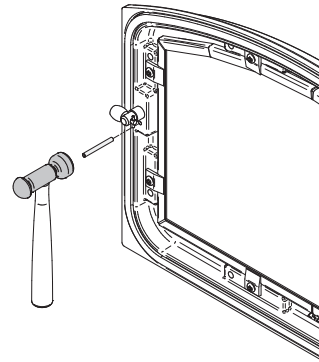
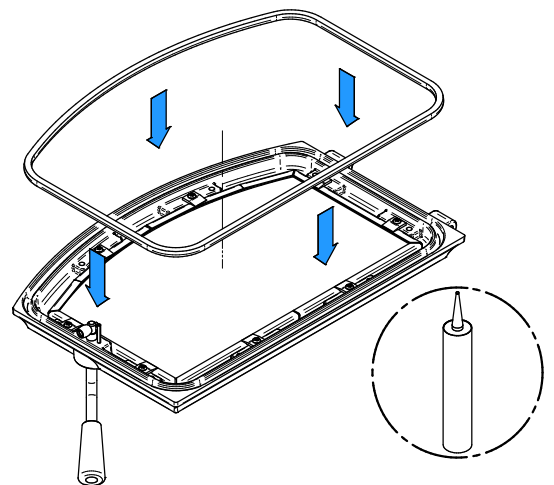


Figure 3: Installing the split pin

### 6.4.2 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 1/2" (10 mm) 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.



## 6.5 Exhaust System

Wood smoke can condense inside the chimney, forming an 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 ( $\frac{1}{8}$ " [3 mm] or more) it should be removed to reduce the risk of a chimney fire.»*

### 6.5.1 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 burner 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.

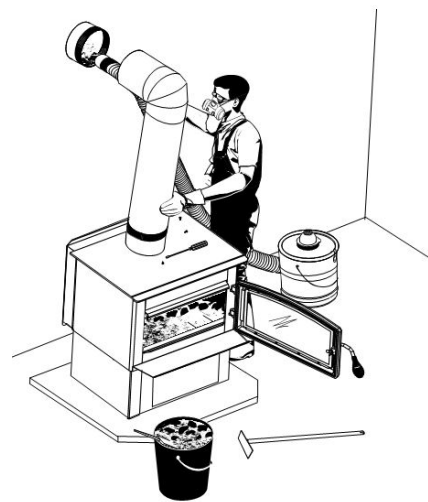
### 6.5.2 Sweeping the Chimney

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 [«Appendix 3: Air Tubes and Baffle Installation»](#) for more details.

### 6.5.3 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.**

## PART B - INSTALLATION

### 7. Safety Information and Standards

- 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.

#### 7.1 Mobile Home

- May be installed in a mobile home. The installation requires a fresh air kit, sold separately.
- **WARNING : DO NOT INSTALL IN THE SLEEPING ROOM.**
- **THE STOVE MUST BE ATTACHED TO THE STRUCTURE OF THE MOBILE HOME.**
- **CAUTION : THE STRUCTURAL INTEGRITY OF THE MOBILE HOME FLOOR, WALL, CEILING AND ROOF MUST BE MAINTAINED.**

#### 7.2 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 103 and ULC S629 or to a code-approved masonry chimney with a flue liner.

### 7.3 Location of the Certification Label

The information given on the certification label 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. Important information about the stove can also 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 since it will be needed to precisely identify the version of the appliance in the event replacement parts or technical assistance is required.

## 8. The Venting System

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.

### 8.1 Suitable Chimneys

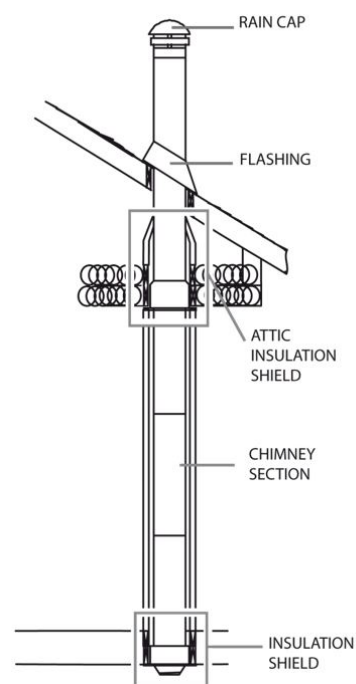
This stove will provide optimum efficiency and performance when connected to a 6" (150 mm) diameter chimney flue system. The connection to a chimney having a diameter of at least 5" (130 mm) (Canada only) or no more than 7" (180 mm) is permitted, if it allows the proper venting of combustion gases and that such application is verified and authorized by a qualified installer. Otherwise, the diameter of the flue should be 6" (150 mm). To be suitable, a factory-built metal chimney must comply with UL 103 HT (U.S.A.) or ULC S629 (Canada).

#### 8.1.1 Factory-Built Metal Chimney

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.

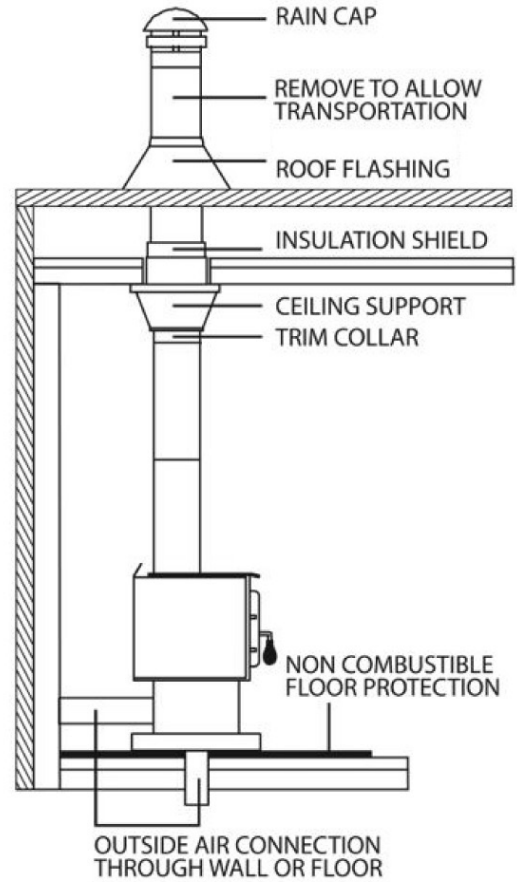


### 8.1.2 Factory-Built Metal Chimney in Mobile Home

For use in a mobile home, this stove is to be connected to a 6" (150 mm) double wall factory built chimney pipe conforming to ULC-S629 or UL 103 HT standards for 650°C Factory-built chimney.

The total length of the flue system should be at least 12' (3,6 m) 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.

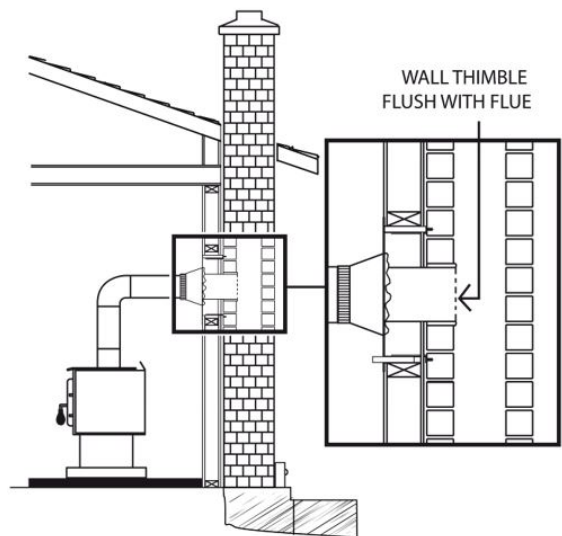


### 8.1.3 Masonry Chimney

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" (150 mm) flue, it should be relined with a suitably listed 6" (150 mm) stainless steel liner.

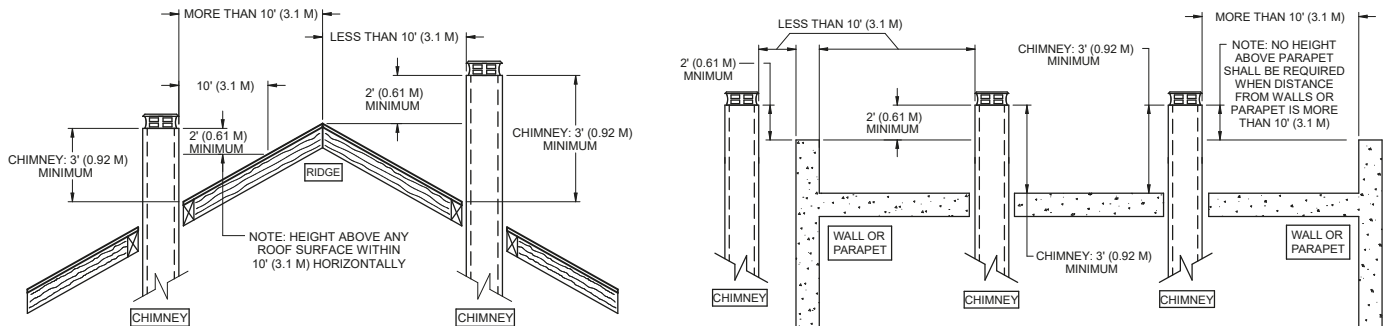
Do not downsize the flue to less than 6" (150 mm) unless the venting system is straight and exceeds 25' (7,6 m) in height. When passing through a combustible wall, the use of an insulated listed thimble is required.





## 8.2 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). The total system height, from the floor the appliance is mounted on to the top of the chimney, should never be less than 15 feet (4.6 m).



## 8.3 Chimney Location

The location of the chimney is crucial for the proper functioning of the appliance. The chimney should be installed within the house rather than up an outside wall and should rise straight up through the tallest part of the house. This installation benefits from being enclosed within the warm house environment, produce stronger draft, accumulate fewer creosote deposits and will be unaffected by cold temperatures or harsh winds.

Outside chimneys will lead to cold back drafting when there is no fire in the stove, slow kindling of new fires, and smoke roll-out when the door is open for loading.

On the other hand, excessive draft will 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.

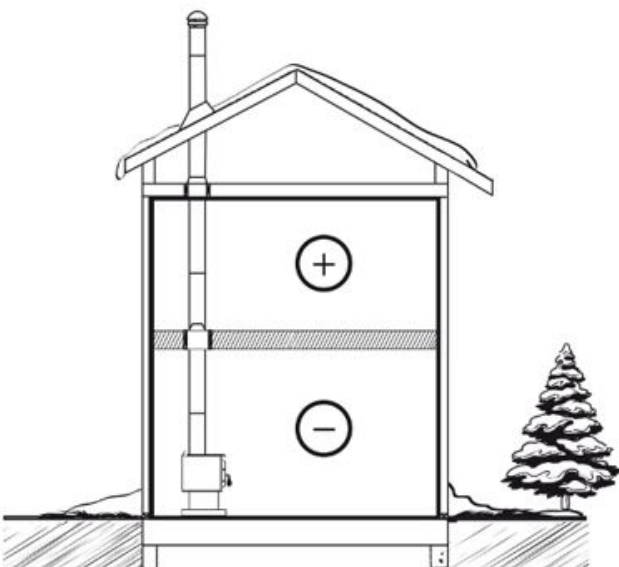


Figure 4: Good System Design

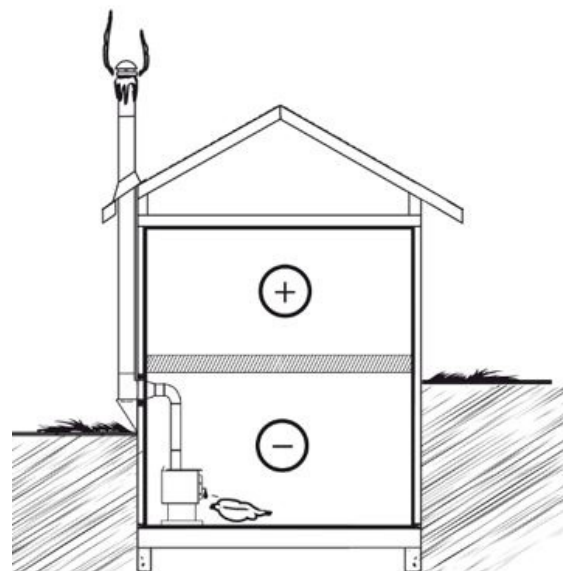


Figure 5: Inferior System Design

## 8.4 Supply of Combustion Air

### 8.4.1 Mobile Home

This stove is approved to be installed in a mobile home. It must therefore 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. The outside termination must have a weather protection cap with a wire mesh. 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 mandatory.

### 8.4.2 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. Almost all 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.

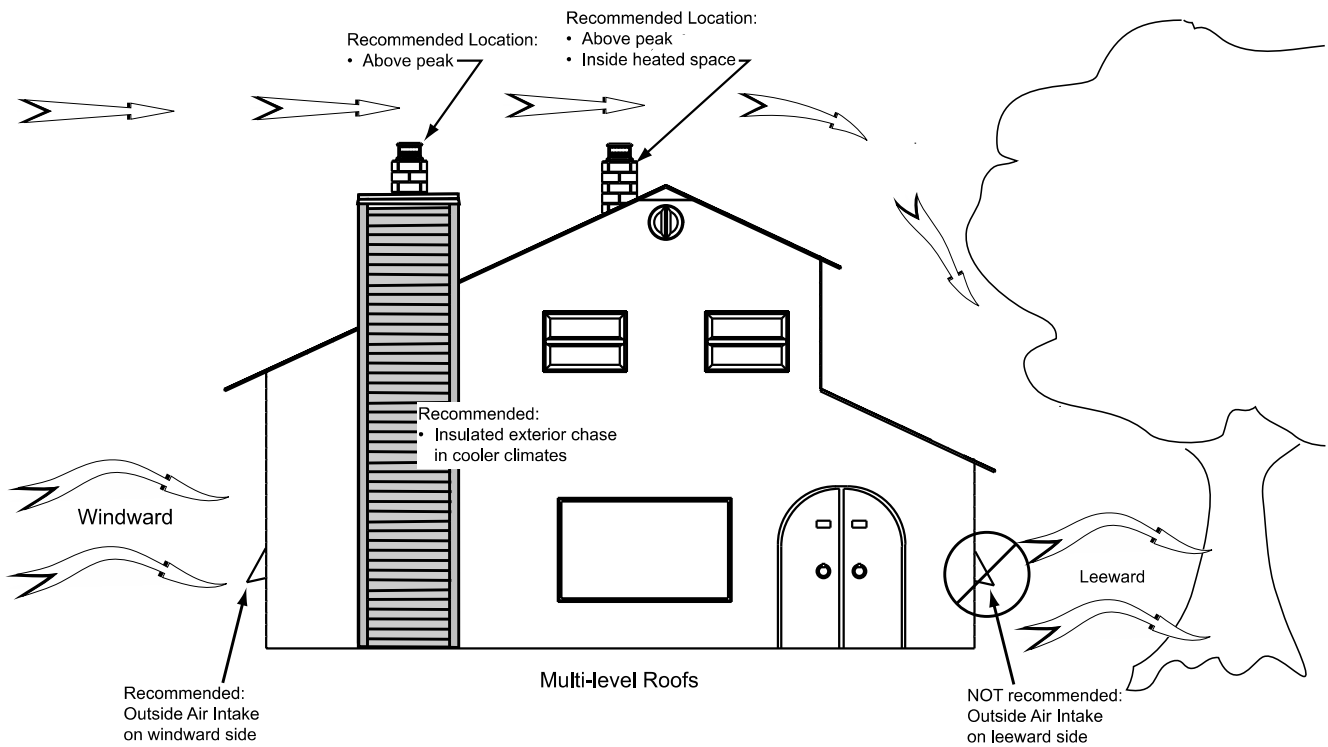


Figure 6: Air supply in conventional houses

If an air intake is installed through the wall of the house, its pressure can vary during windy weather. If smoke puffs from the stove, the air duct should be disconnected to determine if it is the cause of the problem. In some windy conditions, negative pressure near hood may draw hot exhaust gases from the stove to outdoors. Check the outdoor air duct for soot deposits when the full system is cleaned and inspected at least once each year.



## 8.5 Chimney Connector

The chimney connector is the single or double wall pipe installed between the stove flue collar and the chimney breech.

Double wall chimney connectors are tested and certified. The rules concerning installation are found in the manufacturer's installation instructions.

Single wall pipe components are available from most hardware and building supply stores. These components are usually not 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 single wall pipe.

### 8.5.1 Installation configuration

The best installation configuration is the 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.

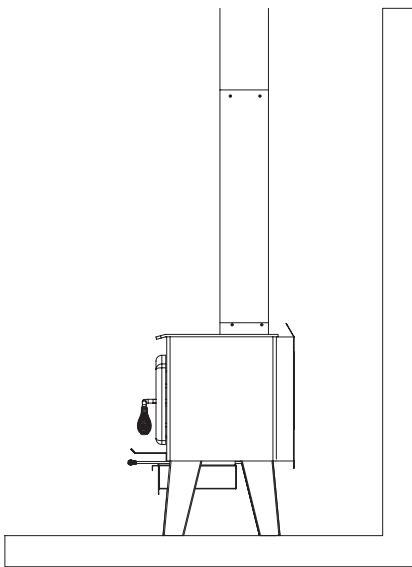


Figure 7: Best

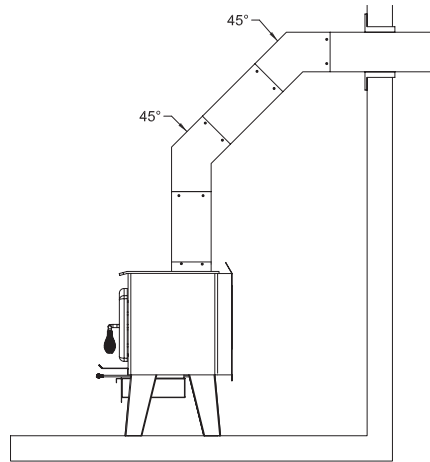


Figure 8: Acceptable

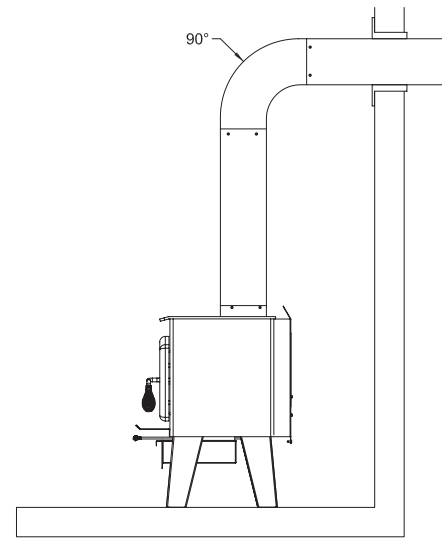


Figure 9: Avoid

### 8.5.2 Installation Rules

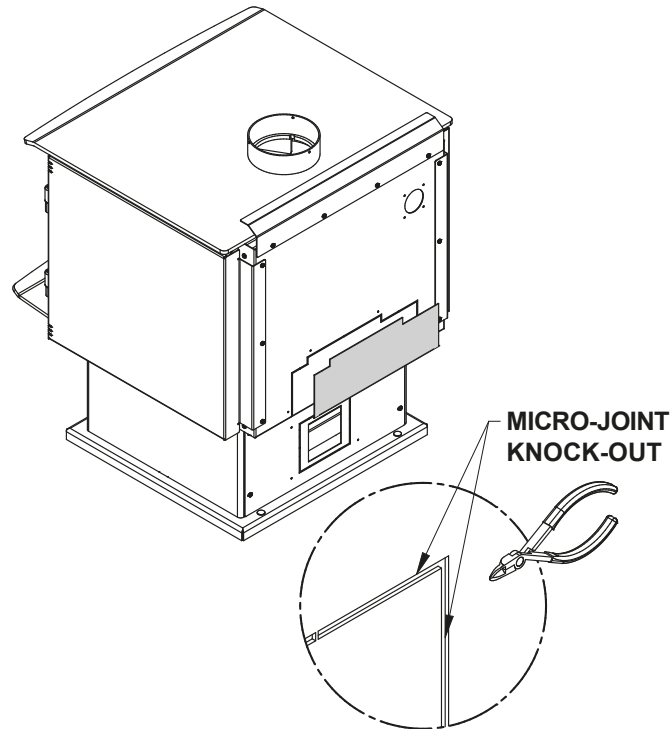
Failure to install the chimney connector properly can result in house fires. The rules below are based on those found in the CSA B365 installation code. Carefully follow these installation instruction rules, or those enforced by the local code.

- Maximum overall length of horizontal pipe: 10' (3 m) including elbows.
- Minimum clearance from combustible material: 18" (450 mm). The minimum clearance may be reduced by 50%, to 9" (225 mm) if proper heat shield 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° elbows is preferable to a single 90° elbow.
- 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' (3.66 m). A chimney which is too short may lack the "tunnel effect" required to obtain a proper draft.
- Maximum number of 90° elbows: 2.
- Maximum unsupported horizontal length: 3' (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 at least 1 ¼" (30 mm).
- Each joint in the assembly must be fastened with at least three screws.
- The installation must allow 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 ashes 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.
- The chimney connector must be clean and in good condition.

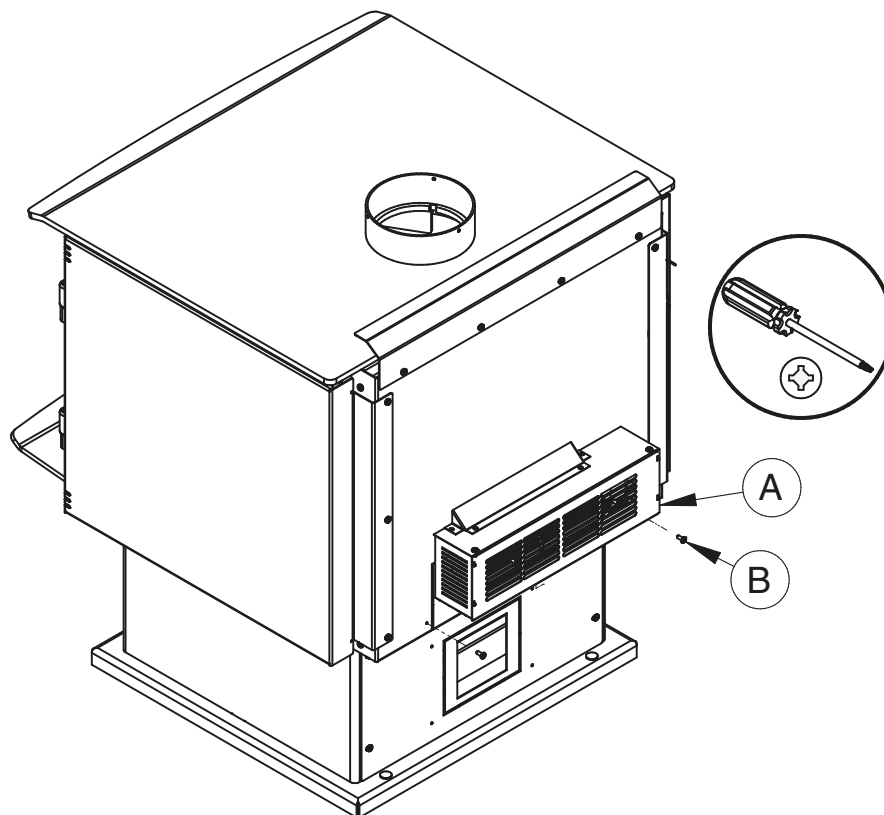
## APPENDIX 1: BLOWER INSTALLATION

1. Remove the backplate by cutting the knockouts with pliers.



2. Screw the blower (A) in place using the screws (B) included in the installation manual.

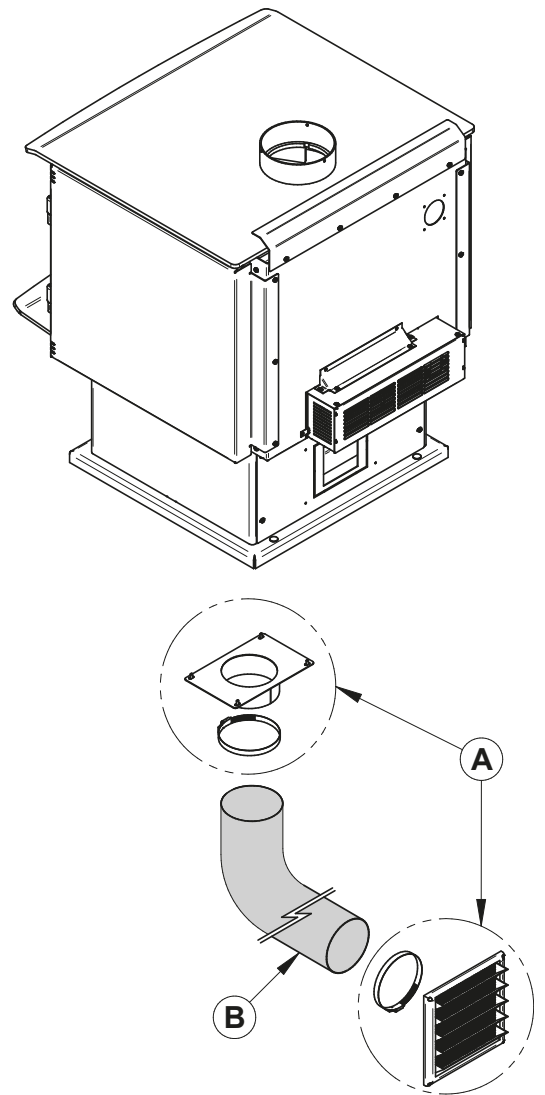
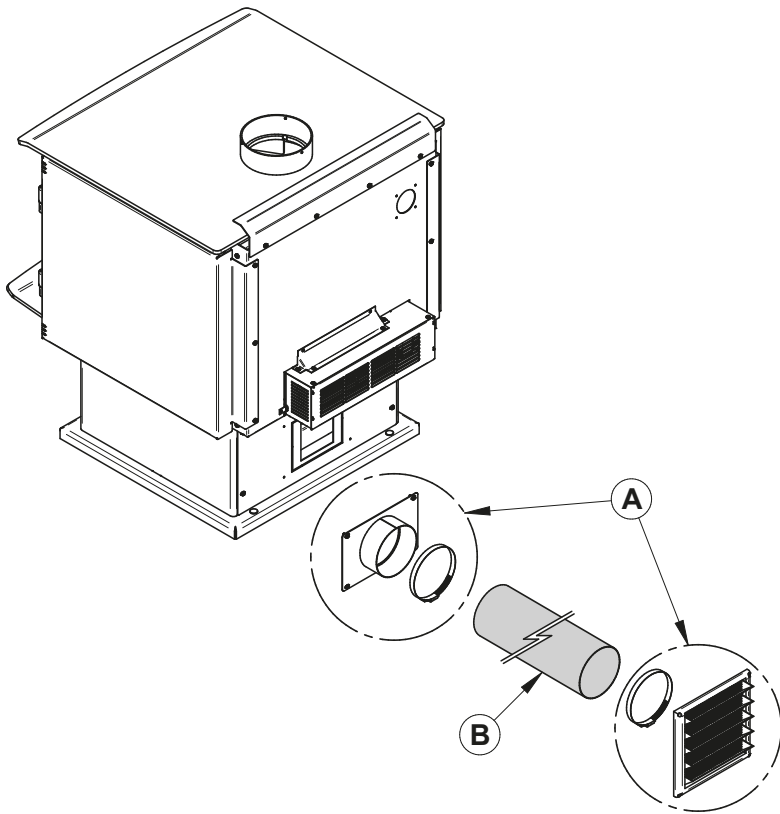
**Ensure that the blower's power cord is not in contact with any surface of the stove to prevent electrical shock or fire damage. Do not run the power cord beneath the stove.**



## APPENDIX 2: OPTIONAL FRESH AIR INTAKE KIT INSTALLATION

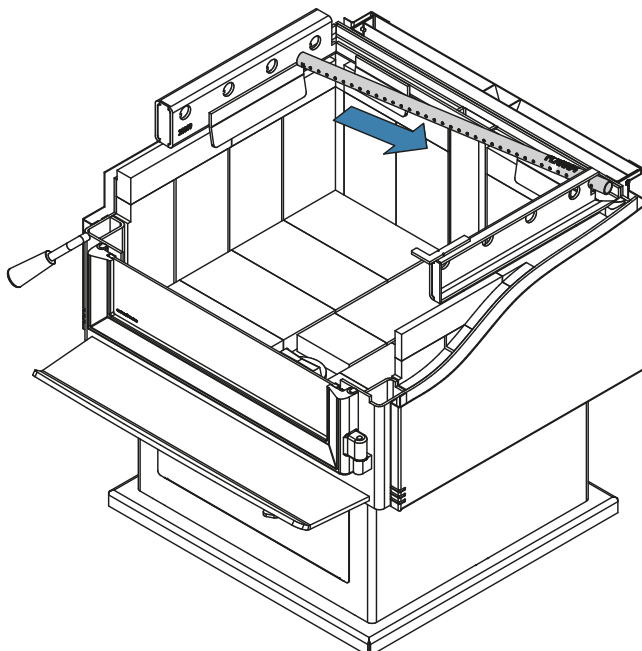
This mobile home approved stove requires the installation of a fresh air intake kit **(A)** and an insulated fresh air intake pipe (HVAC type, must meet ULC S110 or UL 181 class 0 or class 1) **(B)**, sold separately. Refer to air intake kit installation instructions for more details.

ENGLISH

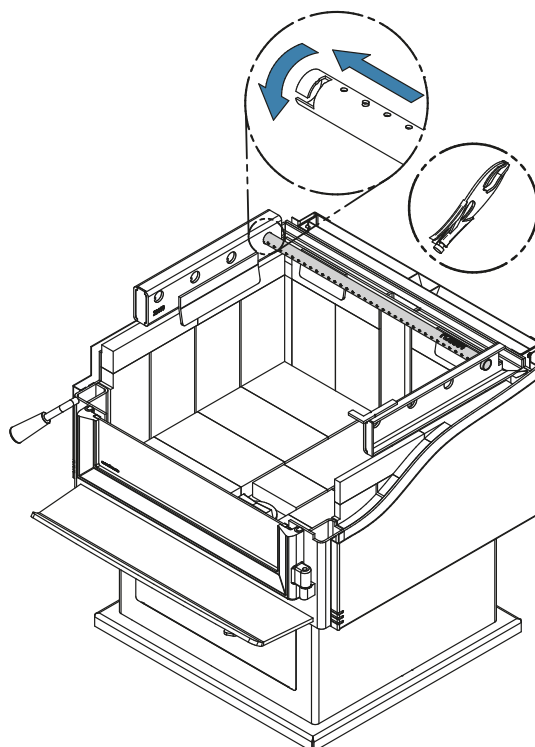


## APPENDIX 3: AIR TUBES AND BAFFLE INSTALLATION

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.

