



**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY**  
WASHINGTON, D.C. 20460

OFFICE OF  
ENFORCEMENT AND  
COMPLIANCE ASSURANCE

October 14, 2022

Bernard Blouin  
Mechanical Engineer  
Stove Builder International, Inc.  
250 Rue de Copenhagen  
Saint-Augustin-de-Desmaures  
Quebec, Canada G3A 2H3

Re: Update of the Certificate of Compliance Number 289-21 for the 1.4 Series (Osburn 950, Escape 1200, Gateway 1400, Solution 1.4, Spark II, Fox, Déco Nano, S250, Harmony 1.4, and HES140) Wood Heater Models – Adding Blue Ridge 100 Model.

Dear Mr. Blouin:

The United States Environmental Protection Agency (EPA) is in receipt of your June 3, 2022, letter requesting a new model designation be added to Certificate of Compliance Number 289-21. This Certificate of Compliance currently includes the Osburn 950, Escape 1200, Gateway 1400, Solution 1.4, Spark II, Fox, Déco Nano, S250, Harmony 1.4, and HES140 models. Specifically, you are requesting the Blue Ridge 100 model be added to the above-referenced Certificate of Compliance. According to your request, you affirm the newly designated model will be manufactured exactly the same as the Spark II, one of the currently certified models, and no changes to the tested design have been made to cause the wood heaters within the model line to exceed applicable emission limits.

Based on a December 22, 2020<sup>1</sup> test report prepared by Intertek Building & Construction demonstrating compliance with the February 28, 2018, EPA-approved Alternative Cordwood Test Method (ATM) ALT-125 and a January 13, 2021<sup>2</sup> Certification of Conformity by Intertek Testing Services NA, Inc., EPA is approving the request for the new model designation to be added to the above-referenced Certificate of Compliance. EPA has determined that the model line continues to meet the certification requirements in the 2015 New Source Performance Standards (NSPS) for New Residential Wood Heaters, New Residential Hydronic Heaters, and Forced-Air Furnaces at 40 CFR § 60.533. EPA also will update the EPA Wood Heater Database to include the Blue Ridge 100 model. Please refer to the above-referenced Certificate of

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<sup>1</sup> Revised on March 3, 2021, June 21, 2021, August 17, 2021, April 11, 2022, September 9, 2022, and October 12, 2022.

<sup>2</sup> Revised on April 7, 2021, June 22, 2021, August 20, 2021, April 15, 2022, September 9, 2022, and October 12, 2022.

Compliance Number in all future correspondence.

Certification under the 2015 Wood Heater Rule is valid through September 21, 2026, and no separate certification is required. This Certificate of Compliance is valid for the above-referenced models and cannot be transferred to another model line without applying for another Certificate of Compliance. This Certificate of Compliance allows you to advertise for sale, offer for sale, and sell the above-referenced models through September 21, 2026 under this Certificate of Compliance without applying for and being issued another Certificate of Compliance.

All wood heaters manufactured or sold under this Certificate of Compliance must comply with EPA labeling requirements found at §60.536. These provisions require each wood heater to have a permanent label affixed to it, including the month and year of manufacture, model name or number, serial number, certification test emission value, test method, standard met, and compliance certification statement.

In addition, you must comply with all applicable requirements of the regulation, including:

1. Conducting a third-party certifier-approved quality assurance program which ensures that all units within a model line are similar to the wood heater submitted for certification testing in all respects that would affect emissions and are in compliance with the applicable emission limit, pursuant to § 60.533(m);
2. Applying for recertification whenever any change is made to the above-referenced models that affect or is presumed to affect the particulate matter emission rate for the model line, pursuant to § 60.533(k)(1);
3. Providing an owner's manual that includes the information listed in § 60.536(g)(1) with each affected wood heater model offered for sale;
4. Placing a copy of the certification test report and summary on the manufacturer's website. The test report and summary shall be available to the public within 30 days after the EPA issues a Certificate of Compliance, pursuant to § 60.533(b)(12);
5. Submitting a report to the EPA every two years following issuance of a Certificate of Compliance for each model line. This report must include the sales for each model by state and certify that no changes in the design or manufacture of this model line have been made that require recertification under § 60.533(k);
6. Retaining records and submitting reports as required at § 60.537; and
7. Submitting wood heaters for audit testing if selected by the EPA under § 60.533(n)(1)(i) and (2)(i).

If you apply for renewal of your Certificate of Compliance pursuant to 40 C.F.R. § 60.533(i)(1) which was previously issued based upon a certification test using ALT-125 or ALT-127<sup>3</sup>, you must conduct a valid certification test in accordance with the 2015 Wood Heater Rule and the test methods and procedures in 40 C.F.R. §60.534 and follow all other procedures as set forth in 40 C.F.R. § 60.533(i)(2). The EPA will not grant a waiver from certification testing upon receipt of a renewal request.

Failure to comply with these requirements may result in revoking this Certificate of Compliance and enforcement action, including penalties as specified under the Clean Air Act. Pursuant to the EPA-approved ATM ALT-125, you must also include your approval letter in the certification test report for posting on your website. To promote transparency in implementing the Wood Heater Program, we suggest that manufacturers submit a copy of the test report and the Uniform Resource Locator (URL) or web address where the test report is posted to [WoodHeaterReports@epa.gov](mailto:WoodHeaterReports@epa.gov) within ten (10) days of posting the test report.

If you have any questions concerning this letter, please contact the Wood Heater Program at [WoodHeaterReports@epa.gov](mailto:WoodHeaterReports@epa.gov).

Sincerely,

Elizabeth Vizard  
Acting Director  
Monitoring, Assistance, and Media Programs Division  
Office of Compliance  
Office of Enforcement and Compliance Assurance

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<sup>3</sup> On January 24, 2022, the EPA announced the withdrawal of broadly applicable alternative test method approval decisions for Alternatives 125 and 127 (or ALT-125 and ALT-127) that the Agency made in 2018 under the 2015 Wood Heater Rule allowing changes to the ASTM E3053 test method. The withdrawal of ALT-125 and ALT-127 test methods became effective on February 23, 2022. See <https://www.federalregister.gov/documents/2022/01/24/2022-01298/withdrawal-of-broadly-applicable-alternative-test-methods>.

# STOVE BUILDER INTERNATIONAL INC. TEST REPORT

## SCOPE OF WORK

EPA EMISSIONS TESTING/1.4 SERIES (OSBURN 950, ESCAPE 1200, GATEWAY 1400, SOLUTION 1.4, SPARK II, FOX, DÉCO NANO, S250, HARMONY 1.4, HES140, BLUE RIDGE 100)/ WOOD FUEL ROOM HEATER

## REPORT NUMBER

104473478MTL-001R6

## TEST DATE(S)

11/17/20 - 11/20/20

## ISSUE DATE

12/22/20

## [REVISED DATE]

10/12/22

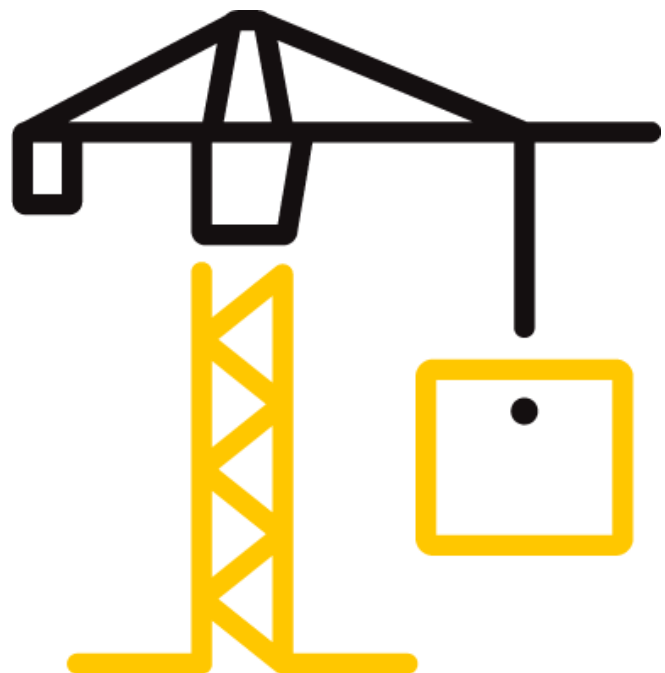
## PAGES

31

## DOCUMENT CONTROL NUMBER

GFT-OP-10c (05/10/17)

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## TEST REPORT FOR STOVE BUILDER INTERNATIONAL INC.

Report No.: 104473478MTL-001R6

Date: 10/12/22

### REPORT ISSUED TO

#### STOVE BUILDER INTERNATIONAL, INC.

250 de Copenhagen

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 Spark II (1.4 Series) Wood Burning Room Heater to evaluate all applicable performance requirements included in "Determination of particulate matter emissions from wood heaters." Spark II is a representative model of the 1.4 Series. This series includes the following models: Osburn 950, Escape 1200, Gateway 1400, Solution 1.4, Spark II, Fox, Déco Nano, S250, Harmony 1.4, HES140 and Blue Ridge 100. See PEV # 104473478MTL-002 and PEV # 104473478MTL-003 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 November 17<sup>th</sup> to November 20<sup>th</sup>, 2020. The following test methods were applicable:

ASTM E2515-11 (R2017)- Standard Test Method for Determination of Particulate Matter Emissions Collected by a Dilution Tunnel

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

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

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

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

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

## TEST REPORT FOR STOVE BUILDER INTERNATIONAL INC.

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### SECTION 2

#### SUMMARY OF TEST RESULTS


The appliance tests resulted in the following performance:

Particulate Emissions: 1.8 g/hr

Carbon Monoxide Emissions: 1.2 g/min

Heating Efficiency: 74% (Higher Heating Value Basis)

For INTERTEK B&C:

<b>COMPLETED BY:</b>	Brian Ziegler	<b>REVIEWED BY:</b>	Ken Slater
<b>TITLE:</b>	Technical Team Leader - Hearth	<b>TITLE:</b>	Associate Engineer - Hearth
<b>SIGNATURE:</b>		<b>SIGNATURE:</b>	 Ken Slater
<b>DATE:</b>	10/12/22	<b>DATE:</b>	10/12/22

aaa:bbb

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

### SECTION 3

#### TEST METHOD(S)

The specimen was evaluated in accordance with the following:

**ASTM E2515-11 (R2017)**- 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

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

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**SECTION 4**

**MATERIAL SOURCE**

A sample was submitted to Intertek directly from the client. The sample was not independently selected for testing. The test unit was handed to the Intertek representative at client’s facility in St-Augustin-de-Desmaures, Quebec. The unit was inspected upon receipt and found to be in good condition. The unit was set up following the manufacturer's instructions without difficulty. Following assembly, the unit was placed on the test stand. On the ash shelf, the opening is 1 5/8 inch from the fully closed position when it was to run under the Medium Test Burn. 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 of pre-burning were conducted from November 2<sup>nd</sup> to November 12<sup>th</sup>, 2020. The fuel used for the break-in process was beech cordwood. Table 1 shows the summary of the burn time in each test ran at medium burn rate; raw data is available on *Appendix F – Unit pre-burn documentation*.

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

DATE	BURN CYCLE	DURATION	LOAD TYPE	FUEL ADDED	MOISTURE
		(MIN)	(-)	(LBS)	(% DB)
2020-11-02	Preload	49	Kindling & SUF	8.09	16.0
	Condition	103	High fire	16.22	20.5
	Medium	410	Medium fire	19.52	20.7
2020-11-03	Preload	67	Kindling & SUF	8.12	14.5
	Condition	102	High fire	16.27	20.3
	Medium	430	Medium fire	19.50	19.8
2020-11-04	Preload	54	Kindling & SUF	8.12	17.1
	Condition	108	High fire	16.24	20.1
	Medium	370	Medium fire	19.47	21.3
2020-11-05	Preload	147	Kindling & SUF	8.11	16.2
	Condition	24	High fire	16.25	20.6
	Medium	72	Medium fire	19.53	19.8
2020-11-09	Preload	108	Kindling & SUF	8.12	14.7
	Condition	67	High fire	16.29	21.5
	Medium	380	Medium fire	19.52	20.4
2020-11-12	Preload	85	Kindling & SUF	8.13	17.3
	Condition	97	High fire	16.26	20.5
	Medium	510	Medium fire	19.51	19.1
Total		3183	minutes		
		53.05	hours		

\* Only partial data is available on November 5<sup>th</sup> 2020 due to a power failure.

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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 November 13<sup>th</sup>, 2020. On November 16<sup>th</sup>, 2020, the unit was set-up for testing.

**SECTION 5  
EQUIPMENT**

Equipment	INV Number	Calibration Due	MU
Floor scale	SBI-014	March 31, 2021	± 0.020 kg
DGM system 1	SBI-046	April 01, 2021	±2% F.S.
DGM System 2	SBI-047	April 06, 2021	±2% F.S.
Reference DGM	SBI-103	October 13, 2021	±2% F.S.
5 kg weight	SBI-190	October 02, 2023	±0.2 g
Temperature acquisition	SBI-197	November 03, 2021	±0.5°F
Pitot tube type S	SBI-204	December 20, 2020	±0.57 mps
Analytical scale	SBI-206	March 31, 2021	±0.08 mg
Table scale	SBI-222	March 31, 2021	±0.5 g
100 mg weight	SBI-237	October 09, 2023	±0.0025 mg
10 g weight	SBI-238	October 09, 2023	±0.012 mg
Hot wire anemometer	SBI-241	March 02, 2021	±0.15 m/s
Magnesense (tunnel)	SBI-254	July 17, 2021	±0.00015" H2O
Magnesense (draft)	SBI-247	July 17, 2021	±0.00015" H2O
DGM system 3	SBI-290	April 05, 2021	±2% F.S.
Pressure transmitter	SBI-294	July 17, 2021	±9.5e-003 psi
Pressure transmitter	SBI-297	July 17, 2021	±9.5e-003 psi
Vacuum transmitter	SBI-301	July 27, 2021	±6.1e-003 in.HG
Vacuum transmitter	SBI-305	July 27, 2021	±5.8e-003 in.HG
Relative humidity temperature meter	SBI-212	September 10, 2021	±3%
200 g weight	SBI-312	October 09, 2023	±0.06 mg
Barometer	SBI-331	October 01, 2022	±0.62mb/hPa



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Moisture Content Standard	SBI-153	October 28, 2021	±0.2%
Multimeter	SBI-194	November 24, 2021	±1% Ω
Thermometer Calibrator	SBI-096	May 25, 2021	±0.5°F

### SECTION 6

#### LIST OF OFFICIAL OBSERVERS

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

### SECTION 7

#### TEST PROCEDURE

From November 17<sup>th</sup> to November 20<sup>th</sup>, 2020, the unit was tested for EPA emissions. For Wood stoves, the test was conducted in accordance with ASTM E3053-17 and ASTM E2515-11 (R2017). The fuel used for the test run was beech cordwood.

The applicable EPA regulatory limits are:

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

#### MANUFACTURER LOADING PROCEDURE

Kindling and SUF (8 lbs) - Split the start-up fuel log into 6 pieces. Put 2 kindling pieces on the brick in an orientation that points to the left (10-15 degrees from North-South). Then, put 2 start-up fuel pieces with two kindling between them in a North-South orientation. Make two more rows in the same way, alternating with a left pointed and North-South orientation. Finally, put the remaining kindling (4-5) in a left pointed orientation. Leave a little space between each piece.

The kindling is made of between 12-13 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 225°F, then close the door. The fan is always OFF.

Low&Medium Pre-load (high fire) (16.2 lbs) - When there is a coal bed of 1.65 lbs left, break ashes and level coal bed, then add pre-load (five pieces). Place the 3 smallest pieces in the bottom in a North-South orientation. They should touch the rear bricks and be 1 ½ inch apart from each other. Then, put the largest piece on top of the left and middle pieces in a right pointed orientation. Put

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the last piece on top of the middle and right piece in a right pointed orientation. There should be at least 2 inches between the two top pieces. Close the door immediately and let burn until the weight is down to target.

When the average stove temperature gets to 440°F, slightly level the coal bed. There should be approximately 3.9 lb of coal bed.

Low fire load (19.5 lbs) - Place the smallest piece on the coal bed in the middle of the stove in a North-South orientation. Place the other two smaller ones on each side at approximately ¼” of the side bricks to leave as much space as possible between the pieces. Then, put the largest piece on top of the left and middle pieces in a right pointed orientation. Put the last piece on top of the middle and right pieces in a right pointed orientation. There should be at least 2 inches between the two top pieces. The bottom pieces should be as close as possible to the inner air channel. Let the door ajar for 4 minutes and then close the door with the primary air control fully open. When the oxygen falls below 7%, close the primary air control to 90% (2.75 on the marking on the ash shelf). If the oxygen continues to drop, continue to close the primary air control to 80% (2.5 on the ash shelf). If the oxygen goes above 9.5%, open the primary to 100%. The goal is to keep the oxygen between 7 and 8%. Start to close slowly the primary air control at 14 minutes, so that at 16 min (15 min or 15 % as per E3053 clause 8.6.7 plus loading time of 1 min as per clause 8.6.5), the primary air control is completely closed. Start the fan at minimum speed at 60 minutes.

Medium fire load (19.5 lbs) - Same as for low fire load, but the primary air inlet is open of 23/64 inch at the end of the 16 minutes run time. On the ash shelf, the opening is 1 5/8 inch from de fully closed position. Start the fan at minimum speed at 30 minutes.

High fire load (16 lbs) – When there is a coal bed of 1.65 lbs left, break ashes and level coal bed, then add the load (four pieces). Put the largest piece and one of the medium pieces centered at the back of the combustion chamber (they should touch the rear bricks). Put the two last pieces in a right pointed orientation on top of the first two pieces. There should be at least 2 inches between the two bottom pieces and between the two top pieces. Close the door immediately after loading. Start the fan at maximum speed at 15 minutes. 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.

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### TEST FUEL PROPERTIES

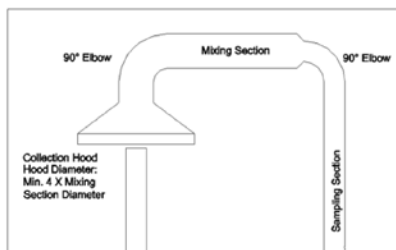
The species of fuel used was beech. The fuel was split cordwood of nominal length of 16 inches  $\pm$  1 inch. The fuel was dried in air to an average moisture content between 18% and 28% on a dry basis. Cordwood fuel was loaded from side to side into the firebox per manufacturer's instructions.

### SAMPLING LOCATIONS

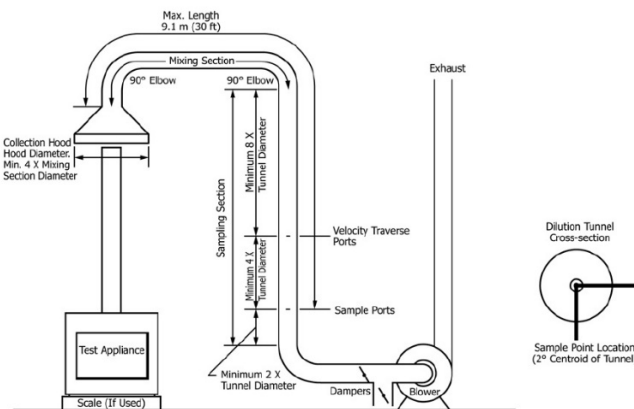
Particulate samples are collected from the dilution tunnel at point 20 feet from the tunnel entrance. The collection hood is 40 inches in diameter. The mixing section started with a 10-inch diameter elbow, followed by a strait 10-inch diameter section. A 10 to 8-inch diameter reducer is installed upstream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

The dilution tunnel is fully compliant with ASTM E2515-11 (R2017).

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



**Figure 1 - Mixing Section with different diameter**



**Figure 2 - Dilution tunnel**

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### SAMPLING METHODS

#### PARTICULATE SAMPLING

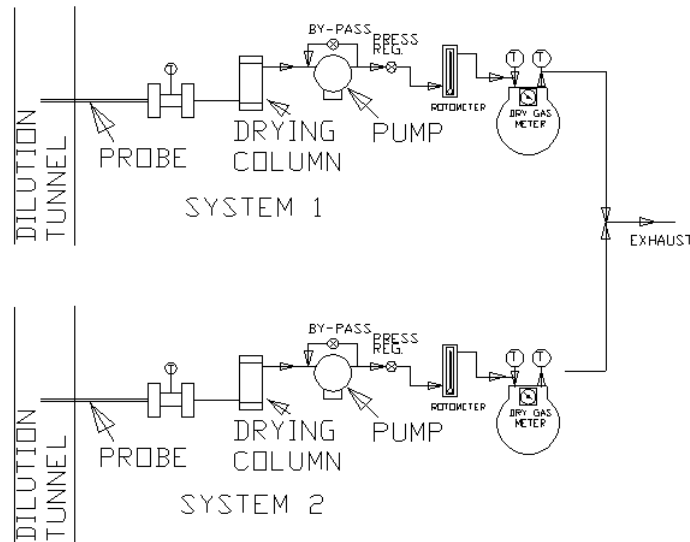


Figure 3 - Stack gas sample train

Particulates were sampled in strict accordance with ASTM E2515-2011 (R2017). Schematic is presented on Figure 3. This method uses three identical sampling systems with PALL TX-40 47-mm diameter filters. The dryers used in the sample systems are filled with “Drierite” before each test run. In order to measure first-hour emissions rates, a third filter set is installed between the two others. The third filter set is stopped individually after 60 minutes of sampling.

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

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

The standard dry gas meter is calibrated every 6 months using a Spirometer designed by the EPA Emissions Measurement Branch. The process involves sampling the train operation for 1 cubic foot of volume. With readings made to .001 ft<sup>3</sup>, the resolution is .1%, giving an accuracy higher than the ±2% required by the standard.

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**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 analyser 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.

**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.

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### PM SAMPLING PROPORTIONALITY

Proportionality was calculated in accordance with ASTM E2515-11 (R2017). The data and results are included in Appendix B. Negative sample probe catch are treated as zero when determining total particulate catch weight. The test run is treated as invalid if the negative value is greater than 5 % of the total particulate catch weight (excluding the probe). For the room air sample probe assembly, negative particulate catch weights are treated as zero when determining total room air particulate weight.

### DEVIATIONS FROM STANDARD METHOD:

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

Changes to ASTM E3053-17 are:

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

Changes to ASTM E2515-11 (R2017) 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.

## SECTION 8

### TEST CALCULATIONS

Weight of test fuel load, dry basis

ASTM E3053

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

where:

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

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### 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.

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

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

or

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

$L_a$  = Maximum acceptable leakage rate for either a pretest or post-test leak-check, equal to 0.0003 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)).

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

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

$P_R$  = Percent of proportional sampling rate.

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

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

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

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

dscm/min (dscf/min).

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

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

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

where:

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

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

$T_s$  = 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).

$V_m$  = 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.

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



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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.

### 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 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

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

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### GENERAL FORMULA – ASTM E2515

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

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.

#### MU OF $C_r$

$$C_r = BG_c/(Q_{BG} \times \theta) = 0.002/(0.15 \times 180) = 0.000074$$

$$\delta C_r/\delta BG_c = 1/Q_{BG} \cdot \theta = 1/0.15 \cdot 180 = 0.03704$$

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

$$\delta C_r/\delta \theta = -BG_c/Q_{BG} \cdot \theta^2 = -0.002/0.15 \cdot 180^2 = -0.0000004$$

$$MU_{C_r} = \sqrt{(0.00027 \cdot 0.03704)^2 + (0.0015 \cdot -0.0004938)^2}$$

$$\sqrt{+ (0.1 \cdot -0.0000004)^2} = 0.00001g$$

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

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

$$E_T = (C_s - C_r) Q_{sd} \theta = (0.000555 - 0.000074) \times 150 \times 180 = 13.00g$$

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

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

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

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

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

$$\sqrt{+ (0.07222 \cdot 0.1)^2} = 0.436$$

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Thus the result in this example would be:  
ET = 13.00g ± 0.44 g at a 95% confidence level.

### EFFICIENCY – CSA B415.1

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

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

Where:

- $\Delta h$  = 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
- 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
- $F_p$  = Pitot tube calibration factor determined from vane anemometer measurements
- $C_p$  = Pitot factor  
= 0.99 for a standard Pitot tube or as determined by calibration for a Type S Pitot tube
- 34.97 = Pitot tube constant

**Note:** The Pitot tube constant is determined on the basis of the following units:  
 $\text{m/s [g/g mole (mm Hg)/(K)(mm H}_2\text{O)]}^{0.5}$

- $\Delta P$  = velocity pressure, mm H<sub>2</sub>O
- T = temperature, K
- 28.56 = molecular weight of air
- $P_{\text{baro}}$  = barometric pressure, mm Hg
- $P_s$  = duct static pressure, mm Hg

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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>

$\rho$  = 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:

$\Delta e$  = rate of heat release into the circulating air, kJ/h

$\Delta h$  = 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:

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

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)

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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 Spark II, being representative of the 1.4 series which includes: Osburn 950, Escape 1200, Gateway 1400, Solution 1.4, Spark II, Fox, Déco Nano, S250, Harmony 1.4, HES140 and Blue Ridge 100. Wood Fuel Room Heater is constructed of sheet steel. The outer dimensions are 27 9/16-inches deep, 28 9/16-inches high, and 18 1/2-inches wide. The unit has a door located on the front with a viewing glass. Proprietary drawings and manufacturing methods are on file at Intertek located at 1829, 32nd Avenue Montreal (Lachine), QC Canada H8T 3J1 and in the EPA filing system.

#### FIREBOX CALCULATION

The model from the 1.4 Series (Spark II) has a usable firebox volume (UFV) of 1.55 cubic foot. Schematic of the firebox dimensions is presented on Figure 4. Please note that the fuel can't be stacked any higher due to the secondary air tubes being at the top of the combustion chamber.

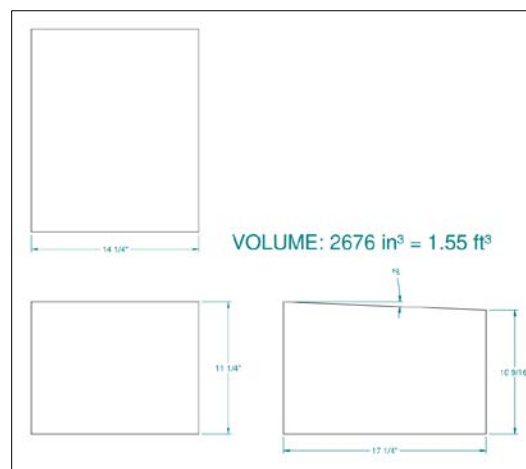


Figure 4 - Schematic of firebox volume

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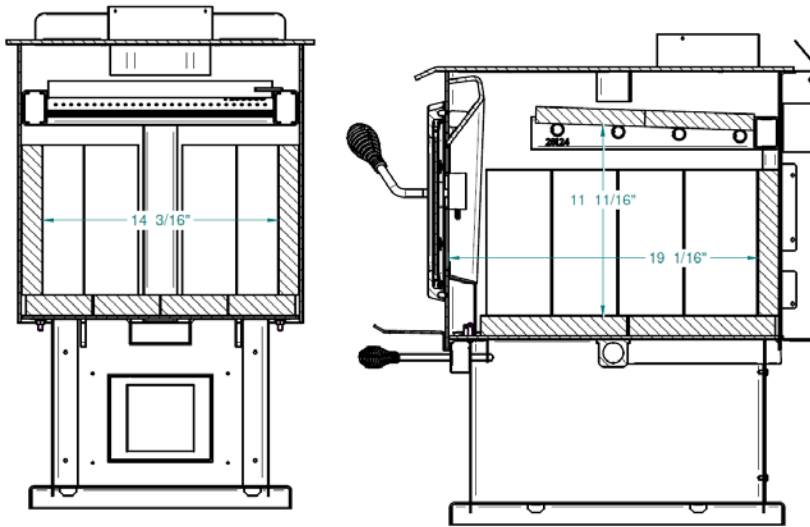
Date: 10/12/22

Firebox volume calculation is presented below:

$$UFV = \frac{(10.563 + 11.25)}{2} \times 14.25 \times 17.25 = 2680.89 \text{ in}^3$$

$$UFV = \frac{2680.89}{12^3} = 1.55 \text{ ft}^3$$

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



The calculation for the overall firebox volume would be the following: width x middle height x full depth. This model has a tapered firebox, which is not included in the calculation.

$$14.188 \times 11.688 \times 19.063 = 3161.20 \text{ in}^2$$

$$\frac{3161.20}{12^3} = 1.8 \text{ ft}^3$$

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**SECTION 10****TEST RESULTS****GENERAL DISCUSSION:**

All runs have been found appropriate and all runs below have been validated and found compliant. One anomaly occurred with Run 1. Run 1 was the first attempt of low burn rate. The combustion went faster than expected, but was found to be compliant, respecting the criterion of 1.15 kg/h maximum. The combustion was barely present at the beginning causing higher emission rate. When dry, the test fuel pieces burn hotter than expected, which gave a higher-than-expected burn rate. A second low burn rate test was performed on Run 3 and burned as expected. All burn rate categories were achieved, and all data were used in the calculation of the weighted average.

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

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

**DESCRIPTION OF TEST RUNS:**

RUN #1 (November 17<sup>th</sup>, 2020) - Air control set fully closed, burn time was 398.5 minutes with a category Low burn rate 1.11 kg/hr. The door was left ajar for 4 minutes, and then closed. The air control was opened for 15 minutes after loading time, and then set at the lowest burn rate (fully closed). The fan was turned on at low speed at 60 minutes.

RUN #2 (November 18<sup>th</sup>, 2020) - Air control set at the medium burn rate (1 5/8 inch from fully closed position on ash shelf), burn time was 445.25 minutes with a category "Medium burn rate" of 0.99 kg/hr. Let the door ajar for 3 min and 45 sec, and then closed. The air control was opened for 15 minutes after loading time and then set at the targeted burn rate 1 5/8 inch from fully closed position). The fan was turned on at medium speed at 30 minutes. At 2h 37min 30sec from the start, the door was open for 30 sec and the remaining fuel was adjusted as per clause 8.6.8.2 of ASTM E3053-17. More than 60% of the test fuel load was consumed and the burn rate was smaller than 1% of the test fuel load weight on a 10 min period. Pictures are presented on *Appendix H*. With a medium burn rate having a smaller dry burn rate than the low burn rate, a second attempt of low burn rate was performed.

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RUN #3 (November 19<sup>th</sup>, 2020) - Air control set fully closed, burn time was 480 minutes with a category Low burn rate 0.91 kg/hr. The door was left ajar for 4 min 30 sec, and then closed. The air control was opened for 15 minutes after loading time, and then set at the lowest burn rate (fully closed). The fan was turned on at low speed at 45 minutes. At 6h 3min 30 sec from the start, the door was open for 30 sec and the remaining fuel was adjusted as per clause 8.6.8.2 of ASTM E3053-17. More than 60% of the test fuel load was consumed and the burn rate was smaller than 1% of the test fuel load weight on a 10 min period. Pictures are presented on *Appendix H*.

RUN #4 (November 20<sup>th</sup>, 2020) - Air control set fully opened, burn time was 205 minutes with a category High burn rate 2.02 kg/hr. Burn time without the cold start was 160 minutes. The door was opened for 3 minutes after kindling was ignited, then closed. Loading occurred at 44min 10 sec. Door was open for 2 minutes. The air control was fully opened. The fan was started at full speed at 7 minutes. The test run ended when 90 % ± 1% of the test full load was consumed.

**RESULT TABLES:**

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

*Table 2 - EMISSION RESULTS*

#	TEST DATE	BURN RATES (kg/hr) (Dry)	PM EMISSION RATE (g/hr)	1 <sup>ST</sup> HOUR EMISSIONS (g)	CO EMISSION RATE (g/hr)	CO EMISSION RATE (g/min)	HEATING EFF. (% HHV)
1	2020-11-17	1.1	2.21	10.6	74	1.2	75%
2	2020-11-18	0.99	1.61	9.08	74	1.2	73%
3	2020-11-19	0.91	1.22	6.82	53	0.9	74%
4	2020-11-20	2.0	2.22	4.46	95	1.6	74%

*Table 3 - FUEL DATA SUMMARY*

#	KINDLING WEIGHT (LBS)	KINDLING MC (%DB)	SU FUEL WEIGHT (LBS)	SU FUEL MC (%DB)	HIGH WEIGHT (LBS)	HIGH MC (%DB)	LOW/MED WEIGHT (LBS)	LOW/MED MC (%DB)
1	3.24	10	4.69	22.6	16.22	19.5	19.50	20.2
2	3.23	10	4.80	23.6	16.24	21.3	19.48	19.5
3	3.20	10	4.81	23.4	16.21	21.0	19.48	20.3
4	3.15	10	4.69	21.1	15.95	19.8	NA	NA



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Table 4 - TEST LAB CONDITIONS

#	AMB. TEMP. (°F) before	AMB. TEMP. (°F) after	PRESSURE (In. Hg) before	PRESSURE (In. Hg) after	R.H.% % before	R.H.% % after	AIR VEL. (Ft/min) before	AIR VEL. (Ft/min) after
1	82.7	74.6	29.45	29.60	19.8	19.5	0	0
2	80.7	83.0	29.95	30.00	14.6	12.7	0	0
3	75.3	82.6	29.95	29.80	13.9	12.5	0	0
4	67.9	69.6	29.70	26.65	25.9	26.2	0	0

Table 5 - DILUTION TUNNEL

#	BURN TIME (min)	TUNNEL VELOCITY (ft/sec)	VOLUMETRIC FLOW RATE (dscf/min)	TUNNEL AVE. TEMP. (°F)	SAMPLE VOLUME (DSCF)		PARTICULATE CATCH (MG)	
					1	2	1	2
1	399	17.17	335.13	88	0.124	0.125	5.4	5.5
2	445	16.98	337.36	86	0.127	0.128	4.6	4.4
3	480	16.70	332.25	84	0.126	0.128	3.9	3.6
4	205	16.63	323.90	92	0.121	0.122	2.8	2.9

Table 6 - DILUTION TUNNEL PRECISION

#	SAMPLE RATIOS (-)		TOTAL EMISSIONS (g)		DEVIATION %	DEVIATION g/kg
	Train 1	Train 2	Train 1	Train 2		
1	2707	2675	14.618	14.710	0.3%	0.01
2	2663	2634	12.248	11.588	2.8%	0.09
3	2629	2596	10.251	9.345	4.6%	0.12
4	2668	2653	7.471	7.693	1.5%	0.03

Table 7 - GENERAL SUMMARY

#	BURN RATE (kg/hr)(Dry)	CHANGE IN SURFACE TEMP. (°F)	INITIAL DRAFT (in. wc)	RUN TIME (min)	AVERAGE DRAFT (in. wc)
1	1.1	159	0.048	398.5	0.041
2	0.99	210	0.050	445.25	0.042
3	0.91	196	0.052	480	0.041
4	2.0	214	0.000	205	0.064

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Table 8 - CSA B415.1-10 SUMMARY

BURN RATE (kg/hr)(Dry)	CO EMISSIONS (g/min)	HEATING EFFICIENCY (% HHV)	HEATING EFFICIENCY (% LHV)	HEAT OUTPUT (Btu/hr)
Low - 0.91	0.9	74	80	12,100
Low - 1.1	1.2	75	80	14,800
Medium – 0.99	1.2	73	79	13,000
High – 2.0	1.6	74	79	26,500

Table 9 - WEIGHTED AVERAGE CALCULATION

#	CAT	(E) PM EMISSION RATE (g/hr)	(CO) EMISSION RATE (g/hr)	HEAT OUTPUT Btu/hr	EFF. (% HHV)	EFF. (% LHV)	(K) Weight ing Factor	(KxE) g/hr	(KxCO) g/hr	(KxCO) g/min	(K x HHV)	(K x LHV)
3	L	1.22	53	12,100	74	80	20%*	0.24	10.6	0.18	14.9	15.9
1	L	2.21	74	14,800	75	80	20%*	0.44	14.9	0.25	15.0	16.0
2	M	1.61	74	13,000	73	79	40%	0.64	29.6	0.49	29.3	31.4
4	H	2.22	95	26,500	74	79	20%	0.44	19.2	0.32	14.7	15.7
<b>Totals:</b>							<b>100%</b>	<b>1.8</b>	<b>74</b>	<b>1.2</b>	<b>74</b>	<b>79</b>

\*Note that run 1 and 3 are equally average as part of the Low burn rate category

**SECTION 11  
CONCLUSION**

This test demonstrates that this unit is an affected facility under the definition given in the regulation. The emission rate of 1.8 g/hr meets the EPA requirements for the Step 2 limits. Model Series 1.4 – Spark II therefore qualifies as mentioned above.

Model Spark II is a representative for similar models: Osburn 950, Escape 1200, Gateway 1400, Solution 1.4, Fox, Déco Nano, S250, Harmony 1.4, HES140 and Blue Ridge 100 stoves. All models have the same internal design, electrical components, and controls. The only differences are external cosmetic designs.

## TEST REPORT FOR STOVE BUILDER INTERNATIONAL INC.

Report No.: 104473478MTL-001R6

Date: 10/12/22

### SECTION 12 PHOTOGRAPHS



Figure 3 - Isometric view of unit



Figure 4 - Typical load

## TEST REPORT FOR STOVE BUILDER INTERNATIONAL INC.

Report No.: 104473478MTL-001R6

Date: 10/12/22

### SECTION 13 REVISION LOG

REVISION #	DATE	PAGES	REVISION
0	12/22/20	N/A	Original Report Issue
1	03/03/21	4 18 20	Table 1 was modified to add the fuel data. Section 9; statement was added to precise the height of the combustion chamber. Added Table 3 - FUEL DATA SUMMARY
2	05/21/21 06/04/21 06/21/21	118 205 487-512 530,533 4 20-22 1-31	Correction of burn rate of run 4. Addition of equipment SBI-238 calibration cert. Modify format of date and time to be readable. Correction of initial weight of run 4. Section 4; 1 5/8 for Medium Burn Test. Burn Rate changed from 2.26 to 2.02 and the Heat output changed to 26,500. HHV% 74 and LHV% 79 in Run # 4 Changed the report number from 104473478MTL-001R1 to 104473478MTL-001R2 and changed the issue date from 03/03/21 to 06/04/21.
3	08/12/21 08/17/21	21 25-31 26 28 29 1-31 1-31 3	Corrected the Pressure before for Run 3 from 79.95 to 29.95 (this was a typo) Burn Rate changed from 2.26 to 2.02 and the Heat output changed to 26,500. HHV% 74 and LHV% 79 in Run # 4 Corrected the point for run 4 (21.1% instead of 21%) section 14 Corrected the PM emission rate in lb/mmBTU to 0.24 instead of 0.23 Section 14 Changed the Total CO to 254 g instead of 256 g Section 14 Changed the report number from 104473478MTL-001R2 to 104473478MTL-001R3 and changed the revised date from 06/04/21 to 08/12/21.  changed the revised date from 08/12/21 to 08/17/21. Added a disclaimer under signatures.

## TEST REPORT FOR STOVE BUILDER INTERNATIONAL INC.

Report No.: 104473478MTL-001R6

Date: 10/12/22

4	04/11/22	2 2,3,6,8,9,11 2 & 3 8 9 18 20 23 39 208 524	Add model Blue Ridge 100 Add (R2017) to ASTM E2515 Add test method ALT-125 Add Figure 1 and explanation of the mixing section Change filter model for Pall TX-40 Add model Blue Ridge 100 Add a note for room air particulate matter collection Add the model names in the Conclusion section Add product evaluation report for addition of Blue Ridge 100 Add drawings of Blue Ridge 100 and audit forms for all models Add installation manual of Blue Ridge 100
5	9/9/22	3   19	Report originally created by Claude Pelland, who is no longer with Intertek. Report revised by Brian Ziegler and reviewed by Ken Slater.   Added "overall firebox volume" to report.
6	10/12/22	1	Corrected original report issue date from 8/17/21 to 12/22/20.

## TEST REPORT FOR STOVE BUILDER INTERNATIONAL INC.

Report No.: 104473478MTL-001R6

Date: 10/12/22

### SECTION 14

#### APPENDIX - REPORT TABLES AS PER ASTM E3053-17

Table 10 - Section 1 - Model Identification

#### WOOD HEATER TESTING SUMMARY

Version August 12, 2020

	Data/Information Input
	From CSA B415.1-10/15
	From Cordwood Load Calculator
	Automatically Calculated

Model Name(s)/Number(s)

Manufacturer

Address 1

Address 2

Appliance Category(s) (Free-standing, Insert, etc.)

Usable Firebox Volume - ft<sup>3</sup>

Catalytic/Non-Cat

Convection Air Fan (No, Standard, Optional)

1.4
Series
Stove builder international inc.
250 Rue Copenhagen
Saint-Augustin-de-Desmaures
Free-standing
1.55
Non-Cat
Optional

#### SECTION 1B – Laboratory Information

Testing Laboratory

Address 1

Address 2

ISO/Accreditation Info

Dates Tested

Test Methods/Standards

Dilution Tunnel Inside Diameter - in.