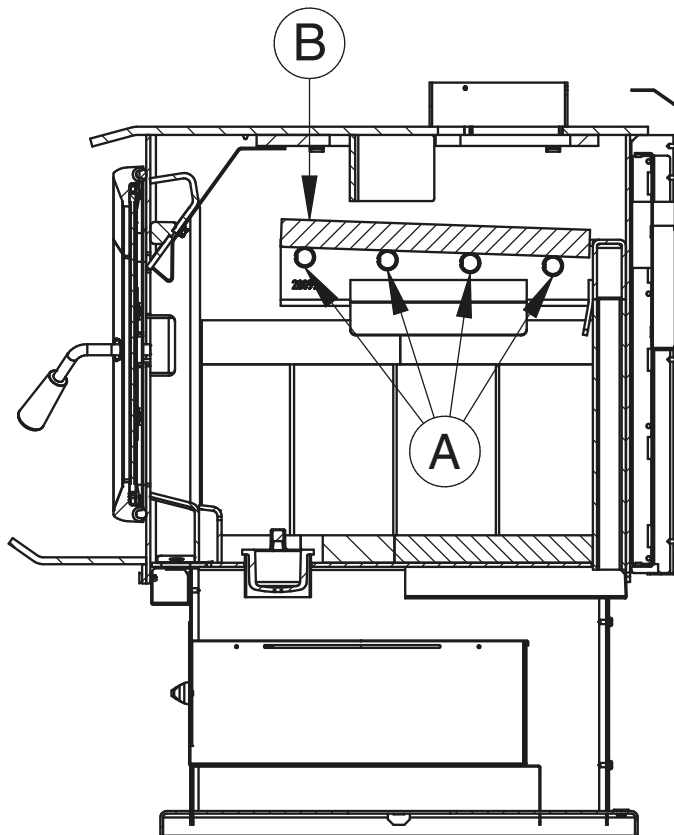
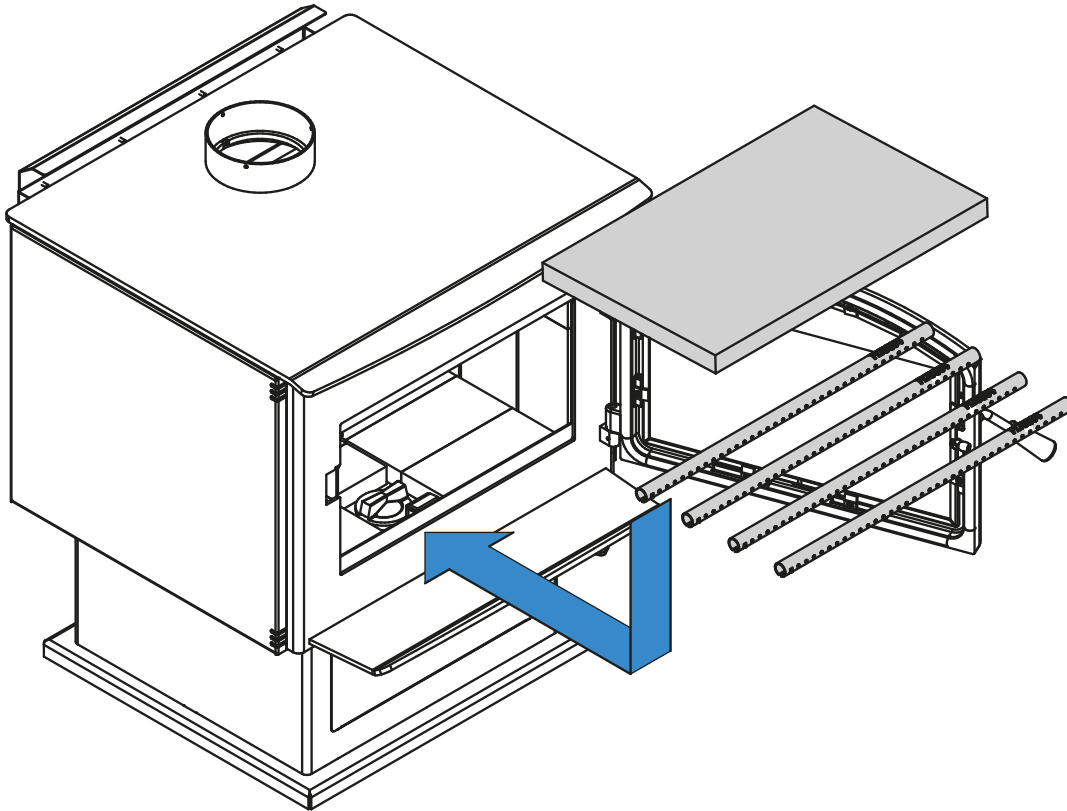


2. Align the notch in the left end of the tube with the key of the left air channel hole. Using a « Wise grip » hold the tube and lock it in place by turning the tube as shown. Make sure the notch reaches the end of the key way.
3. Put the baffle in place.
4. Repeat steps 1 and 2 for the three other tubes.
5. To remove the tubes use the above steps in reverse order.



Note that secondary air tubes (A) can be replaced without removing the baffle board (B) and that all tubes are identical.

ENGLISH



# SBI 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 the factory. Proof of purchase (dated bill of sale), model name and serial number must be supplied when making any warranty claim to the dealer.

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 underestimated 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 the 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 1<sup>st</sup> 2019.

DESCRIPTION	WARRANTY APPLICATION*	
	PARTS	LABOUR
Combustion chamber (welds only) and cast iron door frame.	Lifetime	5 years
Ceramic glass**, plating (manufacturing defect**) and convector air mate.	Lifetime	N/A
Surrounds, heat shields, ash drawer, steel legs, pedestal, trims (aluminum extrusions), C-Cast baffle**, vermiculite baffle**, secondary air tubes**, removable stainless steel combustion chamber, deflectors and supports.	7 years	N/A
Handle assembly, glass retainers and air control mechanism.	5 years	3 years
Removable carbon steel combustion chamber components.	5 years	N/A
Standard and optional blower, heat sensors, switches, rheostat, wiring and electronics.	2 years	1 year
Paint (peeling**), gaskets, insulation, ceramic fiber blankets, firebricks and other options.	1 year	N/A
All parts replaced under the warranty.	90 days	N/A

\*Subject to limitations above. \*\*Picture required.

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 parts.

Shall your unit or a component be defective, contact immediately your 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 dealer. Any merchandise shipped to our plant without authorization will be refused automatically and returned to the sender.***

This document is available for free download on the manufacturer's website. It is a copyrighted document. Resale is strictly prohibited. The manufacturer may update this document from time to time and cannot be responsible for problems, injuries, or damages arising out of the use of information contained in any document obtained from unauthorized sources.



Stove Builder International inc.  
250, De Copenhague street,  
St-Augustin-de-Desmaures (Québec), Canada  
G3A 2H3  
418-908-8002





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:

**Intertek**  
Sept./Sept. 2019  
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)

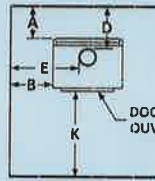
**LISTED SOLID FUEL BURNING APPLIANCE**

**POÊLE À COMBUSTIBLE SOLIDE HOMOLOGUÉ**

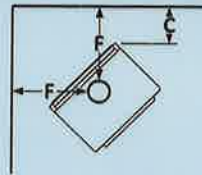
**MODEL / MODÈLE :**

**AUSTRAL III**

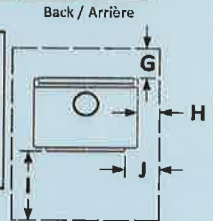
Serial Number / No. de Série: **1**



CANADA



U.S.A.



Back / Arrière

**Clearances to combustibles / Dégagements aux combustibles**

CANADA		U.S.A.		Protection de plancher/Floor protection	
Single wall connector Tuyau à paroi simple	Double wall connector Tuyau à paroi double	Single wall connector Tuyau à paroi simple	Double wall connector Tuyau à paroi double	CANADA	U.S.A.
A: 13.25 in./po. (337 mm)	A: 6 in./po. (152 mm)	A: 13 in./po. (330 mm)	A: 6 in./po. (152 mm)	G: 8 in./po. (203 mm)	I: 16 in./po. (406 mm)
B: 14 in./po. (356 mm)	B: 14 in./po. (356 mm)	B: 14 in./po. (356 mm)	B: 14 in./po. (356 mm)	H: 8 in./po. (203 mm)	J: 8 in./po. (203 mm)
C: 7.25 in./po. (184 mm)	C: 7 in./po. (178 mm)	C: 7.25 in./po. (184 mm)	C: 7 in./po. (178 mm)	I: 18 in./po. (457 mm)	K: 36 in./po. (914 mm)
D: 18 in./po. (457 mm)	D: 10.75 in./po. (273 mm)	D: 17.75 in./po. (451 mm)	D: 10.75 in./po. (273 mm)	J: 48 in./po. (1219 mm)	
E: 24.875 in./po. (632 mm)	E: 24.875 in./po. (632 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)	F: 18 in./po. (457 mm)	F: 17.75 in./po. (451 mm)		
Floor-ceiling/plancher-plafond: 84 in./po. (213cm)					

\* 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 fabricant 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 desservant 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 crésote 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'installations.
- 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 : 0.95 g/h**

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.p65warnngs.ca.gov](http://www.p65warnngs.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  
03/09/2019 (# test)



Fabricant de poêles international  
Stove Builder International

Fabriqué à St-Augustin-de-Desmaures (Qc), Canada  
03/09/2019 (# test)

27811



Intertek  
Sept./Sept. 2019  
Control number: 4002461

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  
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LISTED SOLID FUEL BURNING  
APPLIANCE

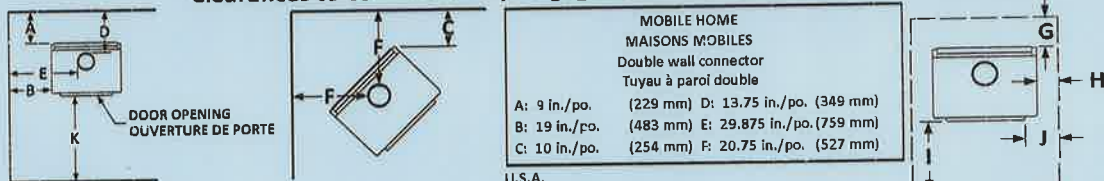
POÊLE À COMBUSTIBLE SOLIDE  
HOMOLOGUÉ

MODEL / MODÈLE :

BLACK STAG II

Serial Number / No. de Série: 1

Clearances to combustibles / Dégagements aux combustibles



CANADA		U.S.A.		CANADA		U.S.A.	
Single wall connector Tuyau à paroi simple	Double wall connector Tuyau à paroi double	Single wall connector Tuyau à paroi simple	Double wall connector Tuyau à paroi double	Protection de plancher/Floor protection			
A: 13.25 in./po. (337 mm)	A: 6 in./po. (152 mm)	A: 13 in./po. (330 mm)	A: 6 in./po. (152 mm)	G: 8 in./po. (203 mm)	I: 16 in./po. (406 mm)		
B: 14 in./po. (356 mm)	B: 14 in./po. (356 mm)	B: 14 in./po. (356 mm)	B: 14 in./po. (356 mm)	H: 8 in./po. (203 mm)	J: 8 in./po. (203 mm)		
C: 7.25 in./po. (184 mm)	C: 7 in./po. (178 mm)	C: 7.25 in./po. (184 mm)	C: 7 in./po. (178 mm)	I: 18 in./po. (457 mm)	K: 36 in./po. (914 mm)		
D: 18 in./po. (457 mm)	D: 10.75 in./po. (273 mm)	D: 17.75 in./po. (451 mm)	D: 10.75 in./po. (273 mm)	J: 24.875 in./po. (632 mm)	K: 48 in./po. (1219 mm)		
E: 24.875 in./po. (632 mm)	E: 24.975 in./po. (632 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)	F: 18 in./po. (457 mm)	F: 17.75 in./po. (451 mm)				
Floor-ceiling/plancher-plafond: 84 in./po. (213cm)		* 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 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 conditions 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 fabricant 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 crésote 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 inconsistante par rapport au manuel de l'utilisateur consiste en 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 : 0.95 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  
03/09/2019 (# test)



Fabricant de poêles international  
Stove Builder International

Fabriqué à St-Augustin-de-Desmaures (Qc), Canada  
03/09/2019 (# test)

27809





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STANDARDS / NORMES D'ESSAI:

**Intertek**  
Sept./Sept. 2019  
Control number: 4002461

Certified to/Certifié selon CSA 8415.1-10  
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**LISTED SOLID FUEL BURNING APPLIANCE**

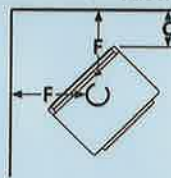
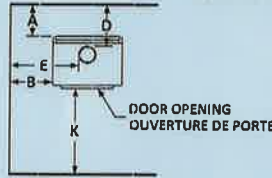
**POÊLE À COMBUSTIBLE SOLIDE HOMOLOGUÉ**

**MODEL / MODÈLE :**

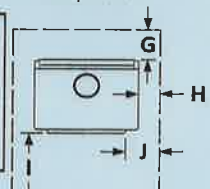
**ESCAPE 1900**

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)



CANADA		U.S.A.		Protection de plancher/Floor protection	
Single wall connector Tuyau à paroi simple	Double wall connector Tuyau à paroi double	Single wall connector Tuyau à paroi simple	Double wall connector Tuyau à paroi double	CANADA	U.S.A.
A: 13.25 in./po. (337 mm)	A: 6 in./po. (152 mm)	A: 13 in./po. (330 mm)	A: 6 in./po. (152 mm)	G: 8 in./po. (203 mm)	I: 16 in./po. (406 mm)
B: 14 in./po. (356 mm)	B: 14 in./po. (356 mm)	B: 14 in./po. (356 mm)	B: 14 in./po. (356 mm)	H: 8 in./po. (203 mm)	J: 8 in./po. (203 mm)
C: 7.25 in./po. (184 mm)	C: 7 in./po. (178 mm)	C: 7.25 in./po. (184 mm)	C: 7 in./po. (178 mm)	I: 18 in./po. (457 mm)	K: 36 in./po. (914 mm)
D: 18 in./po. (457 mm)	D: 10.75 in./po. (273 mm)	D: 17.75 in./po. (451 mm)	D: 10.75 in./po. (273 mm)	K: 48 in./po. (1219 mm)	
E: 24.875 in./po. (632 mm)	E: 24.875 in./po. (632 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)	F: 18 in./po. (457 mm)	F: 17.75 in./po. (451 mm)		
Floor-ceiling/plancher-plafond: 84 in./po. (213cm)		* See owner's manual for other clearances with lowered ceiling/ voir manuel d'installation pour autres dégagements avec plafond abaissé			

**PREVENT HOUSE FIRES**

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- 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 fabricant 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. Préparez 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 crésote peut être rapide.
- Remplacer la vitre seulement avec un verre de céramique.
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- 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 inconsistante 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 en bois.

Weighted average emission rate / Moyenne pondérée des émissions : 0.35 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

03/09/2019

(# test)



Fabricant de poêles international  
Stove Builder International

Fabriqué à St-Augustin-de-Desmaures (Qc), Canada

03/09/2019

(# test)

27803



**Intertek**

Sept./Sept. 2019

Control number: 4002461

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 APPLIANCE**

**POÊLE À COMBUSTIBLE SOLIDE HOMOLOGUÉ**

**MODEL / MODÈLE :**

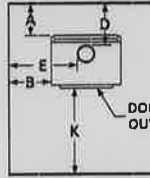
**GATEWAY 3300**

Serial Number

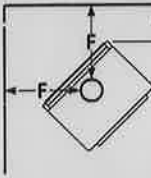
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No. de Série

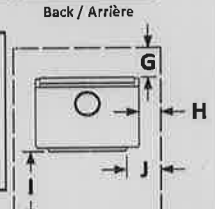
**Clearances to combustibles / Déagements aux combustibles**



DOOR OPENING  
OUVERTURE DE PORTE



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		U.S.A.		Protection de plancher/Floor protection	
Single wall connector Tuyau à paroi simple	Double wall connector Tuyau à paroi double	Single wall connector Tuyau à paroi simple	Double wall connector Tuyau à paroi double	CANADA	U.S.A.
A: 13.25 in./po. (337 mm)	A: 6 in./po. (152 mm)	A: 13 in./po. (330 mm)	A: 6 in./po. (152 mm)	G: 8 in./po. (203 mm)	I: 16 in./po. (406 mm)
B: 14 in./po. (356 mm)	B: 14 in./po. (356 mm)	B: 14 in./po. (356 mm)	B: 14 in./po. (356 mm)	H: 8 in./po. (203 mm)	J: 8 in./po. (203 mm)
C: 7.25 in./po. (184 mm)	C: 7 in./po. (178 mm)	C: 7.25 in./po. (184 mm)	C: 7 in./po. (178 mm)	I: 18 in./po. (457 mm)	K: 36 in./po. (914 mm)
D: 18 in./po. (457 mm)	D: 10.75 in./po. (273 mm)	D: 17.75 in./po. (451 mm)	D: 10.75 in./po. (273 mm)	J: 18 in./po. (457 mm)	
E: 24.875 in./po. (632 mm)	E: 24.875 in./po. (632 mm)	E: 24.875 in./po. (632 mm)	E: 24.875 in./po. (632 mm)	K: 48 in./po. (1219 mm)	
F: 18 in./po. (457 mm)	F: 17.75 in./po. (451 mm)	F: 18 in./po. (457 mm)	F: 17.75 in./po. (451 mm)		
Floor-ceiling/plancher-plafond: 84 in./po. (213cm)		* See owner's manual for other clearances with lowered ceiling/ voir manuel d'installation pour autres déagements 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.

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 : 0.95 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

03/09/2019

(# test)



SINCE 1932

Fabriqué à St-Augustin-de-Desmaures (Qc), Canada

03/09/2019

(# test)

27813



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:

Intertek

Sept./Sept. 2019

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)

LISTED SOLID FUEL BURNING APPLIANCE

POÊLE À COMBUSTIBLE SOLIDE HOMOLOGUÉ

MODEL / MODÈLE :

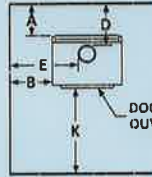
LEGEND III

Serial Number

No. de Série

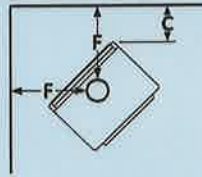
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Clearances to combustibles / Dégagements aux combustibles



CANADA

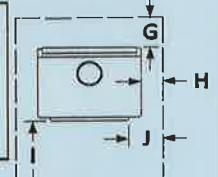
Single wall connector Tuyau à paroi simple	Double wall connector Tuyau à paroi double
A: 13.25 in./po. (337 mm)	A: 6 in./po. (152 mm)
B: 14 in./po. (356 mm)	B: 14 in./po. (356 mm)
C: 7.25 in./po. (184 mm)	C: 7 in./po. (178 mm)
D: 18 in./po. (457 mm)	D: 10.75 in./po. (273 mm)
E: 24.875 in./po. (632 mm)	E: 24.875 in./po. (632 mm)
F: 18 in./po. (457 mm)	F: 17.75 in./po. (451 mm)



U.S.A.

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

Protection de plancher/Floor protection	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)	

Floor-ceiling/plancher-plafond: 84 in./po. (213cm)

\* 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 fabricant 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 desservant 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 crésote 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 incohérente par rapport au manuel de l'utilisateur consiste en 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 : 0.95 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

03/09/2019

(# test)



Fabricant de poêles international  
Stove Builder International

Fabriqué à St-Augustin-de-Desmaures (Qc), Canada

03/09/2019

(# test)





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:

**Intertek**  
Sept./Sept. 2019  
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)

**LISTED SOLID FUEL BURNING APPLIANCE**

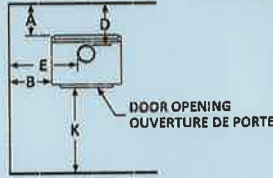
**POÊLE À COMBUSTIBLE SOLIDE HOMOLOGUÉ**

**MODEL / MODÈLE :**

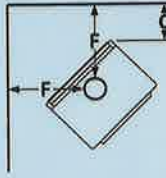
**MYRIAD III**

Serial Number / No. de Série: **1**

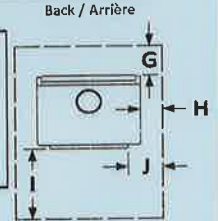
**Clearances to combustibles / Dégagements aux combustibles**



CANADA



U.S.A.



Back / Arrière

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)

CANADA		U.S.A.		Protection de plancher/Floor protection	
Single wall connector Tuyau à paroi simple	Double wall connector Tuyau à paroi double	Single wall connector Tuyau à paroi simple	Double wall connector Tuyau à paroi double	CANADA	U.S.A.
A: 13.25 in./po. (337 mm)	A: 6 in./po. (152 mm)	A: 13 in./po. (330 mm)	A: 6 in./po. (152 mm)	G: 8 in./po. (203 mm)	I: 16 in./po. (406 mm)
B: 14 in./po. (356 mm)	B: 14 in./po. (356 mm)	B: 14 in./po. (356 mm)	B: 14 in./po. (356 mm)	H: 8 in./po. (203 mm)	J: 8 in./po. (203 mm)
C: 7.25 in./po. (184 mm)	C: 7 in./po. (178 mm)	C: 7.25 in./po. (184 mm)	C: 7 in./po. (178 mm)	I: 18 in./po. (457 mm)	K: 36 in./po. (914 mm)
D: 18 in./po. (457 mm)	D: 10.75 in./po. (273 mm)	D: 17.75 in./po. (451 mm)	D: 10.75 in./po. (273 mm)	J: 18 in./po. (457 mm)	
E: 24.875 in./po. (632 mm)	E: 24.875 in./po. (632 mm)	E: 24.875 in./po. (632 mm)	E: 24.875 in./po. (632 mm)	K: 48 in./po. (1219 mm)	
F: 18 in./po. (457 mm)	F: 17.75 in./po. (451 mm)	F: 18 in./po. (457 mm)	F: 17.75 in./po. (451 mm)		

Floor-ceiling/plancher-plafond: 84 in./po. (213cm)

\* 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 fabricant 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 crésote 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 hûche de bois.

Weighted average emission rate / Moyenne pondérée des émissions : 0.95 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](http://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

03/09/2019

(# test)



Fabricant de poêles international  
Stove Builder International

Fabriqué à St-Augustin-de-Desmaures (Qc), Canada

03/09/2019

(# test)

27810



**Intertek**  
Sept./Sept. 2019  
Control number: 4002461

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:

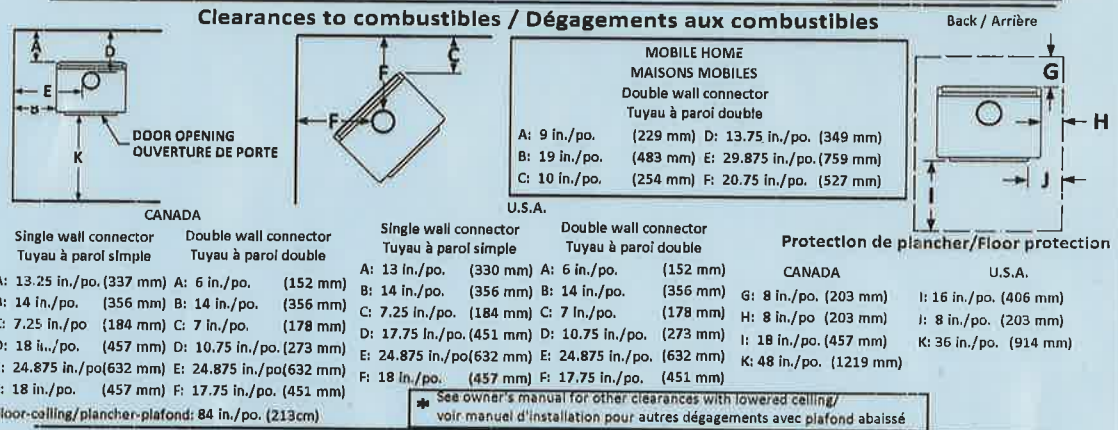
Certified to/Certifié selon CSA B415.1-10  
Certified to/Certifié selon ASTM E3053-17  
Certified to/Certifié selon ASTM E2515-11 (R2017)

**LISTED SOLID FUEL BURNING APPLIANCE**

**POÊLE À COMBUSTIBLE SOLIDE HOMOLOGUÉ**

**MODEL / MODÈLE :  
SOLUTION 3.3**

Serial Number / No. de Série: **1**



**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 5629 (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 5629 (CAN) pour utilisation au bois ou une cheminée de maçonnerie gainée.
- Voir les codes locaux et le manuel d'installation du fabricant 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 desservant 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 crésote 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 DE L'É.-U. Conforme aux normes d'émission de particules de 2020 avec bûche de bois.

Weighted average emission rate / Moyenne pondérée des émissions : 0.95 g/h

Tested and certified in compliance with CFR 40 part 60, subpart AAA, section 60.524(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  
03/09/2019 (# test)



Fabricant de poêles international  
Stove Builder International

Fabriqué à St-Augustin-de-Desmaures (Qc), Canada  
03/09/2019 (# test)





Intertek

June/Juin 2019

Control number: 4002461

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 APPLIANCE

POÊLE À COMBUSTIBLE SOLIDE HOMOLOGUÉ

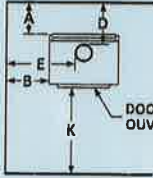
MODEL / MODÈLE :

OSBURN 3300

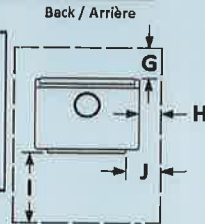
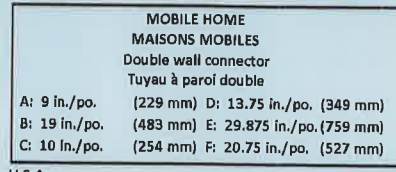
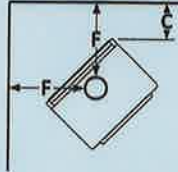
Serial Number  
No. de Série

1

Clearances to combustibles / Dégagements aux combustibles



DOOR OPENING  
OUVERTURE DE PORTE



Back / Arrière

CANADA		U.S.A.		MOBILE HOME MAISONS MOBILES Double wall connector Tuyau à paroi double		Protection de plancher/Floor protection	
Single wall connector Tuyau à paroi simple	Double wall connector Tuyau à paroi double	Single wall connector Tuyau à paroi simple	Double wall connector Tuyau à paroi double			CANADA	U.S.A.
A: 13.25 in./po. (337 mm)	A: 6 in./po. (152 mm)	A: 13 in./po. (330 mm)	A: 6 in./po. (152 mm)	A: 9 in./po. (229 mm)	D: 13.75 in./po. (349 mm)	G: 8 in./po. (203 mm)	I: 16 in./po. (406 mm)
B: 14 in./po. (356 mm)	B: 14 in./po. (356 mm)	B: 14 in./po. (356 mm)	B: 14 in./po. (356 mm)	B: 19 in./po. (483 mm)	E: 29.875 in./po. (759 mm)	H: 8 in./po. (203 mm)	J: 8 in./po. (203 mm)
C: 7.25 in./po. (184 mm)	C: 7 in./po. (178 mm)	C: 7.25 in./po. (184 mm)	C: 7 in./po. (178 mm)	C: 10 in./po. (254 mm)	F: 20.75 in./po. (527 mm)	I: 18 in./po. (457 mm)	K: 36 in./po. (914 mm)
D: 18 in./po. (457 mm)	D: 10.75 in./po. (273 mm)	D: 17.75 in./po. (451 mm)	D: 10.75 in./po. (273 mm)			J: 18 in./po. (457 mm)	
E: 24.875 in./po. (632 mm)	E: 24.875 in./po. (632 mm)	E: 24.875 in./po. (632 mm)	E: 24.875 in./po. (632 mm)			K: 48 in./po. (1219 mm)	
F: 18 in./po. (457 mm)	F: 17.75 in./po. (451 mm)	F: 18 in./po. (457 mm)	F: 17.75 in./po. (451 mm)				
Floor-ceiling/plancher-plafond: 84 in./po. (213cm)		* See owner's manual for other clearances with lowered ceiling/ voir manuel d'installation pour autres dégagements avec plafond abaissé					

PREVENT HOUSE FIRES

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- Do not pass connector through combustible wall or ceiling.
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- 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.
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- Combustion air openings shall not be obstructed.
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- 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 au 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.
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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 : 0.95 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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Made In St-Augustin-de-Desmaures (Qc), Canada

25/06/2019

(# test)



Fabricant de poêles international  
Stove Builder International

Fabriqué à St-Augustin-de-Desmaures (Qc), Canada

25/06/2019

(# test)

27792



## Unit break-in period

<b>Total conditioning time (h)</b>	<b>52.13</b>
------------------------------------	--------------

**Model tested:** 3.3 Series

**Identification number:** Osburn 3300 - Proto - A1.1

Date	Burn cycle	Test run	Duration	Av. Flue	Av. Room	Av. Tunnel	Load type	Fuel added	Moisture
		(#)	(min)	(°F)	(°F)	(°F)	(-)	(lbs)	(%)
2019-05-21	Preload		170	606.4	76.3	128.0	Kindling & SUF	13.87	15
	Condition	NA	-	-	-	-	High fire	27.87	19.2
	Load		541	334.7	75.5	98.0	Medium fire	33.29	19.3
2019-05-22	Preload		169	571.8	76.0	130.3	Kindling & SUF	13.88	15.6
	Condition	NA	12	479.3	82.1	128	High fire	27.98	20.3
	Load		661	287.8	81.0	96.7	Medium fire	33.38	21.2
2019-05-27	Preload		156	618.7	76.0	132.5	Kindling & SUF	13.98	15.3
	Condition	NA	18	462.5	77.4	117	High fire	27.99	21.0
	Load		581	308.3	77.0	95.4	Medium fire	32.78	20.0
2019-05-28	Preload		167	575.1	78.1	128.0	Kindling & SUF	13.96	15.8
	Condition	NA	12	443.5	80	117.4	High fire	28.00	21
	Load		641	292.5	78.8	95.3	Medium fire	33.28	20.3
	Preload						Kindling & SUF		
	Condition	NA					High fire		
	Load						Medium fire		
	Preload						Kindling & SUF		
	Condition	NA					High fire		
	Load						Medium fire		

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



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

ISO 9001 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:** N/D  
**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: 21.0 °C	End: 21.0 °C
Tel que Laissé	Start: 20.0 °C	End: 20.0 °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:** 13-Mar-2019  
**Date calibration Tel que Laissé:** 13-Mar-2019  
**Date d'Émission:** 13-Mar-2019  
**Requested Next Calibration Date:** 31-Mar-2020

**Authorized A2LA Signatory:**

Dany Careau

## Résultats de Mesure

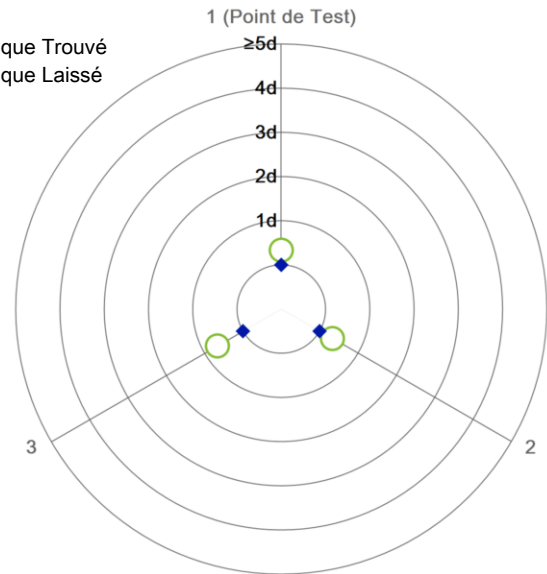
### Répétabilité

Charge de Test: 100 kg

	Tel que Trouvé	Tel que Laissé
1	99.96 kg	100.00 kg
2	99.96 kg	100.00 kg
3	99.98 kg	100.00 kg

○ Tel que Trouvé  
◆ Tel que Laissé

Écart Type	0.012 kg	0.000 kg
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The "d" in the graph represents the readability of the range/interval in which the test was performed.

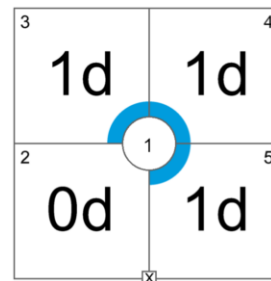
The results of this graph are based upon the absolute values of the differences from the mean value.

### Excentricité

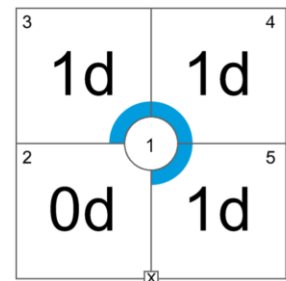
Charge de Test: 100 kg

Position	Tel que Trouvé	Tel que Laissé
1	99.94 kg	100.00 kg
2	99.94 kg	100.00 kg
3	99.96 kg	100.02 kg
4	99.92 kg	99.98 kg
5	99.92 kg	99.98 kg

Déviatoin Maximale	0.02 kg	0.02 kg
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Tel que Trouvé



Tel que Laissé

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

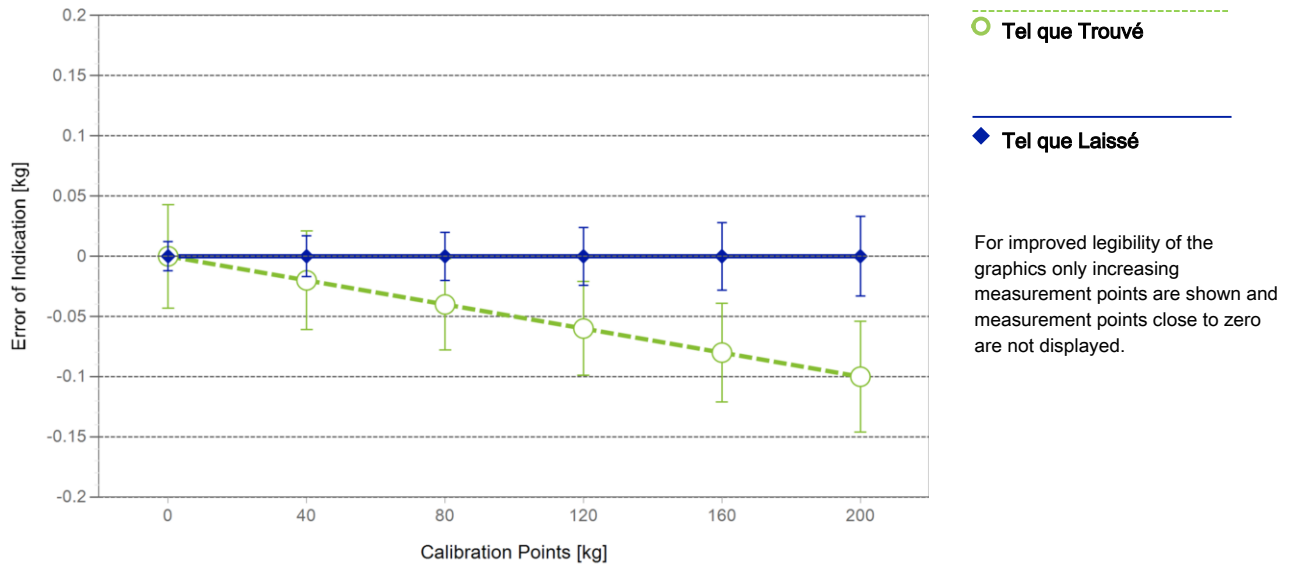
### Erreur d'indication

Tel que Trouvé

	Reference Value	Indication	Erreur d'indication	Incertitude Élargie	k
1	0 kg	0.00 kg	0.00 kg	0.043 kg	3.31
2	40 kg	39.98 kg	-0.02 kg	0.041 kg	2.87
3	80 kg	79.96 kg	-0.04 kg	0.038 kg	2.52
4	120 kg	119.94 kg	-0.06 kg	0.039 kg	2.37
5	160 kg	159.92 kg	-0.08 kg	0.041 kg	2.28
6	200 kg	199.90 kg	-0.10 kg	0.046 kg	2.28

**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	0.017 kg	2
3	80 kg	80.00 kg	0.00 kg	0.020 kg	2
4	120 kg	120.00 kg	0.00 kg	0.024 kg	2
5	160 kg	160.00 kg	0.00 kg	0.028 kg	2
6	200 kg	200.00 kg	0.00 kg	0.033 kg	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 M1**

Weight Set Number: Q Date d'Émission: 27-Feb-2019  
 # Certificat: 1406972 Date de Calibration Due: 27-Feb-2020

**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

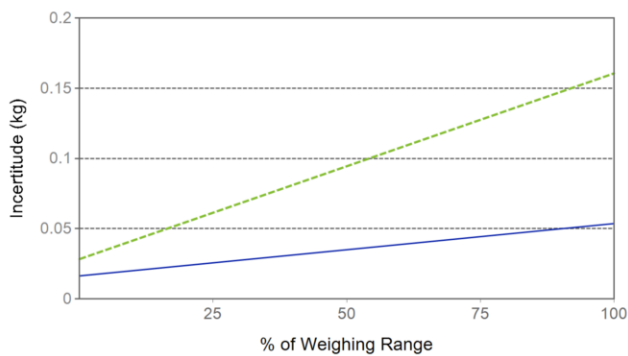
### Linéarisation de l'Équation d'Incertitude

	Plage	Tel que Trouvé	Tel que Laissé
1	0 kg - 500 kg	$U_1 = 28 \text{ g} + 0.662 \text{ g/kg} \cdot R$	$U_1 = 16 \text{ g} + 0.186 \text{ g/kg} \cdot R$

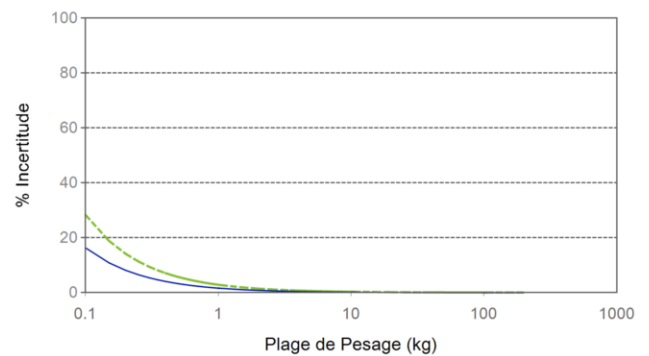
To optimize the stability of the linearization, besides of the zero load only increasing measurement points with a test load of 5% of the measurement range or larger are taken for the calculation of the linear equation.

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

Indication Net	Tel que Trouvé		Tel que Laissé	
	Value	%	Value	%
0.20 kg	0.028 kg	14%	0.016 kg	8.0%
2.00 kg	0.029 kg	1.5%	0.016 kg	0.80%
20.00 kg	0.041 kg	0.21%	0.020 kg	0.10%
100.00 kg	0.094 kg	0.094%	0.035 kg	0.035%
200.00 kg	0.16 kg	0.080%	0.053 kg	0.027%



Tel que Trouvé



Tel que Laissé

# GWP® Certificate



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

Tests Performed:



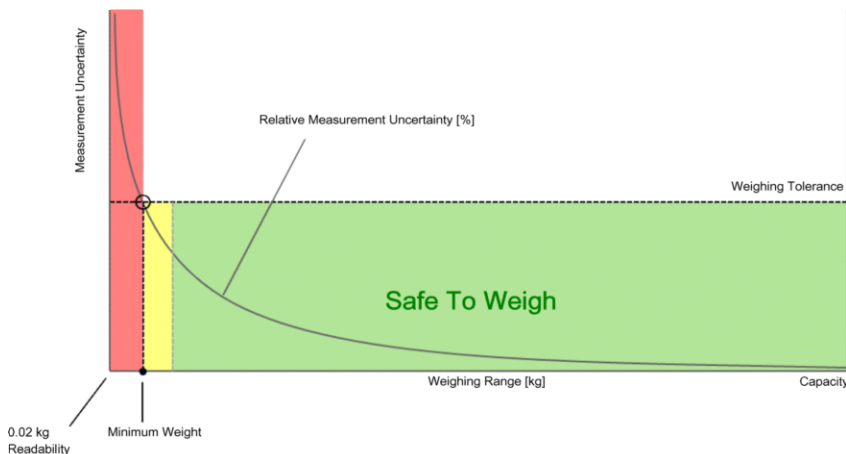
## Process Requirements

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					
Tolérance	Facteur de Sécurité				
	1	2	3	5	10
0.1%	83.646 kg	N/D	N/D	N/D	N/D
0.2%	21.137 kg	83.646 kg	N/D	N/D	N/D
0.5%	6.520 kg	15.387 kg	28.149 kg	83.646 kg	N/D
1%	3.029 kg	6.520 kg	10.588 kg	21.137 kg	83.646 kg
2%	1.463 kg	3.029 kg	4.710 kg	8.473 kg	21.137 kg
5%	0.573 kg	1.162 kg	1.767 kg	3.029 kg	6.520 kg

## As Left Minimum Weight Table

Poids minimum pour différentes tolérances de pesage et facteurs de sécurité					
Tolérance	Facteur de Sécurité				
	1	2	3	5	10
0.1%	20.073 kg	52.084 kg	111.191 kg	N/D	N/D
0.2%	9.004 kg	20.073 kg	34.007 kg	76.476 kg	N/D
0.5%	3.393 kg	7.058 kg	11.032 kg	20.073 kg	52.084 kg
1%	1.664 kg	3.393 kg	5.189 kg	9.004 kg	20.073 kg
2%	0.824 kg	1.664 kg	2.520 kg	4.282 kg	9.004 kg
5%	0.328 kg	0.658 kg	0.991 kg	1.664 kg	3.393 kg

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 kg

Tolérance	Control Limit	Tel que Trouvé		Tel que Laissé	
		Std. Deviation	Result	Std. Deviation	Result
0.1%	N/D	0.012 kg	N/D	0.000 kg*	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 calculated standard deviation is below the rounding error of the balance. The 0.41\*d rule is used for the assessment of this repeatability test.

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

## Excentricité

Charge de Test: 100 kg

Tolérance	Control Limit	Tel que Trouvé		Tel que Laissé	
		Deviation	Result	Deviation	Result
0.1%	0.05 kg	0.02 kg	✓	0.02 kg	⚠
0.2%	0.10 kg		✓		✓
0.5%	0.25 kg		✓		✓
1%	0.50 kg		✓		✓
2%	1.00 kg		✓		✓
5%	2.50 kg		✓		✓

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

## Erreur d'indication

Tel que Trouvé

Reference Value	Error	Control limits for various weighing tolerances					
		0.1%	0.2%	0.5%	1%	2%	5%
0 kg	0.00 kg	N/D	N/D	N/D	N/D	N/D	N/D
40 kg	-0.02 kg	0.02 kg	0.04 kg	0.10 kg	0.20 kg	0.40 kg	1.00 kg
80 kg	-0.04 kg	0.04 kg	0.08 kg	0.20 kg	0.40 kg	0.80 kg	2.00 kg
120 kg	-0.06 kg	0.06 kg	0.12 kg	0.30 kg	0.60 kg	1.20 kg	3.00 kg
160 kg	-0.08 kg	0.08 kg	0.16 kg	0.40 kg	0.80 kg	1.60 kg	4.00 kg
200 kg	-0.10 kg	0.10 kg	0.20 kg	0.50 kg	1.00 kg	2.00 kg	5.00 kg
Result		✓	✓	✓	✓	✓	✓



## Tel que Laissé

Reference Value	Error	Control limits for various weighing tolerances					
		0.1%	0.2%	0.5%	1%	2%	5%
0 kg	0.00 kg	N/D	N/D	N/D	N/D	N/D	N/D
40 kg	0.00 kg	0.02 kg	0.04 kg	0.10 kg	0.20 kg	0.40 kg	1.00 kg
80 kg	0.00 kg	0.04 kg	0.08 kg	0.20 kg	0.40 kg	0.80 kg	2.00 kg
120 kg	0.00 kg	0.06 kg	0.12 kg	0.30 kg	0.60 kg	1.20 kg	3.00 kg
160 kg	0.00 kg	0.08 kg	0.16 kg	0.40 kg	0.80 kg	1.60 kg	4.00 kg
200 kg	0.00 kg	0.10 kg	0.20 kg	0.50 kg	1.00 kg	2.00 kg	5.00 kg
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.

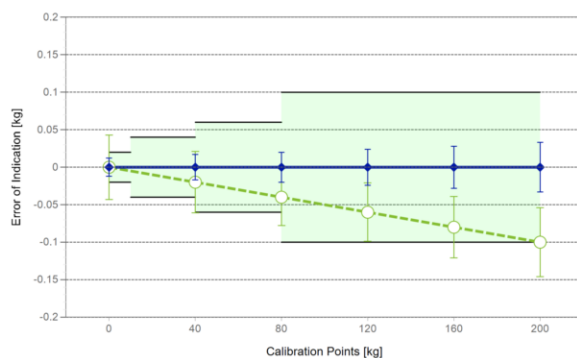
# Handbook 44 Tolerance Assessment (Entretien)

Les mesures du certificat de calibration joint ont été évaluées selon les tolérances définies par NIST HB44.

Global Tel que Trouvé Tel que Laisse ✓ = 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 Laisse

— 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	0.08 kg	✓	0.02 kg	✓
Excentricité (Plage)	100 kg	0.1 kg	0.04 kg	✓	0.04 kg	✓
Répétabilité (Maximum Error)	100 kg	0.1 kg	0.04 kg	✓	0.00 kg	✓
Répétabilité (Plage)	100 kg	0.10 kg	0.02 kg	✓	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	-0.06 kg	✓	0.00 kg	✓
5	160 kg	0.10 kg	-0.08 kg	✓	0.00 kg	✓
6	200 kg	0.10 kg	-0.10 kg	✓	0.00 kg	✓



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[www.ulrich.ca](http://www.ulrich.ca)



ACCREDITATION  
**ISO 17025**  
 SCC Scope Number 220

# CALIBRATION CERTIFICATE

**Certificate no.:** 636904  
**Identification:** SBI-096  
**Description:** CALIBRATOR, OMEGA CL23A  
**Size:** TC K/J/T  
**Manufacturer:** OMEGA  
**Model no.:** CL23A  
**Serial no.:** T-256137

**Calibration date:** April 05, 2018  
**Certificate issued:** April 05, 2018  
**Interval:** 12 months  
**Due date:** April 05, 2019  
**Procedure no.:** MET/CAL  
**Environment:** CLAS Type 2 Laboratory  
**Temperature:** 23 ± 2°C  
**Humidity:** 35 - 55% RH  
**Metrologist:** YUK

**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 provided are traceable to either the National Research Council Canada (NRC), the National Institute of Standards and Technology (NIST), a national laboratory of another country signatory to the CIPM Mutual Recognition Arrangement (MRA), or a calibration laboratory accredited by an accrediting body with which Canada has an equivalence agreement.*

## CALIBRATION STANDARDS

See notes below.

## MEASUREMENT UNCERTAINTY

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

## CALIBRATION DATA

See next page for measurement results.

### Notes:

9V battery replaced.





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 www.ulrich.ca

## CALIBRATION DATA

**Certificate no.:** 636904  
**Identification:** SBI-096  
**Description:** CALIBRATOR THERMOMETER  
**Serial no.:** T-256137  
**Procedure:** Omega CL23A: 5520A-M

**Result:** PASS  
**Condition:** FOUND-LEFT

### CALIBRATION STANDARDS

Identification	Description	Manufacturer	Model no.	Cal. Date	Due Date
7870009	CALIBRATOR	FLUKE	5520A	2018/02/26	2019/02/28

### MEASUREMENT RESULTS (Per MET/CAL)

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

Temperature measurements are performed by electrical simulation.

#### DISPLAY CALIBRATION

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

PASS

#### THERMOMETER CALIBRATION

##### K Type Thermocouple

-200.0degF	-200.5	-201.0	-199.0	PASS	1.7
-60.0degF	-60.1	-61.0	-59.0	PASS	3.1
-40.0degF	-40.2	-40.5	-39.5	PASS	1.5
32.0degF	31.8	31.5	32.5	PASS	1.7
300.0degF	299.8	299.5	300.5	PASS	1.1
572.0degF	571.8	571.5	572.5	PASS	1.1
1240.0degF	1239.8	1239.5	1240.5	PASS	1.1
1260.0degF	1259.7	1259.5	1260.5	PASS	1.1
2500.0degF	2499.7	2499.0	2501.0	PASS	1.4

##### J Type Thermocouple

-200.0degF	-200.2	-201.0	-199.0	PASS	2.1
-60.0degF	-60.0	-61.0	-59.0	PASS	3.5
-40.0degF	-40.1	-40.5	-39.5	PASS	1.7
32.0degF	31.9	31.5	32.5	PASS	2.0
572.0degF	571.9	571.5	572.5	PASS	1.6
300.0degF	299.6	299.5	300.5	PASS	2.0
1240.0degF	1239.8	1239.5	1240.5	PASS	1.6
1260.0degF	1259.8	1259.5	1260.5	PASS	1.6
1400.0degF	1399.8	1399.4	1400.6	PASS	1.8

##### T Type Thermocouple

-200.0degF	-200.0	-201.0	-199.0	PASS	2.3
-60.0degF	-59.8	-61.0	-59.0	PASS	2.3
-40.0degF	-39.9	-40.5	-39.5	PASS	1.2
32.0degF	32.0	31.5	32.5	PASS	1.7
300.0degF	300.0	299.5	300.5	PASS	2.0
572.0degF	572.0	571.5	572.5	PASS	2.0



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PARAMETER	TRUE	TEST	ACCEPTANCE LIMITS		PASS/	TUR
	VALUE	RESULT	LOW	HIGH	FAIL	
750.0degF		750.0	749.5	750.5	PASS	2.0
CALIBRATOR CALIBRATION						
K Type Thermocouple						
-200.0degF		-199.6	-201.0	-199.0	PASS	1.7
-60.0degF		-59.8	-61.0	-59.0	PASS	3.1
-40.0degF		-39.7	-40.5	-39.5	PASS	1.5
32.0degF		32.1	31.5	32.5	PASS	1.7
300.0degF		300.0	299.5	300.5	PASS	1.1
572.0degF		572.2	571.5	572.5	PASS	1.1
1240.0degF		1240.2	1239.5	1240.5	PASS	1.1
1260.0degF		1260.2	1259.5	1260.5	PASS	1.1
2500.0degF		2500.3	2499.0	2501.0	PASS	1.4
J Type Thermocouple						
-200.0degF		-199.8	-201.0	-199.0	PASS	2.1
-60.0degF		-60.0	-61.0	-59.0	PASS	3.5
-40.0degF		-39.9	-40.5	-39.5	PASS	1.7
32.0degF		32.0	31.5	32.5	PASS	2.0
300.0degF		300.1	299.5	300.5	PASS	2.0
572.0degF		572.0	571.5	572.5	PASS	1.6
1240.0degF		1240.2	1239.5	1240.5	PASS	1.6
1260.0degF		1260.2	1259.5	1260.5	PASS	1.6
1400.0degF		1400.0	1399.4	1400.6	PASS	1.8
T Type Thermocouple						
-200.0degF		-200.0	-201.0	-199.0	PASS	2.3
-60.0degF		-60.0	-61.0	-59.0	PASS	2.3
-40.0degF		-39.9	-40.5	-39.5	PASS	1.2
32.0degF		31.9	31.5	32.5	PASS	1.7
300.0degF		300.0	299.5	300.5	PASS	2.0
572.0degF		572.0	571.5	572.5	PASS	2.0
750.0degF		749.9	749.5	750.5	PASS	2.0

**End of Test Data**



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



## Certificate of Calibration

Date: Jun 27, 2018

Cert No. 551220081437093

**Customer:**

STOVE BUILDERS INTERNATIONAL INC.

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

MPC Control #: DA5991  
 Asset ID: SBI-097  
 Gage Type: ANEMOMETER  
 Manufacturer: EUROTRON  
 Model Number: VT 50  
 Size: N/A  
 Temp/RH: 69.6°F / 46.0%  
 Location: Calibration performed at MPC facility

Work Order #: SAC-70095825  
 Purchase Order #: LAB-17082017  
 Serial Number: 79977  
 Department: N/A  
 Performed By: JOSE TUMALAD  
 Received Condition: IN TOLERANCE  
 Returned Condition: IN TOLERANCE  
 Cal. Date: June 26, 2018  
 Cal. Interval: 12 MONTHS  
 Cal. Due Date: June 26, 2019

**Calibration Notes:**

**Test Points**

Seq.	Description	Standard	Tolerance -	Tolerance +	As Found	As Left	UOM	Result	Uncertainty
1	Temperature Tested at:(Deg F)	-4.0	-4.7	-3.3	-3.8	-3.8	Deg F	Passed	0.11
2	Temperature Tested at:(Deg F)	45.0	43.5	46.5	45.6	45.6	Deg F	Passed	0.11
3	Temperature Tested at:(Deg F)	90.0	87.6	92.4	91.2	91.2	Deg F	Passed	0.11
4	Temperature Tested at:(Deg F)	135.0	131.7	138.3	135.6	135.6	Deg F	Passed	0.11
5	Temperature Tested at:(Deg F)	176.0	171.8	180.1	175.6	175.6	Deg F	Passed	0.11
6	Air Velocity Tested At:	500	473	527	492	492	FPM	Passed	15
7	Air Velocity Tested At:	1,000	930	1070	982	982	FPM	Passed	29
8	Air Velocity Tested At:	2,000	1900	2100	1,972	1,972	FPM	Passed	58
9	Air Velocity Tested At:	3,000	2870	3130	2,978	2,978	FPM	Passed	87
10	Air Velocity Tested At:	4,000	3840	4160	3,947	3,947	FPM	Passed	80
11	Air Velocity Tested At:	5,000	4810	5190	4,970	4,970	FPM	Passed	100
12	Air Velocity Tested At:	5,900	5723	6077	5,867	5,867	FPM	Passed	118

Calibrating Technician:

JOSE TUMALAD

QC Approval:

Brian Gold

The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for normal distribution corresponds to a coverage probability of approximately 95%. The standard uncertainty of measurement has been determined in accordance with EA's Publication and NIST Technical Note 1297, 1994 Edition. Services rendered comply with ISO/IEC 17025:2005, ANSI/NCSL Z540-1-1994, ANSI/NCSL Z540.3-2006, MPC Quality Manual, MPC CSD and with customer purchase order instructions.

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. The information on this report, pertains only to the instrument identified.

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. This report may not be reproduced in part or in a whole without the prior written approval of the issuing MPC lab.



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 GRASS VALLEY CA 95949  
 530-268-1860



## Certificate of Calibration

Date: Jun 27, 2018

Cert No. 551220081437093

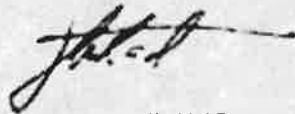
### Standards Used to Calibrate Equipment

I.D.	Description.	Model	Serial	Manufacturer	Cal. Due Date	Traceability #
CR6800	HUMIDITY GENERATOR/ ENVIRONMENTAL CHAMBER	2500	0012263	THUNDER SCIENTIFIC CORPORATION	Aug 31, 2018	512200813002699
CJ5100	WIND TUNNEL WITH CONTROLLER	JS-500	375/305	INTERACTIVE INSTRUMENTS	Oct 31, 2019	512200813087847
CL7223	CHUB-E4	1529-R	A07486/A07485/A0 7728/A476	HART SCIENTIFIC	Apr 30, 2019	512200813334456
CS0080	ANEMOMETER	HHF141	1017400	OMEGA	Mar 31, 2020	800367773

### Procedures Used in this Event

Procedure Name	Description
MPC-00132	Anemometers, General, May-10-2016 rev02

Calibrating Technician:



JOSE TUMALAD

QC Approval:



Brian Gold

The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor  $k=2$ , which for normal distribution corresponds to a coverage probability of approximately 95%. The standard uncertainty of measurement has been determined in accordance with EA's Publication and NIST Technical Note 1297, 1994 Edition. Services rendered comply with ISO/IEC 17025:2005, ANSI/NCSL Z540-1-1994, ANSI/NCSL Z540.3-2006, MPC Quality Manual, MPC CSD and with customer purchase order instructions.

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MICRO PRECISION CALIBRATION  
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 530-268-1860



## Certificate of Calibration

Date: Jun 26, 2018

Cert No. 551220081435485

**Customer:**

STOVE BUILDERS INTERNATIONAL INC.

PORTES 11-12

250 DE COPENHAGUE

SAINT-AUGUSTIN-DE-DESMAURES QC G3A 2H3

Work Order #: SAC-70095825

MPC Control #: DA5990  
 Asset ID: SBI-104  
 Gage Type: PITOT STATIC TUBE  
 Manufacturer: DWYER INSTRUMENTS INC.  
 Model Number: 160S-24  
 Size: N/A  
 Temp/RH: 69.6°F / 46.0%  
 Location: Calibration performed at MPC facility

Serial Number: N/A  
 Department: N/A  
 Performed By: JOSE TUMALAD  
 Received Condition: IN TOLERANCE  
 Returned Condition: IN TOLERANCE  
 Cal. Date: June 26, 2018  
 Cal. Interval: 12 MONTHS  
 Cal. Due Date: June 26, 2019

**Calibration Notes:**

PT coefficient: 0.84

**Test Points**

Seq.	Description	Standard	Tolerance -	Tolerance +	As Found	As Left	UOM	Result	Uncertainty
1	Exhaust flow	10.0	9.0	11.0	10.1	10.1	MPS	Passed	0.29
2	Exhaust flow	20.0	18.0	22.0	20.5	20.5	MPS	Passed	0.58

**Standards Used to Calibrate Equipment**

I.D.	Description.	Model	Serial	Manufacturer	Cal. Due Date	Traceability #
AW3587	TIMER	N/A	N/A	SPORTLINE	Sep 30, 2018	512200813010701
AW4419	MULTI-FUNCTION PRESSURE INDICATOR	DPI 145	14501283	DRUCK INC	Mar 31, 2020	512200813309719
CS0080	ANEMOMETER	HHF141	1017400	OMEGA	Mar 31, 2020	800367773
CJ5100	WIND TUNNEL WITH CONTROLLER	JS-500	375/305	INTERACTIVE INSTRUMENTS	Oct 31, 2019	512200813087847

Calibrating Technician:

JOSE TUMALAD

QC Approval:

Brian Gold

The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for normal distribution corresponds to a coverage probability of approximately 95%. The standard uncertainty of measurement has been determined in accordance with EA's Publication and NIST Technical Note 1297, 1994 Edition. Services rendered comply with ISO/IEC 17025:2005, ANSI/NCSL Z540-1-1994, ANSI/NCSL Z540.3-2008, MPC Quality Manual, MPC CSD and with customer purchase order instructions.

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. The information on this report, pertains only to the instrument identified.

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 22835 INDUSTRIAL PLACE  
 GRASS VALLEY CA 95949  
 530-268-1860



# Certificate of Calibration

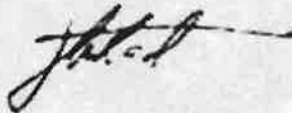
Date: Jun 26, 2018

Cert No. 551220081435485

## Procedures Used in this Event

Procedure Name	Description
MPC-ALT-001	Pitot-Static Test Sets, General Procedure, Jan-04-2018
MPC-ALT-001	Pitot-Static Test Sets, General Procedure, Jan-04-2018

Calibrating Technician:



JOSE TUMALAD

QC Approval:



Brian Gold

The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor  $k=2$ , which for normal distribution corresponds to a coverage probability of approximately 95%. The standard uncertainty of measurement has been determined in accordance with EA's Publication and NIST Technical Note 1297, 1994 Edition. Services rendered comply with ISO/IEC 17025:2005, ANSI/NCSL Z540-1-1994, ANSI/NCSL Z540.3-2006, MPC Quality Manual, MPC CSD and with customer purchase order instructions.

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. The information on this report, pertains only to the instrument identified.

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. This report may not be reproduced in part or in a whole without the prior written approval of the issuing MPC lab.

Date: 2019-02-20

Equipment: SBI-132 (T1)      Temperature: 75 °F  
 Accuracy: 0.1 °F      R.H.: 20.6%  
 Reference: SBI-096

S.D.	0.0025	%	
R.M.U.	0.14	%	
<b>O.M.U</b>	<b>0.40</b>	%	
	Ave A.D.	0.14	%
Standard	Reading	A.D.	
70	69.9	0.14	
70	69.9	0.14	
70	69.9	0.14	

S.D.	0.0026	%	
R.M.U.	0.05	%	
<b>O.M.U</b>	<b>0.32</b>	%	
	Ave A.D.	0.15	%
Standard	Reading	A.D.	
200	199.7	0.15	
200	199.7	0.15	
200	199.7	0.15	

S.D.	0.0000	%	
R.M.U.	0.02	%	
<b>O.M.U</b>	<b>0.03</b>	%	
	Ave A.D.	0.00	%
Standard	Reading	A.D.	
600	600	0.00	
600	600	0.00	
600	600	0.00	

S.D.	0.0035	%	
R.M.U.	0.01	%	
<b>O.M.U</b>	<b>0.40</b>	%	
	Ave A.D.	0.20	%
Standard	Reading	A.D.	
1000	998	0.20	
1000	998	0.20	
1000	998	0.20	

S.D.	0.0012	%	
R.M.U.	0.01	%	
<b>O.M.U</b>	<b>0.14</b>	%	
	Ave A.D.	0.07	%
Standard	Reading	A.D.	
1400	1401	0.07	
1400	1401	0.07	
1400	1401	0.07	

Technician:   
 Claude Paré

Date: 2019-02-22

Equipment: SBI-132 (T2)      Temperature: 70.5 °F  
 Accuracy: 0.1                      R.H.: 30.8%  
 Reference: SBI-096

S.D.	0.00	%	
R.M.U.	0.14	%	
<b>O.M.U</b>	<b>0.90</b>	%	
	Ave A.D.	0.43	%
Standard	Reading	A.D.	
70	69.7	0.43	
70	69.7	0.43	
70	69.7	0.43	

S.D.	0.00	%	
R.M.U.	0.05	%	
<b>O.M.U</b>	<b>0.44</b>	%	
	Ave A.D.	0.22	%
Standard	Reading	A.D.	
200	199.7	0.15	
200	199.5	0.25	
200	199.5	0.25	

S.D.	0.00	%	
R.M.U.	0.02	%	
<b>O.M.U</b>	<b>0.03</b>	%	
	Ave A.D.	0.00	%
Standard	Reading	A.D.	
600	600	0.00	
600	600	0.00	
600	600	0.00	

S.D.	0.00	%	
R.M.U.	0.01	%	
<b>O.M.U</b>	<b>0.40</b>	%	
	Ave A.D.	0.20	%
Standard	Reading	A.D.	
1000	998	0.20	
1000	998	0.20	
1000	998	0.20	

S.D.	0.00	%	
R.M.U.	0.01	%	
<b>O.M.U</b>	<b>0.14</b>	%	
	Ave A.D.	0.07	%
Standard	Reading	A.D.	
1400	1401	0.07	
1400	1401	0.07	
1400	1401	0.07	

Technician:   
 Claude Paré

Date: 2018-10-31

Equipment: SBI-153                      Temperature: 73.5°F  
Accuracy: 0.001                      1 R.H.: 31.6%  
Reference: SBI-194

S.D.	0.00	%	
R.M.U.	0.09	%	
<b>O.M.U</b>	<b>0.75</b>	%	
	Ave A.D.	0.36	%
Standard	Reading	A.D.	
MΩ			
1.100	1.096	0.36	

S.D.	0.00	%	
R.M.U.	0.83	%	
<b>O.M.U</b>	<b>1.67</b>	%	
	Ave A.D.	0.00	%
Standard	Reading	A.D.	
MΩ			
120	120	0.00	

Technician:   
Claude Paré

## CALIBRATION CERTIFICATE

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

### CALIBRATION DATA

Units: kg

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

**Remarks:**

*Inspected, cleaned and tested using the mfr'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.*

#### CALIBRATION STANDARD(S) USED

**Received Condition:**

In tolerance.

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**

The results shown above relate to the above calibrated instrument/equipment only. Copyright of this Certificate is owned by the issuing laboratory and may not be reproduced other than in full except with the prior written approval of the issuing laboratory.