Fliter Diameter - mm

Filter Material

Intertek testing services
1829 32nd Avenue
Lachine, QC H8T 3J1
ISO
17025
11/17/2020 - 11/20/2020
CAS B415.1-10, ASTM E2515, ASTM E3053
8.00
47
Pall TX40

Table 11 - Section 2 - Test Conditions Summary

## TEST REPORT FOR STOVE BUILDER INTERNATIONAL INC.

Report No.: 104473478MTL-001R6

Date: 10/12/22

Model Name(s)/Number(s)  
Usable Firebox Volume - ft<sup>3</sup>  
Convection Air Fan (No, Standard, Optional)  
Test Run #  
Date Tested  
Test Run Category (L, M, H)  
Average Barometric Pressure - in Hg  
Max. Observed Ambient Temp - °F  
Min. Observed Ambient Temp - °F  
Max. Observed Filter Temp - °F  
Test Run Air Settings  
  
Primary (measured up from minimum)  
Secondary (measured up from minimum)  
  
Convection Air Fan Setting  
Test Fuel Load  
Cordwood Fuel Species  
Specific Gravity (from Table 1)  
Higher Heating Value - Btu/lb (from Annex A1)  
Nom. Test Fuel Load Piece Length - in.  
Number of Test Fuel Pieces  
Test Fuel Weight  
Kindling - As Fired lb  
Kindling Wt. - As % of Test Fuel Load  
Kindling Moisture - % DB  
Kindling - kg DB  
SU Fuel - As Fired lb  
SU Fuel Wt. - As % of Test Fuel Load  
SU Fuel Moisture - % DB  
SU Fuel - kg DB  
Test Fuel Load - As Fired lb  
Ave. Test Fuel Load MC % DB  
Test Fuel Load - kg DB  
Test Fuel Loading Density - lb/ft<sup>3</sup>  
Residual SU Fuel Wt. - As Fired lb  
Residual SU Fuel Wt. - As % of Test Fuel Load

1.4 Series			
1.55			
Optional			
1	2	3	4
#####	#####	#####	#####
L	M	L	H
29.52	29.98	29.88	29.68
84	86	85	72
70	74	69	68
85 & 86	87 & 86	86 & 86	87 & 87
Min	1.625	Min	Max (3.625)
na	na	na	na
Off then L	Off then M	Off then L	Off then Max
Beech	Beech	Beech	Beech
0.67	0.67	0.67	0.67
8088	8088	8088	8088
16	16	16	16
5	5	5	4
na	na	na	3.15
na	na	na	20%
na	na	na	10.0%
na	na	na	1.30
na	na	na	4.69
na	na	na	29%
na	na	na	21.1%
na	na	na	1.76
19.5	19.48	19.48	15.95
20.2%	19.5%	20.3%	19.8%
7.36	7.39	7.35	6.04
12.58	12.57	12.57	10.29
na	na	na	1.6
na	na	na	10%

## TEST REPORT FOR STOVE BUILDER INTERNATIONAL INC.

Report No.: 104473478MTL-001R6

Date: 10/12/22

Test Run Duration - minutes	398.5	445.25	480	205
Test Run Duration - h	6.64	7.42	8.00	3.42
Test Fuel Load Wt. at End of Test - As Fired lb	0	0.09	0.08	1.44
Total Total Fuel Burned - kg DB	7.36	7.35	7.31	7.72
% Test Fuel Load Wt. at End of Test	0.0%	0.5%	0.4%	9.0%

Table 12 - Section 3 - Test Run Results Summary

Model Name(s)/Number(s)	1.4 Series			
Usable Firebox Volume - ft <sup>3</sup>	1.55			
Convection Air Fan (No, Standard, Optional)	Optional			
Test Run #	1	2	3	4
Date Tested	11/17/20	11/18/20	11/19/20	11/20/20
Test Run Category	L	M	L	H
Burn Rate - kg/h DB	1.11	0.99	0.91	2.02
Burn Rate - As % of Low to High Midpoint	na	68%	na	na
Burn Duration - h	6.64	7.42	8.00	3.42
Heat Output - Btu/h	14818	12983	12124	26475
Dilution Tunnel Flow Rate - dscfm				
Average	335.13	337.36	332.25	323.90
Maximum Observed	343.73	357.44	353.55	338.34
Minimum Observed	321.74	312.39	311.67	309.63
Dilution Tunnel Temperature - °F				
Average	88	86	84	92
Maximum Observed	104	113	108	110
Minimum Observed	79	76	75	69
Sample Dryer Exit Max. Temp (or Max. DGM Temp) - °F				
Train 1	69	68	68	69
Train 2	69	68	68	69
Average Sample Flow Rates - dscfm				
Train 1	0.124	0.127	0.126	0.121
Train 2	0.125	0.128	0.128	0.122
Sample Vacuum - in. Hg				



## TEST REPORT FOR STOVE BUILDER INTERNATIONAL INC.

Report No.: 104473478MTL-001R6

Date: 10/12/22

Train 1				
Start	0.4	0.4	0.4	0.4
End	0.6	0.5	0.5	0.5
Maximum Observed	0.6	0.5	0.5	0.5
Train 2				
Start	0.4	0.4	0.4	0.4
End	0.6	0.5	0.4	0.4
Maximum Observed	0.6	0.5	0.5	0.5
Proportional Rate Variation (10-minute basis)				
# of Occurrences > 5%, Total Both Trains	0	0	0	0
# of Occurrences > 10%, Total Both Trains	0	0	0	0
Highest PR Variation - %, Either Train	103.5%	104.3%	104.2%	103.9%
Total Sample Volume - dscm (m <sup>3</sup> )				
Train 1	1.397	1.598	1.718	0.705
Train 2	1.414	1.615	1.740	0.709
Average Dilution Ratio				
Train 1	2707.0	2662.7	2628.6	2668.0
Train 2	2674.6	2633.6	2595.7	2652.7
Total PM Catch - mg				
Train 1	5.4	4.6	3.9	2.8
Train 2	5.5	4.4	3.6	2.9
Total Catch PM Weight Excluding Probe - mg				
Train 1 - Immediately Post-Test	5.0	3.2	3.0	2.5
Train 1 - Final Dry Weight	4.9	3.3	3.0	2.5
Train 2 - Immediately Post-Test	4.8	3.3	2.9	2.4
Train 2 - Final Dry Weight	4.9	3.4	2.9	2.5
Final Dry Probe PM Catch - mg				
Train 1	0.5	1.3	0.9	0.3
Train 2	0.6	1.0	0.7	0.4
Probe PM Catch as % of Total PM Catch				
Train 1	9.3%	28.3%	23.1%	10.7%
Train 2	10.9%	22.7%	19.4%	13.8%
Total PM Emissions - g				
Train 1	14.618	12.248	10.251	7.471
Train 2	14.710	11.588	9.345	7.693
Average	14.664	11.918	9.798	7.582
PM Emission Train Precision - %	0.3%	2.8%	4.6%	1.5%

## TEST REPORT FOR STOVE BUILDER INTERNATIONAL INC.

Report No.: 104473478MTL-001R6

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	0.01	0.09	0.12	0.03
PM Emission Train Precision - g/kg				
PM Concentration - mg/m <sup>3</sup>				
Train 1	3.87	2.88	2.27	3.97
Train 2	3.89	2.72	2.07	4.09
PM Emission Rate - g/h	2.21	1.61	1.22	2.22
PM Emission Rate - g/Mj (from CSA B415.1-10/15)	0.14	0.12	0.10	0.10
PM Emission Rate - lb/MMBtu (from CSA B415.1-10/15)	0.33	0.27	0.22	0.24
First Hour Emissions				
Sampling Duration (minutes)	60.00	60.00	60.00	60.00
Average Sample Flow Rate - dscfm	0.1178	0.1214	0.1208	0.1230
Total Sample Volume - dscm (m <sup>3</sup> )	0.200	0.206	0.205	0.209
Average Dilution Tunnel Flow Rate - dscfm	328.53	315.04	316.71	322.69
Average Dilution Ratio	2788.9	2595.1	2621.8	2623.5
Total PM Catch - mg	3.8	3.5	2.6	1.7
PM Concentration - mg/m <sup>3</sup>	18.98	16.97	12.67	8.13
Total PM Emissions - g	10.60	9.08	6.82	4.46
PM Emission Rate - g/h	10.60	9.08	6.82	4.46
Total CO Emissions - g (CSA B415.1-10/15)	493.0	548.0	425.0	254.0
CO Emissions Rate - g/h (CSA B415.1-10/15)	74.3	73.9	53.1	95.2
Test Duration w/o Cold Start (High Fire Only) - h	na	na	na	2.67
Overall Efficiency - CSA B415.1-10/15				
% HHV Basis	74.9	73.3	74.3	73.5
% LHV Basis	80.2	78.6	79.6	78.7

Table 13 - Section 4 - Weighted Average Summary

Model Name(s)/Number(s)	1.4 Series		
Usable Firebox Volume - ft <sup>3</sup>	1.55		
Convection Air Fan (No, Standard, Optional)	Optional		
Average for Each Test Run Category	L	M	H
Burn Rate - kg/h DB	0.91	0.99	2.0
PM Emission Rate - g/h	1.72	1.61	2.22

## TEST REPORT FOR STOVE BUILDER INTERNATIONAL INC.

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CO Emissions Rate - g/h	63.7	73.9	95
Overall Efficiency - CSA B415.1-10			
% HHV Basis	75	73	74
% LHV Basis	80	79	79
Heat Output - Btu/h	<b>12100</b>	13000	26500
Category Weighting	40%	40%	20%

### ASTM E3053 Weighted Averages

PM Emission Rate - g/h	1.8
CO Emissions Rate - g/h	74
CO Emissions Rate - g/min	1.2
Overall Efficiency - CSA B415.1-10	
% HHV Basis	74
% LHV Basis	79
Heat Output Range - Btu/h	12100 to 26500

Note : In Table 13, the burn rate and heat output of the low burn rate are presented are the lowest obtained value to show the possible maximum range of performance. All other values of the low burn rate in table 5 are averaged between the two low burn rate test runs.

# STOVE BUILDER INTERNATIONAL PRODUCT EVALUATION

**PRODUCT EVALUATED**

OSBURN 950, ESCAPE 1200, GATEWAY 1400, SOLUTION 1.4, SPARK II, FOX, DÉCO NANO, S250, HARMONY 1.4, HES140

**EVALUATION PROPERTY**

U.S. ENVIRONMENTAL PROTECTION AGENCY 40 CFR PART 60

**REPORT NUMBER**

104473478MTL-002

**ORIGINAL ISSUE DATE**

12/14/20

**LAST REVISED DATE**

ORIGINAL

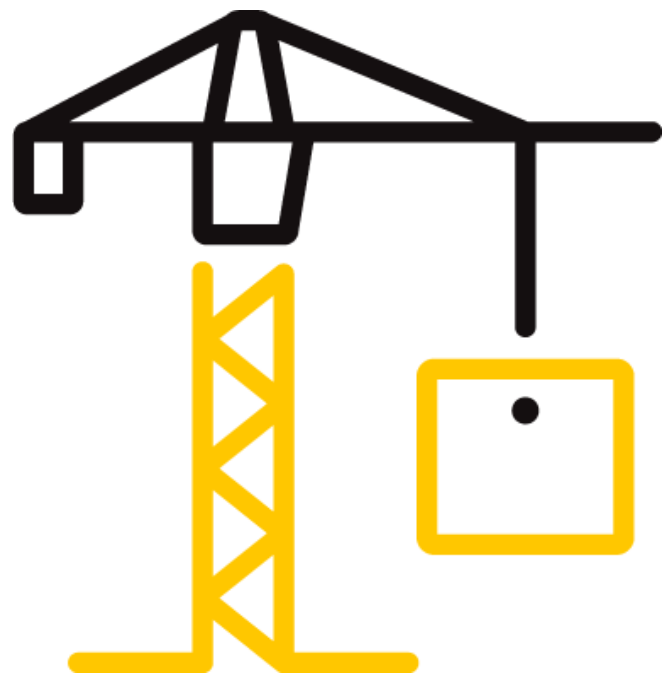
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## PRODUCT EVALUATION FOR STOVE BUILDER INTERNATIONAL

Report No.: 104473478MTL-002

Date: 12/14/20

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### PRODUCT EVALUATION RENDERED TO:

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Company Name:	Stove Builder International
Address:	250 rue de Copenhague
	St-Augustin-de-Desmaures, QC
	G3A 2H3, Canada
Contact Person:	Guillaume Thibodeau-Fortin
Tel:	1-418-878-3040 x5224
Email:	<a href="mailto:gthibodeaufortin@sbi-international.com">gthibodeaufortin@sbi-international.com</a>

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## PRODUCT EVALUATION FOR STOVE BUILDER INTERNATIONAL

Report No.: 104473478MTL-002

Date: 12/14/20

### 1 Introduction

---

Intertek Testing Services NA Ltd./Inc. (Intertek) is conducting a product evaluation for Stove Builder International, on Osburn 950, Escape 1200, Gateway 1400, Solution 1.4, Spark II, Fox, Déco Nano, S250, Harmony 1.4 and HES140 to evaluate if the differences with the tested Spark II (1.4 Series) will increase particulate matter emission rate limit. The evaluation is being conducted to determine if items listed in *U.S. Environmental Protection Agency 40 CFR Part 60 Standards of Performance for New Residential Wood Heaters; Final Rule, SECTION 60.533(k)* will show equivalency with the previously tested Spark II (1.4 Series).

### 2 Product and Assembly Description

---

#### 2.1. Product Description:

The model Spark II (1.4 Series) Wood Fuel Room Heater is constructed of sheet steel. The outer dimensions are 27 9/16-inches deep, 28 9/16-inches high, and 18 1/2-inches wide. The unit has a door located on the front with a viewing glass.

Construction drawings are in appendix and named EM00008-V01.

This PEV refers to a product described in Intertek Test Report 104473478MTL-001. Consult that document for additional information and specific test conditions.

#### 2.2. Product Traceability:

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

#### 2.3. Product Certification:

Stove Builder International is an Intertek testing client and an Intertek Listing and Follow-up Service client. Stove models Osburn 950, Escape 1200, Gateway 1400, Solution 1.4, Spark II, Fox, Déco Nano, S250, Harmony 1.4 and HES140 are in the process of listing within Intertek. Currently, Intertek does not have any Listings for these models contained in Intertek's Directory of Listed Building Products.

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

## PRODUCT EVALUATION FOR STOVE BUILDER INTERNATIONAL

Report No.: 104473478MTL-002

Date: 12/14/20

### 3 Reference Documents

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

- *U.S. Environmental Protection Agency 40 CFR Part 60 Standards of Performance for New Residential Wood Heaters; Final Rule, SECTION 60.533(k)*
- SBI drawings number : EM00008-V01, CB00025-V01, DB03182-V01, DB03186-V01, DB03215-V01, DB03401-V01, EB00061-V01, EB00065-V01, OB00950-V01, SF00605-V01 and VB00023-V01.
- Intertek Testing Report No.: 104473478MTL-001

### 4 Evaluation Method

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This PEV represents the results of an evaluation on free standing stove models listed in object when compared to the tested Spark II Stove. This investigation was authorized by SBI on December 14<sup>th</sup>, 2020. Drawings number EM00008-V01, CB00025-V01, DB03182-V01, DB03186-V01, DB03215-V01, DB03401-V01, EB00061-V01, EB00065-V01, OB00950-V01, SF00605-V01 and VB00023-V01 were received on December 14<sup>th</sup>, 2020 at the Intertek Lachine facility. Drawings can be found in appendix.

The Models listed in subject are free standing stoves manufactured based on the construction of the Spark II. The combustion room of all the mentioned units are identical. The primary air opening has a different shape between the tested model and the future production model. After manufacturing review of the unit, the air shutter pivot needed to be moved forward to prevent manufacturing issues. The surface opening, either fully opened and fully closed are identical between the tested and the future production unit. Detailed drawings are available in Appendix on Figure 1 and Figure 2. Outside of the firebox primary air inlet is far from the primary outlet inside of the firebox. At least 4 section changes occurred symmetrically (left-right) from the inlet to the outlet, making the shape of the entrance not significant to the amount of air supplied to the firebox.

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

- The loading door differs by shape;
- The façade differs by shape;
- The pedestal or leg differs by shape and materials;
- The decorative side panels differ by shape.

Design drawings were evaluated to determine similarities between the above-mentioned models. Drawings show internal fire box size to be the same at 17 5/8" deep, 11 1/16" high (from brick to higher tube) and 14 1/4" wide ± ¼". All appliances share a 6" flue collar and have the same primary air entrance area. Differences noted during this evaluation were on the door shape, pedestal, legs, decorative side panels as well as the typical look of the façade of all unit' inspired by their typical branding look.

### 5 Conclusion

---

Intertek has conducted this product evaluation for Stove Builder International, on Osburn 950, Escape 1200, Gateway 1400, Solution 1.4, Spark II, Fox, Déco Nano, S250, Harmony 1.4 and HES140, to evaluate if the differences with the tested Spark II will increase particulate matter emission rate limit. The evaluation was conducted to

## PRODUCT EVALUATION FOR STOVE BUILDER INTERNATIONAL

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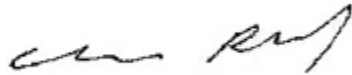
Date: 12/14/20

determine if items listed in *U.S. Environmental Protection Agency 40 CFR Part 60 Standards of Performance for New Residential Wood Heaters; Final Rule, SECTION 60.533(k)* will show equivalency with the tested Spark II Stove.

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

- Changes made are only aesthetical and do not increase particulate matter emission rate.
- Change made to the air inlet shape is in respect of the criteria of 60.533(k) and do not increase particulate matter emission rate.

### INTERTEK TESTING SERVICES NA LTD.



Reported by:

\_\_\_\_\_  
Claude Pelland P.Eng.  
Staff Engineer  
Intertek Lachine



Reviewed by:

\_\_\_\_\_  
Brian Ziegler  
Technical Team Leader - Hearth  
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**PRODUCT EVALUATION FOR STOVE BUILDER INTERNATIONAL**

Report No.: 104473478MTL-002

Date: 12/14/20

**7 LAST PAGE & REVISION SUMMARY**

---

DATE	SUMMARY	REPORTER	REVIEWER
12/14/20	Original	Claude Pelland	Brian Ziegler

# STOVE BUILDER INTERNATIONAL PRODUCT EVALUATION

**PRODUCT EVALUATED**

BLUE RIDGE 100

**EVALUATION PROPERTY**

U.S. ENVIRONMENTAL PROTECTION AGENCY 40 CFR PART 60, ASTM E2515-11 (R2017),  
ASTM E3053-17, CSA B415.1-10

**REPORT NUMBER**

104473478MTL-003

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04/11/22

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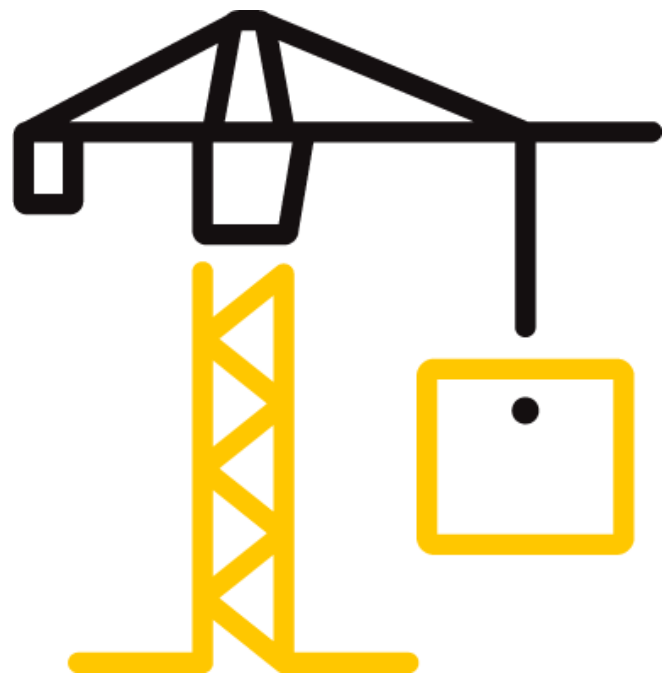
**PAGES**

8

**DOCUMENT CONTROL NUMBER**

SFT-BC-OP-19H

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## PRODUCT EVALUATION FOR STOVE BUILDER INTERNATIONAL

Report No.: 104473478MTL-003

Date: 04/11/22

PRODUCT EVALUATION RENDERED TO:	
Company Name:	Stove Builder International
Address:	250 rue de Copenhague St-Augustin-de-Desmaures, QC G3A 2H3, Canada
Contact Person:	Guillaume Thibodeau-Fortin
Tel:	1-418-878-3040 x5224
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## PRODUCT EVALUATION FOR STOVE BUILDER INTERNATIONAL

Report No.: 104473478MTL-003

Date: 04/11/22

### 1 Introduction

---

Intertek Testing Services NA Ltd./Inc. (Intertek) is conducting a product evaluation for Stove Builder International, on Blue Ridge 100 to evaluate if the differences with the tested Spark II (1.4 Series) will increase particulate matter emission rate limit. The evaluation is being conducted to determine if items listed in *U.S. Environmental Protection Agency 40 CFR Part 60 Standards of Performance for New Residential Wood Heaters; Final Rule, SECTION 60.533(k), in ASTM E2515-11 (R2017), in ASTM E3053-17 and in CSA B415.1-10* will show equivalency with the previously tested Spark II (1.4 Series).