CALIBRATED BY		Q.A. APPROVAL	
	Christopher Riddle		Andres Galeano

**END OF REPORT**

Date: 2018-10-26

Equipment: SBI-197

Ambiant

Temperature: 65.8 F

Accuracy: 0.01

R.H.: 30%

Reference: SBI-096

P.B.: 101.6 kPa

S.D.	0.01	%	
R.M.U.	0.01	%	
<b>O.M.U</b>	<b>1.29</b>	<b>%</b>	
	Ave A.D.	0.64	%
Standard	Reading	A.D.	
°F	°F		
70.0	69.55	0.64	

S.D.	0.00	%	
R.M.U.	0.01	%	
<b>O.M.U</b>	<b>0.49</b>	<b>%</b>	
	Ave A.D.	0.25	%
Standard	Reading	A.D.	
°F	°F		
200.0	199.51	0.25	

S.D.	0.00	%	
R.M.U.	0.00	%	
<b>O.M.U</b>	<b>0.11</b>	<b>%</b>	
	Ave A.D.	0.05	%
Standard	Reading	A.D.	
°F	°F		
600.0	599.68	0.05	

S.D.	0.00	%	
R.M.U.	0.00	%	
<b>O.M.U</b>	<b>0.04</b>	<b>%</b>	
	Ave A.D.	0.02	%
Standard	Reading	A.D.	
°F	°F		
1000.0	999.82	0.02	

S.D.	0.00	%	
R.M.U.	0.00	%	
<b>O.M.U</b>	<b>0.03</b>	<b>%</b>	
	Ave A.D.	0.01	%
Standard	Reading	A.D.	
°F	°F		
1400.0	1399.80	0.01	

  
Claude Paré

Mettler Toledo  
Service Business Unit Industrial  
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:** N/D  
**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 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.

In accordance with EURAMET cg-18 (11/2015), the test loads were selected to reflect the specific use of the weighing device or to accommodate specific calibration conditions.

	Temperature	
Tel que Trouvé	Start: 71.2 °F	End: 71.2 °F
Tel que Laissé	Start: 71.2 °F	End: 71.2 °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:** 13-Mar-2019  
**Date calibration Tel que Laissé:** 13-Mar-2019  
**Date d'Émission:** 13-Mar-2019  
**Requested Next Calibration Date:** 31-Mar-2020

**Authorized A2LA Signatory:**

Dany Careau

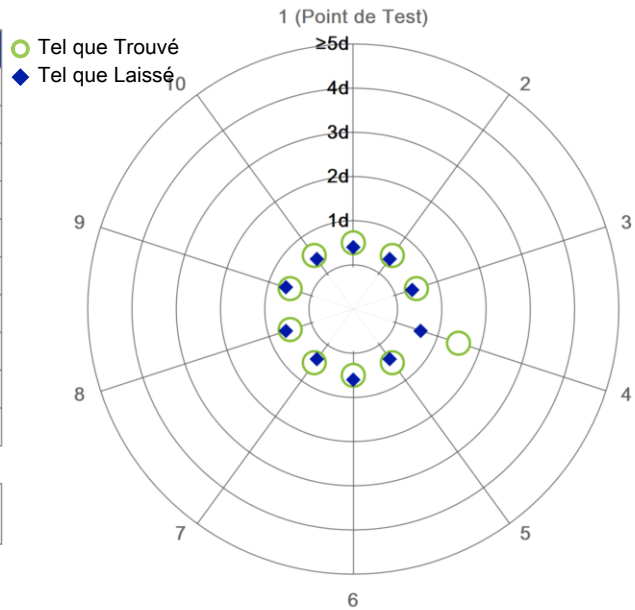
## Résultats de Mesure

### Répétabilité

Charge de Test: 10 g

	Tel que Trouvé	Tel que Laissé
1	10.0000 g	10.0000 g
2	10.0000 g	10.0000 g
3	10.0000 g	10.0000 g
4	10.0002 g	9.9999 g
5	10.0001 g	10.0000 g
6	10.0000 g	9.9999 g
7	10.0001 g	10.0000 g
8	10.0000 g	9.9999 g
9	10.0001 g	9.9999 g
10	10.0000 g	10.0000 g

Écart Type	0.00007 g	0.00005 g
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The "d" in the graph represents the readability of the range/interval in which the test was performed.

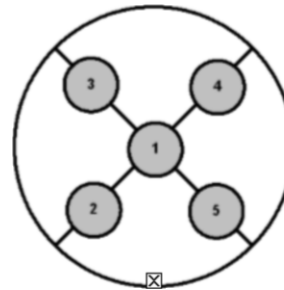
The results of this graph are based upon the absolute values of the differences from the mean value.

### Excentricité

Charge de Test: 100 g

Position	Tel que Trouvé	Tel que Laissé
1	99.9998 g	100.0000 g
2	99.9999 g	100.0001 g
3	99.9998 g	99.9999 g
4	99.9999 g	100.0000 g
5	99.9999 g	100.0001 g

Déviaton Maximale	0.0001 g	0.0001 g
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### Erreur d'indication

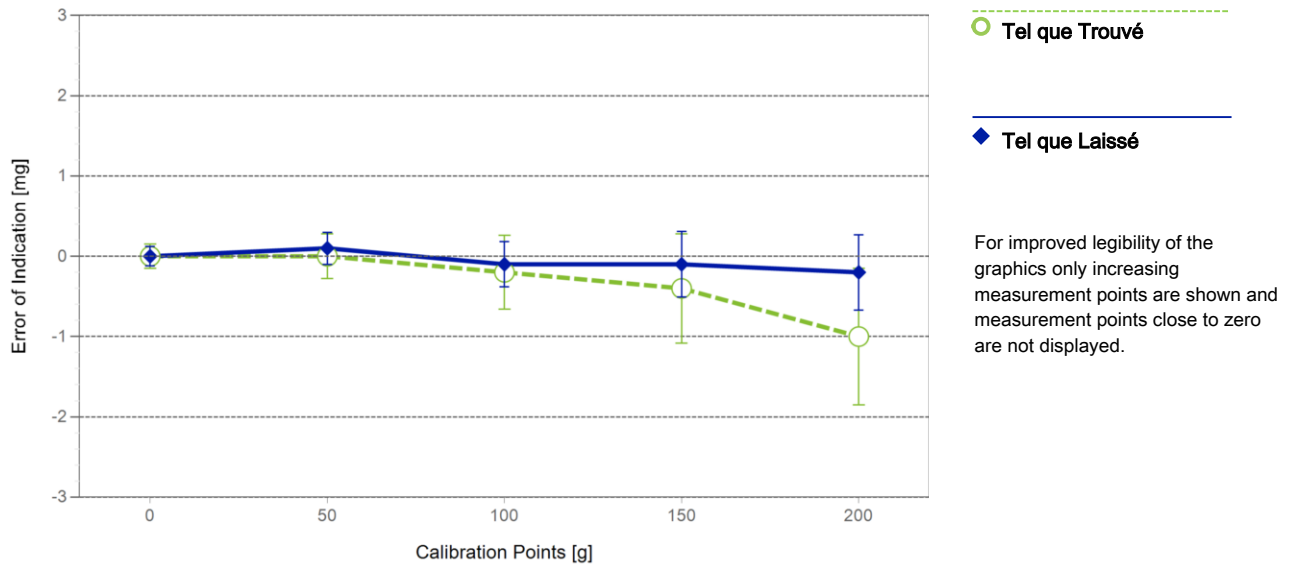
Tel que Trouvé

	Reference Value	Indication	Erreur d'indication	Incertitude Élargie	k
1	0.0000 g	0.0000 g	0.0000 g	0.15 mg	2
2	50.0000 g	50.0000 g	0.0000 g	0.28 mg	2
3	100.0001 g	99.9999 g	-0.0002 g	0.46 mg	2
4	150.0001 g	149.9997 g	-0.0004 g	0.68 mg	2
5	200.0001 g	199.9991 g	-0.0010 g	0.85 mg	2



**Tel que Laissé**

	Reference Value	Indication	Erreur d'indication	Incertitude Élargie	k
1	0.0000 g	0.0000 g	0.0000 g	0.12 mg	2
2	50.0000 g	50.0001 g	0.0001 g	0.20 mg	2
3	100.0001 g	100.0000 g	-0.0001 g	0.28 mg	2
4	150.0001 g	150.0000 g	-0.0001 g	0.41 mg	2
5	200.0001 g	199.9999 g	-0.0002 g	0.47 mg	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 E2**

Weight Set Number: 510 Date d'Émission: 19-Feb-2019  
 # Certificat: 01060642-1 Date de Calibration Due: 29-Feb-2020

**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:  $7 \text{ }^\circ\text{F}$

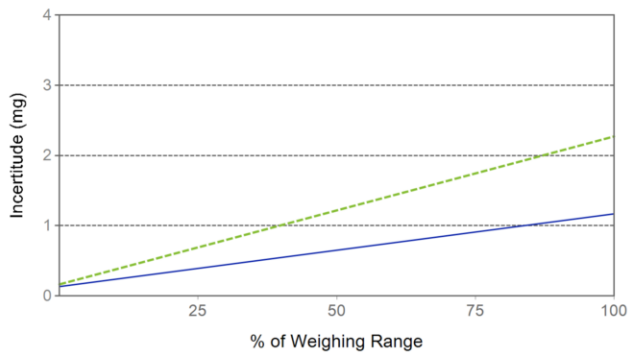
### Linéarisation de l'Équation d'Incertitude

	Plage	Tel que Trouvé	Tel que Laissé
1	0 g - 210 g	$U_1 = 0.16 \text{ mg} + 0.0100 \text{ mg/g} \cdot R$	$U_1 = 0.13 \text{ mg} + 0.00494 \text{ mg/g} \cdot R$

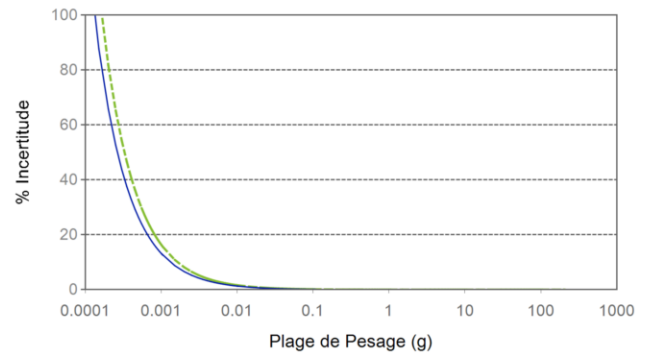
To optimize the stability of the linearization, besides of the zero load only increasing measurement points with a test load of 5% of the measurement range or larger are taken for the calculation of the linear equation.

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

Indication Net	Tel que Trouvé		Tel que Laissé	
	Value	%	Value	%
0.0210 g	0.16 mg	0.76%	0.13 mg	0.62%
0.2100 g	0.16 mg	0.076%	0.13 mg	0.062%
2.1000 g	0.18 mg	0.0086%	0.14 mg	0.0067%
21.0000 g	0.37 mg	0.0018%	0.23 mg	0.0011%
210.0000 g	2.3 mg	0.0011%	1.2 mg	0.00056%



Tel que Trouvé



Tel que Laissé

# GWP® Certificate



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

Tests Performed:



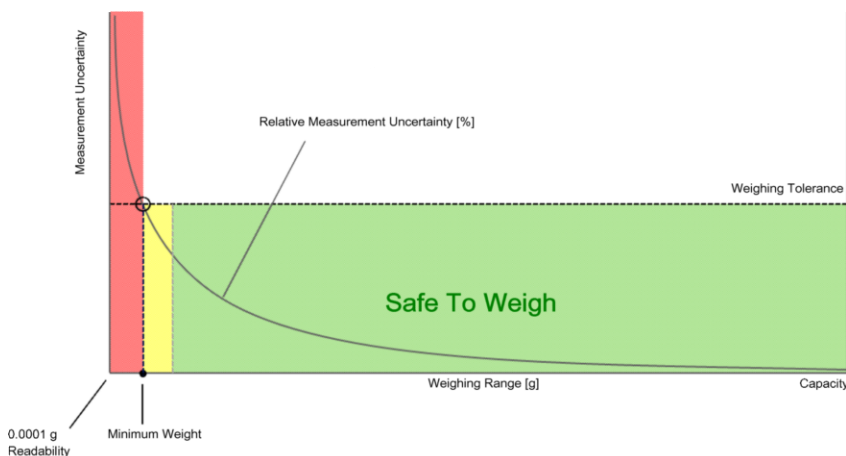
## Process Requirements

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					
Tolérance	Facteur de Sécurité				
	1	2	3	5	10
0.1%	0.16496 g	0.33329 g	0.50511 g	0.85964 g	1.81521 g
0.2%	0.08206 g	0.16496 g	0.24869 g	0.41876 g	0.85964 g
0.5%	0.03273 g	0.06558 g	0.09857 g	0.16496 g	0.33329 g
1%	0.01635 g	0.03273 g	0.04914 g	0.08206 g	0.16496 g
2%	0.00817 g	0.01635 g	0.02453 g	0.04093 g	0.08206 g
5%	0.00327 g	0.00653 g	0.00980 g	0.01635 g	0.03273 g

## As Left Minimum Weight Table

Poids minimum pour différentes tolérances de pesage et facteurs de sécurité					
Tolérance	Facteur de Sécurité				
	1	2	3	5	10
0.1%	0.13231 g	0.26594 g	0.40090 g	0.67494 g	1.38492 g
0.2%	0.06599 g	0.13231 g	0.19896 g	0.33325 g	0.67494 g
0.5%	0.02636 g	0.05277 g	0.07923 g	0.13231 g	0.26594 g
1%	0.01317 g	0.02636 g	0.03956 g	0.06599 g	0.13231 g
2%	0.00658 g	0.01317 g	0.01976 g	0.03295 g	0.06599 g
5%	0.00263 g	0.00527 g	0.00790 g	0.01317 g	0.02636 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: 10 g

Tolérance	Control Limit	Tel que Trouvé		Tel que Laissé	
		Std. Deviation	Result	Std. Deviation	Result
0.1%	N/D	0.00007 g	N/D	0.00005 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

Tolérance	Control Limit	Tel que Trouvé		Tel que Laissé	
		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

Reference Value	Error	Control limits for various weighing tolerances					
		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	0.0000 g	0.0250 g	0.0500 g	0.1250 g	0.2500 g	0.5000 g	1.2500 g
100.0001 g	-0.0002 g	0.0500 g	0.1000 g	0.2500 g	0.5000 g	1.0000 g	2.5000 g
150.0001 g	-0.0004 g	0.0750 g	0.1500 g	0.3750 g	0.7500 g	1.5000 g	3.7500 g
200.0001 g	-0.0010 g	0.1000 g	0.2000 g	0.5000 g	1.0000 g	2.0000 g	5.0000 g
Result		✓	✓	✓	✓	✓	✓

## Tel que Laissé

Reference Value	Error	Control limits for various weighing tolerances					
		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
100.0001 g	-0.0001 g	0.0500 g	0.1000 g	0.2500 g	0.5000 g	1.0000 g	2.5000 g
150.0001 g	-0.0001 g	0.0750 g	0.1500 g	0.3750 g	0.7500 g	1.5000 g	3.7500 g
200.0001 g	-0.0002 g	0.1000 g	0.2000 g	0.5000 g	1.0000 g	2.0000 g	5.0000 g
<b>Result</b>		✓	✓	✓	✓	✓	✓

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.

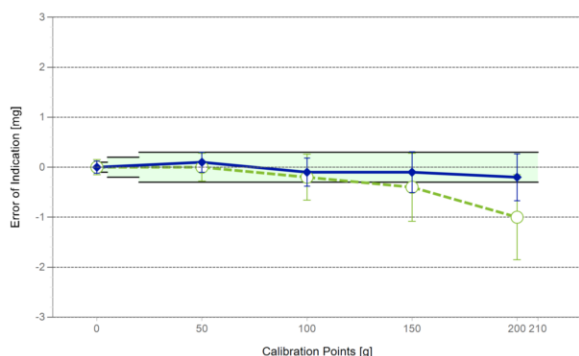
# Handbook 44 Tolerance Assessment(Entretien)

Les mesures du certificat de calibration joint ont été évaluées selon les tolérances définies par NIST HB44.

Global **Tel que Trouvé** ✗ **Tel que Laissé** ✔ ✔ = 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	0.0003 g	✔	0.0002 g	✔
Excentricité (Plage)	100 g	0.0003 g	0.0001 g	✔	0.0002 g	✔
Répétabilité (Maximum Error)	10 g	0.0002 g	0.0002 g	✔	0.0001 g	✔
Répétabilité (Plage)	10 g	0.0002 g	0.0002 g	✔	0.0001 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	0.0000 g	0.0001 g	0.0000 g	✔	0.0000 g	✔
2	50.0000 g	0.0003 g	0.0000 g	✔	0.0001 g	✔
3	100.0001 g	0.0003 g	-0.0002 g	✔	-0.0001 g	✔
4	150.0001 g	0.0003 g	-0.0004 g	✗	-0.0001 g	✔
5	200.0001 g	0.0003 g	-0.0010 g	✗	-0.0002 g	✔





**Ulrich Métrologie Inc.**  
**Ulrich Metrology Inc.**  
 9900, Côte-de-Liesse  
 Montréal (Québec) H8T 1A1

Tél. (514) 631-6653  
 Fax (514) 631-6122  
[info@ulrich.ca](mailto:info@ulrich.ca)  
[www.ulrich.ca](http://www.ulrich.ca)



# CALIBRATION CERTIFICATE

**Certificate no.:** 648826  
**Identification:** SBI-212  
**Description:** THERMO-HYGROMETER, AMPROBE TH-3  
**Manufacturer:** AMPROBE  
**Model no.:** TH-3  
**Serial no.:** 100906351

**Calibration date:** June 19, 2018  
**Certificate issued:** June 19, 2018  
**Interval:** 12 months  
**Due date:** June 19, 2019  
**Procedure no.:** MET/CAL  
**Environment:** CLAS Type 2 Laboratory  
**Temperature:** 23 ± 2°C  
**Humidity:** 35 - 55% RH  
**Metrologist:** MIC

**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 provided are traceable to either the National Research Council Canada (NRC), the National Institute of Standards and Technology (NIST), a national laboratory of another country signatory to the CIPM Mutual Recognition Arrangement (MRA), or a calibration laboratory accredited by an accrediting body with which Canada has an equivalence agreement.*

## CALIBRATION STANDARDS

See notes below.

## MEASUREMENT UNCERTAINTY

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

## CALIBRATION DATA

See next page for measurement results.





**Ulrich Métrologie inc.**  
**Ulrich Metrology Inc.**  
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Montréal (Québec) H8T 1A1

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info@ulrich.ca  
[www.ulrich.ca](http://www.ulrich.ca)

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## CALIBRATION DATA

---

**Certificate no.:** 648826  
**Identification:** SBI-212  
**Description:** THERMO-HYGROMETER  
**Serial no.:** 100906351  
**Procedure:** Amprobe TH-3: 2500ST-LT-M

**Result:** PASS  
**Condition:** FOUND-LEFT

### CALIBRATION STANDARDS

Identification	Description	Manufacturer	Model no.	Cal. Date	Due Date
1304953	HUMIDITY GENERATOR	THUNDER SCIENTIFIC	2500ST-LT	2017/07/25	2018/07/31

### MEASUREMENT RESULTS (Per MET/CAL)

PARAMETER	TRUE VALUE	TEST RESULT	ACCEPTANCE LOW	LIMITS HIGH	PASS/FAIL	TUR
TEMPERATURE CALIBRATION						
23 °C						
23.00degC		23.72	22.20	23.80	PASS	
RELATIVE HUMIDITY CALIBRATION AT 23 °C						
20% RH						
20.01%		21.90	17.01	23.01	PASS	
50% RH						
50.03%		50.40	47.03	53.03	PASS	
80% RH						
80.03%		77.30	77.03	83.03	PASS	

*End of Test Data*

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



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

ISO 9001 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:** N/D  
**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 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: 21.0 °C	End: 21.0 °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:** 13-Mar-2019 **Authorized A2LA Signatory:**   
**Date calibration Tel que Laissé:** N/D  
**Date d'Émission:** 13-Mar-2019 **Dany Careau**  
**Requested Next Calibration Date:** 31-Mar-2020

## Résultats de Mesure

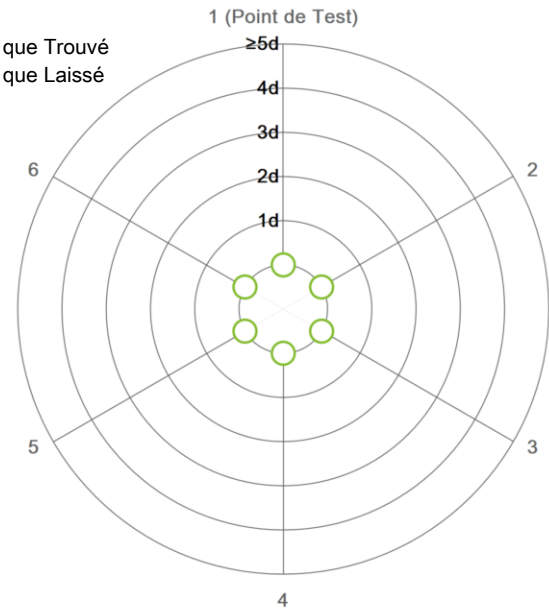
### Répétabilité

Charge de Test: 5000 g

	Tel que Trouvé	Tel que Laissé
1	5000 g	N/D
2	5000 g	N/D
3	5000 g	N/D
4	5000 g	N/D
5	5000 g	N/D
6	5000 g	N/D

Écart Type	0.0 g	N/D
------------	-------	-----

- Tel que Trouvé
- ◆ Tel que Laissé



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

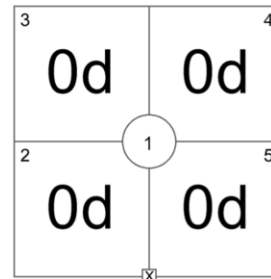
The results of this graph are based upon the absolute values of the differences from the mean value.

### Excentricité

Charge de Test: 5000 g

Position	Tel que Trouvé	Tel que Laissé
1	5000 g	N/D
2	5000 g	N/D
3	5000 g	N/D
4	5000 g	N/D
5	5000 g	N/D

Déviaton Maximale	0 g	N/A
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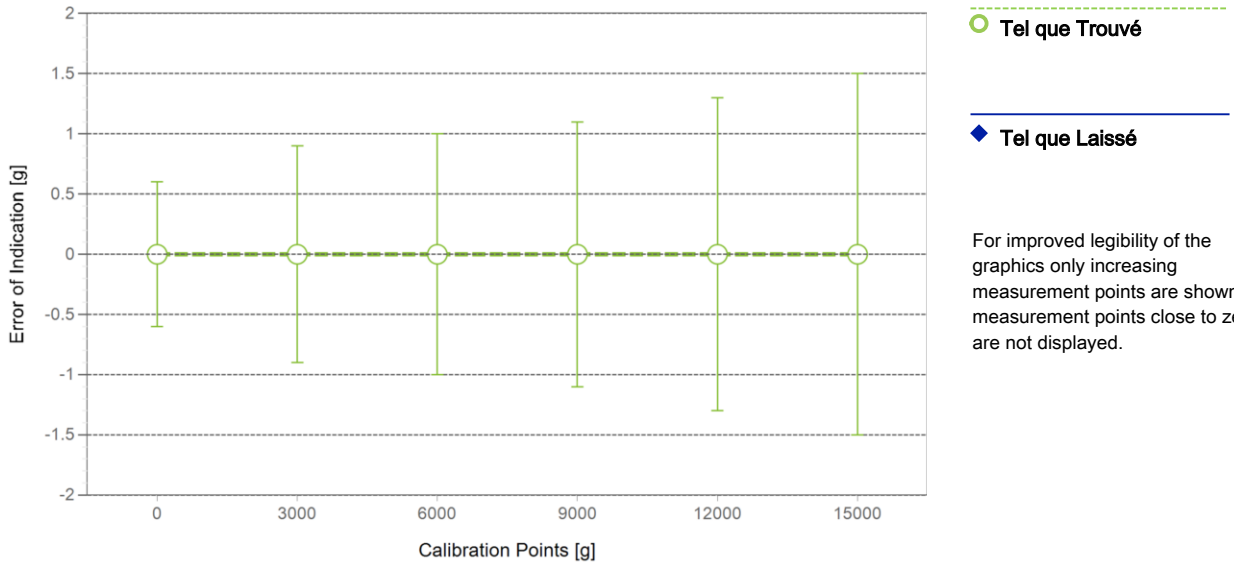
Tel que Trouvé

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 g	0 g	0 g	0.6 g	2
2	3000 g	3000 g	0 g	0.9 g	2
3	6000 g	6000 g	0 g	1.0 g	2
4	9000 g	9000 g	0 g	1.1 g	2
5	12000 g	12000 g	0 g	1.3 g	2
6	15000 g	15000 g	0 g	1.5 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 M1

Weight Set Number:	<u>42260</u>	Date d'Émission:	<u>24-Aug-2018</u>
# Certificat:	<u>M18-0321</u>	Date de Calibration Due:	<u>24-Aug-2019</u>

### 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 · 10<sup>-6</sup> / K

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

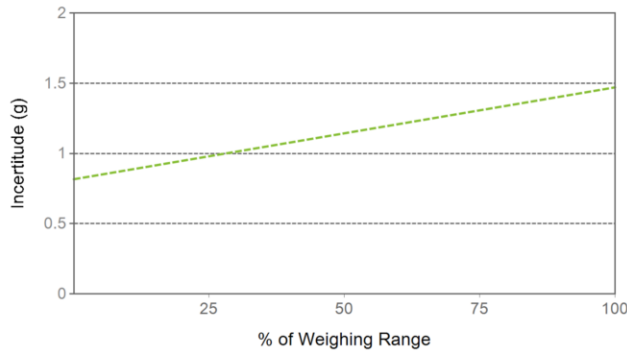
**Linéarisation de l'Équation d'Incertitude**

	Plage	Tel que Trouvé	Tel que Laissé
1	0 g - 15000 g	$U_1 = 816 \text{ mg} + 0.0436 \text{ mg/g} \cdot R$	N/A

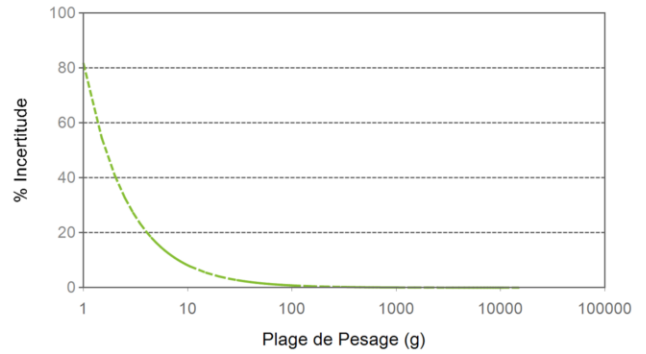
To optimize the stability of the linearization, besides of the zero load only increasing measurement points with a test load of 5% of the measurement range or larger are taken for the calculation of the linear equation.

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

Indication Net	Tel que Trouvé		Tel que Laissé	
	Value	%	Value	%
15 g	0.82 g	5.3%	N/A	N/A
150 g	0.82 g	0.53%	N/A	N/A
1500 g	0.88 g	0.060%	N/A	N/A
7500 g	1.1 g	0.015%	N/A	N/A
15000 g	1.5 g	0.010%	N/A	N/A



**Tel que Trouvé**



**Tel que Laissé**

# 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.

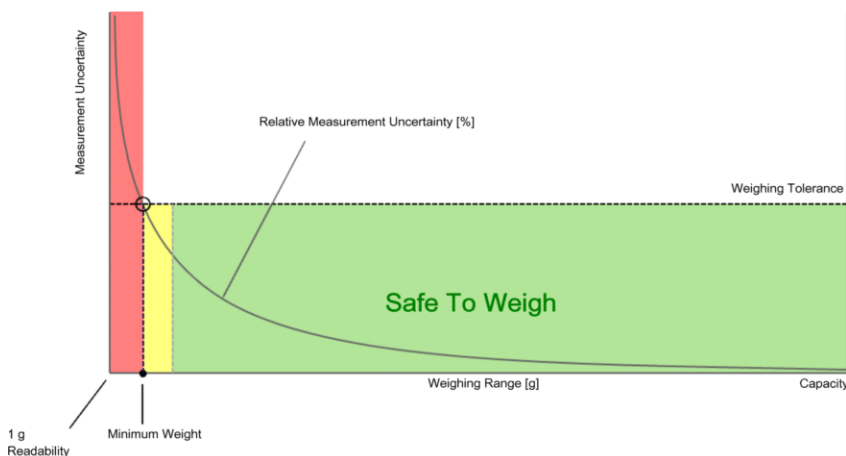
## Process Requirements

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					
Tolérance	Facteur de Sécurité				
	1	2	3	5	10
0.1%	853.8 g	1789.2 g	2818.6 g	5222.2 g	14489.6 g
0.2%	417.4 g	853.8 g	1310.6 g	2291.3 g	5222.2 g
0.5%	164.7 g	332.4 g	503.1 g	853.8 g	1789.2 g
1%	82.0 g	164.7 g	248.2 g	417.4 g	853.8 g
2%	40.9 g	82.0 g	123.3 g	206.4 g	417.4 g
5%	16.3 g	32.7 g	49.1 g	82.0 g	164.7 g

## As Left Minimum Weight Table

Poids minimum pour différentes tolérances de pesage et facteurs de sécurité					
Tolérance	Facteur de Sécurité				
	1	2	3	5	10
0.1%	853.8 g	1789.2 g	2818.6 g	5222.2 g	14489.6 g
0.2%	417.4 g	853.8 g	1310.6 g	2291.3 g	5222.2 g
0.5%	164.7 g	332.4 g	503.1 g	853.8 g	1789.2 g
1%	82.0 g	164.7 g	248.2 g	417.4 g	853.8 g
2%	40.9 g	82.0 g	123.3 g	206.4 g	417.4 g
5%	16.3 g	32.7 g	49.1 g	82.0 g	164.7 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: 5000 g

Tolérance	Control Limit	Tel que Trouvé		Tel que Laissé	
		Std. Deviation	Result	Std. Deviation	Result
0.1%	N/D	0.0 g*	N/D	0.0 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 calculated standard deviation is below the rounding error of the balance. The 0.41\*d rule is used for the assessment of this repeatability test.

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

## Excentricité

Charge de Test: 5000 g

Tolérance	Control Limit	Tel que Trouvé		Tel que Laissé	
		Deviation	Result	Deviation	Result
0.1%	3 g	0 g	✓	0 g	✓
0.2%	5 g		✓		✓
0.5%	13 g		✓		✓
1%	25 g		✓		✓
2%	50 g		✓		✓
5%	125 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

Reference Value	Error	Control limits for various weighing tolerances					
		0.1%	0.2%	0.5%	1%	2%	5%
0 g	0 g	N/D	N/D	N/D	N/D	N/D	N/D
3000 g	0 g	2 g	3 g	8 g	15 g	30 g	75 g
6000 g	0 g	3 g	6 g	15 g	30 g	60 g	150 g
9000 g	0 g	5 g	9 g	23 g	45 g	90 g	225 g
12000 g	0 g	6 g	12 g	30 g	60 g	120 g	300 g
15000 g	0 g	8 g	15 g	38 g	75 g	150 g	375 g
Result		✓	✓	✓	✓	✓	✓

## Tel que Laissé

Reference Value	Error	Control limits for various weighing tolerances					
		0.1%	0.2%	0.5%	1%	2%	5%
0 g	0 g	N/D	N/D	N/D	N/D	N/D	N/D
3000 g	0 g	2 g	3 g	8 g	15 g	30 g	75 g
6000 g	0 g	3 g	6 g	15 g	30 g	60 g	150 g
9000 g	0 g	5 g	9 g	23 g	45 g	90 g	225 g
12000 g	0 g	6 g	12 g	30 g	60 g	120 g	300 g
15000 g	0 g	8 g	15 g	38 g	75 g	150 g	375 g
<b>Result</b>		✓	✓	✓	✓	✓	✓

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.

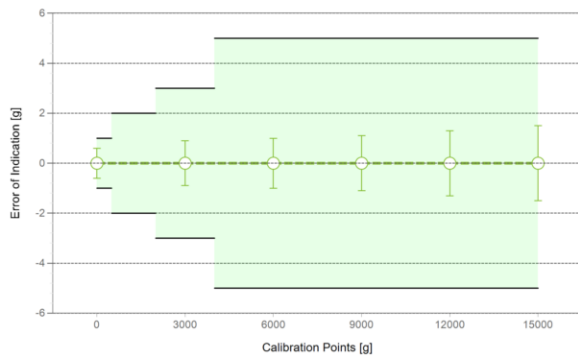
# Handbook 44 Tolerance Assessment (Entretien)

Les mesures du certificat de calibration joint ont été évaluées selon les tolérances définies par NIST HB44.

Global **Tel que Trouvé**  **Tel que Laissé** N/D  = 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	0 g		N/D	N/D
Excentricité (Plage)	5000 g	5 g	0 g		N/D	N/D
Répétabilité (Maximum Error)	5000 g	5 g	0 g		N/D	N/D
Répétabilité (Plage)	5000 g	5 g	0 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 g	1 g	0 g		0 g	
2	3000 g	3 g	0 g		0 g	
3	6000 g	5 g	0 g		0 g	
4	9000 g	5 g	0 g		0 g	
5	12000 g	5 g	0 g		0 g	
6	15000 g	5 g	0 g		0 g	

Certificate No: 01037944A-1

# METTLER TOLEDO

## METTLER-TOLEDO, LLC

201 Wolf Dr  
Thorofare NJ 08086  
1-800-METTLER



## Mass Calibration Certificate

### Customer Information

*Customer Name:* Stove Builder International, Inc. *City:*  
*Address:* 250 de Copenhauge *State / Province:* QC  
St.-Augustin-de-Desmaures  
*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.

This certificate may not be partially reproduced, except with prior written permission of the issuing laboratory. This certificate must not be used by the customer to claim product endorsement by NIST, NVLAP, or any other agency of the J.S. government.

*Calibration Date:* 09-OCT-2018

*Next Calibration Due:* 09-OCT-2023

*Calibration Technician:* Robotic Calibration

*Signature:*

Joseph Moran, Metrology Manager

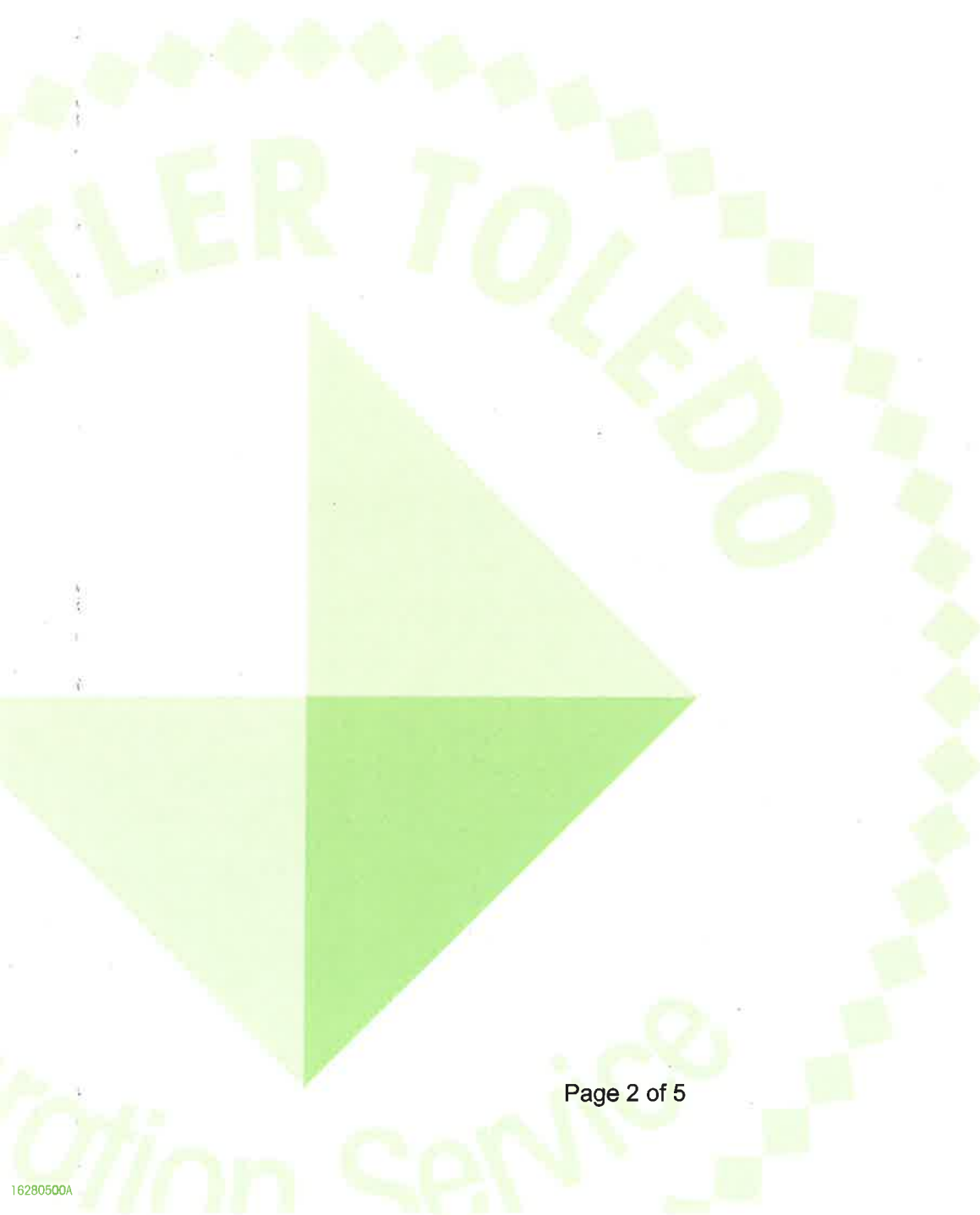
Approved Signatory

10-OCT-2018

Certificate No: 01037944A-1

**As Found Data**

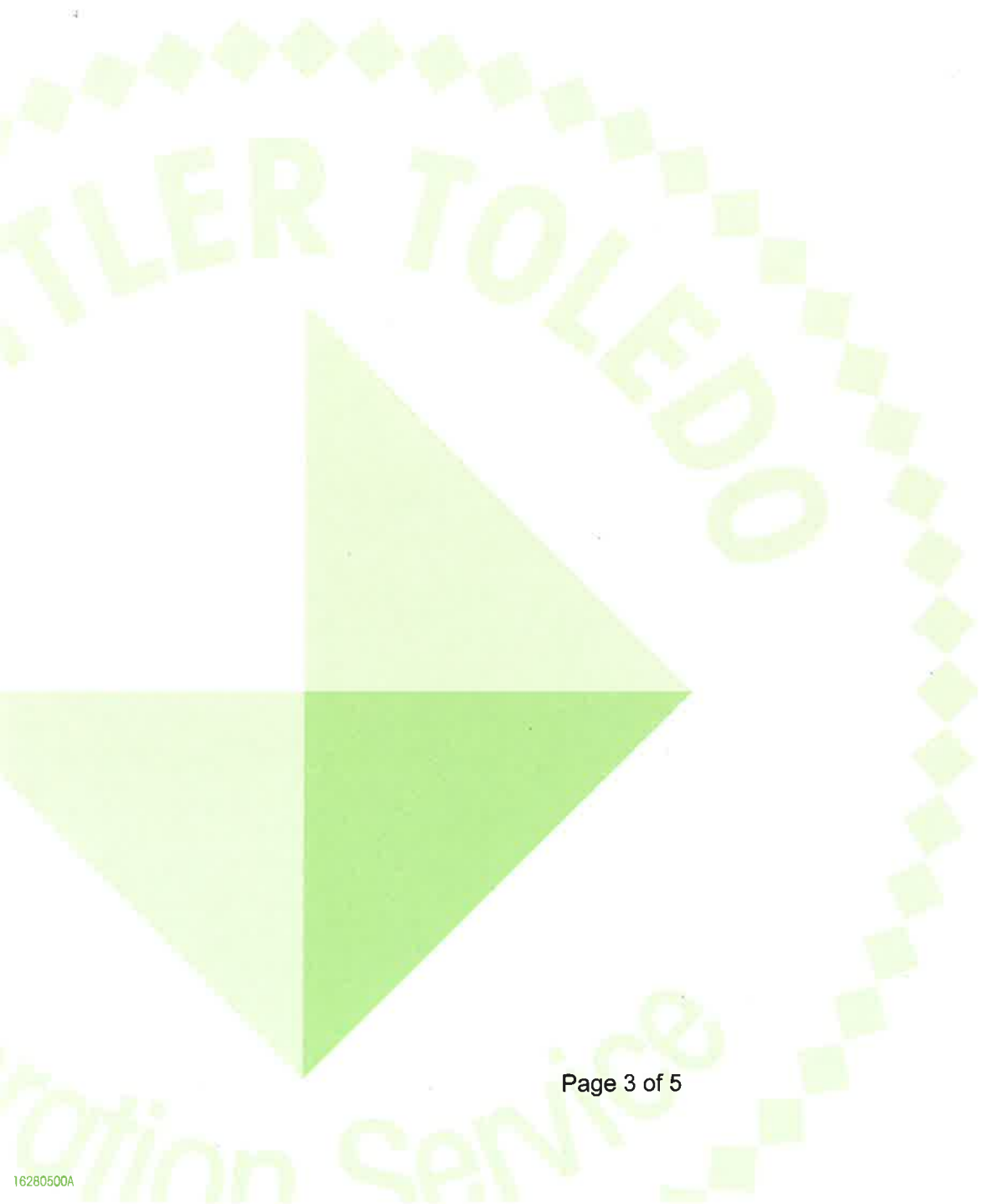
Nominal Value&Suffix	Serial Number	True Mass (g)	Conv. Mass (g)	Uncertainty (mg, k = 2)	Tolerance (mg)	Density (g/cm <sup>3</sup> )
100 mg	B316238717	0.0999983	0.0999983	0.0025	0.0160	8.00



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/cm <sup>3</sup> )
100 mg	B316238717	0.0999983	0.0999983	0.0025	0.0160	8.00





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Certificate No: 01037944A-1

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**Standards and Comparators Used**

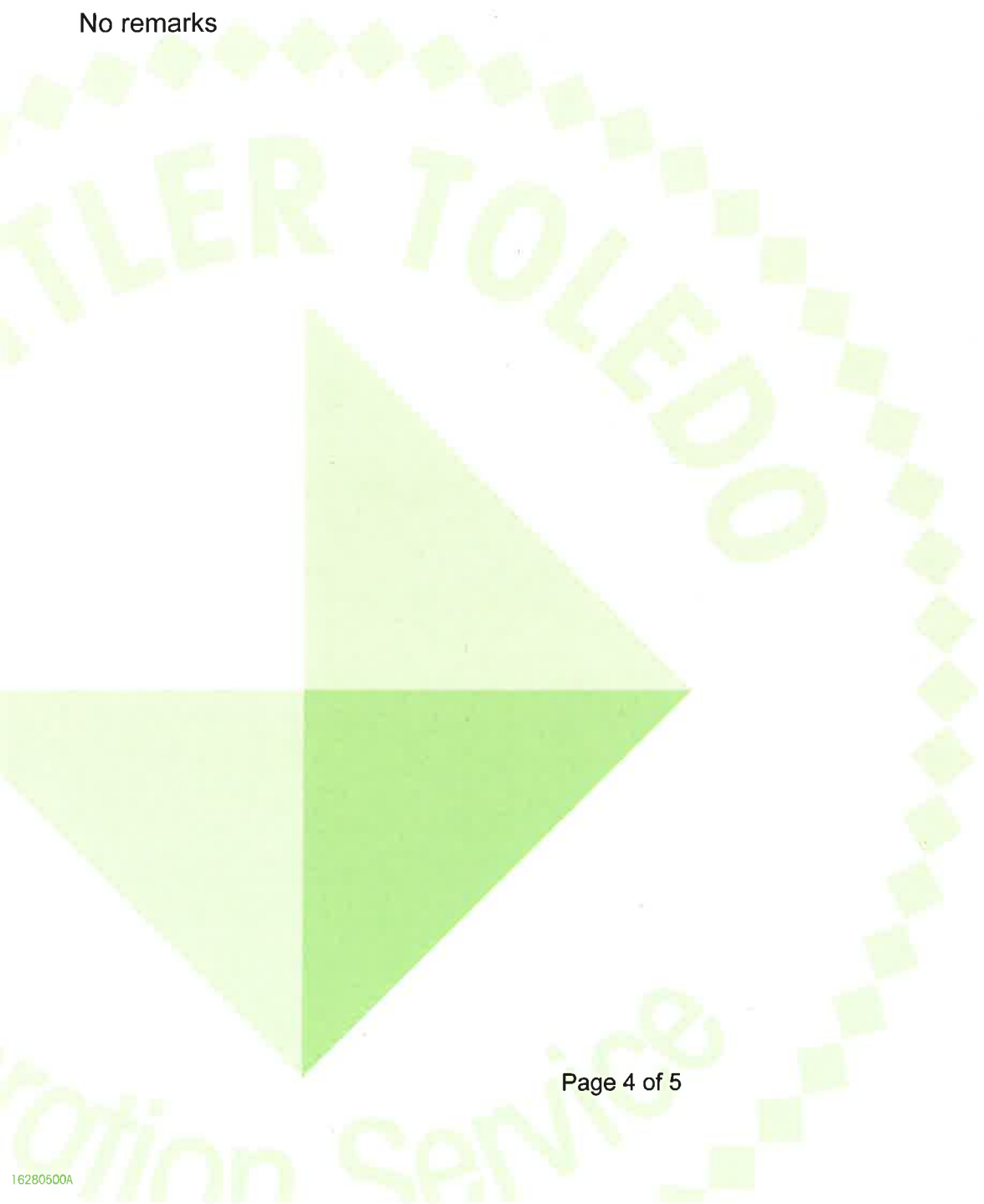
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Nominal Value&Suffix	Serial Number	Standard Set No.	Cal Due	Comparator Used	Cal Due	Procedure Used	
100 mg	B316238717	A031	07/01/19	A5XL	131	01/01/19	Multi A-B

**Comments**

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No remarks



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Certificate No: 01037944A-1

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## Definitions

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**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/m<sup>3</sup> which it balances in air with a density of 1.2 kg/m<sup>3</sup>. 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



## Mass Calibration Certificate

### Customer Information

*Customer Name:* Stove Builder International, Inc.      *City:*  
*Address:* 250 de Copenhauge      *State / Province:* QC  
St.-Augustin-de-Desmaures  
*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.

This certificate may not be partially reproduced, except with prior written permission of the issuing laboratory. This certificate must not be used by the customer to claim product endorsement by NIST, NVLAP, or any other agency of the U.S. government.

*Calibration Date:* 09-OCT-2018      *Next Calibration Due:* 09-OCT-2023

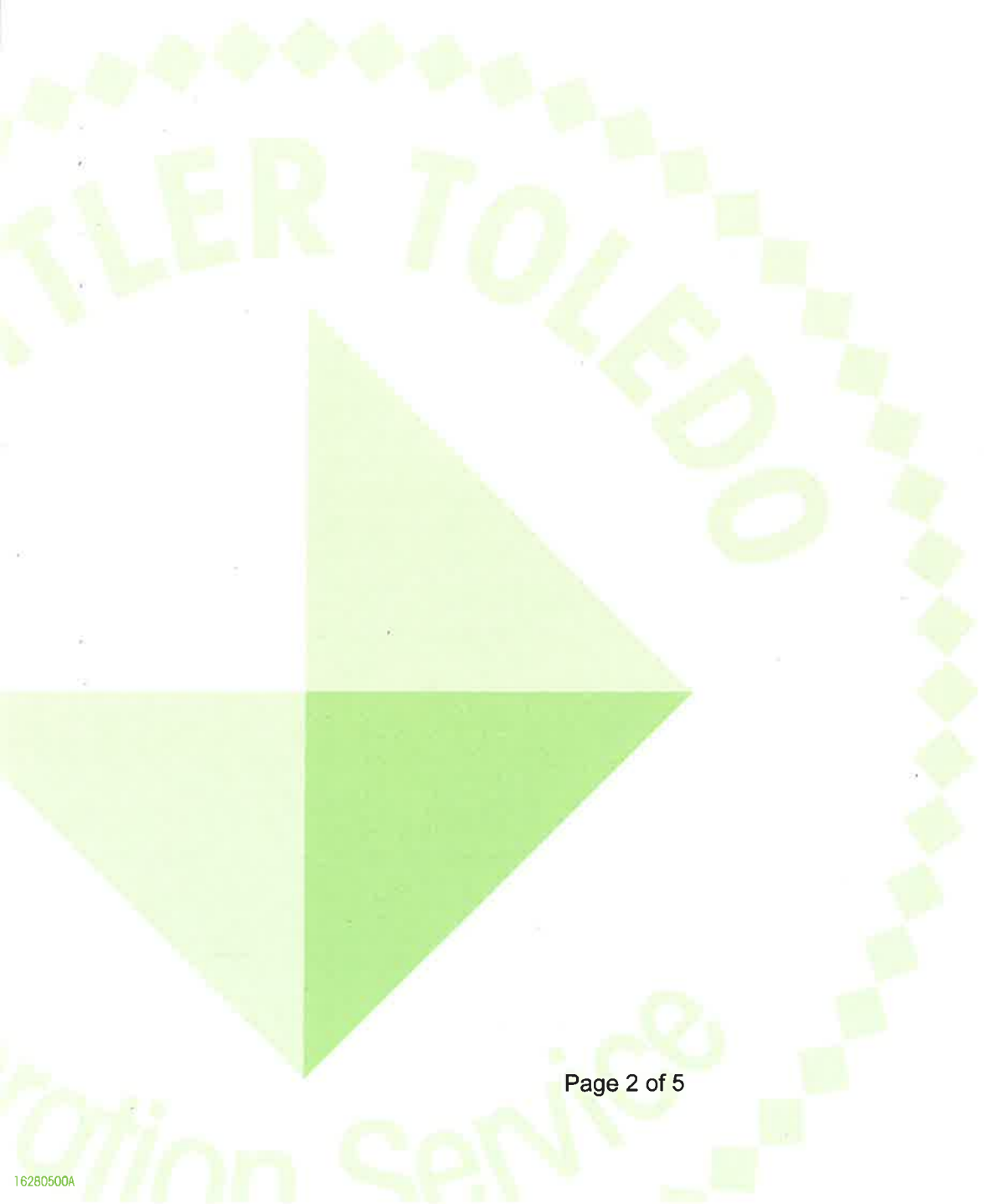
*Calibration Technician:* Robotic Calibration

*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/cm <sup>3</sup> )
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/cm <sup>3</sup> )
10 g	B316238717	10.000070	10.000060	0.012	0.200	7.95

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Certificate No: 01037944B-1

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**Standards and Comparators Used**

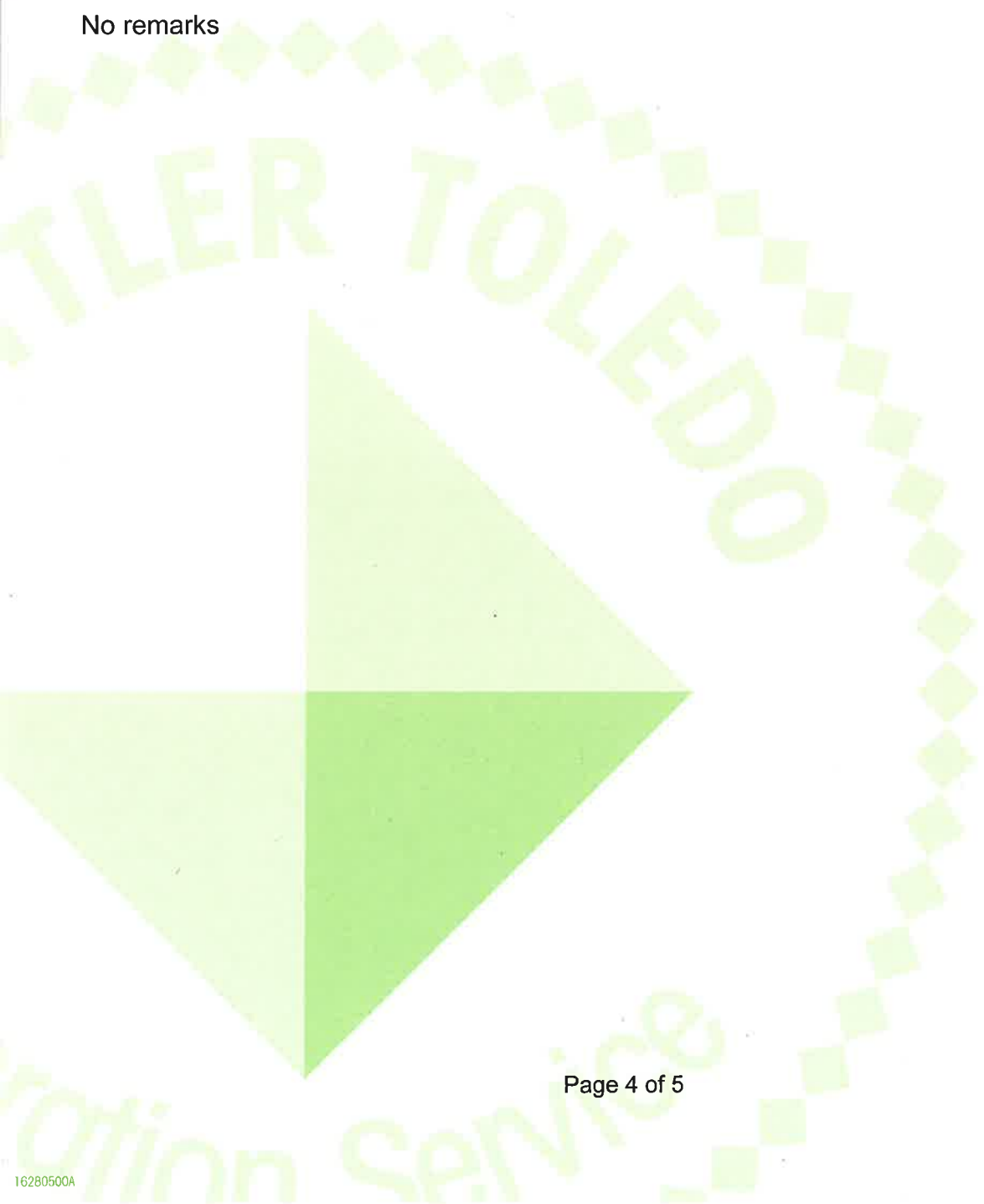
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Nominal Value&Suffix	Serial Number	Standard Set No.	Cal Due	Comparator Used	Cal Due	Procedure Used
10 g	B316238717	MS002	08/01/19	A200XXL 132	01/01/19	Multi A-B

**Comments**

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No remarks



## Definitions

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**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/m<sup>3</sup> which it balances in air with a density of 1.2 kg/m<sup>3</sup>. 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 OF CALIBRATION



Certificate Number: 2018004298

Page 1 of 2

<b>Manufacturer:</b>	Dwyer	<b>RMA:</b>	AC18061323
<b>Model:</b>	MS-121-LCD	<b>Workorder:</b>	2018004298
<b>Description:</b>	Digital Pressure Gauge	<b>Barcode:</b>	AL0015069-P
<b>Serial:</b>	E51U01003612	<b>Received Conditions:</b>	In Tolerance
<b>ID:</b>	SBI-253	<b>Calibration Date:</b>	27-Jun-2018
<b>Customer:</b>	STOVE BUILDER INTERNATIONAL INC. 250 RUE DE COPENHAGUE ST-AUGUSTIN-DE-DESMAURES QC G3A 2H3	<b>Calibration Due:</b>	27-Jun-2019
		<b>Temperature:</b>	20.89°C
		<b>Humidity:</b>	59.2%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-17025:2005 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.

This certificate shall not be reproduced except in full without written approval of Alpha Controls and Instrumentation Inc.

## STANDARDS USED

Description	Model	ID	Cal Date	Due Date
Multimeter	Fluke 8845A	ELC-MTR-04	08-Jan-2018	08-Jan-2019
Low Pressure Calibrator	Ruska 7250LP	PRE-CAL-06	16-Oct-2017	16-Oct-2018

**Notes:** Calibrated 0 to 0.25" Only.

Performed by: Anthony Morra  
(digitally signed)

Reviewed by: Slava Peciurov  
(digitally signed)

Quality Management System is assessed and registered by Intertek as conforming to the requirements of ISO9001



Procedure: Dwyer MS-121-LCD 0 to 0.1;0.25 inH2O/7520lp 8845A (1.0.A)

Found / Left (Pass)

Test Description	True Value	Test Results	Tolerance	Lower Limit	Upper Limit	Status	Uncertainty
Range: 0 to 0.25 inH2O							
Output signal: 4 to 20 mA							
PRESSURE TEST							
Display Reading						0	
Output @ 0.0000 inH2O, mA						4.01	
0.0000 inH2O	0.0000 inH2O	0.0002 inH2O	±0.0025 inH2O	-0.0025 inH2O	0.0025 inH2O	Pass	0.00015 inH2O
Display Reading						.0002	
Output @ 0.0625 inH2O, mA						7.9	
0.0625 inH2O	0.0625 inH2O	0.0609 inH2O	±0.0025 inH2O	0.0600 inH2O	0.0650 inH2O	Pass	0.00015 inH2O
Display Reading						.0608	
Output @ 0.1250 inH2O, mA						11.875	
0.1250 inH2O	0.1250 inH2O	0.1230 inH2O	±0.0025 inH2O	0.1225 inH2O	0.1275 inH2O	Pass	0.00015 inH2O
Display Reading						.1230	
Output @ 0.1875 inH2O, mA						15.92	
0.1875 inH2O	0.1875 inH2O	0.1863 inH2O	±0.0025 inH2O	0.1850 inH2O	0.1900 inH2O	Pass	0.00015 inH2O
Display Reading						.1855	
Output @ 0.2500 inH2O, mA						19.875	
0.2500 inH2O	0.2500 inH2O	0.2480 inH2O	±0.0025 inH2O	0.2475 inH2O	0.2525 inH2O	Pass	0.00015 inH2O
Display Reading						.2483	
Output @ 0.1875 inH2O, mA						15.96	
0.1875 inH2O	0.1875 inH2O	0.1869 inH2O	±0.0025 inH2O	0.1850 inH2O	0.1900 inH2O	Pass	0.00015 inH2O
Display Reading						.1868	
Output @ 0.1250 inH2O, mA						11.94	
0.1250 inH2O	0.1250 inH2O	0.1241 inH2O	±0.0025 inH2O	0.1225 inH2O	0.1275 inH2O	Pass	0.00015 inH2O
Display Reading						.1243	
Output @ 0.0625 inH2O, mA						7.947	
0.0625 inH2O	0.0625 inH2O	0.0617 inH2O	±0.0025 inH2O	0.0600 inH2O	0.0650 inH2O	Pass	0.00015 inH2O
Display Reading						.0618	
Output @ 0.0000 inH2O, mA						3.965	
0.0000 inH2O	0.0000 inH2O	-0.0005 inH2O	±0.0025 inH2O	-0.0025 inH2O	0.0025 inH2O	Pass	0.00015 inH2O

END OF CERTIFICATE



# CERTIFICATE OF CALIBRATION



Certificate Number: 2018006288

Page 1 of 2

<b>Manufacturer:</b>	Dwyer Instruments Inc.	<b>RMA:</b>	AC18091585
<b>Model:</b>	MS-121-LCD	<b>Workorder:</b>	2018006288
<b>Description:</b>	Digital Pressure Gauge	<b>Barcode:</b>	AL0015074-P
<b>Serial:</b>	E52U01007512	<b>Received Conditions:</b>	In Tolerance
<b>ID:</b>	SBI-254	<b>Calibration Date:</b>	10-Oct-2018
<b>Customer:</b>	STOVE BUILDER INTERNATIONAL INC. 250 RUE DE COPENHAGUE ST-AUGUSTIN-DE-DESMAURES QC G3A 2H3	<b>Calibration Due:</b>	10-Oct-2019
		<b>Temperature:</b>	22.07°C
		<b>Humidity:</b>	61.2%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-17025:2005 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.

This certificate shall not be reproduced except in full without written approval of Alpha Controls and Instrumentation Inc.

## STANDARDS USED

Description	Model	ID	Cal Date	Due Date
Multimeter	Fluke 8845A	ELC-MTR-04	08-Jan-2018	08-Jan-2019
Low Pressure Calibrator	Ruska 7250LP	PRE-CAL-06	16-Oct-2017	16-Oct-2018

**Notes:** Unit was calibrated in vertical position.

**Performed by:** Roy Mathew  
(digitally signed)

**Reviewed by:** Slava Peciurov  
(digitally signed)

Quality Management System is assessed and registered by Intertek as conforming to the requirements of ISO9001

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

Found / 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						4.0141	
0.0000 inH2O	0.0000 inH2O	0.0040 inH2O	±0.0050 inH2O	-0.0050 inH2O	0.0050 inH2O	Pass	0.00015 inH2O
Display Reading						0.1245	
Output @ 0.1250 inH2O, mA						7.9852	
0.1250 inH2O	0.1250 inH2O	0.1245 inH2O	±0.0050 inH2O	0.1200 inH2O	0.1300 inH2O	Pass	0.00015 inH2O
Display Reading						0.2505	
Output @ 0.2500 inH2O, mA						12.0045	
0.2500 inH2O	0.2500 inH2O	0.2501 inH2O	±0.0050 inH2O	0.2450 inH2O	0.2550 inH2O	Pass	0.00015 inH2O
Display Reading						0.3770	
Output @ 0.3750 inH2O, mA						16.058	
0.3750 inH2O	0.3750 inH2O	0.3768 inH2O	±0.0050 inH2O	0.3700 inH2O	0.3800 inH2O	Pass	0.00015 inH2O
Display Reading						0.5002	
Output @ 0.5000 inH2O, mA						19.9790	
0.5000 inH2O	0.5000 inH2O	0.4993 inH2O	±0.0050 inH2O	0.4950 inH2O	0.5050 inH2O	Pass	0.00015 inH2O
Display Reading						0.3784	
Output @ 0.3750 inH2O, mA						16.079	
0.3750 inH2O	0.3750 inH2O	0.3775 inH2O	±0.0050 inH2O	0.3700 inH2O	0.3800 inH2O	Pass	0.00015 inH2O
Display Reading						0.2515	
Output @ 0.2500 inH2O, mA						12.050	
0.2500 inH2O	0.2500 inH2O	0.2516 inH2O	±0.0050 inH2O	0.2450 inH2O	0.2550 inH2O	Pass	0.00015 inH2O
Display Reading						0.1265	
Output @ 0.1250 inH2O, mA						8.0369	
0.1250 inH2O	0.1250 inH2O	0.1262 inH2O	±0.0050 inH2O	0.1200 inH2O	0.1300 inH2O	Pass	0.00015 inH2O
Display Reading						0.0002	
Output @ 0.0000 inH2O, mA						4.0139	
0.000 inH2O	0.0000 inH2O	0.0004 inH2O	±0.0050 inH2O	-0.0050 inH2O	0.0050 inH2O	Pass	0.00015 inH2O

END OF CERTIFICATE



# CERTIFICATE OF CALIBRATION



Certificate Number: 2018004300

Page 1 of 2

<b>Manufacturer:</b>	Dwyer	<b>RMA:</b>	AC18061323
<b>Model:</b>	626-06-GH-P1-E1-S1	<b>Workorder:</b>	2018004300
<b>Description:</b>	Pressure Transmitter	<b>Barcode:</b>	AL00023150-P
<b>Serial:</b>	N/A	<b>Received Conditions:</b>	In Tolerance
<b>ID:</b>	SBI-293	<b>Calibration Date:</b>	26-Jun-2018
<b>Customer:</b>	STOVE BUILDER INTERNATIONAL INC. 250 RUE DE COPENHAGUE ST-AUGUSTIN-DE-DESMAURES QC G3A 2H3	<b>Calibration Due:</b>	26-Jun-2019
		<b>Temperature:</b>	19.42°C
		<b>Humidity:</b>	42.6%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-17025:2005 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.

This certificate shall not be reproduced except in full without written approval of Alpha Controls and Instrumentation Inc.