### 2 Product and Assembly Description

---

#### 2.1. Product Description:

The model Spark II (1.4 Series) Wood Fuel Room Heater is constructed of sheet steel. The outer dimensions are 27 9/16-inches deep, 28 9/16-inches high, and 18 1/2-inches wide. The unit has a door located on the front with a viewing glass.

Construction drawings are in appendix and named DB03401-V01.

This PEV refers to a product described in Intertek Test Report 104473478MTL-001R4. Consult that document for additional information and specific test conditions.

#### 2.2. Product Traceability:

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

#### 2.3. Product Certification:

Stove Builder International is an Intertek testing client and an Intertek Listing and Follow-up Service client. Stove model Blue Ridge 100 is in the process of listing within Intertek. Currently, Intertek does not have any Listings for this model contained in Intertek's Directory of Listed Building Products.

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

## PRODUCT EVALUATION FOR STOVE BUILDER INTERNATIONAL

Report No.: 104473478MTL-003

Date: 04/11/22

### 3 Reference Documents

---

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

- *U.S. Environmental Protection Agency 40 CFR Part 60 Standards of Performance for New Residential Wood Heaters; Final Rule, SECTION 60.533(k), ASTM E2515-11 (R2017), ASTM E3053-17 and CSA B415.1-10*
- SBI drawings number: DB03401-V01 & ESW0001-V01.
- Intertek Testing Report No.: 104473478MTL-001R4

### 4 Evaluation Method

---

This PEV represents the results of an evaluation on free standing stove models listed in object when compared to the tested Spark II Stove. This investigation was authorized by SBI in April 11<sup>th</sup>, 2022. Drawings number DB03401-V01 and ESW0001-V01 were received on April 11<sup>th</sup>, 2022 at the Intertek Lachine facility. Drawings can be found in appendix.

The Models listed in subject are free standing stoves manufactured based on the construction of the Spark II. The combustion room of all the mentioned units are identical.

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

- The loading door differs by shape;
- The façade differs by shape;
- The pedestal or leg differs by shape and materials.

Design drawings were evaluated to determine similarities between the above-mentioned models. Drawings show internal fire box size to be the same at 17 5/8" deep, 11 1/16" high (from brick to higher tube) and 14 1/4" wide ± ¼". All appliances share a 6" flue collar and have the same primary air entrance area. Differences noted during this evaluation were on the door shape, pedestal, legs as well as the typical look of the façade of all unit' inspired by their typical branding look.

### 5 Conclusion

---

Intertek has conducted this product evaluation for Stove Builder International, on Blue Ridge 100, to evaluate if the differences with the tested Spark II will increase particulate matter emission rate limit. The evaluation was conducted to determine if items listed in *U.S. Environmental Protection Agency 40 CFR Part 60 Standards of Performance for New Residential Wood Heaters; Final Rule, SECTION 60.533(k) , in ASTM E2515-11 (R2017), in ASTM E3053-17 and in CSA B415.1-10* will show equivalency with the tested Spark II Stove.

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

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



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Middleton, Wisconsin 53562


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**PRODUCT EVALUATION FOR STOVE BUILDER INTERNATIONAL**

Report No.: 104473478MTL-003

Date: 04/11/22

**INTERTEK TESTING SERVICES NA LTD.**

Reported by:   
\_\_\_\_\_  
Claude Pelland P.Eng.  
Staff Engineer  
Intertek Lachine

Reviewed by:   
\_\_\_\_\_  
Brian Ziegler  
Project Team Leader  
Building Products Division



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**PRODUCT EVALUATION FOR STOVE BUILDER INTERNATIONAL**

Report No.: 104473478MTL-003

Date: 04/11/22

**7 LAST PAGE & REVISION SUMMARY**

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DATE	SUMMARY	REPORTER	REVIEWER
04/11/2022	Original	Claude Pelland	Brian Ziegler



Fabricant de poêles international inc.  
Stove Builder International Inc.

## **Test load procedure for certification of 1.4 Series wood stove using ASTM E3053-17 according to EPA Alt-125**

Fuel specie: Beech

Fuel length: 16 inches  $\pm$  1 inch

### **Low burn rate**

#### **Stove lighting: 8.0 lbs**

Split the start-up fuel log into 6 pieces. Put 2 kindling pieces on the brick in an orientation that points to the left (10-15 degrees from North-South). Then, put 2 start-up fuel pieces with two kindling between them in a North-South orientation. Make two more rows in the same way, alternating with a left pointed and North-South orientation. Finally, put the remaining kindling (4-5) in a left pointed orientation. Leave a little space between each piece.

The kindling is made of between 12-13 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 225°F, then close the door. The fan is always OFF.

#### **Pre-load (high burn): 16.2 lbs**

When there is a coal bed of 1.65 lbs left, break ashes and level coal bed, then add pre-load (five pieces). Place the 3 smallest pieces in the bottom in a North-South orientation. They should touch the rear bricks and be 1 ½ inch apart from each other. Then, put the largest piece on top of the left and middle pieces in a right pointed orientation. Put the last piece on top of the middle and right piece in a right pointed orientation. There should be at least 2 inches between the two top pieces. Close the door immediately and let burn until the weight is down to target.

When the average stove temperature gets to 440°F, slightly level the coal bed. There should be approximately 3.9 lb of coal bed.

#### **Loading: 19.5 lbs (five pieces)**

Place the smallest piece on the coal bed in the middle of the stove in a North-South orientation. Place the other two smaller ones on each side at approximately ¼" of the side bricks to leave as much space as possible between the pieces. Then, put the largest piece on top of the left and middle pieces in a right pointed orientation. Put the last piece on top of the middle and right pieces in a right pointed orientation. There should be at least 2 inches between the two top pieces. The bottom pieces should be as close as possible to the inner air channel. Let the door ajar for 4 minutes and then close the door with the primary air control fully open. When the oxygen falls below 7%, close the primary air control to 90% (2.75 on the marking on the ash shelf). If the oxygen continues to drop, continue to close the primary air control to 80% (2.5 on the ash shelf). If the oxygen goes above 9.5%, open the primary to 100%. The goal is to keep the oxygen between 7 and 8%. Start to close slowly the primary air control at 14 minutes, so that at 16 min (15 min or 15 % as per E3053 clause 8.6.7 plus loading time of 1 min as per clause 8.6.5), the primary air control is completely closed. Start the fan at minimum speed at 60 minutes.





Fabricant de poêles international inc.  
Stove Builder International Inc.

## Medium burn rate

### **Stove lighting: 8.0 lbs**

Use the same method than for low burn rate.

### **Pre-load (high burn): 16.2 lbs**

Use the same method than for low burn rate.

### **Loading: 19.5 lbs (five pieces)**

Place the biggest piece on the coal bed at one inch of the left bricks. Put the smallest piece against a medium piece at one inch of the left bricks (the smallest piece between the largest and the medium pieces). There should be about 2 inches between the smallest and the largest pieces. Put the two last pieces in a right pointed orientation on top of the first three pieces. Leave a space of about 2 inches between the two top pieces. Leave one inch or air space between the rear bricks and the pieces. Let the door ajar for 3 minutes 30 seconds and then close the door with the primary air control open. When the oxygen falls below 7%, close the primary air control to 90% (2.75 on the marking on the ash shelf). If the oxygen continues to drop, continue to close the primary air control to 80% (2.5 on the ash shelf). If the oxygen goes above 9.5%, open the primary of 100%. The goal is to keep the oxygen between 7 and 8%. Start to close slowly the primary air control at 14 minutes, so that at 16 min, the primary air inlet is open of 23/64 inch. On the ash shelf, the opening is 1 5/8 inch from de fully closed position. Start the fan at minimum speed at 30 minutes.

## High burn rate

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

### **Stove lighting: 8.0 lbs**

Same as low burn.

### **High burn: 16 lbs**

When there is a coal bed of 1.65 lbs left, break ashes and level coal bed, then add the load (four pieces). Put the largest piece and one of the medium pieces centered at the back of the combustion chamber (they should touch the rear bricks). Put the two last pieces in a right pointed orientation on top of the first two pieces. There should be at least 2 inches between the two bottom pieces and between the two top pieces. Close the door immediately after loading. Start the fan at maximum speed at 15 minutes. Stop the test when 90% of the high fire load has been consumed.

Date: 2020-11-17

Page      of     

Manufacturer: SBI

Model: 1.4 series

Project #: G104473478 Run: 1

Tech:      Reviewer: C. Belland

**COMMENTS**

induced draft - 0.0017 (initial)	w/draft 0.002	C-implant
wind speed front of unit 48 ft/min (SBI-241)		
8:21 Kindling lit on		
8:24 Door closed		
9:12 1.65 lbs Pellets inserted		
9:17 Door closed		
11:29 20 Stearing for 1 minute (including activation)		
11:23 Start of test.		
Loading + picture + activation		
11:27 door closed (4 minutes in the test)		
11:40 (16 min in the test) door closed,		
12:23 fan on (1 hr into the test)		
18:05 End of test		

**TEST LOAD CONFIGURATION**

# Fuel load calculation - PRELOAD

Date: 2020-11-17  
 Run #: 1

Rev date: 05-07-2017  
 Doc rev: Rev 2

November 20 Adjunct to ASTM E XXXX Wood Heater Cordwood Test Method  
 Cordwood Fuel Load Calculators - 10 lb/ft<sup>3</sup> Nominal Load Density  
 Core 45-65% of Total Load Weight. Remainder 35-55% of Total Load Weight  
 Values to be input manually

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**For All Usable Firebox Volumes - High Fire Test Only**

Nominal Required Load Density (wet basis)	10 lb/ft <sup>3</sup>
Usable Firebox Volume	1.55 ft <sup>3</sup>
Total Nom. Load Wt. Target	15.5 lb
Total Load Wt. Allowable Range	14.70 to 16.30 lb
Core Target Wt. Allowable Range	7 to 10.10 lb
Remainder Load Wt. Allowable Range	5.40 to 8.50 lb
Core Load Pc. Wt. Allowable Range	2.30 to 3.90 lb
Remainder Load Pc. Wt. Allowable Range	1.60 to 3.50 lb
	Mid-Point
	3.10
	5.05

Cal. Block #: SBI-153 12%: 12.0  
 Wood moisture meter #: SBI-214 22%: 22.0  
 Room temp. (°F): 68.5  
 Room RH (%): 32.2  
 Ambient hygrometer #: SBI-212

Fuel Piece Moisture Reading (%-dry basis)	1	2	3	Ave.
Core Load Piece Wt. Actual	17.1	16.9	21.4	
Core Load Total. Wt. Actual	18.6	17.8	21.7	
Core Load Total. Wt. Actual (1 to 3 Pcs.)	21.8	19.1	16.5	
Remainder Load Piece Wt.	25.7	16.2	17.3	
Remainder Load Tot. Wt. Act	22.1	23.4	17.5	
Remainder Load Piece Weight Ratio - Small/Large				
Remainder Load Tot. Wt. Act				
Total Load Wt. Actual				
Core % of Total Wt.				
Remainder % of Total Wt.				
Actual Load % of Nominal Target				
Actual Fuel Load Density				
Kindling and Start-up Fuel				
Maximum Kindling Wt. (20% of Tot. Load Wt.)				
Actual Kindling Wt.				
Maximum Start-up Fuel Wt. (30% of Tot. Load Wt.)				
Actual Start-up Fuel Wt.				

Fuel Piece Moisture Reading (%-dry basis)	1	2	3	Ave.
Kindling Moisture (%-dry basis)	10	10	10	10
Start-up Fuel Moisture Readings (%-dry basis)	18.4	22.4	27.1	22.6
Total Wt. All Fuel Added (dry basis)				
Total Wt. All Fuel Burned (dry basis)				

Actual Kindling Wt.	3.236	#DIV/0!	#DIV/0!
Maximum Start-up Fuel Wt. (30% of Tot. Load Wt.)	0.00	0.00 lb/ft <sup>3</sup>	0.00 lb
Actual Start-up Fuel Wt.	4.685	#DIV/0!	#DIV/0!

Signature: C. McDonald

# Fuel Load Data - LOW

Date: 2020-11-17  
 Run #: 1

Rev date: 05-07-2017  
 Doc rev: Rev 2

November 20, 2015 Adjunct to ASTM E XXXX Wood Heater Cordwood Test Method  
 Cordwood Fuel Load Calculators - 12 lb/ft<sup>3</sup> Nominal Load Density  
 Core 45-65% of Total Load Weight, Remainder 35-55% of Total Load Weight  
 Values to be input manually.

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## For Usable Firebox Volumes up to 3.0 ft<sup>3</sup> - Low and Medium Fire

Nominal Required Load Density (wet basis)	10 lb/ft <sup>3</sup>	
Usable Firebox Volume	1.58 ft <sup>3</sup>	
Total Nom. Load Wt. Target	15.5 lb	
Total Load Wt. Allowable Range	14.73 to 16.28 lb	
Core Target Wt. Allowable Range	6.975 to 10.08 lb	
Remainder Load Wt. Allowable Range	5.43 to 8.53 lb	
Core Load Fuel P.C. Wt. Allowable Range	2.33 to 3.88 lb	Mid-Point 3.10
Remainder Load P.C. Wt. Allowable Range	1.55 to 4.65 lb	3.10

Cal. Block #:	SBI-153	12%:	<u>12.0</u>
Wood moisture meter #:	<u>SBI-214</u>	22%:	<u>22.0</u>
Room temp. (*F):	<u>68.7</u>		
Room RH (%):	<u>31.5</u>		
Ambiant hygrometer #:	<u>SBI-212</u>		

	Pc. #	1	2	3	Ave.
Core Load Piece Wt. Actual		<u>3,431</u> lb	<u>3,482</u> lb	<u>4,179</u> lb	
Core Load Total. Wt. Actual		<u>0.00</u> lb			
Remainder Load Piece Wt.		<u>5,1481</u> lb			
(2 or 3 Pcs.)		<u>2,923</u> lb			
Remainder Load Piece Weight Ratio - Small/Large		#NOMBREI			
Remainder Load Tot. Wt. Act		0.00 lb			
Total Load Wt. Actual		0.00 lb			
Core % of Total Wt.		#DIV/0!			
Remainder % of Total Wt.		#DIV/0!			
Actual Load % of Nominal Target		<u>0%</u>			
Actual Fuel Load Density		0.0 lb/ft <sup>3</sup>			
Allowable Charcoal Bed Wt. Range (lb)	0.1	to	-0.1		
Actual Charcoal Bed Wt.		3.8 lb			
Actual Fuel Load Ending Wt.		0.1 lb			
Total Wt. of Fuel Burned During Test Run lb.		-0.1 lb			

	1	2	3	Ave.
Fuel Piece Moisture Reading (%-dry basis)	<u>18.7</u>	<u>23.0</u>	<u>23.0</u>	<u>#DIV/0!</u>
	<u>16.4</u>	<u>22.1</u>	<u>18.9</u>	<u>#DIV/0!</u>
	<u>17.4</u>	<u>20.0</u>	<u>22.1</u>	<u>#DIV/0!</u>
	<u>18.3</u>	<u>19.3</u>	<u>21.9</u>	<u>#DIV/0!</u>
	<u>16.9</u>	<u>18.9</u>	<u>27.3</u>	<u>#DIV/0!</u>
				NA
				<u>#DIV/0!</u>
				<u>#DIV/0!</u>
Total Load Ave. MC % (dry basis)				
Total Load Ave. MC % (wet basis)				
Total Test Load Weight (dry basis)				
Total Fuel Weight Burned During Test Run (dry basis)				

Signature: C. Pelloni

Date: 2020-11-17

Page \_\_\_ of \_\_\_

Manufacturer: SBI

Model: 1.4 series

Project #: R-104473478 Run: 1

Tech: \_\_\_\_\_ Reviewer: [Signature]

**SAMPLING EQUIPMENT CHECK OUT**

**Leakage Checks Tunnel Samplers**

	SYSTEM 1 (#SBI-046) <sup>7</sup> <sub>65</sub>		SYSTEM 2 (#SBI-047) <sup>6</sup> <sub>65</sub>		SYSTEM 3 (#SBI-276) <sup>65</sup> <sub>290</sub>	
	Pre-Test	Post-Test	Pre-Test	Post-Test	Pre-Test	Post-Test
Plug and set vacuum at 5 in Hg. (17.3 mA)			959,112			
Plug and note initial reading on DGM (ft <sup>3</sup> )	241,592	<del>241,592</del> 291,303	<del>959,112</del> 959,073	1009,361	029,640	36,801
Wait 1 min and note final reading DGM (ft <sup>3</sup> )	241,593	291,304	959,112	1009,361	029,640	36,802
Difference between initial and final (ft <sup>3</sup> )	0,001	0,001	0	0	0	0,001
Allowable leakage 4% x Sample rate	0,004	0,004	0,004	0,004	0,004	0,004
Check OK	✓	✓	✓	✓	✓	✓

**Leakage Checks Flue Gas Sampler (Testo 350 #SBI-246)**

Plugged Probe	Pre Test	Post Test
Check OK	OK	OK

Signature: [Signature]

Date: 2020-11-17

Page      of     

Manufacturer: SBI

Model: 1.4 series

Project #: B104473478

Run: 1

Tech:                      Reviewer: G. DeHond

**PRETEST DILUTION TUNNEL TRAVERSE RUN**

Barometric pressure ( $P_{bar}$ ) 29.45 (inches Hg.)      Static pressure ( $P_q$ ) 0.138 (inches w.c.)

Inside diameter: Port A 8in. Port B 8in.

Tunnel cross sectional area: 0.349 ft<sup>2</sup>

Pitot tube #: SBI-204

Pitot tube factor: 0.844

Traverse Point	Position (inches)	Velocity Head $\Delta_p$ (inches H <sub>2</sub> O)	Tunnel Temperature (°F)	$\sqrt{\Delta_p}$
A - Centroid	4.00	0.089	102.0	
B - Centroid	4.00	0.090	101.3	
A-1	0.54	0.083	102.0	
A-2	2.00	0.093	102.4	
A-3	6.00	0.078	102.6	
A-4	7.46	0.087	78.8	
B-1	0.54	0.083	103.0	
B-2	2.00	0.093	104.5	
B-3	6.00	0.075	104.2	
B-4	7.46	0.1060	98.9	
		AVERAGE		



Date: 2020-11-17

Page 1 of 1

Manufacturer: SBI

Model: 1.4 series

Project #: 6104473478

Category #: LOW

Run: 1

Engineer: C. Belland

### RAW DRY GAS METER READINGS

	Start	End	Difference
System 1 (ft <sup>3</sup> ) Equipment #: <u>SBI-047</u>	241,639	291,276	49,637
System 2 (ft <sup>3</sup> ) Equipment #: <u>SBI-046</u>	959,175	1009,352	50,177
System 3 (ft <sup>3</sup> ) Equipment #: <u>SBI-290</u>	029,658	36,777	7,119

### AMBIENT CONDITIONS

	Start	End
	Date: <u>2020-11-17</u>	Date: <u>2020-11-17</u>
	Time: <u>11h20</u>	Time: <u>18h05</u>
Barometer. (inches Hg) <sup>GS</sup> Meteo.gc.ca- <u>SBI-331</u>	29,45	29,6
Indoor Dry Bulb (°F) Equipment #: <u>SBI-212</u>	82,7	74,6
Indoor Humidity (%) Equipment #: <u>SBI-212</u>	19,8	19,5

Signature: C. Belland

## Probes weights

### General information

<b>Project:</b>	G104473478
<b>Project Engineer:</b>	Claude Pelland
<b>Scale ID:</b>	SBI-206

		Date/Pressure (kPa)		2020-11-17/99.4		2020-11-17/99.4		2020-11-26/100.5		2020-11-30/100.1	
<b>Calibration Record</b>	SBI-237	0.1000	0.1000	0.1000	0.1000	0.0999	0.1000	0.0999	0.1000	0.1000	0.1000
	SBI-238	10.0001	10.0000	10.0000	10.0000	10.0001	10.0001	10.0001	10.0001	10.0001	10.0001
	SBI-238	200.0000	200.0000	200.0000	200.0000	200.0000	200.0000	200.0000	199.9999	199.9999	199.9999
Start Time	Temp. [°F]	9h35	68.8	18h10	68.8	11h15	69.0	10h20	70.7	10h20	70.7
End Time	RH [%]	10h25	0.1	18h23	0.1	11h45	0.2	10h40	1.7	10h40	1.7

Run	Sampling train	Probe ID	Pretest Weight (g)	Post test Weight (g)	Post test Weight (g)	Post test Weight (g)
<b>1</b>	1	59	94.3349	94.3349	94.3354	94.3354
	2	60	94.1210	94.1214	94.1218	94.1216
	3 (1 hr)	65	94.0269	94.0278	94.0273	94.0273

		Date									
<b>Calibration Record</b>	SBI-237	0.1000									
	SBI-238	10.0001									
	SBI-238	200.0000									
Start Time	Temp. [°F]										
End Time	RH [%]										

Run	Sampling train	Probe ID	Post test weight (g)	Post test Weight (g)	Post test Weight (g)	Post test Weight (g)
	1					
	2					
	3 (1 hr)					

		Date									
<b>Calibration Record</b>	SBI-237	0.1000									
	SBI-238	10.0001									
	SBI-238	200.0000									
Start Time	Temp. [°F]										
End Time	RH [%]										

Run	Sampling train	Probe ID	Post test Weight (g)	Post test Weight (g)	Post test Weight (g)	Post test Weight (g)
	1					
	2					
	3 (1 hr)					



## Filters weights

### General information

<b>Project:</b> 1.4 series	G104473478
<b>Project Engineer:</b>	Claude Pelland
<b>Scale ID:</b>	SBI-206

		Date / Pression*		2020-11-17 / 99.4		2020-11-17 / 99.4		2020-11-26 / 100.5		2020-11-30 / 100.1	
<b>Calibration Record</b>	SBI-237	0.1000	0.1000	0.1000	0.1000	0.0999	0.1000	0.0999	0.1000	0.1000	0.1000
	SBI-238	10.0001	10.0000	10.0000	10.0000	10.0001	10.0001	10.0001	10.0001	10.0001	10.0001
	SBI-238	200.0000	200.0000	200.0000	200.0000	200.0000	200.0000	200.0000	200.0000	200.0000	200.0000
Start Time	Temp. [°F]	9h35	68.8	18h10	68.8	11h15	69.0	10h20	70.7	10h20	70.7
End Time	RH [%]	10h25	0.1	18h18	0.1	11h45	0.2	10h40	1.7	10h40	1.7

Run	Sampling train	Filter ID	Pretest Weight (g)	Post test Weight (g)	Post test Weight (g)	Post test Weight (g)	Post test Weight (g)
1	front	1	183.3	188.3	188.2	188.2	188.2
	rear	2					
2	front	3	179.0	183.8	184.0	183.9	183.9
	rear	4					
3 (1 hr)	front	5	183.5	187.4	186.9	186.9	186.9
	rear	6					

(mg)\*\*

		Date									
<b>Calibration Record</b>	SBI-237	0.1000									
	SBI-238	10.0001									
	SBI-238	200.0000									
Start Time	Temp. [°F]										
End Time	RH [%]										

Run	Sampling train	Filter ID	Post test Weight (g)	Post test Weight (g)	Post test Weight (g)	Post test Weight (g)
1	front					
	rear					
2	front					
	rear					
3 (1 hr)	front					
	rear					

		Date									
<b>Calibration Record</b>	SBI-237	0.1000									
	SBI-238	10.0001									
	SBI-238	200.0000									
Start Time	Temp. [°F]										
End Time	RH [%]										

Run	Sampling train	Filter ID	Post test Weight (g)	Post test Weight (g)	Post test Weight (g)	Post test Weight (g)
1	front					
	rear					
2	front					
	rear					
3 (1 hr)	front					
	rear					

\* (kPa)

## Continuous Analyzer

<b>Project:</b>	G104473 478
<b>Project Engineer:</b>	
<b>Equipment :</b>	Testo 350 (SBI-246)

Pre-test (after adjustment)      Run: 1      Date : 2020-11-17      Time : 7h49

	Zero		Span		Mid point (record only)		Full Scale
CO [ppm]	0.0	0.0	29930 ppm	29900 ppm	5569 ppm	5569 ppm	6000
CO2 [%]	0.0	0.0	16.14%	16.1%	16.0%	16.0%	50%
O2 [%]	0.0	0.0	17.52%	17.9%	17.57%	18.0%	21%
	Actual	Calibration gaz	Actual	Calibration gaz	Actual	Calibration gaz	

Post-test      Date : 2020-11-18      Time : 8h15

	Zero	Span	Cal.	Zero drift	Span drift	Cal. Drift	Max drift
CO [ppm]	0.0	29888 ppm	5503 ppm	0	12 ppm	66 ppm	282
CO2 [%]	0.0	16.01%	15.93%	0	0.09%	0.07%	0.80%
O2 [%]	0.0	17.37%	17.50%	0	0.53%	0.50%	0.90%

**Max drift is 5 % of full scale according to Intertek 192-Q-0602**

**Max drift is 1 % of full scale according to CSA B415.1-10, 6.3.1 (est-ce que c'est pour un 24h sans test ?)**

Federal Register p.13709

The manufacturer must have the approved test laboratory measure the efficiency, heat output and carbon

CSA B415.1-10 p.11

6.3 Flue gas composition

6.3.1

The percentage of carbon monoxide (CO) and carbon dioxide (CO2) in the flue gas shall be measured by a continuous infrared analyzer or equivalent. Continuous analyzers (or equivalent) shall have maximum

zero and span drift, over a 24 h period, of 1% of full scale.

6.3.2

Gas samples shall be taken by a probe inserted at the centreline of the chimney 50 mm (2 in) above the thermocouple measuring flue gas temperature.

6.3.3

Continuous analyzers (or equivalent) shall be arranged so that they are synchronized to reach 90% of their final reading within 30 s when beginning at ambient levels and responding to a calibration gas that contains at least 80% of full-scale value of the constituent being measured. The calibration gas for this test shall be introduced through the sampling probe.



# Fuel load calculation - PRELOAD

Date: 2020-11-18  
 Run #: 2

Rev date: 05-07-2017  
 Doc rev: Rev 2

November 20 Adjunct to ASTM E XXXX Wood Heater Cordwood Test Method  
 Cordwood Fuel Load Calculators - 10 lb/ft<sup>3</sup> Nominal Load Density  
 Core 45-65% of Total Load Weight, Remainder 35-55% of Total Load Weight  
 Values to be input manually

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## For All Usable Firebox Volumes - High Fire Test Only

Nominal Required Load Density (wet basis)	10 lb/ft <sup>3</sup>
Usable Firebox Volume	1.55 ft <sup>3</sup>
Total Nom. Load Wt. Target	15.5 lb
Total Load Wt. Allowable Range	14.70 to 16.30 lb
Core Target Wt. Allowable Range	7 to 10.10 lb
Remainder Load Wt. Allowable Range	5.40 to 8.50 lb
Core Load Pc. Wt. Allowable Range	2.30 to 3.90 lb
Remainder Load Pc. Wt. Allowable Range	1.60 to 8.50 lb
	Pc. #
	Mid-Point
	3.10
	5.05

Core Load Piece Wt. Actual	1	3.205	lb
	2	2.297	lb
	3	3.384	lb
Core Load Total. Wt. Actual		0.00	lb
Remainder Load Piece Wt.	4	3.873	lb
(1 to 3 Pcs.)	5	3.483	lb
	3		lb
Remainder Load Piece Weight Ratio - Small/Large		#NOMBREI	0.00 lb
Remainder Load Tot. Wt. Act		#DIV/0!	0.00 lb
Total Load Wt. Actual		#DIV/0!	0.00 lb
Core % of Total Wt.		#DIV/0!	0%
Remainder % of Total Wt.		#DIV/0!	0%
Actual Load % of Nominal Target		#DIV/0!	0%
Actual Fuel Load Density		0.0	lb/ft <sup>3</sup>
Kindling and Start-up Fuel		0.00	lb
Maximum Kindling Wt. (20% of Tot. Load Wt.)		3.226	lb
Actual Kindling Wt.		0.00	lb
Maximum Start-up Fuel Wt. (30% of Tot. Load Wt.)		4.804	lb
Actual Start-up Fuel Wt.			lb

Cal. Block #: SBI-153 12%  
 Wood moisture meter #: SBI-ZR 229 W 22%  
 Room temp. (°F): 66.5-F  
 Room RH (%): 28.7%  
 Ambient hygrometer #: SPI-212

## Fuel Piece Moisture Reading (%-dry basis)

	1	2	3	Ave.
21.5	20.6	21.3		0
21.6	20.1	16.7		0
22.4	19.3	22.8		0
20.1	29.2	22.0		0
23.5	18.4	17.9		0

## Kindling Moisture (%-dry basis)

10	10	10	kg
28.0	25.3	17.4	kg
Total Wt. All Fuel Added (dry basis)			kg
Total Wt. All Fuel Burned (dry basis)			kg

Signature: S. Pelland

# Fuel load data - MEDIUM

Rev date: 05-07-2017

Doc rev: Rev 2

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Cal. Block #: SBI-153  
 12%: 12.0  
 22%: 22.0

Wood moisture meter #: SBI-229  
 Room temp. (°F): 64.5  
 Room RH (%): 25.3  
 Ambient hygrometer #: 504 212

Fuel Piece Moisture Reading (%-dry basis)

	1	2	3	Ave.	Pc. Wt. Dry Basis
	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	
	19.8	21.8	20.9		
	20.2	19.5	19.6		
	19.4	20.7	14.7		
	16.5	23.4	16.1		
	16.7	21.6	21.0		
				NA	
				#DIV/0!	
				#DIV/0!	

Total Load Ave. MC % (dry basis)  
 Total Load Ave. MC % (wet basis)  
 Total Test Load Weight (dry basis)  
 Total Fuel Weight Burned During Test Run (dry basis)

Date: 2020-11-18  
 Run #: 2

November 20, 2015 Adjunct to ASTM E XXXX Wood Heater Cordwood Test Method  
 Cordwood Fuel Load Calculators - 12 lb/ft<sup>3</sup> Nominal Load Density  
 Core 45-65% of Total Load Weight, Remainder 35-55% of Total Load Weight  
 Values to be input manually

For Usable Firebox Volumes up to 3.0 ft<sup>3</sup> - Low and Medium Fire

Nominal Required Load Density (wet basis)	10 lb/ft <sup>3</sup>								
Usable Firebox Volume	1.55 ft <sup>3</sup>								
Total Nom. Load Wt. Target	15.5 lb								
Total Load Wt. Allowable Range	14.73 lb	to	16.28 lb						
Core Target Wt. Allowable Range	6.975 lb	to	10.08 lb						
Remainder Load Wt. Allowable Range	5.43 lb	to	8.53 lb						
Core Load Fuel Pc. Wt. Allowable Range	2.33 lb	to	3.88 lb						Mid-Point 3.10
Remainder Load Pc. Wt. Allowable Range	1.55 lb	to	4.65 lb						3.10
Pc. #									
Core Load Piece Wt. Actual	1	5.255 lb							
	2	3.210 lb							
	3	4.221 lb							
Core Load Total. Wt. Actual		0.00 lb							
Pc. #									
Remainder Load Piece Wt.	1	3.437 lb							
(2 or 3 Pcs.)	2	3.358 lb							
	3								
Remainder Load Piece Weight Ratio - Small/Large		#NOMBRE!							≤ 67%
Remainder Load Tot. Wt. Act		0.00 lb							
Total Load Wt. Actual		0.00 lb							
Core % of Total Wt.		#DIV/0!							45-65%
Remainder % of Total Wt.		#DIV/0!							35-55%
Actual Fuel Load Density		0.0 lb/ft <sup>3</sup>							95-105%
Allowable Charcoal Bed Wt. Range (lb)	0.1	to	-0.1						Mid-Point 0.0
Actual Charcoal Bed Wt.		3.8 lb							Out of Range
Actual Fuel Load Ending Wt.		0.1 lb							Involts Test
Total Wt. of Fuel Burned During Test Run lb.		-0.1 lb							≥ 90%

Signature: *Callard*



Date: 2020-11-18

Page 1 of 1

Manufacturer: SBI

Model: 1.4 series

Project #: G104473478

Category #: med

Run: 2

Engineer: C. Pelland

### RAW DRY GAS METER READINGS

	Start	End	Difference
System 1 (ft <sup>3</sup> ) Equipment #: <u>SBI-047</u>	291,354	347,137	55,783
System 2 (ft <sup>3</sup> ) Equipment #: <u>SBI-046</u>	9,983	66,337	56,354
System 3 (ft <sup>3</sup> ) Equipment #: <u>SBI-190</u>	36,914	44,124	7.21

### AMBIENT CONDITIONS

	Start	End
	Date: <u>2020-11-18</u> Time: <u>11h46</u>	Date: <u>2020-11-18</u> Time: <u>19h15</u>
Barometer. (inches Hg) Meteo.gc.ca <u>SBI-331</u>	29.95	30.0
Indoor Dry Bulb (°F) Equipment #: <u>SBI-212</u>	80.7	83.0
Indoor Humidity (%) Equipment #: <u>SBI-212</u>	14.6	12.7

Signature: C. Pelland



Date: 2020-11-18

Page      of     

Manufacturer: SBI

Model: 1.4 series

Project #: G104473478 Run: 2

Tech:                      Reviewer: e. Pellam

**SAMPLING EQUIPMENT CHECK OUT**

**Leakage Checks Tunnel Samplers**

	SYSTEM 1 (#SBI-046) <sup>7</sup>		SYSTEM 2 (#SBI-047) <sup>6</sup>		SYSTEM 3 (#SBI-276) <sup>290</sup>	
	Pre-Test	Post-Test	Pre-Test	Post-Test	Pre-Test	Post-Test
Plug and set vacuum at 5 in Hg. (17.3 mA)						
Plug and note initial reading on DGM (ft <sup>3</sup> )	291,304	347,415	9,352	66,344	36,830	44,139
Wait 1 min and note final reading DGM (ft <sup>3</sup> )	291,305	347.415	9,353	66,344	36,830	44,139
Difference between initial and final (ft <sup>3</sup> )	0,001	∅	0,001	∅	∅	∅
Allowable leakage 4% x Sample rate	0,004	0.004	0,004	0.004	0,004	0,004
Check OK	✓	✓	✓	✓	✓	✓

**Leakage Checks Flue Gas Sampler (Testo 350 #SBI-246)**

Plugged Probe	Pre Test	Post Test
Check OK	✓	OK

Signature: e. Pellam

Date: 2020-11-18

Page      of     

Manufacturer: SBI

Model: 1.4 series

Project #: B104473478

Run: 2

Tech:                      Reviewer: C. Pelland

**PRETEST DILUTION TUNNEL TRAVERSE RUN**

Barometric pressure ( $P_{bar}$ ) 29.95 (inches Hg.)      Static pressure ( $P_s$ ) 0.134 (inches w.c.)

Inside diameter: Port A 8in. Port B 8in.

Tunnel cross sectional area: 0.349 ft<sup>2</sup>

Pitot tube #: SBI-204

Pitot tube factor: 0.844

Traverse Point	Position (inches)	Velocity Head $\Delta_p$ (inches H <sub>2</sub> O)	Tunnel Temperature (°F)	$\sqrt{\Delta_p}$
A - Centroid	4.00	0,085	110,9	
B - Centroid	4.00	0,089	108,0	
A-1	0.54	0,078	110,4	
A-2	2.00	0,088	110,8	
A-3	6.00	0,073	110,1	
A-4	7.46	0,078	80,8	
B-1	0.54	0,083	109,3	
B-2	2.00	0,093	110,2	
B-3	6.00	0,080	110,3	
B-4	7.46	0,059	101,5	
		AVERAGE		



## Probes weights

### General information

<b>Project:</b>	G104473478 Claude Pelland SBI-206
<b>Project Engineer:</b>	
<b>Scale ID:</b>	

		Date / Pressure (kPa)		2020-11-18 / 101.0		2020-11-18 / 101.0		2020-11-26 / 102.5		2020-11-30 / 100.1	
<b>Calibration Record</b>	SBI-237	0.1000	0.1000	0.1000	0.1000	0.0999	0.1000	0.1000	0.1000	0.1000	0.1000
	SBI-238	10.0001	10.0001	10.0001	10.0001	10.0001	10.0001	10.0001	10.0001	10.0001	10.0001
	SBI-238	200.0000	200.0000	200.0000	200.0000	200.0000	200.0000	199.9999	200.0000	199.9999	200.0000
Start Time	Temp. [°F]	10h25	68.7	19h30	68.7	11h15	69.0	10h20	70.7	10h20	70.7
End Time	RH [%]	10h07	0.1	19h40	0.1	11h45	0.2	10h40	1.7	10h40	1.7

Run	Sampling train	Probe ID	Pretest Weight (g)	Post test Weight (g)	Post test Weight (g)	Post test Weight (g)
2	1	2	79.7016	79.7021	79.7029	79.7029
	2	3	79.8830	79.8837	79.8839	79.8840
	3 (1 hr)	64	94.2245	94.2262	94.2251	94.2253

		Date									
<b>Calibration Record</b>	SBI-237	0.1000									
	SBI-238	10.0001									
	SBI-238	200.0000									
Start Time	Temp. [°F]										
End Time	RH [%]										

Run	Sampling train	Probe ID	Post test weight (g)	Post test Weight (g)	Post test Weight (g)	Post test Weight (g)
	1					
	2					
	3 (1 hr)					

		Date									
<b>Calibration Record</b>	SBI-237	0.1000									
	SBI-238	10.0001									
	SBI-238	200.0000									
Start Time	Temp. [°F]										
End Time	RH [%]										

Run	Sampling train	Probe ID	Post test Weight (g)	Post test Weight (g)	Post test Weight (g)	Post test Weight (g)
	1					
	2					
	3 (1 hr)					

## Filters weights

### General information

<b>Project:</b>	G104473478
<b>Project Engineer:</b>	Claude Pelland
<b>Scale ID:</b>	SBI-206

		Date/pressure (kPa)		2010-11-18/101.0	2010-11-18/101.0	2010-11-26/100.5	2010-11-30/100.1
<b>Calibration Record</b>	SBI-237	0.1000	0.1000	0.1000	0.1000	0.0999	0.1000
	SBI-238	10.0001	10.0001	10.0001	10.0001	10.0001	10.0001
	SBI-238	200.0000	200.0000	200.0000	200.0000	200.0000	199.9999
Start Time	Temp. [°F]	10h25	68.7	19h30	68.7	11h15	69.0
End Time	RH [%]	11h07	0.1	19h40	0.1	11h45	0.2
						10h20	70.7
						10h40	1.7

Run	Sampling train	Filter ID	Pretest Weight (g)	Post test Weight (g)	Post test Weight (g)	Post test Weight (g)	Post test Weight (g) * (mg)
2	1	front	7	183.8	187.0	187.2	187.1
		rear	8				
	2	front	9	184.3	187.6	187.6	187.7
		rear	10				
	3 (1 hr)	front	11	184.0	186.8	186.7	186.7
		rear	12				

		Date					
<b>Calibration Record</b>	SBI-237	0.1000					
	SBI-238	10.0001					
	SBI-238	200.0000					
Start Time	Temp. [°F]						
End Time	RH [%]						

Run	Sampling train	Filter ID	Post test Weight (g)	Post test Weight (g)	Post test Weight (g)	Post test Weight (g)
	1	front				
		rear				
	2	front				
		rear				
	3 (1 hr)	front				
		rear				

		Date					
<b>Calibration Record</b>	SBI-237	0.1000					
	SBI-238	10.0001					
	SBI-238	200.0000					
Start Time	Temp. [°F]						
End Time	RH [%]						

Run	Sampling train	Filter ID	Post test Weight (g)	Post test Weight (g)	Post test Weight (g)	Post test Weight (g)
	1	front				
		rear				
	2	front				
		rear				
	3 (1 hr)	front				
		rear				

Responsible: Claude Pelland

Version 1.0

1 of 1

Signature: C. Pelland

## Continuous Analyzer

<b>Project:</b>	G104473478
<b>Project Engineer:</b>	
<b>Equipment :</b>	Testo 350 (SBI-246)

Pre-test (after adjustment)      Run: 2      Date: 2020-11-18      Time: 8h45

	Zero		Span		Mid point (record only)		Full Scale
CO [ppm]	0.0	0.0	29888ppm	29900ppm	5503ppm	5569ppm	6000
CO2 [%]	0.0	0.0	16.01%	16.1%	15.93%	16.0%	50%
O2 [%]	0.0	0.0	17.9%	17.9%	18.0%	18.0%	21%
	Actual	Calibration gaz	Actual	Calibration gaz	Actual	Calibration gaz	

Post-test      Date: 2020-11-19      Time: 8h15

	Zero	Span	Cal.	Zero drift	Span drift	Cal. Drift	Max drift
CO [ppm]	0.0	29978ppm	5534ppm	0.0	78ppm	35ppm	282
CO2 [%]	0.0	16.16%	15.99%	0.0	0.06%	0.01%	0.80%
O2 [%]	0.0	17.46%	17.46%	0.0	0.44%	0.54%	0.90%

**Max drift is 5 % of full scale according to Intertek 192-Q-0602**

**Max drift is 1 % of full scale according to CSA B415.1-10, 6.3.1 (est-ce que c'est pour un 24h sans test ?)**

Federal Register p.13709

The manufacturer must have the approved test laboratory measure the efficiency, heat output and carbon

CSA B415.1-10 p.11

6.3 Flue gas composition

6.3.1

The percentage of carbon monoxide (CO) and carbon dioxide (CO2) in the flue gas shall be measured by a continuous infrared analyzer or equivalent. Continuous analyzers (or equivalent) shall have maximum

zero and span drift, over a 24 h period, of 1% of full scale.