## STANDARDS USED

Description	Model	ID	Cal Date	Due Date
Multimeter	Fluke 8845A	ELC-MTR-04	08-Jan-2018	08-Jan-2019
Pressure Controller/Calibrator	DH Instruments PPC3	PRE-CAL-04	21-May-2018	21-May-2019

**Notes:** Transmitter was calibrated in vertical position.  
Unit is not adjustable.  
Tolerance specified by customer.

Performed by: Anthony Morra  
(digitally signed)

Reviewed by: Slava Peciurov  
(digitally signed)

Quality Management System is assessed and registered by Intertek as conforming to the requirements of ISO9001

Procedure: Pressure Transmitter: psi/4-20mA: CAL VER /PPC3,8845 (1.1.A)

FOUND-LEFT (Pass)

Test Description	True Value	Test Results	Tolerance	Lower Limit	Upper Limit	Status	Uncertainty
Calibrated in the vertical position.							
Range: 0 to 5 psi							
Output: 4-20 mA							
PRESSURE TEST							
Output=4.004 mA							
0.0000 psi	0.0000 psi	0.001 psi	±0.0200 psi	-0.020 psi	0.020 psi	Pass	4.5e-003 psi
Output=7.982 mA							
1.2500 psi	1.2500 psi	1.244 psi	±0.0200 psi	1.230 psi	1.270 psi	Pass	5.7e-003 psi
Output=11.967 mA							
2.5000 psi	2.5000 psi	2.489 psi	±0.0200 psi	2.480 psi	2.520 psi	Pass	7.0e-003 psi
Output=15.97 mA							
3.7500 psi	3.7500 psi	3.741 psi	±0.0200 psi	3.730 psi	3.770 psi	Pass	8.2e-003 psi
Output=19.996 mA							
5.0000 psi	5.0000 psi	4.999 psi	±0.0200 psi	4.980 psi	5.020 psi	Pass	9.4e-003 psi
Output=15.976 mA							
3.7500 psi	3.7500 psi	3.743 psi	±0.0200 psi	3.730 psi	3.770 psi	Pass	8.2e-003 psi
Output=11.969 mA							
2.5000 psi	2.5000 psi	2.490 psi	±0.0200 psi	2.480 psi	2.520 psi	Pass	7.0e-003 psi
Output=7.98 mA							
1.2500 psi	1.2500 psi	1.244 psi	±0.0200 psi	1.230 psi	1.270 psi	Pass	5.7e-003 psi
Output=4.009 mA							
0.0000 psi	0.0000 psi	0.002 psi	±0.0200 psi	-0.020 psi	0.020 psi	Pass	4.5e-003 psi

END OF CERTIFICATE



# CERTIFICATE OF CALIBRATION



Certificate Number: 2018006291

Page 1 of 2

**Manufacturer:** Dwyer Instruments Inc.  
**Model:** 626-06-GH-PA-E1-S1  
**Description:** Pressure Transmitter  
**Serial:** N/A  
**ID:** SBI-298  
**Customer:** STOVE BUILDER INTERNATIONAL INC.  
 250 RUE DE COPENHAGUE  
 ST-AUGUSTIN-DE-DESMAURES QC  
 G3A 2H3

**RMA:** AC18091585  
**Workorder:** 2018006291  
**Barcode:** AL00023736-P  
**Received Conditions:** In Tolerance  
**Calibration Date:** 15-Oct-2018  
**Calibration Due:** 15-Oct-2019  
**Temperature:** 22.09°C  
**Humidity:** 47.7%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-17025:2005 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.

This certificate shall not be reproduced except in full without written approval of Alpha Controls and Instrumentation Inc.

## STANDARDS USED

Description	Model	ID	Cal Date	Due Date
Multimeter	Fluke 8845A	ELC-MTR-04	08-Jan-2018	08-Jan-2019
Pressure Controller/Calibrator	DH Instruments PPC3	PRE-CAL-04	21-May-2018	21-May-2019

**Notes:** Unit was calibrated in vertical position.

**Performed by:** Roy Mathew  
(digitally signed)

**Reviewed by:** Lauren Lazar  
(digitally signed)

Quality Management System is assessed and registered by Intertek as conforming to the requirements of ISO9001

Procedure: Pressure Transmitter: psi/4-20mA: CAL VER /PPC3,8845 (1.1.A)

FOUND-LEFT (Pass)

Test Description	True Value	Test Results	Tolerance	Lower Limit	Upper Limit	Status	Uncertainty
Calibrated in the vertical position.							
Range: 0 to 5 psi							
Output: 4-20 mA							
PRESSURE TEST							
Output=4.074 mA							
0.0000 psi	0.0000 psi	0.023 psi	±0.0300 psi	-0.030 psi	0.030 psi	Pass	4.6e-003 psi
Output=8.075 mA							
1.2500 psi	1.2500 psi	1.273 psi	±0.0300 psi	1.220 psi	1.280 psi	Pass	5.8e-003 psi
Output=12.045 mA							
2.5000 psi	2.5000 psi	2.515 psi	±0.0300 psi	2.470 psi	2.530 psi	Pass	7.0e-003 psi
Output=16.041 mA							
3.7500 psi	3.7500 psi	3.763 psi	±0.0300 psi	3.720 psi	3.780 psi	Pass	8.2e-003 psi
Output=20.074 mA							
5.0000 psi	5.0000 psi	5.023 psi	±0.0300 psi	4.970 psi	5.030 psi	Pass	9.5e-003 psi
Output=16.058 mA							
3.7500 psi	3.7500 psi	3.768 psi	±0.0300 psi	3.720 psi	3.780 psi	Pass	8.2e-003 psi
Output=12.054 mA							
2.5000 psi	2.5000 psi	2.517 psi	±0.0300 psi	2.470 psi	2.530 psi	Pass	7.0e-003 psi
Output=8.058 mA							
1.2500 psi	1.2500 psi	1.268 psi	±0.0300 psi	1.220 psi	1.280 psi	Pass	5.8e-003 psi
Output=4.074 mA							
0.0000 psi	0.0000 psi	0.023 psi	±0.0300 psi	-0.030 psi	0.030 psi	Pass	4.6e-003 psi

END OF CERTIFICATE





# CERTIFICATE OF CALIBRATION



Certificate Number: 2018004303

Page 1 of 2

<b>Manufacturer:</b>	Dwyer	<b>RMA:</b>	AC18061323
<b>Model:</b>	628-00C-GH-P1-E1-S1	<b>Workorder:</b>	2018004303
<b>Description:</b>	Pressure Transmitter	<b>Barcode:</b>	AL00023154-P
<b>Serial:</b>	N/A	<b>Received Conditions:</b>	In Tolerance
<b>ID:</b>	SBI-302	<b>Calibration Date:</b>	27-Jun-2018
<b>Customer:</b>	STOVE BUILDER INTERNATIONAL INC. 250 RUE DE COPENHAGUE ST-AUGUSTIN-DE-DESMAURES QC G3A 2H3	<b>Calibration Due:</b>	27-Jun-2019
		<b>Temperature:</b>	21.63°C
		<b>Humidity:</b>	58.1%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-17025:2005 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.

This certificate shall not be reproduced except in full without written approval of Alpha Controls and Instrumentation Inc.

## STANDARDS USED

Description	Model	ID	Cal Date	Due Date
Multimeter	Fluke 8845A	ELC-MTR-04	08-Jan-2018	08-Jan-2019
Pressure Controller/Calibrator	DH Instruments PPC3	PRE-CAL-04	21-May-2018	21-May-2019
Reference Pressure Monitor	Fluke RPM4	PRE-MTR-04	18-May-2018	18-May-2019

**Notes:** Calibrated in the vertical position. Unit is not adjustable.

Performed by: Anthony Morra  
(digitally signed)

Reviewed by: Slava Peciurov  
(digitally signed)

Quality Management System is assessed and registered by Intertek as conforming to the requirements of ISO9001

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 = 4.925 mA							
-28.50	-28.50	-28.3	±0.30	-28.8	-28.2	Pass	5.8e-002
OUT = 7.747 mA							
-23.00	-23.00	-23.0	±0.30	-23.3	-22.7	Pass	5.8e-002
OUT = 11 mA							
-17.00	-17.00	-16.9	±0.30	-17.3	-16.7	Pass	5.8e-002
OUT = 14.2 mA							
-11.00	-11.00	-10.9	±0.30	-11.3	-10.7	Pass	5.8e-002
OUT = 16.86 mA							
-6.00	-6.00	-5.9	±0.30	-6.3	-5.7	Pass	5.8e-002
OUT = 20.05 mA							
0.00	0.00	0.1	±0.30	-0.3	0.3	Pass	5.8e-002
OUT = 16.88 mA							
-6.00	-6.00	-5.8	±0.30	-6.3	-5.7	Pass	5.8e-002
OUT = 14.235 mA							
-11.00	-11.00	-10.8	±0.30	-11.3	-10.7	Pass	5.8e-002
OUT = 11.05 mA							
-17.00	-17.00	-16.8	±0.30	-17.3	-16.7	Pass	5.8e-002
OUT = 7.863 mA							
-23.00	-23.00	-22.8	±0.30	-23.3	-22.7	Pass	5.8e-002
OUT = 4.922 mA							
-28.50	-28.50	-28.3	±0.30	-28.8	-28.2	Pass	5.8e-002

END OF CERTIFICATE



# CERTIFICATE OF CALIBRATION



Certificate Number: 2018006292

Page 1 of 2

<b>Manufacturer:</b>	Dwyer Instruments Inc.	<b>RMA:</b>	AC18091585
<b>Model:</b>	628-00C-GH-P1-E1-S1	<b>Workorder:</b>	2018006292
<b>Description:</b>	Pressure Transmitter	<b>Barcode:</b>	AL00023737-P
<b>Serial:</b>	N/A	<b>Received Conditions:</b>	In Tolerance
<b>ID:</b>	SBI-305	<b>Calibration Date:</b>	12-Oct-2018
<b>Customer:</b>	STOVE BUILDER INTERNATIONAL INC. 250 RUE DE COPENHAGUE ST-AUGUSTIN-DE-DESMAURES QC G3A 2H3	<b>Calibration Due:</b>	12-Oct-2019
		<b>Temperature:</b>	20.42°C
		<b>Humidity:</b>	31.8%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-17025:2005 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.

This certificate shall not be reproduced except in full without written approval of Alpha Controls and Instrumentation Inc.

## STANDARDS USED

Description	Model	ID	Cal Date	Due Date
Pressure Controller/Calibrator	DH Instruments PPC3	PRE-CAL-04	21-May-2018	21-May-2019
Reference Pressure Monitor	Fluke RPM4	PRE-MTR-04	18-May-2018	18-May-2019

**Notes:** Unit was calibrated in vertical position.

Performed by:

Roy Mathew

(digitally signed)

Reviewed by:

Slava Peciurov

(digitally signed)

Quality Management System is assessed and registered by Intertek as conforming to the requirements of ISO9001

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 = 4.9087 mA							
-28.400	-28.400	-28.30	±0.300	-28.70	-28.10	Pass	6.1e-003
OUT = 8.049 mA							
-22.500	-22.500	-22.41	±0.300	-22.80	-22.20	Pass	6.1e-003
OUT = 12.056 mA							
-15.000	-15.000	-14.90	±0.300	-15.30	-14.70	Pass	6.1e-003
OUT = 16.087 mA							
-7.500	-7.500	-7.34	±0.300	-7.80	-7.20	Pass	6.1e-003
OUT = 20.098 mA							
0.000	0.000	0.18	±0.300	-0.30	0.30	Pass	6.1e-003
OUT = 16.119 mA							
-7.500	-7.500	-7.28	±0.300	-7.80	-7.20	Pass	6.1e-003
OUT = 12.125 mA							
-15.000	-15.000	-14.77	±0.300	-15.30	-14.70	Pass	6.1e-003
OUT = 8.126 mA							
-22.500	-22.500	-22.26	±0.300	-22.80	-22.20	Pass	6.1e-003
OUT = 4.907 mA							
-28.400	-28.400	-28.30	±0.300	-28.70	-28.10	Pass	6.1e-003

END OF CERTIFICATE

Certificate No: 01037944-1

# METTLER TOLEDO

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



## Mass Calibration Certificate

### Customer Information

*Customer Name:* Stove Builder International, Inc. *City:*  
*Address:* 250 de Copenhauge *State / Province:* QC  
St.-Augustin-de-Desmaures  
*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.

This certificate may not be partially reproduced, except with prior written permission of the issuing laboratory. This certificate must not be used by the customer to claim product endorsement by NIST, NVLAP, or any other agency of the U.S. government.

*Calibration Date:* 09-OCT-2018

*Next Calibration Due:* 09-OCT-2023

*Calibration Technician:* Robotic Calibration

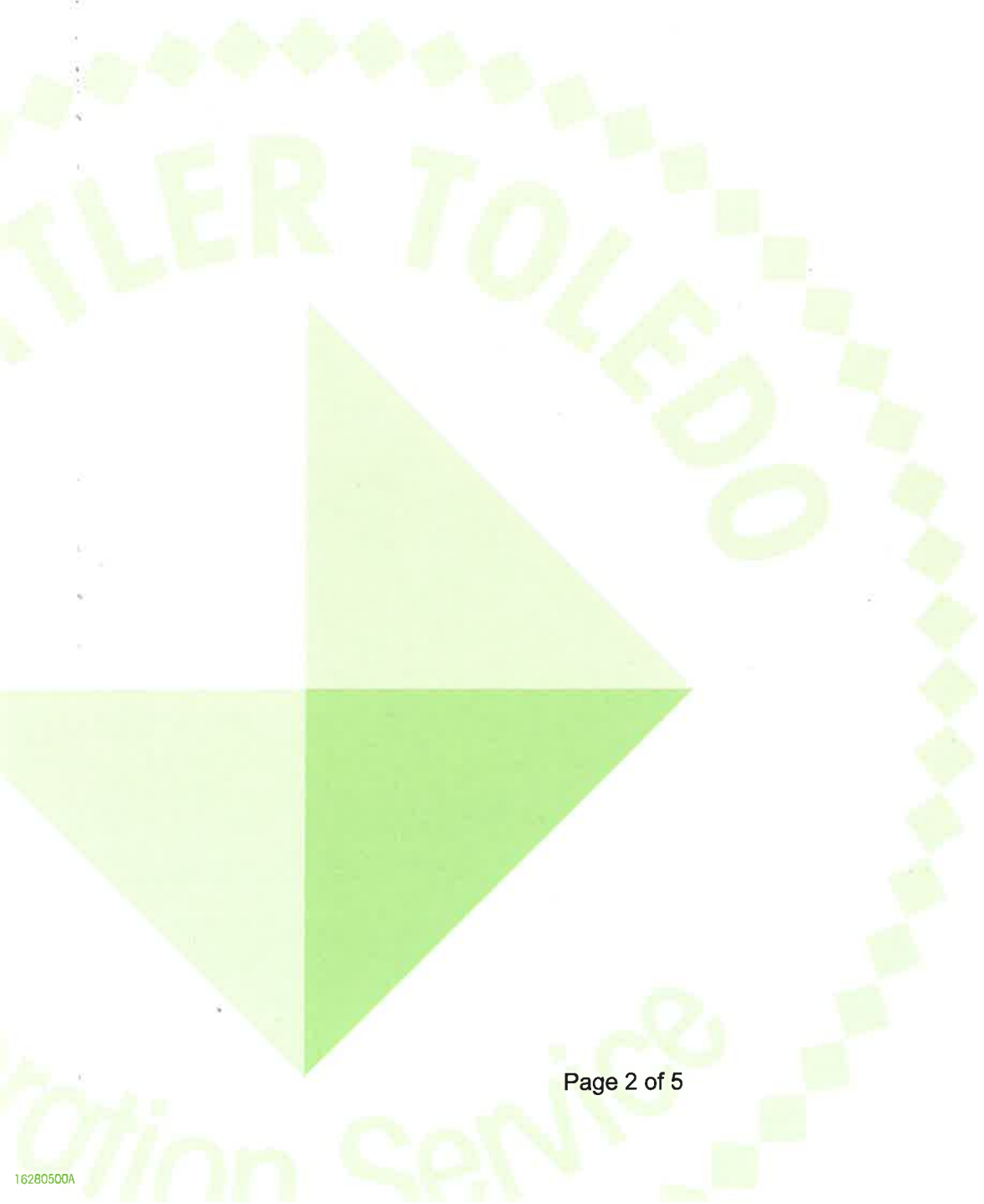
*Signature:*

Joseph Moran, Metrology Manager  
Approved Signatory 10-OCT-2018

Certificate No: 01037944-1

**As Found Data**

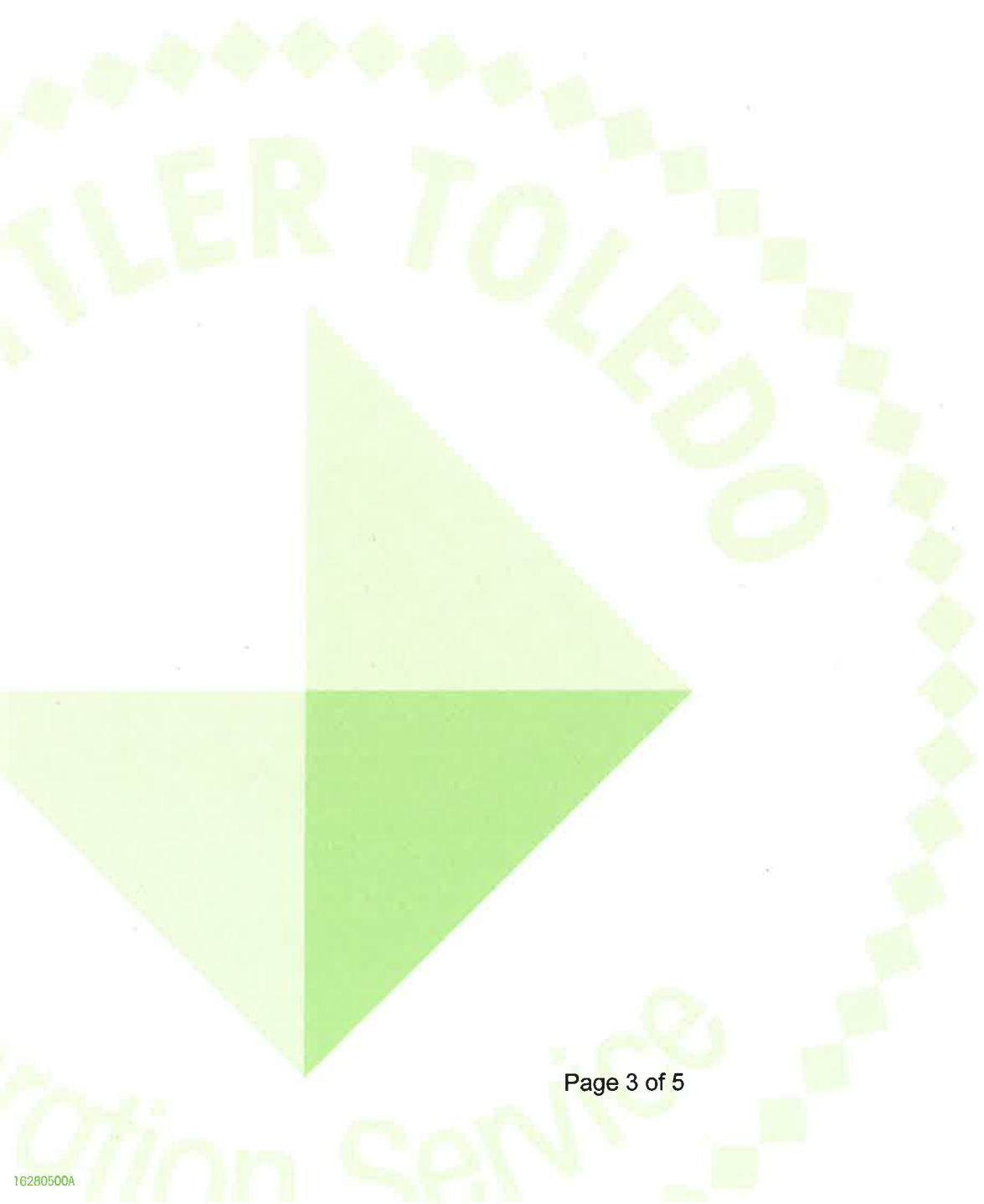
Nominal Value&Suffix	Serial Number	True Mass (g)	Conv. Mass (g)	Uncertainty (mg, k = 2)	Tolerance (mg)	Density (g/cm <sup>3</sup> )
200 g	B739752165	200.00009	200.00009	0.06	0.30	8.00



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/cm <sup>3</sup> )
200 g	B739752165	200.00009	200.00009	0.06	0.30	8.00

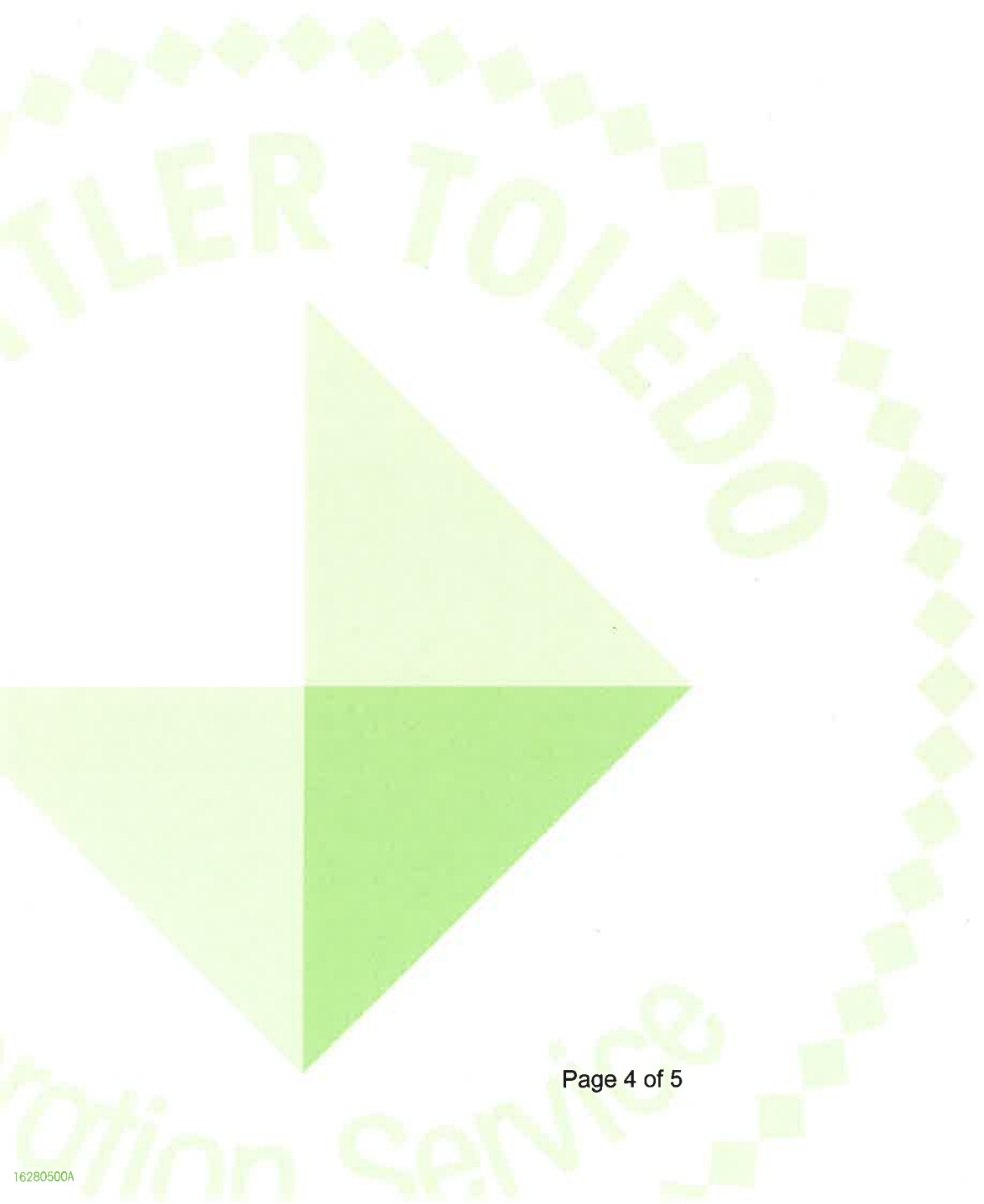


Certificate No: 01037944-1

**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**





## Definitions

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**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/m<sup>3</sup> which it balances in air with a density of 1.2 kg/m<sup>3</sup>. 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.

**CERTIFICAT D'ÉTALONNAGE # 8719**

Date d'étalonnage : 2018-10-26

Date d'émission du certificat : 2018-10-26

**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 – 2005, à la norme ISO 9001 – 2015 ainsi qu'à tout autre exigences de qualité définies dans la description d'achat des clients.

**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, AINSI/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 références utilisées pour l'étalonnage de débit ont une incertitude de  $\pm 0.2\%$  de la lecture pour les mesures entre 5 SCCM à 10 SLPM,  $\pm 0.3\%$  de la lecture pour les mesures entre 10 SLPM à 30 SLPM,  $\pm 0.2\%$  de la lecture pour les mesures entre 30 SLPM à 3000 SLPM,  $\pm 0.3\%$  de la lecture pour les mesures supérieures à 3000 SLPM jusqu'à 6000 SLPM et  $\pm 0.5\%$  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 - vitre légèrement brisée à la réception
Travail Effectué	Étalonnage de l'instrument
Résultats	Lectures Initiales = Lectures finales, aucun ajustement
Remarques	Lectures finales dans les tolérances
	Fréquence d'étalonnage aux 12 mois

  
\_\_\_\_\_  
Metrologiste

  
\_\_\_\_\_  
Responsable du laboratoire

**Certificat d'étalonnage # 8719**

Numéro de série:	07J264834	Station de mesure:	3
Date d'étalonnage:	2018-10-26	Procédure:	POS-CAL-005
Identification de l'instrument:	SBI-103		

**Instrument de mesure de référence utilisé pour l'étalonnage final**

Description	Modèle	# Série	Traçabilité	Date dû
DHI molbloc (30 slpm)	3E4-VCR-V-Q	2403	1500237464	2019-04-26
DHI molbox1	Molbox1	755	1500237197	2019-04-25
RTD Mist	M22	2208102	2018002234	2019-04-11
Module 44.5 PSI avec Baro 163671	Module 30	160659	2018002180	2019-04-12

**Spécifications finales de l'appareil**


**Condition d'étalonnage**

Gaz	Air	Gaz	Air
Température d'opération		Température ambiante	21 °C
Pression à l'entrée		Pression ambiante	1017.99 mbar
Pression à la sortie		Orientation	Horizontale
Température de référence		Élastomère	Viton
Pression de référence		Valve	Viton
Étendue d'échelle	0-200 ACFH		
Signaux Entrée/Sortie	-		
Alimentation			
Tolérance	±2 %F.S.		

**Lectures finales**

Débit du test ACFH	Instrument en test ft³	Valeurs mesurées			Référence calculée ft³	Erreur calculée ft³	Tolérance acceptable ft³	TUR
		Pression PSIA	Température °C	Référence ft³				
5.0526	0.8500	14.7758	21.56	0.8451	0.8418	0.0082	0.6665	>4
9.9963	1.6780	14.7774	21.51	1.6716	1.6646	0.0134	0.6661	>4
15.1919	2.5580	14.7782	21.47	2.5427	2.5316	0.0264	0.6666	>4
25.0425	4.2230	14.7815	21.41	4.1908	4.1707	0.0523	0.6662	>4
40.0833	6.7640	14.7872	21.40	6.7048	6.6700	0.0940	0.6656	>4

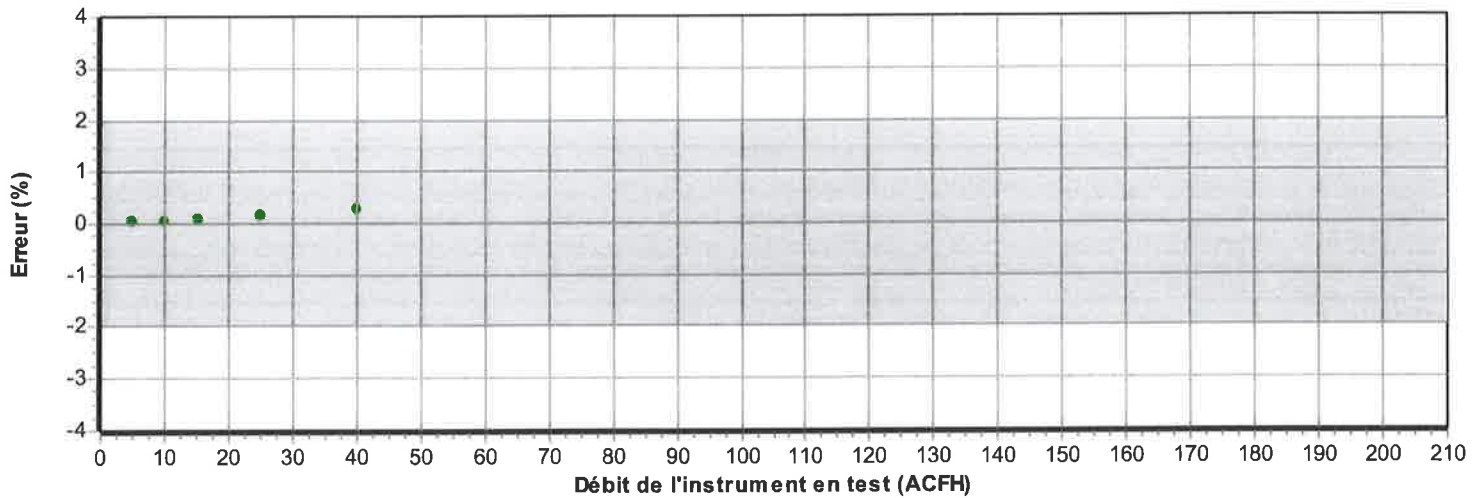
Bernard Poirier  
Métrologue

  
Signature

## Certificat d'étalonnage # 8719

Numéro de série:	07J264834	Station de mesure:	3
Date d'étalonnage:	2018-10-26	Procédure:	POS-CAL-005
Identification de l'instrument:	SBI-103		

## Résultats finaux



- La mesure (et son incertitude) se situe dans les tolérances
- La mesure (et son incertitude) se situe hors tolérance
- La mesure (et son incertitude) ne rencontre pas la marge de sécurité tel que spécifié dans le document G-8 de l'ILAC

Bernard Poirier  
Métrologue


  
Signature

# Thermal Metering System Calibration

## Y factor for Method 5G sampling

Manufacturer: American Meter Company  
 Model: DTM-200A  
 Serial Number: SBI-046 (90R054300)

<b>Average Gas Meter y Factor</b>
<b>1.008</b>

Calibration Date: 05-24-19  
 Calibrated by: Claude Paré  
 Calibration Frequency: 6-month  
 Next Calibration Due: 11-22-19  
 Instrument Range: 1.000 cfm  
 Standard Temp.: 72.5 oF  
 Standard Press.: 29.92 "Hg  
 Barometric Press.: 29.9 "Hg  
 Signature/Date:  2019-05-24

### Previous Calibration Comparison

Date	2018-10-10	Acceptable	
		Deviation (5%)	Deviation
y Factor	1.013	0.05065	0.005
Acceptance	Acceptable		

### Current Calibration

Acceptable y Deviation	0.050
Maximum y Deviation	0.005
Acceptance	Acceptable

### Reference Standard \*

Standard	Model	Standard Test Meter
Calibrator	S/N	07J264834
	Calib. Date	26-oct-18
	Calib. Value	0.992 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	999.6	1005.1	1011.9
Final Reference Meter	1004.703	1011.464	1018.046
Initial DGM	780.23	785.675	792.365
Final DGM	785.266	791.923	798.369
Temp. Ref. Meter (°F), Tr	71.6	71.8	71.6
Temperature DGM (°F), Td	70.1	70.4	70.4
Time (Minutes)	43.0	39.0	31.0
Net Volume Ref. Meter, Vr	5.103	6.364	6.146
Net Volume DGM, Vd	5.036	6.248	6.004
<b>Gas Meter y Factor =</b>	<b>1.002</b>	<b>1.008</b>	<b>1.013</b>
<b>Gas Meter y Factor Deviation (from avg.)</b>	0.005	0.000	0.005
<b>Orifice dH@</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
<b>Orifice dH@ Deviation (from avg.)</b>	0.000	0.000	0.000

where:  $0.117116279$

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


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

# Thermal Metering System Calibration

## Y factor for Method 5G sampling

Manufacturer: American Meter Company  
 Model: DTM-200A  
 Serial Number: SBI-047 (98Z332226)

<b>Average Gas Meter y Factor</b>
<b>1.004</b>

Calibration Date: 05-23-19  
 Calibrated by: Claude Paré  
 Calibration Frequency: 6-month  
 Next Calibration Due: 11-21-19  
 Instrument Range: 1.000 cfm  
 Standard Temp.: 74.8 °F  
 Standard Press.: 29.92 "Hg  
 Barometric Press.: 30 "Hg  
 Signature/Date:  2019-05-23

### Previous Calibration Comparison

Date	2018-10-10	Acceptable	
		Deviation (5%)	Deviation
y Factor	1.012	0.0506	0.008
Acceptance	<b>Acceptable</b>		

### Current Calibration

Acceptable y Deviation	0.050
Maximum y Deviation	0.007
Acceptance	<b>Acceptable</b>

### Reference Standard \*

Standard	Model	Standard Test Meter
Calibrator	S/N	07J264834
	Calib. Date	26-oct-18
	Calib. Value	0.992 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	979.6	985.1	990.8
Final Reference Meter	984.685	990.234	995.808
Initial DGM	897.544	903.012	908.652
Final DGM	902.582	908.077	913.551
Temp. Ref. Meter (°F), Tr	74.6	75.0	75.0
Temperature DGM (°F), Td	73.7	73.5	73.5
Time (Minutes)	41.0	32.0	25.0
Net Volume Ref. Meter, Vr	5.085	5.134	5.008
Net Volume DGM, Vd	5.038	5.065	4.899
<b>Gas Meter y Factor =</b>	<b>1.000</b>	<b>1.003</b>	<b>1.011</b>
<b>Gas Meter y Factor Deviation (from avg.)</b>	0.005	0.002	0.007
<b>Orifice dH@</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
<b>Orifice dH@ Deviation (from avg.)</b>	0.000	0.000	0.000

where: 0.122878049

1. Deviation = |Average value for all runs - current run value|
2.  $y = [V_r \times (y \text{ factor (ref)}) \times (P_b) \times (T_d + 460)] / [V_d \times (P_b + (dH / 13.6)) \times (T_r + 460)]$
3.  $dH@ = 0.0317 \times dH / (P_b (T_d + 460)) \times [(T_r + 460) \times \text{time}] / V_r ]^2$


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

# Thermal Metering System Calibration

## Y factor for Method 5G sampling

Manufacturer: Rockwell International  
 Model: S-275  
 Serial Number: 9388  
 Asset No. SBI-276

<b>Average Gas Meter y Factor</b>
<b>1.000</b>

Calibration Date: 05-27-19  
 Calibrated by: Claude Paré  
 Calibration Frequency: 6-month  
 Next Calibration Due: 11-25-19  
 Instrument Range: 1.000 cfm  
 Standard Temp.: 71.5 oF  
 Standard Press.: 29.92 "Hg  
 Barometric Press.: 30 "Hg  
 Signature/Date:  2019-05-27

### Previous Calibration Comparison

Date	2019-04-09	Acceptable	
		Deviation (5%)	Deviation
y Factor	0.995	0.04975	0.005
Acceptance	Acceptable		

### Current Calibration

Acceptable y Deviation	0.020
Maximum y Deviation	0.001
Acceptance	Acceptable

### Reference Standard \*

	Standard	Standard Test Meter
	Model	
Calibrator	S/N	07J264834
	Calib. Date	26-oct-18
	Calib. Value	0.992 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	19.700	25.100	30.700
Final Reference Meter	24.753	30.169	35.877
Initial DGM	957.530	962.910	968.503
Final DGM	962.535	967.940	973.648
Temp. Ref. Meter (°F), Tr	71.5	71.9	72.3
Temperature DGM (°F), Td	71.5	72.2	72.9
Time (Minutes)	59.0	36.0	27.0
Net Volume Ref. Meter, Vr	5.053	5.069	5.177
Net Volume DGM, Vd	5.005	5.03	5.145
<b>Gas Meter y Factor =</b>	<b>1.002</b>	<b>1.000</b>	<b>0.999</b>
<b>Gas Meter y Factor Deviation (from avg.)</b>	0.001	0.000	0.001
<b>Orifice dH@</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
<b>Orifice dH@ Deviation (from avg.)</b>	0.000	0.000	0.000

where: 0.084830508

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

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




# Thermal Metering System Calibration

## Y factor for Method 5G sampling

Manufacturer: American Meter Company  
 Model: DTM-200A  
 Serial Number: SBI-046 (90R054300)

**Average Gas  
Meter y Factor**  
**1.012**

Calibration Date: 06-11-19  
 Calibrated by: Claude Paré  
 Calibration Frequency: Post test calibration  
 Next Calibration Due: \_\_\_\_\_  
 Instrument Range: 1.000 cfm  
 Standard Temp.: 78.9 °F  
 Standard Press.: 29.92 "Hg  
 Barometric Press.: 29.7 "Hg  
 Signature/Date:  2019-06-11

### Previous Calibration Comparison

Date	2019-05-24	Acceptable	
		Deviation (5%)	Deviation
y Factor	1.008	0.0504	0.004
Acceptance	Acceptable		

### Current Calibration

Acceptable y Deviation	0.050
Maximum y Deviation	0.001
Acceptance	Acceptable

### Reference Standard \*

Standard	Model	Standard Test Meter
Calibrator	S/N	07J264834
	Calib. Date	26-oct-18
	Calib. Value	0.992 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	59.100	64.400	69.900
Final Reference Meter	64.165	69.58	75.143
Initial DGM	339.981	345.157	350.541
Final DGM	344.928	350.225	355.673
Temp. Ref. Meter (°F), Tr	78.6	78.5	78.2
Temperature DGM (°F), Td	77.1	77.0	76.7
Time (Minutes)	33.0	34.0	34.0
Net Volume Ref. Meter, Vr	5.065	5.180	5.243
Net Volume DGM, Vd	4.947	5.068	5.132
<b>Gas Meter y Factor =</b>	<b>1.013</b>	<b>1.011</b>	<b>1.011</b>
<b>Gas Meter y Factor Deviation (from avg.)</b>	0.001	0.000	0.001
<b>Orifice dH@</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
<b>Orifice dH@ Deviation (from avg.)</b>	0.000	0.000	0.000

where: 0.149909091

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

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




# Thermal Metering System Calibration

## Y factor for Method 5G sampling

Manufacturer: American Meter Company  
 Model: DTM-200A  
 Serial Number: SBI-047 (98Z332226)

**Average Gas  
Meter y Factor**  
**1.006**

Calibration Date: 06-11-19  
 Calibrated by: Claude Paré  
 Calibration Frequency: Post test calibration  
 Next Calibration Due: \_\_\_\_\_  
 Instrument Range: 1.000 cfm  
 Standard Temp.: 77 °F  
 Standard Press.: 29.92 "Hg  
 Barometric Press.: 29.7 "Hg  
 Signature/Date:  2019-06-11

### Previous Calibration Comparison

Date	2019-05-23	Acceptable	
		Deviation (5%)	Deviation
y Factor	1.004	0.0502	0.002
Acceptance	Acceptable		

### Current Calibration

Acceptable y Deviation	0.050
Maximum y Deviation	0.002
Acceptance	Acceptable

### Reference Standard \*

Standard	Model	Standard Test Meter
Calibrator	S/N	07J264834
	Calib. Date	26-oct-18
	Calib. Value	0.992 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	38.500	43.900	50.400
Final Reference Meter	43.673	50.113	56.562
Initial DGM	454.07	459.389	465.797
Final DGM	459.166	465.515	471.866
Temp. Ref. Meter (°F), Tr	75.5	76.4	77.0
Temperature DGM (°F), Td	76.2	76.1	76.1
Time (Minutes)	35.0	44.0	43.0
Net Volume Ref. Meter, Vr	5.173	6.213	6.162
Net Volume DGM, Vd	5.096	6.126	6.069
<b>Gas Meter y Factor =</b>	<b>1.008</b>	<b>1.006</b>	<b>1.006</b>
<b>Gas Meter y Factor Deviation (from avg.)</b>	0.002	0.001	0.001
<b>Orifice dH@</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
<b>Orifice dH@ Deviation (from avg.)</b>	0.000	0.000	0.000

where:

0.1456

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


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

# Thermal Metering System Calibration

## Y factor for Method 5G sampling

Manufacturer: Rockwell International  
 Model: S-275  
 Serial Number: 9388  
 Asset No. SBI-276

<b>Average Gas Meter y Factor</b>
<b>0.998</b>

Calibration Date: 06-12-19  
 Calibrated by: Claude Paré  
 Calibration Frequency: Post test calibration  
 Next Calibration Due: \_\_\_\_\_  
 Instrument Range: 1.000 cfm  
 Standard Temp.: 73 °F  
 Standard Press.: 29.92 "Hg  
 Barometric Press.: 30.1 "Hg  
 Signature/Date:  2019-06-12

### Previous Calibration Comparison

Date	2019-05-27	Acceptable	
		Deviation (5%)	Deviation
y Factor	1.000	0.05	0.002
Acceptance	<b>Acceptable</b>		

### Current Calibration

Acceptable y Deviation	0.020
Maximum y Deviation	0.002
Acceptance	<b>Acceptable</b>

### Reference Standard \*

Standard	Model	Standard Test Meter
Calibrator	S/N	07J264834
	Calib. Date	26-oct-18
	Calib. Value	0.992 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	82.700	89.600	96.900
Final Reference Meter	89.377	96.644	103.413
Initial DGM	20.085	26.933	34.168
Final DGM	26.713	33.918	40.645
Temp. Ref. Meter (°F), Tr	72.4	72.1	72.1
Temperature DGM (°F), Td	71.8	71.3	71.4
Time (Minutes)	38.0	40.0	37.0
Net Volume Ref. Meter, Vr	6.677	7.044	6.513
Net Volume DGM, Vd	6.6275	6.985	6.4775
<b>Gas Meter y Factor =</b>	<b>0.998</b>	<b>0.999</b>	<b>0.996</b>
<b>Gas Meter y Factor Deviation (from avg.)</b>	0.001	0.001	0.002
<b>Orifice dH@</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
<b>Orifice dH@ Deviation (from avg.)</b>	0.000	0.000	0.000

where: 0.174407895

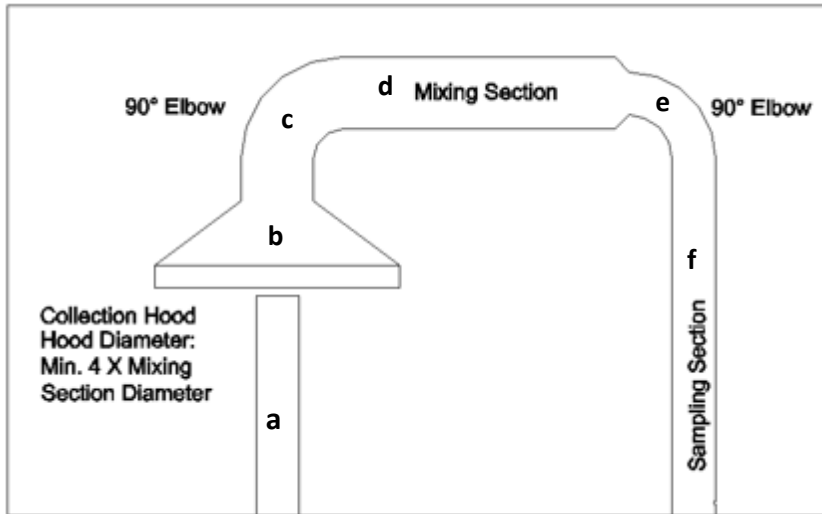
1. Deviation = |Average value for all runs - current run value|
2.  $y = [Vr \times (y \text{ factor (ref)}) \times (Pb) \times (Td + 460)] / [Vd \times (Pb + (dH / 13.6)) \times (Tr + 460)]$
3.  $dH@ = 0.0317 \times dH / (Pb (Td + 460)) \times [(Tr + 460) \times \text{time}] / Vr ]^2$

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

## **Appendix H**

### **Tunnel cleaning and test load photograph**

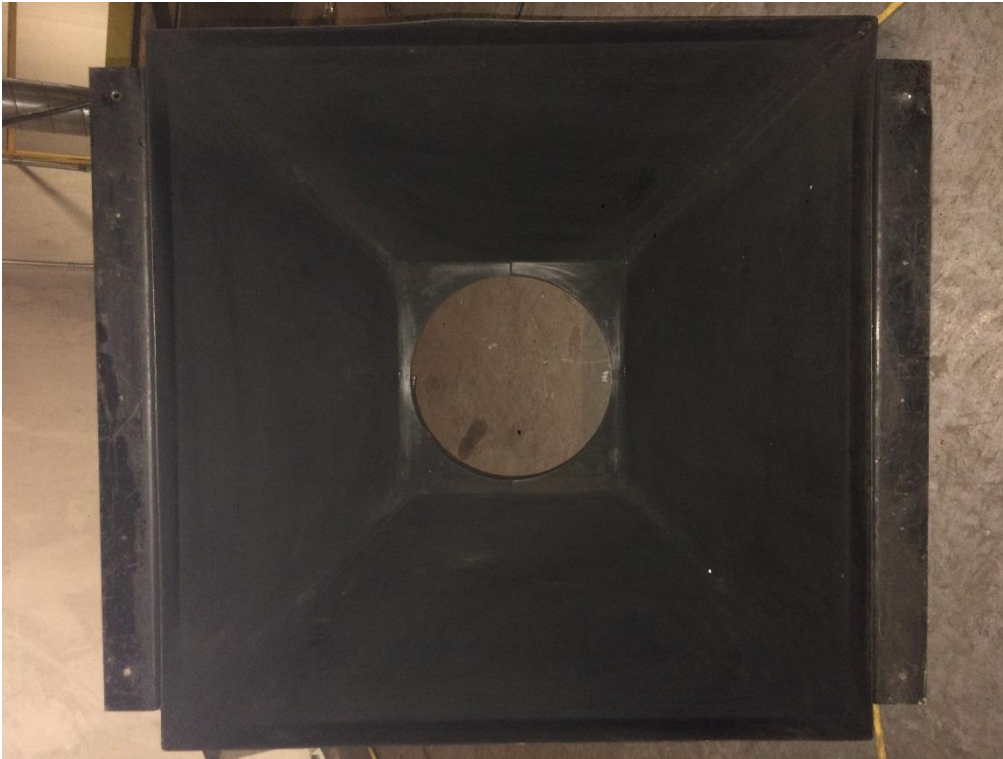
## 1. Tunnel cleaning pictures



a. Picture of the chimney



b. Picture of the collecting hood

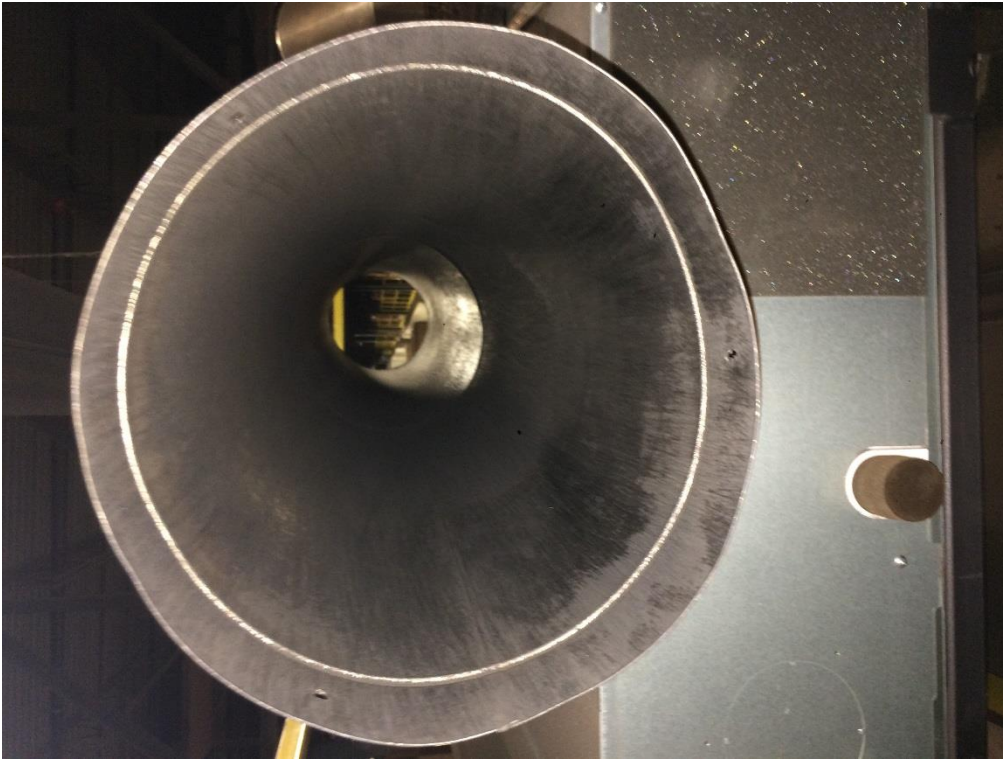


c. Picture of the first elbow





d. Picture of the mixing section



e. Picture of the second elbow



f. Picture of the sampling section



**2. Identification pictures (Ex : Model name – Proto – A1.2)**

a. Front view





b. Rear view



c. Iso view

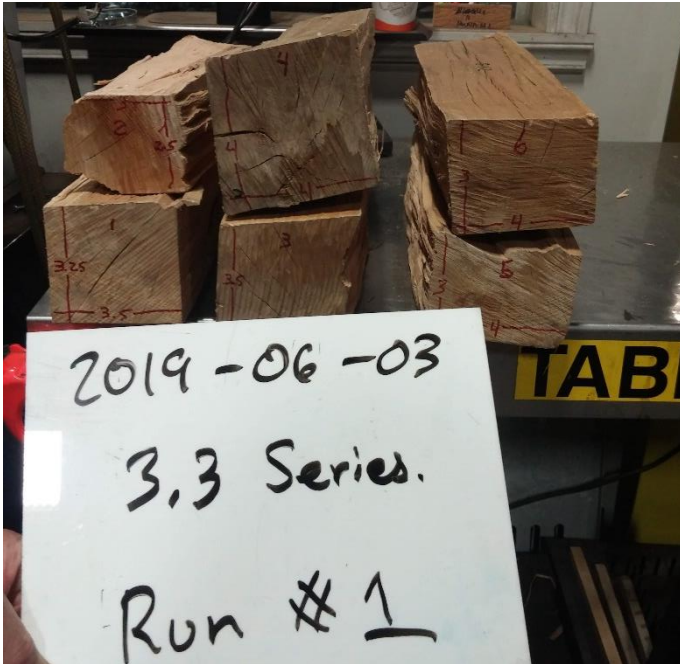




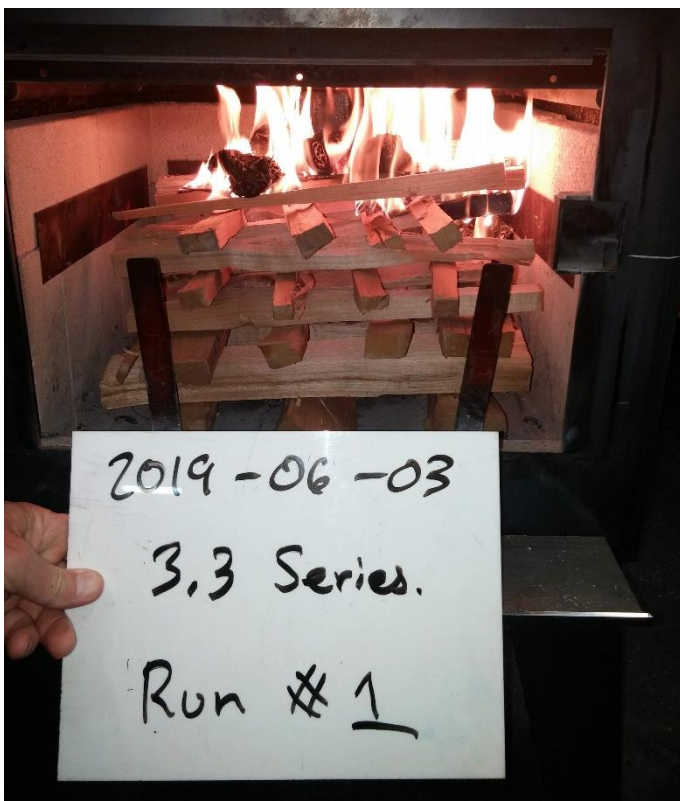
### 3. Test run pictures

a. Run #1

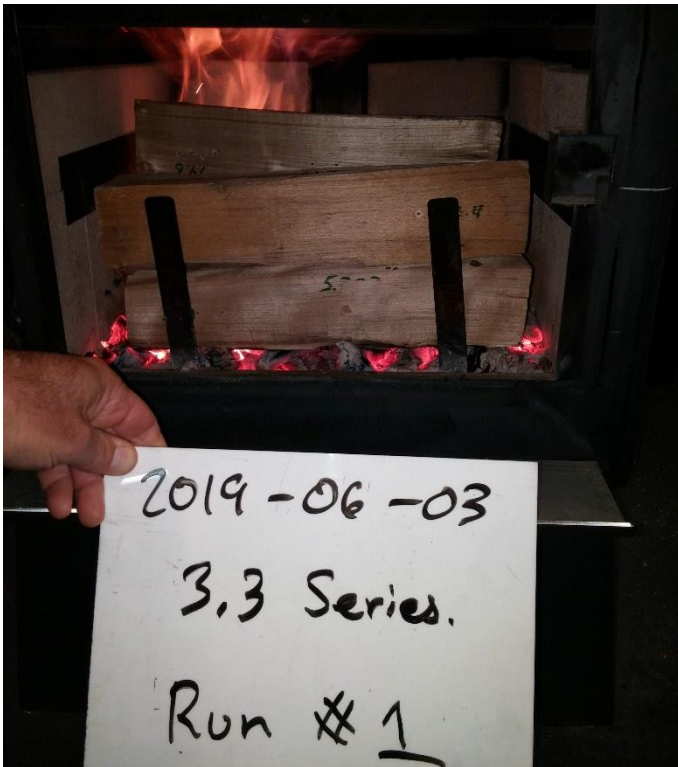
i. Picture of the load with all dimensions



ii. Picture of kindling and start-up fuel after ignition

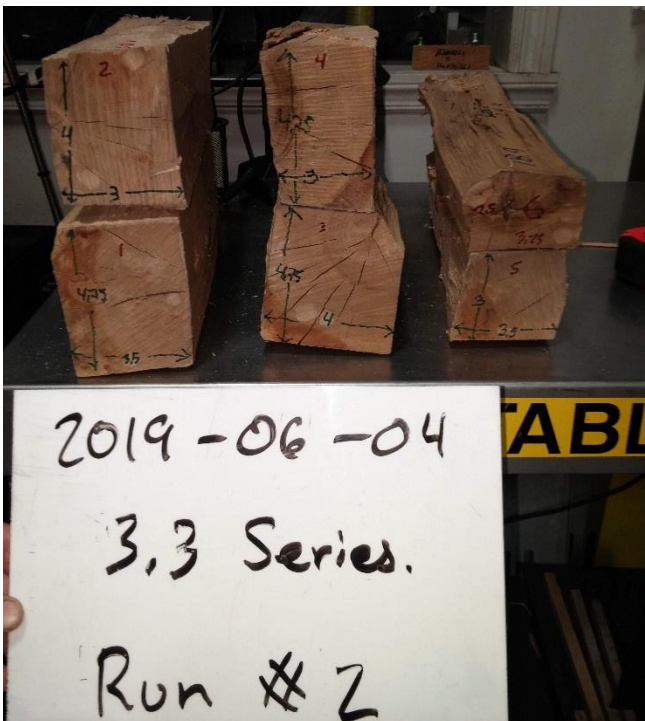


iii. Picture of the high fire load inside of the combustion chamber

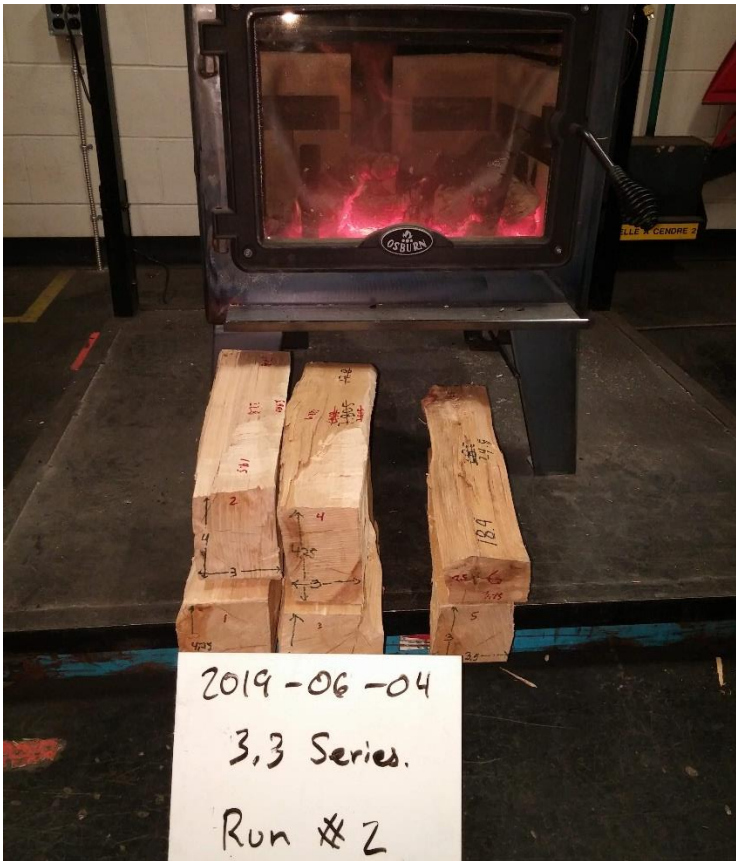


b. Run #2

i. Picture of the load with all dimensions

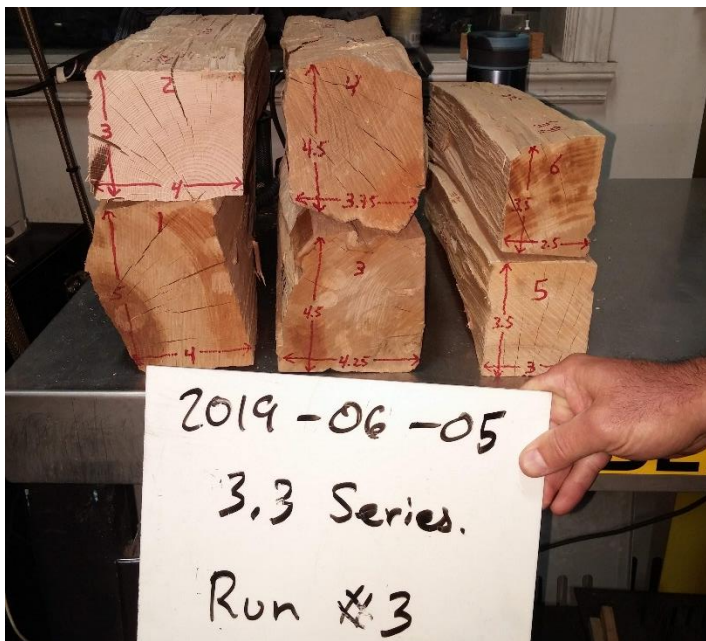


ii. Picture before loading



c. Run #3

i. Picture of the load with all dimensions



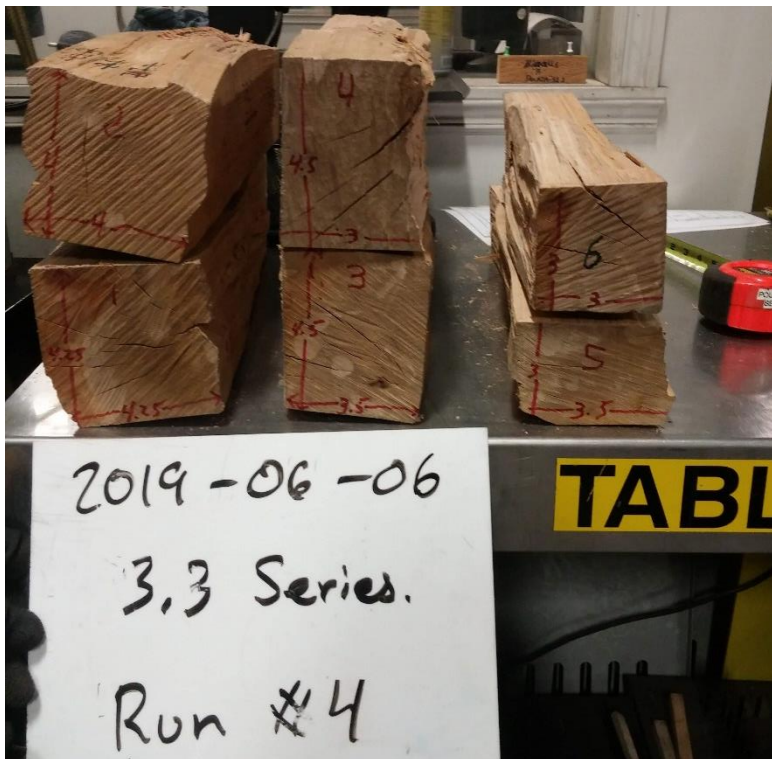


ii. Picture before loading



d. Run #4

i. Picture of the load with all dimensions



i. Picture before loading



4. Picture of the sealed unit

a. Front view



b. Rear View



c. Iso view



Signature : \_\_\_\_\_

Date : \_\_\_\_\_

# Stove Builder International Inc.

**Manufacturer:** SBI  
**Model:** 3.3 Series  
**Date:** 06-03-19  
**Run:** 1  
**Control #:** G103994967  
**Test Duration:** 134  
**Output Category:** High

**Technicians:** \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

## Test Results in Accordance with CSA B415.1-10

	HHV Basis	LHV Basis
<b>Overall Efficiency</b>	70.4%	75.9%
<b>Combustion Efficiency</b>	98.9%	98.9%
<b>Heat Transfer Efficiency</b>	71%	76.7%

<b>Output Rate (kJ/h)</b>	60,132	57,041	<b>(Btu/h)</b>
<b>Burn Rate (kg/h)</b>	4.29	9.46	<b>(lb/h)</b>
<b>Input (kJ/h)</b>	85,354	80,968	<b>(Btu/h)</b>

<b>Test Load Weight (dry kg)</b>	9.59	21.13	<b>dry lb</b>
<b>MC wet (%)</b>	16.5		
<b>MC dry (%)</b>	19.76		
<b>Particulate (g)</b>	0		
<b>CO (g)</b>	178		
<b>Test Duration (h)</b>	2.23		

Emissions	Particulate	CO
<b>g/MJ Output</b>	0.00	1.32
<b>g/kg Dry Fuel</b>	0.00	18.55
<b>g/h</b>	0.00	79.63
<b>lb/MM Btu Output</b>	0.00	3.08

<b>Air/Fuel Ratio (A/F)</b>	9.37
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VERSION:

2.4

2010-04-15



# Stove Builder International Inc.

**Manufacturer:** SBI  
**Model:** 3.3 Series  
**Date:** 06-04-19  
**Run:** 2  
**Control #:** G103994967  
**Test Duration:** 630  
**Output Category:** Low

**Technicians:** \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

## Test Results in Accordance with CSA B415.1-10

	HHV Basis	LHV Basis
<b>Overall Efficiency</b>	70.0%	75.4%
<b>Combustion Efficiency</b>	96.6%	96.6%
<b>Heat Transfer Efficiency</b>	72%	78.0%