6.3.2

Gas samples shall be taken by a probe inserted at the centreline of the chimney 50 mm (2 in) above the thermocouple measuring flue gas temperature.

6.3.3

Continuous analyzers (or equivalent) shall be arranged so that they are synchronized to reach 90% of their final reading within 30 s when beginning at ambient levels and responding to a calibration gas that contains at least 80% of full-scale value of the constituent being measured. The calibration gas for this test shall be introduced through the sampling probe.

Date: 2020-11-19

Page \_\_\_ of \_\_\_

Manufacturer: SBI

Model: 1.4 series

Project #: G104473498 Run: 3

Tech: \_\_\_\_\_ Reviewer: C. Peltier

**COMMENTS**

9:02	Start up.		
9:55	pre-load insertion		
9:57	Door closed		
11:49	steering		
11:50	door closed		
11:51	loading.	(T=0)	
11:56	door closed	(T: 4:30)	
	Air entry => 2.75	(T: 10:00)	
12:02	" => 2.50		
12:07	door closed	(T: 6:00)	
12:32	fan ON	(T: 00:45:00)	
5:55	Steering 30 sec.	T: 6:03:30	2 Pits Taken
			1 before 1 after
7:51	End of test.	(T: 8:00:00)	
		<b>TEST LOAD CONFIGURATION</b>	

# Fuel load calculation - PRELOAD

Date: 2020-11-19  
 Run #: 3

Rev date: 05-07-2017  
 Doc rev: Rev 2

November 20 Adjunct to ASTM E XXXX Wood Heater Cordwood Test Method  
 Cordwood Fuel Load Calculators - 10 lb/ft<sup>3</sup> Nominal Load Density  
 Core 45-65% of Total Load Weight, Remainder 35-55% of Total Load Weight  
 Values to be input manually

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### For All Usable Firebox Volumes - High Fire Test Only

Nominal Required Load Density (wet basis)	10 lb/ft <sup>3</sup>	
Usable Firebox Volume	1.55 ft <sup>3</sup>	
Total Nom. Load Wt. Target	15.5 lb	
Total Load Wt. Allowable Range	14.70 to 16.30 lb	
Core Target Wt. Allowable Range	7 to 10.10 lb	
Remainder Load Wt. Allowable Range	5.40 to 8.50 lb	
Core Load Pc. Wt. Allowable Range	2.30 to 3.90 lb	Mid-Point 3.10
Remainder Load Pc. Wt. Allowable Range	1.60 to 8.50 lb	5.05

Core Load Piece Wt. Actual	1	2.962 lb	
	2	2.413 lb	
	3	3.197 lb	
Core Load Total. Wt. Actual		0.00 lb	

Remainder Load Piece Wt.	1	3.848 lb	
	2	3.793 lb	
	3		
(1 to 3 Pcs)			

Remainder Load Piece Weight Ratio - Small/Large  
 Remainder Load Tot. Wt. Act  
 #NOMB/REI 0.00 lb  
 #DIV/OI 0.00 lb

Total Load Wt. Actual  
 Core % of Total Wt.  
 Remainder % of Total Wt.  
 Actual Load % of Nominal Target  
 Actual Fuel Load Density  
 #DIV/OI 0.00 lb/ft<sup>3</sup>

Kindling and Start-up Fuel  
 Maximum Kindling Wt. (20% of Tot. Load Wt.)  
 Actual Kindling Wt. 3.198 lb  
 Maximum Start-up Fuel Wt. (30% of Tot. Load Wt.)  
 Actual Start-up Fuel Wt. 4.812 lb

Cal. Block #: SBI-153 12%  
 Wood moisture meter #: SBI-214 22%  
 Room temp. (°F): 67.1  
 Room RH (%): 22.8  
 Ambient hygrometer #: SBI-212

Fuel Piece Moisture Reading (%-dry basis)	1	2	3	Ave.
20.8	23.9	18.3		0
28.2	17.1	19.2		0
25.4	14.8	18.0		0
19.2	25.4	23.6		0
27.1	16.9	17.3		0
				0

Kindling Moisture (%-dry basis)  
 10 10 10 kg  
 Start-up Fuel Moisture Readings (%-dry basis)  
 23.7 25.9 20.6 kg  
 Total Wt. All Fuel Added (dry basis)  
 Total Wt. All Fuel Burned (dry basis)

Signature: C. Pelland

# Fuel load data - LOW

Date: 1010-11-19  
Run #: 3

Rev date: 05-07-2017  
Doc rev: Rev 2

November 20, 2015 Adjunct to ASTM E XXXX Wood Heater Cordwood Test Method  
Cordwood Fuel Load Calculators - 12 lb/ft<sup>3</sup> Nominal Load Density  
Core 45-65% of Total Load Weight, Remainder 35-55% of Total Load Weight  
Values to be input manually

For Usable Firebox Volumes up to 3.0 ft<sup>3</sup> - Low and Medium Fire

Nominal Required Load Density (wet basis)	10 lb/ft <sup>3</sup>	
Usable Firebox Volume	1.55 ft <sup>3</sup>	
Total Nom. Load Wt. Target	15.5 lb	
Total Load Wt. Allowable Range	14.73 to 16.28 lb	
Core Target Wt. Allowable Range	6.975 to 10.08 lb	
Remainder Load Wt. Allowable Range	5.43 to 8.53 lb	
Core Load Fuel Pc. Wt. Allowable Range	2.33 to 3.88 lb	Mid-Point 3.10
Remainder Load Pc. Wt. Allowable Range	1.55 to 4.65 lb	3.10

Pc. #	Core Load Piece Wt. Actual	Remainder Load Piece Wt.	(2 or 3 Pcs.)
1	3.575 lb	5.452 lb	
2	3.214 lb	3.792 lb	
3	3.506 lb		
	0.00 lb		

Remainder Load Piece Weight Ratio - Small/Large	#NOMBRE!	≤ 67%
Remainder Load Tot. Wt. Act	0.00 lb	
Total Load Wt. Actual	0.00 lb	
Core % of Total Wt.	#DIV/0!	45-65%
Remainder % of Total Wt.	#DIV/0!	35-55%
Actual Fuel Load Density	0.0 lb/ft <sup>3</sup>	95-105%
Allowable Charcoal Bed Wt. Range (lb)	0.1 to -0.1	Mid-Point 0.0
Actual Charcoal Bed Wt.	3.8 lb	Out of Range
Actual Fuel Load Ending Wt.	0.1 lb	Invalid Test
Total Wt. of Fuel Burned During Test Run lb.	-0.1 lb	≥ 90%

Cal. Block #: SBI-153 12%: 12.8  
 Wood moisture meter #: SBI-214 22%: 22.2  
 Room temp. (°F): 66.2 F  
 Room RH (%): 23.0 Z  
 hygrometer #: SBI-217

Fuel Piece Moisture Reading (%-dry basis)	1	2	3	Ave.	Pc. Wt. Dry Basis
	28.0	22.9	13.0	#DIV/0!	kg
	18.0	27.3	19.8	#DIV/0!	kg
	30.6	14.1	16.5	#DIV/0!	kg
	27.9	14.2	17.3	#DIV/0!	kg
	24.1	16.1	15.9	#DIV/0!	kg
				NA	kg
Total Load Ave. MC % (dry basis)				#DIV/0!	kg
Total Load Ave. MC % (wet basis)				#DIV/0!	kg
Total Test Load Weight (dry basis)					kg
Total Fuel Weight Burned During Test Run (dry basis)					kg

Signature: C. Colvard



Date: 2020-11-19

Page 1 of 1

Manufacturer: SBI

Model: 1.4 series

Project #: 8104473478

Category #: LOW

Run: 3

Engineer: C. Pelland

### RAW DRY GAS METER READINGS

	Start	End	Difference
<b>System 1 (ft<sup>3</sup>)</b> Equipment #: <u>SBI-047</u>	347.516	407,556	60,04
<b>System 2 (ft<sup>3</sup>)</b> Equipment #: <u>SBI-046</u>	66,468	127,237	60,769
<b>System 3 (ft<sup>3</sup>)</b> Equipment #: <u>SBI-290</u>	44.158	51,340	7,182

### AMBIENT CONDITIONS

	Start	End
	Date: <u>2020-11-19</u> Time: <u>11h51</u>	Date: <u>2020-11-19</u> Time: <u>19h51</u>
<b>Barometer. (inches Hg)</b> Meteo-gc.ca <u>SBI-331</u>	29.95	29.8
<b>Indoor Dry Bulb (°F)</b> Equipment #: <u>SBI-212</u>	75.3	<del>80</del> <sup>65</sup> 82.6
<b>Indoor Humidity (%)</b> Equipment #: <u>SBI-212</u>	13.9	12.5

Signature: C. Pelland

Date: 2020-11-19

Page \_\_\_\_\_ of \_\_\_\_\_

Manufacturer: SBI

Model: 1.4 series

Project #: G104473478 Run: 3

Tech: \_\_\_\_\_ Reviewer: C. Pelland

**SAMPLING EQUIPMENT CHECK OUT**

**Leakage Checks Tunnel Samplers**

	SYSTEM 1 (#SBI-046) <sup>7</sup> <sub>GS</sub>		SYSTEM 2 (#SBI-047) <sup>6</sup> <sub>GS</sub>		SYSTEM 3 (#SBI-276) <sup>290</sup> <sub>GS</sub>	
	Pre-Test	Post-Test	Pre-Test	Post-Test	Pre-Test	Post-Test
Plug and set vacuum at 5 in Hg. (17.3 mA)						
Plug and note initial reading on DGM (ft <sup>3</sup> )	347,427	408,055	66,349	128.2049 <sup>GS</sup>	44.141	51.739
Wait 1 min and note final reading DGM (ft <sup>3</sup> )	347,429	408,055	66,350	128.049	44.141	51.739
Difference between initial and final (ft <sup>3</sup> )	0.002	0.000	0.001	0.000	0,000	0,000
Allowable leakage 4% x Sample rate	0.004	0,004	0,004	0.004	0.004	0,004
Check OK	✓	✓	✓	✓	✓	✓

**Leakage Checks Flue Gas Sampler (Testo 350 #SBI-246)**

Plugged Probe	Pre Test	Post Test
Check OK	OK	OK

Signature: C. Pelland



Date: 2020-11-19

Page \_\_\_ of \_\_\_

Manufacturer: SBI

Model: 1.4 series

Project #: G104473478

Run: 3

Tech: \_\_\_\_\_ Reviewer: C. Pelland

**PRETEST DILUTION TUNNEL TRAVERSE RUN**

Barometric pressure ( $P_{bar}$ ) 29.95 (inches Hg.)      Static pressure ( $P_q$ ) 0.134 (inches w.c.)

Inside diameter: Port A 8in. Port B 8in.

Tunnel cross sectional area: 0.349 ft<sup>2</sup>

Pitot tube #: SBI-204

Pitot tube factor: 0.844

Traverse Point	Position (inches)	Velocity Head $\Delta_p$ (inches H <sub>2</sub> O)	Tunnel Temperature (°F)	$\sqrt{\Delta_p}$
A - Centroid	4.00	0,085	105,7	
B - Centroid	4.00	0,090	107,1	
A-1	0.54	0,073	111,1	
A-2	2.00	0,089	112,2	
A-3	6.00	0,076	111,6	
A-4	7.46	0,080	79,5	
B-1	0.54	0,086	109,4	
B-2	2.00	0,092	110,9	
B-3	6.00	0,076	110,6	
B-4	7.46	0,056	97,6	
		AVERAGE		

## Probes weights

### General information

<b>Project:</b>	G104473478
<b>Project Engineer:</b>	Claude Pelland
<b>Scale ID:</b>	SBI-206

		Date/Pressure (kPa)		2020-11-19/101.4		2020-11-19/101.4		2020-11-26/100.5		2020-11-30/100.1	
<b>Calibration Record</b>	SBI-237	0.1000	0.1000	0.1000	0.1000	0.0999	0.1000	0.1000	0.1000	0.1000	0.1000
	SBI-238	10.0001	10.0000	10.0000	10.0000	10.0001	10.0001	10.0001	10.0001	10.0001	10.0001
	SBI-238	200.0000	199.9999	199.9999	199.9999	200.0000	199.9999	200.0000	199.9999	199.9999	199.9999
	Start Time	Temp. [°F]	10h21	68.4	10h07	68.4	11h15	69.0	10h20	70.7	70.7
	End Time	RH [%]	10h48	0.4	10h18	0.4	11h45	0.2	10h40	1.7	1.7

Run	Sampling train	Probe ID	Pretest Weight (g)	Post test Weight (g)	Post test Weight (g)	Post test Weight (g)
3	1	10	80.1542	80.1561	80.1551	80.1551
	2	32	80.6799	80.6810	80.6806	80.6806
	3 (1 hr)	34	80.7719	80.7738	80.7726	80.7726

		Date									
<b>Calibration Record</b>	SBI-237	0.1000									
	SBI-238	10.0001									
	SBI-238	200.0000									
	Start Time	Temp. [°F]									
	End Time	RH [%]									

Run	Sampling train	Probe ID	Post test weight (g)	Post test Weight (g)	Post test Weight (g)	Post test Weight (g)
	1					
	2					
	3 (1 hr)					

		Date									
<b>Calibration Record</b>	SBI-237	0.1000									
	SBI-238	10.0001									
	SBI-238	200.0000									
	Start Time	Temp. [°F]									
	End Time	RH [%]									

Run	Sampling train	Probe ID	Post test Weight (g)	Post test Weight (g)	Post test Weight (g)	Post test Weight (g)
	1					
	2					
	3 (1 hr)					

## Filters weights

### General information

<b>Project:</b>	3104473478 Claude Pelland SBI-206
<b>Project Engineer:</b>	
<b>Scale ID:</b>	

		Date/pressure (kPa)		2020-11-19/101.4		2020-11-19/101.4		2020-11-26/100.5		2020-11-30/100.1	
<b>Calibration Record</b>	SBI-237	0.1000	0.1000	0.1000	0.1000	0.0999	0.1000	0.1000	0.1000	0.1000	0.1000
	SBI-238	10.0001	10.0000	10.0000	10.0000	10.0001	10.0001	10.0001	10.0001	10.0001	10.0001
	SBI-238	200.0000	199.9999	199.9999	199.9999	200.0000	199.9999	200.0000	199.9999	199.9999	199.9999
	Start Time	Temp. [°F]	10h21	68.4	10h07	68.4	11h15	69.0	10h20	70.7	
	End Time	RH [%]	10h48	0.4	10h18	0.4	11h45	0.2	10h40	1.7	

Run	Sampling train	Filter ID	Pretest Weight (g)	Post test Weight (g)	Post test Weight (g)	Post test Weight (g)	Post test Weight (g)
3	1	front	182.4	185.4	185.4	185.4	185.4
		rear					
	2	front	182.4	185.3	185.3	185.3	185.3
		rear					
	3 (1 hr)	front	183.6	185.6	185.6	185.6	185.5
		rear					

		Date									
<b>Calibration Record</b>	SBI-237	0.1000									
	SBI-238	10.0001									
	SBI-238	200.0000									
	Start Time	Temp. [°F]									
	End Time	RH [%]									

Run	Sampling train	Filter ID	Post test Weight (g)	Post test Weight (g)	Post test Weight (g)	Post test Weight (g)
	1	front				
		rear				
	2	front				
		rear				
	3 (1 hr)	front				
		rear				

		Date									
<b>Calibration Record</b>	SBI-237	0.1000									
	SBI-238	10.0001									
	SBI-238	200.0000									
	Start Time	Temp. [°F]									
	End Time	RH [%]									

Run	Sampling train	Filter ID	Post test Weight (g)	Post test Weight (g)	Post test Weight (g)	Post test Weight (g)
	1	front				
		rear				
	2	front				
		rear				
	3 (1 hr)	front				
		rear				

Responsable: Claude Pelland

Version 1.0

1 of 1

Signature: C. Pelland

## Continuous Analyzer

<b>Project:</b>	G104473478
<b>Project Engineer:</b>	
<b>Equipment :</b>	Testo 350 (SBI-246)

Pre-test (after adjustment)      Run: 3      Date: 2020-11-19      Time: 8h40

	Zero		Span		Mid point (record only)		Full Scale
CO [ppm]	0.0	0.0	29978ppm	29900ppm	5534ppm	5569ppm	6000
CO2 [%]	0.0	0.0	16.16%	16.1%	15.99%	16.0%	50%
O2 [%]	0.0	0.0	17.46%	17.9%	17.46%	18.0%	21%
	Actual	Calibration gaz	Actual	Calibration gaz	Actual	Calibration gaz	

Post-test      Date: 2020-11-20      Time: 8h17

	Zero	Span	Cal.	Zero drift	Span drift	Cal. Drift	Max drift
CO [ppm]	0.0	29929ppm	5581	0.0	29ppm	12ppm	282
CO2 [%]	0.0	16.34%	16.05%	0.0	0.24%	0.05%	0.80%
O2 [%]	0.0	17.45%	17.45%	0.0	0.45%	0.55%	0.90%

**Max drift is 5 % of full scale according to Intertek 192-Q-0602**

**Max drift is 1 % of full scale according to CSA B415.1-10, 6.3.1 (est-ce que c'est pour un 24h sans test ?)**

Federal Register p.13709

The manufacturer must have the approved test laboratory measure the efficiency, heat output and carbon

CSA B415.1-10 p.11

6.3 Flue gas composition

6.3.1

The percentage of carbon monoxide (CO) and carbon dioxide (CO2) in the flue gas shall be measured by a continuous infrared analyzer or equivalent. Continuous analyzers (or equivalent) shall have maximum

zero and span drift, over a 24 h period, of 1% of full scale.

6.3.2

Gas samples shall be taken by a probe inserted at the centreline of the chimney 50 mm (2 in) above the thermocouple measuring flue gas temperature.

6.3.3

Continuous analyzers (or equivalent) shall be arranged so that they are synchronized to reach 90% of their final reading within 30 s when beginning at ambient levels and responding to a calibration gas that contains at least 80% of full-scale value of the constituent being measured. The calibration gas for this test shall be introduced through the sampling probe.



# Fuel load data - HIGH

Date: 2020-11-20  
 Run #: 4

Rev date: 05-07-2017  
 Doc rev: Rev 2

November 20 Adjunct to ASTM E XXXX Wood Heater Cordwood Test Method  
 Cordwood Fuel Load Calculators - 10 lb/ft<sup>3</sup> Nominal Load Density  
 Core 45-65% of Total Load Weight, Remainder 35-55% of Total Load Weight  
 Values to be input manually

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**For All Usable Firebox Volumes - High Fire Test Only**

Nominal Required Load Density (wet basis)	10 lb/ft <sup>3</sup>
Usable Firebox Volume	1.55 ft <sup>3</sup>
Total Nom. Load Wt. Target	15.5 lb
Total Load Wt. Allowable Range	14.70 to 16.30 lb
Core Target Wt. Allowable Range	7 to 10.10 lb
Remainder Load Wt. Allowable Range	5.40 to 8.50 lb
Core Load Pc. Wt. Allowable Range	2.30 to 3.90 lb
Remainder Load Pc. Wt. Allowable Range	1.60 to 8.50 lb
	Mid-Point 3.10 5.05

Cal. Block #: SBI-153 12%: 12.0  
 Wood moisture meter #: SBI-229 22%: 22.0  
 Room temp. (°F): 68.4 F  
 Room RH (%): 26.1 %  
 Ambient hygrometer #: SBI-712

Pc. #	Core Load Piece Wt. Actual	Remainder Load Piece Wt. (1 to 3 Pcs.)	Remainder Load Piece Weight Ratio - Small/Large	Total Load Wt. Actual	Core % of Total Wt.	Remainder % of Total Wt.	Actual Fuel Load Density	Kindling and Start-up Fuel	Maximum Kindling Wt. (20% of Tot. Load Wt.)	Actual Kindling Wt.	Maximum Start-up Fuel Wt. (30% of Tot. Load Wt.)	Actual Start-up Fuel Wt.
1	3.204		#NOMBRE!	3.204	20.6%	79.4%	0.00 lb/ft <sup>3</sup>	0.00	0.64	0.00	0.00	0.00
2	2.973			2.973	19.1%	80.9%	0.00	0.00	0.59	0.00	0.00	0.00
3	3.796			3.796	24.5%	75.5%	0.00	0.00	0.76	0.00	0.00	0.00
	Core Load Total Wt. Actual			10.00					2.00			
	Remainder Load Total Wt. Actual			5.977					1.18			
	Kindling Moisture (%-dry basis)			10					2.30			
	Start-up Fuel Moisture Readings (%-dry basis)			23.0					2.30			
	Total Wt. All Fuel Added (dry basis)			16.2					4.69			
	Total Wt. All Fuel Burned (dry basis)											

Fuel Piece Moisture Reading (%-dry basis)

Pc. #	1	2	3	Ave.
1	15.0	24.6	17.8	
2	16.7	21.0	19.0	
3	25.7	17.8	17.0	
	26.2	18.7	16.1	

Kindling Moisture (%-dry basis): 10 kg  
 Start-up Fuel Moisture Readings (%-dry basis): 23.0 kg  
 Total Wt. All Fuel Added (dry basis): 16.2 kg  
 Total Wt. All Fuel Burned (dry basis):      kg

Signature: C. Pelland



Date: 2020-11-20

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Manufacturer: SBI

Model: 1.4 series

Project #: G104473478

Category #: High

Run: 4

Engineer: e. Pellard

### RAW DRY GAS METER READINGS

	Start	End	Difference
System 1 (ft <sup>3</sup> ) Equipment #: <u>SBI-047</u>	407,655	432,521	
System 2 (ft <sup>3</sup> ) Equipment #: <u>SBI-046</u>	127,271	152,259	
System 3 (ft <sup>3</sup> ) Equipment #: <u>SBI-290</u>	51,361	58,738	

### AMBIENT CONDITIONS

	Start	End
	Date: <u>2020-11-20</u> Time: <u>10h27</u>	Date: <u>2020-11-20</u> Time: <u>13h54</u>
Barometer. (inches Hg) Meteo.gc.ca <u>SBI-331</u>	29,7	29,65
Indoor Dry Bulb (°F) Equipment #: <u>SBI-212</u>	67,9	69.6
Indoor Humidity (%) Equipment #: <u>SBI-212</u>	25,9	26.2

Signature: e. Pellard

Date: 2020-11-20

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Manufacturer: SBI

Model: 1.4 series

Project #: G104473478 Run: 4

Tech:                      Reviewer: e Pellard

**SAMPLING EQUIPMENT CHECK OUT**

**Leakage Checks Tunnel Samplers**

	SYSTEM 1 (#SBI-046)		SYSTEM 2 (#SBI-047)		SYSTEM 3 (#SBI-276)	
	Pre-Test	Post-Test	Pre-Test	Post-Test	Pre-Test	Post-Test
Plug and set vacuum at 5 in Hg. (17.3 mA)						
Plug and note initial reading on DGM (ft <sup>3</sup> )	407,655	432.521	127,286	152,267	51,347	587,440
Wait 1 min and note final reading DGM (ft <sup>3</sup> )	407,655	432.521	127,287	152,267	51,347	587,440
Difference between initial and final (ft <sup>3</sup> )	0.000	0.000	0.001	0,000	0,000	0,000
Allowable leakage 4% x Sample rate	0.004	0.004	0.004	0,004	0,004	0,004
Check OK	✓	✓	✓	✓	✓	✓

**Leakage Checks Flue Gas Sampler (Testo 350 #SBI-246)**

Plugged Probe	Pre Test	Post Test
Check OK	OK	OK

Signature: e Pellard



Date: 2020-11-20

Page \_\_\_ of \_\_\_

Manufacturer: SBI

Model: 1.4 series

Project #: G104473478

Run: 4

Tech: \_\_\_\_\_ Reviewer: C. Pellor

**PRETEST DILUTION TUNNEL TRAVERSE RUN**

Barometric pressure ( $P_{bar}$ ) 29.7 (inches Hg.)      Static pressure ( $P_q$ ) 0.141 (inches w.c.)

Inside diameter: Port A 8in. Port B 8in.

Tunnel cross sectional area: 0.349 ft<sup>2</sup>

Pitot tube #: SBI-204

Pitot tube factor: 0.844

Traverse Point	Position (inches)	Velocity Head $\Delta_p$ (inches H <sub>2</sub> O)	Tunnel Temperature (°F)	$\sqrt{\Delta_p}$
A - Centroid	4.00	0.094	68.2	
B - Centroid	4.00	0.098	68.1	
A-1	0.54	0.084	68.2	
A-2	2.00	0.096	68.2	
A-3	6.00	0.084	68.1	
A-4	7.46	0.088	67.2	
B-1	0.54	0.093	68.2	
B-2	2.00	0.099	68.2	
B-3	6.00	0.087	68.2	
B-4	7.46	0.066	68.0	
		AVERAGE		

## Probes weights

### General information

<b>Project:</b>	G104473478
<b>Project Engineer:</b>	Claude Pelland
<b>Scale ID:</b>	SBI-206

		Date / <small>(RH)</small> Pressure		2020-11-20/101.0		2020-11-20/101.0		2020-11-26/100.5		2020-11-30/100.1		
<b>Calibration Record</b>	SBI-237	0.1000	0.0999	0.0999	0.0999	0.0999	0.0999	0.0999	0.0999	0.1000	0.1000	
	SBI-238	10.0001	10.0001	10.0001	10.0001	10.0001	10.0001	10.0001	10.0001	10.0001	10.0001	
	SBI-238	200.0000	200.0001	200.0001	200.0001	200.0000	200.0000	200.0000	200.0000	199.9999	199.9999	
	Start Time	Temp. [°F]	8h30	68.9	14h15	68.9	11h15	69.0	10h20	70.7	70.7	
	End Time	RH [%]	9h30	1.6	14h20	1.6	11h45	0.2	10h40	1.7	1.7	
Run	Sampling train	Probe ID	Pretest Weight (g)		Post test Weight (g)		Post test Weight (g)		Post test Weight (g)		Post test Weight (g)	
4	1	5	80.6303		80.6306		80.6305		80.6306		80.6306	
	2	18	80.8797		80.8800		80.8801		80.8801		80.8801	
	3 (1 hr)	33	82.8743		82.8751		82.8745		82.8745		82.8743	

		Date									
<b>Calibration Record</b>	SBI-237	0.1000									
	SBI-238	10.0001									
	SBI-238	200.0000									
	Start Time	Temp. [°F]									
	End Time	RH [%]									

Run	Sampling train	Probe ID	Post test weight (g)		Post test Weight (g)		Post test Weight (g)		Post test Weight (g)	
	1									
	2									
	3 (1 hr)									

		Date									
<b>Calibration Record</b>	SBI-237	0.1000									
	SBI-238	10.0001									
	SBI-238	200.0000									
	Start Time	Temp. [°F]									
	End Time	RH [%]									

Run	Sampling train	Probe ID	Post test Weight (g)		Post test Weight (g)		Post test Weight (g)		Post test Weight (g)	
	1									
	2									
	3 (1 hr)									

## Filters weights

### General information

<b>Project:</b>	G-104473478
<b>Project Engineer:</b>	Claude Pelland
<b>Scale ID:</b>	SBI-206

		Date/Pressure (kPa)		2010-11-20/101.0	2010-11-20/101.0	2010-11-26/100.5	2010-11-30/100.1		
<b>Calibration Record</b>	SBI-237	0.1000		0.0999	0.0999	0.0999	0.1000		
	SBI-238	10.0001		10.0001	10.0001	10.0001	10.0001		
	SBI-238	200.0000		200.0001	200.0001	200.0000	199.9999		
	Start Time	Temp. [°F]	8h30	68.9	8h30	68.9	11h15	10h20	70.7
	End Time	RH [%]	9h30	1.6	9h30	1.6	11h45	10h40	1.7

Run	Sampling train	Filter ID	Pretest Weight (g)	Post test Weight (g)	Post test Weight (g)	Post test Weight (g)	Post test Weight (g)
4	1	front	25	185.0	187.5	187.4	187.5
		rear	26				
	2	front	29	185.0	187.4	187.6	187.5
		rear	30				
	3 (1 hr)	front	33	183.4	185.2	185.1	185.1
		rear	34				

		Date					
<b>Calibration Record</b>	SBI-237	0.1000					
	SBI-238	10.0001					
	SBI-238	200.0000					
	Start Time	Temp. [°F]					
	End Time	RH [%]					

Run	Sampling train	Filter ID	Post test Weight (g)	Post test Weight (g)	Post test Weight (g)	Post test Weight (g)
	1	front				
		rear				
	2	front				
		rear				
	3 (1 hr)	front				
		rear				

		Date					
<b>Calibration Record</b>	SBI-237	0.1000					
	SBI-238	10.0001					
	SBI-238	200.0000					
	Start Time	Temp. [°F]					
	End Time	RH [%]					

Run	Sampling train	Filter ID	Post test Weight (g)	Post test Weight (g)	Post test Weight (g)	Post test Weight (g)
	1	front				
		rear				
	2	front				
		rear				
	3 (1 hr)	front				
		rear				

Responsible: Claude Pelland

Version 1.0

1 of 1

Signature: C. Pelland

## Continuous Analyzer

<b>Project:</b>	G104473478
<b>Project Engineer:</b>	
<b>Equipment :</b>	Testo 350 (SBI-246)

Pre-test (after adjustment)      Run: 4      Date: 2020-11-20      Time: 8h48

	Zero		Span		Mid point (record only)		Full Scale
CO [ppm]	0.0	0.0	29929ppm	29900ppm	5581ppm	5569ppm	6000
CO2 [%]	0.0	0.0	16.34%	16.17%	16.05%	16.0%	50%
O2 [%]	0.0	0.0	17.45%	17.9%	17.45%	18.0%	21%
	Actual	Calibration gaz	Actual	Calibration gaz	Actual	Calibration gaz	

Post-test      Date: 2020-11-23      Time: 7h50

	Zero	Span	Cal.	Zero drift	Span drift	Cal. Drift	Max drift
CO [ppm]	0.0	30031ppm	5596ppm	0.0	131ppm	27ppm	282
CO2 [%]	0.0	15.91%	15.86%	0.0	0.19%	0.14%	0.80%
O2 [%]	0.0	17.50%	17.50%	0.0	0.4%	0.5%	0.90%

**Max drift is 5 % of full scale according to Intertek 192-Q-0602**

**Max drift is 1 % of full scale according to CSA B415.1-10, 6.3.1 (est-ce que c'est pour un 24h sans test ?)**

Federal Register p.13709

The manufacturer must have the approved test laboratory measure the efficiency, heat output and carbon

CSA B415.1-10 p.11

6.3 Flue gas composition

6.3.1

The percentage of carbon monoxide (CO) and carbon dioxide (CO2) in the flue gas shall be measured by a continuous infrared analyzer or equivalent. Continuous analyzers (or equivalent) shall have maximum

zero and span drift, over a 24 h period, of 1% of full scale.

6.3.2

Gas samples shall be taken by a probe inserted at the centreline of the chimney 50 mm (2 in) above the thermocouple measuring flue gas temperature.

6.3.3

Continuous analyzers (or equivalent) shall be arranged so that they are synchronized to reach 90% of their final reading within 30 s when beginning at ambient levels and responding to a calibration gas that contains at least 80% of full-scale value of the constituent being measured. The calibration gas for this test shall be introduced through the sampling probe.

Time	Ambiant	Flue	Dilution Tu	Firebox Top	Firebox Back	Firebox Right	Firebox Left	Firebox Botto
0	80.5166	271.6856119	95.31774	440.4515753	436.0256005	415.3143024	405.1236096	408.058697
10	77.5682	425.2609729	103.7658	606.238181	386.3541382	387.5756922	376.1223302	403.365309
20	77.7144	386.3564098	99.43107	718.6452228	351.509228	394.6095531	360.5385264	384.560792
30	84.3025	336.1746397	96.15162	620.082903	326.5524761	383.5419683	352.7789908	372.777417
40	83.436	294.04854	92.91787	532.9040727	305.8761782	354.1450376	338.4604201	353.22579
50	82.0548	286.4626702	92.42432	508.2653173	292.95975	331.1623792	323.8200377	335.292258
60	78.8433	306.5705385	94.4811	535.082116	264.5318126	315.8960002	316.3707537	315.012576
70	78.5089	356.5365444	97.10162	625.6586335	173.0359079	322.9863471	327.7039456	291.219871
80	75.6143	414.9221993	100.8617	786.5059748	190.7921824	366.829759	358.1617286	277.978489
90	74.8452	406.5207685	100.4595	800.2141476	202.7412265	408.5824019	383.4831399	267.456503
100	74.8813	399.6811051	100.1825	797.0494043	211.2662989	428.1308232	394.2452451	261.828689
110	74.8562	382.3733604	99.82212	787.7352425	222.0863732	438.2014985	401.9698936	262.362108
120	73.1036	329.0940239	96.51795	688.2006895	230.7420816	446.9298828	405.5084097	262.347408
130	74.7011	279.4658875	92.89172	567.4038277	233.4352139	436.258044	399.5063058	263.597571
140	74.0983	258.1153129	90.95227	520.6376497	251.9346986	416.6553034	395.0666125	267.740351
150	74.0949	237.2908617	89.27481	490.6530177	251.3864343	400.449633	392.5912441	275.896596
160	73.5888	215.9855999	88.12228	432.3647769	242.1950936	382.8533835	381.8042473	288.052131
170	73.202	203.630385	86.60805	396.1540308	235.6865267	368.2993572	369.6241057	298.874695
180	72.8784	196.534295	85.54777	375.9081357	231.6407679	356.2648138	360.1504829	309.887893
190	72.9567	191.0708368	84.93518	364.0655241	227.8387751	348.0502352	353.9955573	318.259451
200	72.6193	188.2167073	84.25491	356.9833413	225.6852443	342.3369321	350.4190605	324.879622
210	72.42	187.042598	83.95008	355.9780379	223.5225683	338.6625898	348.2179567	327.973507
220	72.188	186.3152931	83.35454	352.7633349	222.5838678	336.6703543	346.7387983	330.770131
230	71.924	185.5900932	82.97157	348.0633476	220.6123411	335.3497948	344.4525705	333.866726
240	72.0398	184.3188947	82.96422	350.574419	217.970926	333.9685637	343.0558321	336.351591
250	71.9538	179.6592122	82.45316	341.4183968	212.1149322	329.9679999	338.014516	336.922172
260	71.5494	175.5800068	82.32172	331.5359572	206.6132715	324.2413097	330.5059691	333.850049
270	71.4243	172.237692	82.35176	323.0240852	201.5895542	317.870156	323.528681	331.029754
280	71.3079	169.7302473	81.83144	314.1859696	197.8321973	312.0818739	317.1348602	325.309277
290	70.9595	167.0593644	81.09719	306.2918027	192.7845171	306.6843798	311.376967	319.742017
300	70.9696	165.2852846	80.67875	300.5779147	188.9456275	301.7700667	305.8497136	315.793813
310	70.484	164.4717868	80.26564	296.7819087	185.8347952	297.9297299	301.8101115	311.901915
320	70.4958	163.5418969	80.23756	293.2333123	183.3230645	295.2221599	298.3678377	309.731727
330	70.5971	162.9744335	80.09253	292.5450225	182.3544638	293.5337465	295.294537	310.218897
340	70.2952	164.0648733	80.03339	293.7324864	181.3292165	293.3215749	292.9339697	308.551857
350	69.8395	162.9915606	79.65373	290.5486183	178.9532681	293.2925754	290.4340351	307.767758
360	70.1673	161.9441573	79.41765	287.4596703	175.6896612	292.1172687	287.6587901	306.263388
370	70.2357	160.5018432	79.40371	287.294738	174.6227031	291.0493456	285.1524894	304.798568
380	70.5605	159.6154429	79.16635	286.9370353	172.7885671	289.8323784	282.9442278	303.305994
390	70.4602	158.1958266	79.07853	283.133254	171.1723108	287.6580617	280.5624549	301.051139
398	70.6117	156.6743447	79.14729	275.8705115	168.5712284	284.9508782	278.6401713	299.848288