<b>Output Rate (kJ/h)</b>	16,699	15,841	<b>(Btu/h)</b>
<b>Burn Rate (kg/h)</b>	1.20	2.64	<b>(lb/h)</b>
<b>Input (kJ/h)</b>	23,854	22,628	<b>(Btu/h)</b>

<b>Test Load Weight (dry kg)</b>	12.59	27.76	<b>dry lb</b>
<b>MC wet (%)</b>	17.1		
<b>MC dry (%)</b>	20.63		
<b>Particulate (g)</b>	4.105		
<b>CO (g)</b>	672		
<b>Test Duration (h)</b>	10.50		

Emissions	Particulate	CO
<b>g/MJ Output</b>	0.02	3.83
<b>g/kg Dry Fuel</b>	0.33	53.34
<b>g/h</b>	0.39	63.98
<b>lb/MM Btu Output</b>	0.05	8.90

<b>Air/Fuel Ratio (A/F)</b>	16.90
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VERSION:

2.4

2010-04-15

# Stove Builder International Inc.

**Manufacturer:** SBI  
**Model:** 3.3 Series  
**Date:** 06-06-19  
**Run:** 4  
**Control #:** G103994967  
**Test Duration:** 510  
**Output Category:** Medium

**Technicians:** \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

## Test Results in Accordance with CSA B415.1-10

	HHV Basis	LHV Basis
<b>Overall Efficiency</b>	72.5%	78.1%
<b>Combustion Efficiency</b>	97.7%	97.7%
<b>Heat Transfer Efficiency</b>	74%	79.9%

<b>Output Rate (kJ/h)</b>	21,480	20,376	<b>(Btu/h)</b>
<b>Burn Rate (kg/h)</b>	1.49	3.28	<b>(lb/h)</b>
<b>Input (kJ/h)</b>	29,621	28,099	<b>(Btu/h)</b>

<b>Test Load Weight (dry kg)</b>	12.66	27.90	<b>dry lb</b>
<b>MC wet (%)</b>	16.6		
<b>MC dry (%)</b>	19.90		
<b>Particulate (g)</b>	4.695		
<b>CO (g)</b>	421		
<b>Test Duration (h)</b>	8.50		

Emissions	Particulate	CO
<b>g/MJ Output</b>	0.03	2.31
<b>g/kg Dry Fuel</b>	0.37	33.25
<b>g/h</b>	0.55	49.52
<b>lb/MM Btu Output</b>	0.06	5.36

<b>Air/Fuel Ratio (A/F)</b>	15.03
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VERSION:

2.4

2010-04-15

**Intertek Testing Services**

**Manufacturer: SBI**  
**Model: 3.3 Series**  
**Date: 6-3-19**  
**Run: 1**  
**Project #: G103994967**  
**Test Duration: 200**  
**(minutes)**

**RESULTS**

**Average emission rate:(gr/hr) 2.855**

Burn Rate (Dry kg/hr): 3.984  
 (fuel burned only, cold start)

PRESSURE FACTOR: 0.99098

**BAROMETRIC PRESSURE**

Average: 29.65

**TEMPERATURE FACTORS**

Start: 29.6

DGM #1: 0.99116

End: 29.7

DGM #2: 0.99174

**DRY GAS METER VALUES**

**VOLUMES SAMPLED**

DGM #1 Final: 225.852

DGM #1: 31.16607

Initial: 194.248

DGM #2: 31.04909

DGM #2 Final: 114.230

TOTAL TUNNEL VOLUME (scf): 62984

Initial: 82.888

**SAMPLE RATIOS**

**TEMPERATURES (DEG. RANKIN)**

Sample Train 1: 2020.911

DGM #1: 532.710

Sample Train 2: 2028.525

DGM #2: 532.397

**TOTAL EMISSIONS**

**CALIBRATION FACTORS**

Sample Train 1 (g): **9.296**

DGM #1: 1.0040

Sample Train 2 (g): **9.737**

DGM #2: 1.0080

**EMISSION RATES**

TUNNEL FLOW RATE: 314.919

Sample Train 1 (g/hr): **2.79**

Sample Train 2 (g/hr): **2.92**

**PARTICULATE CATCH (mg)**

Total Sample Train 1: 4.6

Total Sample Train 2: 4.8

Filter and seal Sample Train 1: **3.8**

Filter and seal Sample Train 2: **3.7**

MAX Allowed 7.50%

Probe Sample Train 1: **0.8**

Probe Sample Train 2: **1.1**

DEVIATION: 2.32%

**Intertek Testing Services**

**Manufacturer: SBI**  
**Model: 3.3 Series**  
**Date: 6-3-19**  
**Run: 1**  
**Project #: G103994967**  
**Test Duration: 60**  
**(minutes)**

**RESULTS**

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

Burn Rate (Dry kg/hr): 13.278  
(fuel burned only, cold start)

PRESSURE FACTOR: 0.99098

**BAROMETRIC PRESSURE**

Average: 29.65

**TEMPERATURE FACTORS**

Start: 29.6

DGM #1: 0.98755

End: 29.7

DGM #2: 1.14783

**DRY GAS METER VALUES**

**VOLUMES SAMPLED**

DGM #1 Final: 983.968

DGM #1: 9.32054

Initial: 974.444

DGM #2: 0.00000

DGM #2 Final: 0.000

TOTAL TUNNEL VOLUME (scf): 19420

Initial: 0.000

**SAMPLE RATIOS**

**TEMPERATURES (DEG. RANKIN)**

Sample Train 1: 2083.573

DGM #1: 534.657

Sample Train 2: #DIV/0!

DGM #2: 460.000

**TOTAL EMISSIONS**

**CALIBRATION FACTORS**

Sample Train 1 (g): **3.542**

DGM #1: 1.0000

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

DGM #2: 0.0000

**EMISSION RATES**

TUNNEL FLOW RATE: 323.667

Sample Train 1 (g/hr): **3.54**

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

**PARTICULATE CATCH (mg)**

Total Sample Train 1: 1.7

Total Sample Train 2: 0

Filter and seal Sample Train 1: 1.3

Filter and seal Sample Train 2:

MAX Allowed 7.50%

Probe Sample Train 1: 0.4

Probe Sample Train 2:

DEVIATION: #DIV/0!

**Intertek Testing Services**

**Manufacturer: SBI**  
**Model: 3.3 Series**  
**Date: 6-4-19**  
**Run: 2**  
**Project #: G103994967**  
**Test Duration: 630**  
**(minutes)**

**RESULTS**

**Average emission rate:(gr/hr) 0.391**

Burn Rate (Dry kg/hr): 1.201

PRESSURE FACTOR: 0.99933

**BAROMETRIC PRESSURE**

Average: 29.9

**TEMPERATURE FACTORS**

Start: 29.9

DGM #1: 0.98805

End: 29.9

DGM #2: 0.98504

**DRY GAS METER VALUES**

**VOLUMES SAMPLED**

DGM #1 Final: 329.132

DGM #1: 102.30172

Initial: 225.937

DGM #2: 100.71737

DGM #2 Final: 215.869

TOTAL TUNNEL VOLUME (scf): 213785

Initial: 114.366

**SAMPLE RATIOS**

**TEMPERATURES (DEG. RANKIN)**

Sample Train 1: 2089.752

DGM #1: 534.383

Sample Train 2: 2122.625

DGM #2: 536.017

**TOTAL EMISSIONS**

**CALIBRATION FACTORS**

Sample Train 1 (g): **4.388**

DGM #1: 1.0040

Sample Train 2 (g): **3.821**

DGM #2: 1.0080

**EMISSION RATES**

TUNNEL FLOW RATE: 339.342

Sample Train 1 (g/hr): **0.42**

Sample Train 2 (g/hr): **0.36**

**PARTICULATE CATCH (mg)**

Total Sample Train 1: 2.1

Total Sample Train 2: 1.8

Filter and seal Sample Train 1: 1.7

Filter and seal Sample Train 2: 1.4

MAX Allowed 7.50%

Probe Sample Train 1: 0.4

Probe Sample Train 2: 0.4

DEVIATION: 6.92%

**Intertek Testing Services**

**Manufacturer: SBI**  
**Model: 3.3 Series**  
**Date: 6-4-19**  
**Run: 2**  
**Project #: G103994967**  
**Test Duration: 60**  
**(minutes)**

**RESULTS**

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

Burn Rate (Dry kg/hr): 12.608

PRESSURE FACTOR: 0.99933

**BAROMETRIC PRESSURE**

Average: 29.9

**TEMPERATURE FACTORS**

Start: 29.9

DGM #1: 0.98802

End: 29.9

DGM #2: 1.14783

**DRY GAS METER VALUES**

**VOLUMES SAMPLED**

DGM #1 Final: 993.653

DGM #1: 9.50091

Initial: 984.030

DGM #2: 0.00000

DGM #2 Final: 0.000

TOTAL TUNNEL VOLUME (scf): 19313

Initial: 0.000

**SAMPLE RATIOS**

**TEMPERATURES (DEG. RANKIN)**

Sample Train 1: 2032.734

DGM #1: 534.400

Sample Train 2: #DIV/0!

DGM #2: 460.000

**TOTAL EMISSIONS**

**CALIBRATION FACTORS**

Sample Train 1 (g): **1.829**

DGM #1: 1.0000

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

DGM #2: 0.0000

**EMISSION RATES**

TUNNEL FLOW RATE: 321.880

Sample Train 1 (g/hr): **1.83**

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

**PARTICULATE CATCH (mg)**

Total Sample Train 1: 0.9

Total Sample Train 2: 0

Filter and seal Sample Train 1: 0.7

Filter and seal Sample Train 2:

MAX Allowed 7.50%

Probe Sample Train 1: 0.2

Probe Sample Train 2:

DEVIATION: #DIV/0!

**Intertek Testing Services**

**Manufacturer: SBI**  
**Model: 3.3 Series**  
**Date: 6-5-19**  
**Run: 3**  
**Project #: G103994967**  
**Test Duration: 230**  
**(minutes)**

**RESULTS**

**Average emission rate:(gr/hr) 11.440**

Burn Rate (Dry kg/hr): 3.314

PRESSURE FACTOR: 0.99599

**BAROMETRIC PRESSURE**

Average: 29.8

**TEMPERATURE FACTORS**

Start: 29.8

DGM #1: 0.98672

End: 29.8

DGM #2: 0.98734

**DRY GAS METER VALUES**

**VOLUMES SAMPLED**

DGM #1 Final: 365.290

DGM #1: 35.62554

Initial: 329.184

DGM #2: 36.05158

DGM #2 Final: 252.365

TOTAL TUNNEL VOLUME (scf): 74841

Initial: 215.995

**SAMPLE RATIOS**

**TEMPERATURES (DEG. RANKIN)**

Sample Train 1: 2100.756

DGM #1: 535.107

Sample Train 2: 2075.929

DGM #2: 534.771

**TOTAL EMISSIONS**

**CALIBRATION FACTORS**

Sample Train 1 (g): **43.906**

DGM #1: 1.0040

Sample Train 2 (g): **43.802**

DGM #2: 1.0080

**EMISSION RATES**

TUNNEL FLOW RATE: 325.394

Sample Train 1 (g/hr): **11.45**

Sample Train 2 (g/hr): **11.43**

**PARTICULATE CATCH (mg)**

Total Sample Train 1: 20.9

Total Sample Train 2: 21.1

Filter and seal Sample Train 1: **19.8**

Filter and seal Sample Train 2: **19.9**

MAX Allowed 7.50%

Probe Sample Train 1: **1.1**

Probe Sample Train 2: **1.2**

DEVIATION: 0.12%



**Intertek Testing Services**

**Manufacturer: SBI**  
**Model: 3.3 Series**  
**Date: 6-5-19**  
**Run: 3**  
**Project #: G103994967**  
**Test Duration: 60**  
**(minutes)**

**RESULTS**

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

Burn Rate (Dry kg/hr): 12.705

PRESSURE FACTOR: 0.99599

**BAROMETRIC PRESSURE**

Average: 29.8

**TEMPERATURE FACTORS**

Start: 29.8

DGM #1: 0.98639

End: 29.8

DGM #2: 1.14783

**DRY GAS METER VALUES**

**VOLUMES SAMPLED**

DGM #1 Final: 1003.178

DGM #1: 9.33803

Initial: 993.673

DGM #2: 0.00000

DGM #2 Final: 0.000

TOTAL TUNNEL VOLUME (scf): 19020

Initial: 0.000

**SAMPLE RATIOS**

**TEMPERATURES (DEG. RANKIN)**

Sample Train 1: 2036.886

DGM #1: 535.286

Sample Train 2: #DIV/0!

DGM #2: 460.000

**TOTAL EMISSIONS**

**CALIBRATION FACTORS**

Sample Train 1 (g): **2.648**

DGM #1: 1.0000

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

DGM #2: 0.0000

**EMISSION RATES**

TUNNEL FLOW RATE: 317.008

Sample Train 1 (g/hr): **2.65**

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

**PARTICULATE CATCH (mg)**

Total Sample Train 1: 1.3

Total Sample Train 2: 0

Filter and seal Sample Train 1: 0.7

Filter and seal Sample Train 2:

MAX Allowed 7.50%

Probe Sample Train 1: 0.6

Probe Sample Train 2:

DEVIATION: #DIV/0!

**Intertek Testing Services**

**Manufacturer: SBI**  
**Model: 3.3 Series**  
**Date: 6-6-19**  
**Run: 4**  
**Project #: G103994967**  
**Test Duration: 510**  
**(minutes)**

**RESULTS**

**Average emission rate:(gr/hr) 0.552**

Burn Rate (Dry kg/hr): 1.488

PRESSURE FACTOR: 0.99599

**BAROMETRIC PRESSURE**

Average: 29.8

**TEMPERATURE FACTORS**

Start: 29.8

DGM #1: 0.98158

End: 29.8

DGM #2: 0.98102

**DRY GAS METER VALUES**

**VOLUMES SAMPLED**

DGM #1 Final: 452.183

DGM #1: 85.22851

Initial: 365.353

DGM #2: 83.88414

DGM #2 Final: 337.722

TOTAL TUNNEL VOLUME (scf): 168909

Initial: 252.552

**SAMPLE RATIOS**

**TEMPERATURES (DEG. RANKIN)**

Sample Train 1: 1981.835

DGM #1: 537.907

Sample Train 2: 2013.597

DGM #2: 538.215

**TOTAL EMISSIONS**

**CALIBRATION FACTORS**

Sample Train 1 (g): **4.558**

DGM #1: 1.0040

Sample Train 2 (g): **4.833**

DGM #2: 1.0080

**EMISSION RATES**

TUNNEL FLOW RATE: 331.194

Sample Train 1 (g/hr): **0.54**

Sample Train 2 (g/hr): **0.57**

**PARTICULATE CATCH (mg)**

Total Sample Train 1: 2.3

Total Sample Train 2: 2.4

Filter and seal Sample Train 1: 1.6

Filter and seal Sample Train 2: 1.6

Probe Sample Train 1: 0.7

Probe Sample Train 2: 0.8

MAX Allowed 7.50%

DEVIATION: 2.92%

**Intertek Testing Services**

**Manufacturer: SBI**  
**Model: 3.3 Series**  
**Date: 6-6-19**  
**Run: 4**  
**Project #: G103994967**  
**Test Duration: 60**  
**(minutes)**

**RESULTS**

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

Burn Rate (Dry kg/hr): 12.649

PRESSURE FACTOR: 0.99599

**BAROMETRIC PRESSURE**

Average: 29.8

**TEMPERATURE FACTORS**

Start: 29.8

End: 29.8

DGM #1: 0.98429

DGM #2: 1.14783

**DRY GAS METER VALUES**

**VOLUMES SAMPLED**

DGM #1 Final: 12.794

DGM #1: 9.36372 Initial: 3.243

DGM #2: 0.00000

DGM #2 Final: 0.000

TOTAL TUNNEL VOLUME (scf): 18683

Initial: 0.000

**SAMPLE RATIOS**

**TEMPERATURES (DEG. RANKIN)**

Sample Train 1: 1995.251

DGM #1: 536.429

Sample Train 2: #DIV/0!

DGM #2: 460.000

**TOTAL EMISSIONS**

**CALIBRATION FACTORS**

Sample Train 1 (g): **2.195**

DGM #1: 1.0000

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

DGM #2: 0.0000

**EMISSION RATES**

TUNNEL FLOW RATE: 311.383

Sample Train 1 (g/hr): **2.19**

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

**PARTICULATE CATCH (mg)**

Total Sample Train 1: 1.1

Total Sample Train 2: 0

Filter and seal Sample Train 1: **0.8**

Filter and seal Sample Train 2: **0.3**

MAX Allowed 7.50%

Probe Sample Train 1: **0.3**

Probe Sample Train 2: **0.3**

DEVIATION: #DIV/0!



Fabricant de poêles international inc.  
Stove Builder International Inc.

Notre *passion* devient source d'énergie  
We Turn *passion* Into Energy

June 21<sup>st</sup>, 2019

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

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 103994967-MTL001 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](mailto: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 103994967-MTL001. 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 103994967-MTL001 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



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Stove Builder International Inc.

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We Turn *passion* Into Energy

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 Middleton 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, Eng.

Date : 2019/07/03

Signature of responsible representative of the manufacturer certifying the accuracy of the above statements:

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.

## Guillaume Thibodeau-Fortin

---

**De:** Guillaume Thibodeau-Fortin  
**Envoyé:** 13 mai 2019 15:31  
**À:** 'WoodHeaterReports'  
**Cc:** 'Rafael Sanchez'  
**Objet:** RE: 30-days notification

Hi,  
This is to notify that the certification runs planned May 23<sup>rd</sup>, 2019 need to be postponed to June 3<sup>rd</sup>, 2019 due to too high moisture content in the test cord wood. Two additional weeks would probably be a enough for air drying.

Thanks,



### Guillaume Thibodeau-Fortin, Ing./Eng.

Ingénieur mécanique  
Mechanical Engineer

| T : 418-878-3040 ext.5224 |



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**De :** Guillaume Thibodeau-Fortin  
**Envoyé :** 17 avril 2019 16:42  
**À :** WoodHeaterReports <WoodHeaterReports@epa.gov>  
**Cc :** 'Rafael Sanchez' <sanchez.rafael@epa.gov>  
**Objet :** 30-days notification

Hi,  
This is to notify that SBI is planning to certify a wood stove on May 23<sup>rd</sup>, 2019.

Have a good day,



### Guillaume Thibodeau-Fortin, Ing./Eng.

Ingénieur mécanique  
Mechanical Engineer

| T : 418-878-3040 ext.5224 |





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.

**Disclaimer:** The statutory provisions and the EPA regulations described in this document contain legally binding requirements. This document is not a substitute for those provisions or regulations, nor is it a regulation itself. In the event of a discrepancy, please refer to 40 CFR PART 60 Subparts AAA AND QQQQ, sections 60.537 and 60.5479. If you have additional questions, please contact Rafael Sanchez at 202-564-7028 or via email at [sanchez.rafael@epa.gov](mailto:sanchez.rafael@epa.gov).

**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](mailto:WoodHeaterReports@epa.gov). This notice must be received by the EPA at least 30 days before the start of testing.

<b>GENERAL INFORMATION</b>						
<b>Manufacturer's Name: Stove Builder International</b>						
<b>Heater Type Check one):</b>	<input checked="" type="checkbox"/> Adjustable Burn Rate Wood Heater	<input type="checkbox"/> Pellet Stove	<input type="checkbox"/> Single Burn Rate Heater	<input type="checkbox"/> Hydronic Heater	<input type="checkbox"/> Forced Air Furnace	<input type="checkbox"/> Other:
<b>Hydronic Heater Type (Check one):</b>	<input type="checkbox"/> Full Storage	<input type="checkbox"/> Partial Storage	<input type="checkbox"/> Indoor	<input type="checkbox"/> Outdoor	<input type="checkbox"/> Other:	
<b>Forced-Air Furnace Type (Check one):</b>	<input type="checkbox"/> Small (less than 65,000 BTU/hr heat output)		<input type="checkbox"/> Large (greater than 65,000 BTU/hr heat output)			
<b>Fuel Tested (Check one):</b>	<input type="checkbox"/> Crib	<input type="checkbox"/> Pellet	<input checked="" type="checkbox"/> Cordwood	<input type="checkbox"/> Wood Chips	<input type="checkbox"/> Other:	
<b>Model Name(s) (as will appear on test report): 3.1 Series</b>						
<b>Model Number(s) (as will appear on test report): These are preliminary names subject to change. Official names will be on Test Report : Austral III, Blackstag II, Legend III, Myriad III, Escape 1900, Solution 3.1, Osburn 3300</b>						
<b>Equipped with a catalytic combustor? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</b>						





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<b>Mailing Address: Same as street address</b>		
<b>Street Address: 250 rue de Copenhague</b>		
<b>City: Saint-Augustin-de-Desmaures</b>	<b>State: Québec</b>	<b>ZIP Code: G3A 2H3</b>
<b>Phone: 1-418-878-3040 x5224</b>	<b>Fax: 1-418-878-3001</b>	<b>Web Site: <a href="http://www.sbi-international.com">www.sbi-international.com</a></b>
<b>Address of Manufacturer: Same as above.</b>		
<b>City:</b>	<b>State</b>	<b>ZIP Code:</b>
<b>EPA APPROVED TEST LABORATORY</b>		
<b>Name and Title of Authorized Representative: Claude Pelland, Project Engineer</b>		
<b>Company: Intertek</b>		
<b>Phone: 1-514-631-3100 x277</b>	<b>E-mail: <a href="mailto:claudio.pelland@intertek.com">claudio.pelland@intertek.com</a></b>	<b>Fax: 1-514-631-1133</b>



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City: Lachine	State: Québec	ZIP Code: H8T 3J1
<b>EPA APPROVED THIRD-PARTY CERTIFIER</b>		
Name and Title of Authorized Representative: Brian Ziegler		
Company: Intertek		
Phone: 608-824-7425	E-mail: <a href="mailto:brian.ziegler@intertek.com">brian.ziegler@intertek.com</a>	Fax:
City: Middleton	State: WI	ZIP Code: 53562
<b>COMPLIANCE TEST INFORMATION</b>		
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: May 23 <sup>rd</sup> , 2019		



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

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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](mailto:WoodHeaterReports@epa.gov). This notice must be received by the EPA at least 30 days before the start of testing.

<b>Testing Location (Name and Address):</b> Stove Builder International Laboratory 250 rue de Copenhague, Saint-Augustin-de-Desmaures, Québec, Canada, G3A 2H3	
<b>Contact Name:</b> Guillaume Thibodeau-Fortin	<b>Title:</b> Engineer
<b>Phone Number:</b> 1-418-878-3040 x5224	<b>Email Address:</b> <a href="mailto:gthibodeaufortin@sbi-international.com">gthibodeaufortin@sbi-international.com</a>



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

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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](mailto:WoodHeaterReports@epa.gov). This notice must be received by the EPA at least 30 days before the start of testing.

Guillaume Thibodeau - Fortin  
**Print Name and Title of Authorized Official**

**Signature**

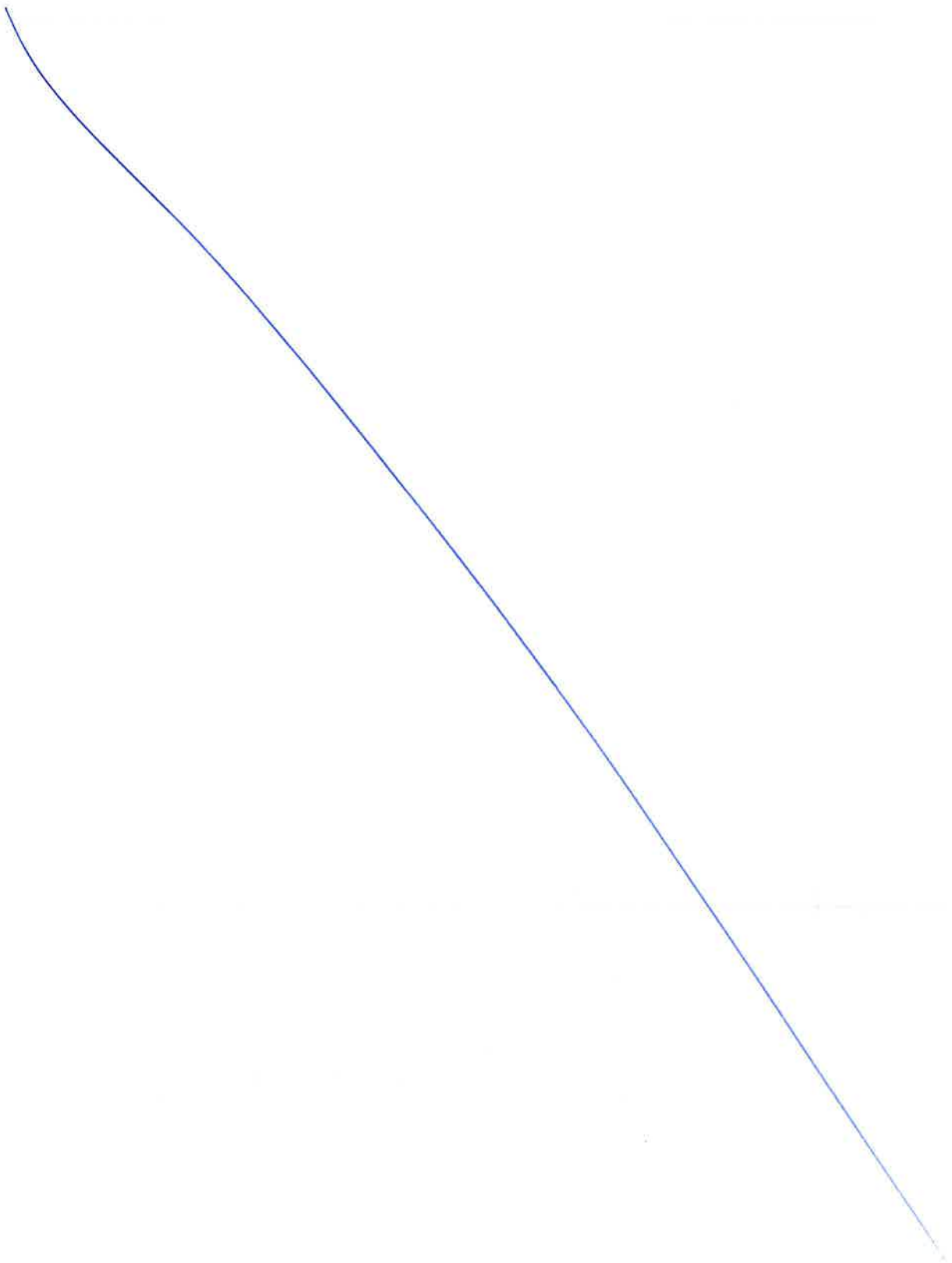
2019 April 17th  
**Date**

**Telephone Number:** 418-878-3040 x 5224

**Email Address:** gthibodeaufortin@Sbi-international.com

**Remarks:**

v1





UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
RESEARCH TRIANGLE PARK, NC 27711

FEB 28 2018

Mr. Justin White  
Hearthstone QHPP, Inc.  
#17 Stafford Ave.  
Morrisville, VT 05661

OFFICE OF  
AIR QUALITY PLANNING  
AND STANDARDS

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.

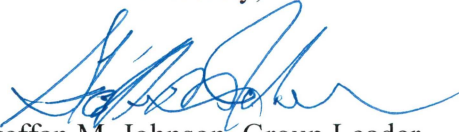
A copy of this letter must be included in each certification test report where this alternative test method is utilized.

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](mailto: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



**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](mailto: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.

**Disclaimer:** The statutory provisions and the EPA regulations described in this document contain legally binding requirements. This document is not a substitute for those provisions or regulations, nor is it a regulation itself. In the event of a discrepancy, please refer to Part 60 Subparts AAA AND QQQQ, Sections 60.537 and 60.5479. If you have additional questions, please contact Rafael Sanchez at 202-

564-7028, Residential Wood Heater Compliance Program Lead, or via email at [sanchez.rafael@epa.gov](mailto:sanchez.rafael@epa.gov).

## MANUFACTURER INFORMATION

**Manufacturer's Name:** Stove Builder International

**Manufacturer's Physical Address:**  
250 rue de Copenhagen  
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](mailto:gthibodeaufortin@sbi-international.com)

**Manufacturer's Phone Number:** 1-418-878-3040 x5224

**Manufacturer's Website Address:**  
[www.sbi-international.com](http://www.sbi-international.com)

**Manufacturer's Website Address where the test report and owner's manual will be posted, if known:**  
[www.drolet.com](http://www.drolet.com)

<b>AFFECTED WOOD HEATER MODEL INFORMATION</b>					
<b>Model Name(s) (as appearing on the certification test report).</b> 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": 3.3 Series					
<b>Model Number(s) (as appearing on the certification test report):</b> Osburn 3300, Austral III, Black Stag II, Escape 1900, Gateway 3300, Legend III, Myriad III, Solution 3.3					
<b>Heater Type Check one):</b>	<input checked="" type="checkbox"/> Adjustable Burn Rate Wood Stover	<input type="checkbox"/> Pellet Stove	<input type="checkbox"/> Single Burn Rate Wood Stove	<input type="checkbox"/> Hydronic Heater	<input type="checkbox"/> Forced-Air Furnace (FAF)
<b>Hydronic Heater Type (Check one):</b>	<input type="checkbox"/> Full Storage	<input type="checkbox"/> Partial Storage	<input type="checkbox"/> Indoor	<input type="checkbox"/> Outdoor	
<b>Forced-Air Furnace Type (Check one):</b>	<input type="checkbox"/> Small (less than 65,000 BTU/hr heat output)		<input type="checkbox"/> Large (greater than 65,000 BTU/hr heat output)		
<b>Fuel Tested (Check one):</b>	<input type="checkbox"/> Crib	<input type="checkbox"/> Pellet	<input checked="" type="checkbox"/> Cordwood	<input type="checkbox"/> Wood Chips	<input type="checkbox"/> Other:
<b>Certification Step:</b>	<input type="checkbox"/> 2015	<input type="checkbox"/> 2016 (FAFs only)	<input type="checkbox"/> 2017 (FAFs only)	<input checked="" type="checkbox"/> 2020 (ALL HEATERS)	
<b>Was this heater tested using an EPA-approved Alternative Test Method (ATM)?</b> <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No				<b>Heater equipped with a catalytic combustor?</b> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
<b>If yes, provide date of EPA approval and attach copy of EPA approved ATM letter):</b> 2/28/2018					
<b>If not, what Test Method(s) did the test laboratory use for the certification test? (List all applicable test methods):</b>					

**Date of submission of 30-Day Notice to the EPA: 4/17/2019**

**What was the proposed date(s) of testing? 05/23/2019**

**What was the actual date(s) of testing? 06/03/2019**

**Was the compliance test postponed or suspended?  Y  N If yes, date of EPA notification of postponement or suspension: 05/13/2019**

**Explain reason for postponing or suspending the certification test:**

"This is to notify that the certification runs planned May 23<sup>rd</sup>, 2019 need to be postponed to June 3<sup>rd</sup>, 2019 due to too high moisture content in the test cord wood. Two additional weeks would probably be a enough for air drying."

### **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, Eng.**

**Position/Title: Project Engineer**

**Address: 1829, 32<sup>nd</sup> avenue**

**City: Lachine**

**State: Québec**

**ZIP Code: H8T 3J1**

**Phone: 1-514-631-3100 x277**

**Email: claud.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: Brian Ziegler**

**Position/Title: Technical Team Leader**

**Address: 8431 Murphy Drive**

**City: Middleton**

**State: WI**

**ZIP Code: 53562**

**Phone: 608-824-7425**

**Email: brian.ziegler@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 including 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



**SIGNATURE OF RESPONSIBLE OFFICER OR AUTHORIZED REPRESENTATIVE OF THE MANUFACTURER CERTIFYING THE ACCURACY AND COMPLETENESS OF THIS APPLICATION:**

Signature:

 Ing.

Print Name:

Guillaume Thibodeau Fortin Ing.

Title:

Engineer

Date:

June 21<sup>st</sup> 2019.

**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.**