Time 10.0	Flue Temp 1	Room Temp 2	Tunnel Dry Bulb 3	DGM 1 In 13	DGM 1 Out 14	Filter 1 15	DGM 2 In 16	DGM 2 Out 17	Filter 2 18	DGM 3 In 19	Filter 3 20	Meter #1 21	Meter #2 22	Draft 23	Tunnel 24	CO			scale Lbs 28	0 Meter				
																% 25	% 25	O2 % 27		Corrected Scale	Meter #1 Cu Ft	Meter #2 Cu Ft	Draft	Calculated Tunnel
0.0	271.6856	80.51663	95.31774	68.71915	68.77459	79.95791	68.85546	69.11931	80.51124			241.639	959.175	0.019006	0.08914				19.50	19.50	8.53	33.86	-0.245248	-0.22771
10.0	425.261	77.56816	103.7658	69.12839	68.74115	84.06527	69.19466	69.11422	81.74077			242.861	960.438	0.070934	0.088238				17.67	17.67	8.57	33.90	-0.232266	-0.22794
20.0	386.3564	77.71443	99.43107	69.04854	68.70256	83.76552	69.1394	69.04229	83.66581			244.083	961.658	0.062778	0.087981				16.11	16.11	8.62	33.95	-0.234305	-0.228
30.0	336.1746	84.30247	96.15162	69.01355	68.65505	81.94762	69.06649	68.97145	84.55227			245.308	962.896	0.062367	0.089709				15.00	15.00	8.66	33.99	-0.234408	-0.22757
40.0	294.0485	83.43597	92.91787	68.95538	68.62148	83.39086	69.01332	68.94496	85.49305			246.530	964.140	0.05542	0.090496				14.21	14.21	8.70	34.03	-0.236145	-0.22738
50.0	286.4627	82.05483	92.42432	69.04477	68.59956	83.91815	69.07353	68.95723	85.97264			247.749	965.378	0.05462	0.090599				13.44	13.44	8.75	34.08	-0.236345	-0.22735
60.0	306.5705	78.84327	94.4811	69.05093	68.60907	83.85022	69.09511	68.9734	86.08082			248.980	966.633	0.058573	0.088931				12.64	12.64	8.79	34.12	-0.235357	-0.22777
70.0	356.5365	78.50895	97.10162	69.07679	68.63118	83.64007	69.14973	69.02219	85.76388			250.207	967.880	0.062449	0.090733				11.49	11.49	8.83	34.17	-0.234388	-0.22732
80.0	414.9222	75.61434	100.8617	68.99959	68.65235	84.31633	69.10087	68.99084	85.81007			251.437	969.129	0.070812	0.088519				9.71	9.71	8.88	34.21	-0.232297	-0.22787
90.0	406.5208	74.84523	100.4595	69.02426	68.60073	84.97185	69.10095	69.01676	85.86677			252.664	970.375	0.069862	0.090088				8.03	8.03	8.92	34.25	-0.232535	-0.22748
100.0	399.6811	74.88126	100.1825	69.04747	68.58934	84.54788	69.11499	68.97994	85.59015			253.876	971.599	0.069346	0.086236				6.56	6.56	8.96	34.30	-0.232664	-0.22844
110.0	382.3734	74.85616	99.82212	68.96311	68.57792	84.5746	69.12317	69.00021	85.77143			255.077	972.820	0.065909	0.088241				5.38	5.38	9.00	34.34	-0.233523	-0.22794
120.0	329.094	73.10364	96.51795	68.92947	68.56929	84.26991	69.08953	68.96282	85.81908			256.293	974.050	0.055971	0.088455				4.54	4.54	9.05	34.38	-0.236007	-0.22789
130.0	279.4659	74.70111	92.89172	68.96476	68.54288	83.48458	69.10064	68.95142	85.23778			257.512	975.284	0.050776	0.089454				4.04	4.04	9.09	34.43	-0.237306	-0.22764
140.0	258.1153	74.09831	90.95227	68.93058	68.55122	83.25202	69.07021	68.9164	84.68499			258.740	976.523	0.048665	0.090937				3.63	3.63	9.13	34.47	-0.237834	-0.22727
150.0	237.2909	74.09492	89.27481	68.88842	68.5003	83.09429	69.04973	68.92301	84.22132			259.969	977.762	0.042762	0.09105				3.35	3.35	9.18	34.51	-0.23931	-0.22724
160.0	215.9856	73.58883	88.12228	68.91758	68.47235	82.62738	69.0443	68.89633	84.01863			261.214	979.010	0.038666	0.091513				3.17	3.17	9.22	34.56	-0.240334	-0.22712
170.0	203.6304	73.20202	86.60805	68.84922	68.49904	82.49118	68.99053	68.88007	83.55444			262.460	980.263	0.036758	0.093225				2.99	2.99	9.26	34.60	-0.24081	-0.22669
180.0	196.5343	72.87839	85.54777	68.86593	68.47864	82.35914	68.98848	68.85426	83.39558			263.724	981.509	0.034846	0.092396				2.83	2.83	9.31	34.65	-0.241288	-0.22669
190.0	191.0708	72.95668	84.93518	68.93353	68.47954	82.15053	69.00564	68.84224	83.31868			264.983	982.758	0.034847	0.092679				2.65	2.65	9.35	34.69	-0.241288	-0.22683
200.0	188.2167	72.61925	84.25491	69.02022	68.49413	82.0996	69.09692	68.90101	82.89943			266.266	984.037	0.032267	0.093001				2.49	2.49	9.40	34.74	-0.241933	-0.22675
210.0	187.0426	72.41997	83.95008	69.02776	68.53669	83.29677	69.15238	68.97857	83.89879			267.521	985.302	0.032945	0.092495				2.32	2.32	9.44	34.78	-0.241764	-0.22688
220.0	186.3153	72.18799	83.35454	69.02216	68.60614	83.7654	69.16304	69.01716	84.42517			268.769	986.556	0.032999	0.091529				2.17	2.17	9.49	34.83	-0.24175	-0.22712
230.0	185.5901	71.92396	82.97157	69.00158	68.58847	83.90839	69.15955	69.02201	84.58548			270.017	987.814	0.033626	0.093117				1.99	1.99	9.53	34.87	-0.241593	-0.22671
240.0	184.3189	72.03977	82.96422	68.9575	68.59858	84.16206	69.12548	69.01419	84.77538			271.300	989.105	0.032621	0.092516				1.83	1.83	9.58	34.92	-0.241845	-0.22687
250.0	179.6592	71.95378	82.45316	68.92682	68.50786	83.96491	69.0923	69.0327	84.74577			272.520	990.333	0.031284	0.091922				1.67	1.67	9.62	34.96	-0.242179	-0.22702
260.0	175.58	71.54938	82.32172	68.92662	68.48807	83.78973	69.09585	68.96456	84.6666			273.771	991.595	0.030357	0.09293				1.55	1.55	9.66	35.00	-0.242411	-0.22677
270.0	172.2377	71.4243	82.35176	68.86057	68.45411	83.75561	69.06107	68.90893	84.43772			275.025	992.863	0.029447	0.092289				1.41	1.41	9.71	35.05	-0.242638	-0.22693
280.0	169.7302	71.30791	81.83144	68.87952	68.43762	83.55555	69.05292	68.92913	84.39076			276.285	994.123	0.030627	0.093269				1.29	1.29	9.75	35.09	-0.242343	-0.22668
290.0	167.0594	70.95955	81.09719	68.83591	68.4136	83.1986	69.02641	68.92387	84.19321			277.544	995.419	0.028342	0.092835				1.16	1.16	9.80	35.14	-0.242914	-0.22679
300.0	165.2853	70.96958	80.67875	68.71089	68.35193	82.93956	68.95559	68.85054	84.02366			278.803	996.715	0.027769	0.093155				1.05	1.05	9.84	35.18	-0.243058	-0.22671
310.0	164.4718	70.48405	80.26564	68.67137	68.25653	82.55881	68.85521	68.77225	83.5761			280.073	998.010	0.027909	0.093928				0.93	0.93	9.89	35.23	-0.243023	-0.22652
320.0	163.5419	70.49581	80.23756	68.6056	68.2583	82.67027	68.82071	68.71525	83.25386			281.331	999.313	0.027092	0.093592				0.82	0.82	9.93	35.28	-0.243227	-0.2266
330.0	162.9744	70.59708	80.09253	68.57064	68.20248	82.52295	68.80201	68.6461	83.2237			282.603	1000.620	0.028185	0.092431				0.71	0.71	9.98	35.32	-0.242954	-0.22689
340.0	164.0649	70.29523	80.03339	68.50281	68.13589	82.33181	68.72877	68.62205	83.10672			283.860	1001.910	0.027948	0.093467				0.58	0.58	10.02	35.37	-0.243013	-0.22663
350.0	162.9916	69.83954	79.65373	68.37573	68.06217	82.10375	68.63964	68.51582	83.11922			285.122	1003.213	0.02885	0.093175				0.46	0.46	10.06	35.41	-0.242787	-0.22671
360.0	161.9442	70.16726	79.41765	68.32179	67.92439	82.26259	68.52109	68.45313	83.19645			286.388	1004.475	0.02804	0.090982				0.36	0.36	10.11	35.46	-0.24299	-0.22725
370.0	160.5018	70.23575	79.40371	68.30569	67.89245	82.27642	68.54793	68.40868	83.14612			287.650	1005.740	0.028199	0.094387				0.27	0.27	10.15	35.50	-0.24295	-0.22664
380.0	159.6154	70.56049	79.16635	68.26175	67.86434	82.5168	68.47439	68.36849	83.1501			288.910	1006.998	0.026892	0.094626				0.17	0.17	10.20	35.55	-0.243277	-0.22634
390.0	158.1958	70.46021	79.07853	68.30521	67.87028	82.53429	68.53161	68.37401	83.15475			290.177	1008.254	0.026816	0.092842				0.07	0.07	10.24	35.59	-0.243296	-0.22679
398.5	156.6743	70.61174	79.14729	68.2747	67.82183	82.54994	68.52569	68.40562	83.26476			291.276	1009.352	0.027519	0.092237				0.00	0.00	10.28	35.63	-0.24312	-0.22694

**Intertek Testing Services**

**Manufacturer: SBI**

**Model: 1.4 Series**

**Date: 11-17-20**

**Run: 1**

**Project #: G104473478**

**Test Duration: 398.5  
(minutes)**

**RESULTS**

**Average emission rate:(gr/hr) 2.205**

Burn Rate (Dry kg/hr): 1.107

PRESSURE FACTOR: 0.98680

BAROMETRIC PRESSURE

Average: 29.525

TEMPERATURE FACTORS

Start: 29.45

DGM #1: 0.99882

End: 29.6

DGM #2: 0.99827

DRY GAS METER VALUES

VOLUMES SAMPLED

DGM #1 Final: 291.276

DGM #1: 49.41293

Initial: 241.639

DGM #2: 49.97269

DGM #2 Final: 1009.352

TOTAL TUNNEL VOLUME (scf): 133516

Initial: 959.175

SAMPLE RATIOS

TEMPERATURES (DEG. RANKIN)

Sample Train 1: 2702.055

DGM #1: 528.626

Sample Train 2: 2671.789

DGM #2: 528.914

TOTAL EMISSIONS

CALIBRATION FACTORS

Sample Train 1 (g): **14.591**

DGM #1: 1.0100

Sample Train 2 (g): **14.695**

DGM #2: 1.0110

EMISSION RATES

TUNNEL FLOW RATE: 335.048

Sample Train 1 (g/hr): **2.20**

Sample Train 2 (g/hr): **2.21**

PARTICULATE CATCH (mg)

Total Sample Train 1: 5.4

Total Sample Train 2: 5.5

Filter and seal Sample Train 1: **4.9**

Filter and seal Sample Train 2: **4.9**

MAX Allowed 7.50%

Probe Sample Train 1: **0.5**

Probe Sample Train 2: **0.6**

DEVIATION: 0.35%

		Room Temp		Bar Pressure		Relative Humidity		Air Velocity	
		Before	After	Before	After	Before	After	Before	After
		81	71	29.45	29.60	19.8	19.5	0	0
Average Dilution Tunnel Measurements									
Burn Time	Velocity (Ft/sec)	Flow Rate (dscf/min)	Temp (R)	Total Sample		Sample Data			
				1	2	Particulate Catch		1	2
399	17.17	335.05	547.62	49.41	49.97	5.40		5.50	
Dilution Tunnel Dual Train Precision									
Sample Ratios			Total Emissions (g)						
Train 1		Train 2	Train 1	Train 2	Deviation (%)				
2702.06		2671.79	14.59	14.69	0.35%				
Burn Rate	Surface		Initial Draft		Run Time	Average Draft			
1.107	0.000		0.019		398.500	0.041			
Run	Date	Burn Rate	Emission						
1	2020-11-17	1.107	2.205						





# E&E Boiler Tunnel Traverse Worksheet

Static Pressure: **0.138**  
Barometer: 29.45

	TUNNEL VELOCITY	TUNNEL TEMP	SQUARE ROOT
A CENTER	0.089	102.000	0.2983
B CENTER	0.090	101.300	0.3000
A1	0.083	102.000	0.2881
A2	0.093	102.400	0.3050
A3	0.078	102.600	0.2793
A4	0.087	78.800	0.2950
B1	0.078	102.600	0.2793
B2	0.087	78.800	0.2950
B3	0.083	103.000	0.2881
B4	0.093	104.500	0.3050
AVERAGE		97.8	0.2933

**PITOT**  
**CONSTANT=** 0.9804

# E&E FUEL LOAD DATA SHEET

Test Load Weight:

	Lower	Ideal	Upper	
Firebox Volume: <input style="width: 80px;" type="text" value="1.55"/>	17.67	18.60	19.53	cu. ft
Load Volume: <input style="width: 80px;" type="text" value="1.5500"/>				cu. ft
				Loading Density: 12.578 lbs./ft3
Number of Spacers: <input style="width: 80px;" type="text"/>				Load Density: 12.578 lbs./ft3

Thick	Piece Size:			Weight lbs	Meter Moisture Content Dry Uncorrected %				
	x	Wide	x		Length				
2		4		16	3.43	18.70	23.00	23.00	84.00
2		4		16	3.48	16.40	22.10	18.90	84.00
2		4		16	4.18	17.40	20.00	22.10	84.00
2		4		16	5.48	18.30	19.30	21.90	84.00
2		4		16	2.92	16.90	18.90	27.30	84.00
									0.00
									0.00
									0.00
									0.00

**Test Load Weight**  lbs.

**Dry Weight**  kg.

**Average Moisture Content: %**

Dry:

Wet:

**Pre-test moisture content: %**

Wet:

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

Values to be input manually

For Usable Firebox Volumes up to 3.0 ft <sup>3</sup> - Low and Medium Fire				
Nominal Required Load Density (wet basis)	12 lb/ft <sup>3</sup>			
Usable Firebox Volume	1.55 ft <sup>3</sup>			
Total Nom. Load Wt. Target	18.6 lb			
Total Load Wt. Allowable Range	17.67 to 19.53 lb			
Core Target Wt. Allowable Range	8.37 to 12.09 lb			
Remainder Load Wt. Allowable Range	6.51 to 10.23 lb			
Core Load Fuel Pc. Wt. Allowable Range	2.79	to 4.65 lb	Mid-Point	3.72
Remainder Load Pc. Wt. Allowable Range	1.86	to 5.58 lb	Ordre	3.72
Core Load Piece Wt. Actual	Pc. #			
	1	3.43 lb	In Range	3.000
	2	3.48 lb	In Range	1.000
	3	4.18 lb	In Range	5.000
Core Load Total. Wt. Actual		11.09 lb	In Range	
Remainder Load Piece Wt.	Pc. #			
(2 or 3 Pcs.)	1	5.48 lb	In Range	4.000
	2	2.92 lb	In Range	2.000
	3	lb	NA	
Remainder Load Piece Weight Ratio - Small/Large		53%	In Range	≤ 67%
Remainder Load Tot. Wt. Act		8.40 lb	In Range	
Total Load Wt. Actual		19.50 lb	In Range	
Core % of Total Wt.		57%	In Range	45-65%
Remainder % of Total Wt.		43%	In Range	35-55%
Actual Load % of Nominal Target		105%	In Range	95-105%
Actual Fuel Load Density		12.6 lb/ft <sup>3</sup>		
Allowable Charcoal Bed Wt. Range (lb)	2.0	to 3.8	Mid-Point	2.9
Actual Charcoal Bed Wt.		3.8 lb	In Range	
Actual Fuel Load Ending Wt.		0.0 lb	Valid Test	≥ 90%
Total Wt. of Fuel Burned During Test Run lb.		19.5 lb		

Fuel Piece Moisture Reading (%-dry basis)						
1	2	3	Ave.		Pc. Wt. Dry Basis	
18.7	23	23	21.6	In Range	2.82 lb	1.28 kg
16.4	22.1	18.9	19.1	In Range	2.92 lb	1.33 kg
17.4	20	22.1	19.8	In Range	3.49 lb	1.58 kg
18.3	19.3	21.9	19.8	In Range	4.57 lb	2.07 kg
16.9	18.9	27.3	21.0	In Range	2.42 lb	1.10 kg
					0.00 lb	0.00 kg
Total Load Ave. MC % (dry basis)				20.2	In Range	
Total Load Ave. MC % (wet basis)				16.8		
Total Test Load Weight (dry basis)						16.22 lb 7.36 kg
Total Fuel Weight Burned During Test Run (dry basis)						16.2 lb 7.36 kg
2.9244						
20.39						
3.82 braise						

For Usable Firebox Volumes above 3.0 ft <sup>3</sup> - Low and Medium Fire				
Nominal Required Load Density (wet basis)	12 lb/ft <sup>3</sup>			
Usable Firebox Volume	0.00 ft <sup>3</sup>			
Total Nom. Load Wt. Target	0 lb			
Total Load Wt. Allowable Range	0.00 to 0.00 lb			
Core Target Wt. Allowable Range	0.00 to 0.00 lb			
Remainder Load Wt. Allowable Range	0.00 to 0.00 lb			
Core Load Fuel Pc. Wt. Allowable Range	0.00	to 0.00 lb	Mid-Point	0.00
Remainder Load Pc. Wt. Allowable Range	0.00	to 0.00 lb		0.00
Core Load Piece Wt. Actual	Pc. #			
	1	lb	In Range	
	2	lb	In Range	
	3	lb	In Range	
Core Load Total. Wt. Actual		0.00 lb	In Range	
Remainder Load Piece Wt.	Pc. #			
(3 or 4 Pcs.)	1	lb	In Range	
	2	lb	In Range	
	3	lb	In Range	
	4	lb	NA	
Remainder Load Piece Weight Ratio - Small/Large		#NOMBRE!	#NOMBRE!	≤ 67%
Remainder Load Tot. Wt. Act		0.00 lb	In Range	
Total Load Wt. Actual		0.00 lb	In Range	
Core % of Total Wt.		#DIV/0!	#DIV/0!	45-65%
Remainder % of Total Wt.		#DIV/0!	#DIV/0!	35-55%
Actual Load % of Nominal Target		#DIV/0!	#DIV/0!	95-105%
Actual Fuel Load Density		#DIV/0! lb/ft <sup>3</sup>		
Allowable Charcoal Bed Wt. Range (lb)	0.1	to -0.1	Mid-Point	0.0
Actual Charcoal Bed Wt.		lb	Out of Range	0.0
Actual Fuel Load Ending Wt.		lb	Valid Test	≥ 90%
Total Wt. of Fuel Burned During Test Run lb.		0.0 lb		

Fuel Piece Moisture Reading (%-dry basis)						
1	2	3	Ave.		Pc. Wt. Dry Basis	
			#DIV/0!	#DIV/0!	#DIV/0! lb	#DIV/0! kg
			#DIV/0!	#DIV/0!	#DIV/0! lb	#DIV/0! kg
			#DIV/0!	#DIV/0!	#DIV/0! lb	#DIV/0! kg
			NA	NA	NA lb	NA kg
Total Load Ave. MC % (dry basis)				#DIV/0!	#DIV/0!	
Total Load Ave. MC % (wet basis)				#DIV/0!		
Total Test Load Weight (dry basis)						#DIV/0! lb #DIV/0! kg
Total Fuel Weight Burned During Test Run (dry basis)						#DIV/0! lb #DIV/0! kg

November 20 Adjunct to ASTM E XXXX Wood Heater Cordwood Test Method  
 Cordwood Fuel Load Calculators - 10 lb/ft<sup>3</sup> Nominal Load Density  
 Core 45-65% of Total Load Weight, Remainder 35-55% of Total Load Weight  
 Values to be input manually

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For All Usable Firebox Volumes - High Fire Test Only				
Nominal Required Load Density (wet basis)	10	lb/ft <sup>3</sup>		
Usable Firebox Volume	1.55	ft <sup>3</sup>		
Total Nom. Load Wt. Target	15.50	lb		
Total Load Wt. Allowable Range	14.70	to	16.30	lb
Core Target Wt. Allowable Range	7.00	to	10.10	lb
Remainder Load Wt. Allowable Range	5.40	to	8.50	lb
				Mid-Point
Core Load Pc. Wt. Allowable Range	2.30	to	3.90	lb
Remainder Load Pc. Wt. Allowable Range	1.60	to	8.50	lb
	Pc. #			
Core Load Piece Wt. Actual	1	3.13	lb	In Range
	2	3.50	lb	In Range
	3	3.45	lb	In Range
Core Load Total. Wt. Actual		10.07	lb	In Range
	Pc. #			
Remainder Load Piece Wt.	1	3.83	lb	In Range
(1 to 3 Pcs.)	2	2.32	lb	In Range
	3		lb	NA
Remainder Load Piece Weight Ratio - Small/Large		60%		In Range
Remainder Load Tot. Wt. Act		6.15	lb	In Range
Total Load Wt. Actual		16.22	lb	In Range
Core % of Total Wt.		62%		In Range
Remainder % of Total Wt.		38%		In Range
Actual Load % of Nominal Target		105%		In Range
Actual Fuel Load Density		10.5	lb/ft <sup>3</sup>	
<b>Kindling and Start-up Fuel</b>				
Maximum Kindling Wt. (20% of Tot. Load Wt.)		3.24	lb	
Actual Kindling Wt.		3.24	lb	In Range
Maximum Start-up Fuel Wt. (30% of Tot. Load Wt.)		4.87	lb	
Actual Start-up Fuel Wt.		4.69	lb	In Range
Allowable Residual Start-up Fuel Wt. Range	1.6	to	3.2	lb
Actual Residual Start-up Fuel Wt.		1.69	lb	In Range
Total Wt. All Fuel Added (wet basis)		24.14	lb	
<b>High Fire Test Run End Point Range</b>				
Based on Fuel Load Wt. (w/tares)	Low	1.5	to	High
				1.8
Actual Fuel Load Ending Wt.		0.0	lb	Out of Range

Fuel Piece Moisture Reading (%-dry basis)									
1	2	3	Ave.			Pc. Wt. Dry Basis			
17.1	16.9	21.4	18.5	In Range		2.64	lb	1.20	kg
18.6	17.8	21.7	19.4	In Range		2.93	lb	1.33	kg
21.8	19.1	16.5	19.1	In Range		2.89	lb	1.31	kg
25.7	16.2	17.3	19.7	In Range		3.20	lb	1.45	kg
22.1	23.4	17.5	21.0	In Range		1.91	lb	0.87	kg
						0.00	lb	0.00	kg
Total Load Ave. MC (%-dry basis)			19.5	In Range					
Total Load Ave. MC % (wet basis)			16.3						
Total Test Load Weight (dry basis)						13.58	lb	6.16	kg
<b>Kindling Moisture (%-dry basis)</b>									
10	10	10	10.0	In Range		2.94	lb	1.33	kg
<b>Start-up Fuel Moisture Readings (%-dry basis)</b>									
18.4	22.4	27.1	22.6	In Range		3.82	lb	1.73	kg
Total Wt. All Fuel Added (dry basis)						20.34	lb	9.23	kg
Total Wt. All Fuel Burned (dry basis)						18.7	lb	8.5	kg



Intertek Testing Services			
<b>Manufacturer: SBI</b>		<b>RESULTS</b>	
<b>Model: 1.4 Series</b>			
<b>Date: 11-17-20</b>		<b>Average emission rate:(gr/hr)</b>	<b>#DIV/0!</b>
<b>Run: 1 - First hour</b>			
<b>Project #: G104473478</b>		Burn Rate (Dry kg/hr):	7.352
<b>Test Duration: 60 (minutes)</b>			
PRESSURE FACTOR:		0.98680	BAROMETRIC PRESSURE
TEMPERATURE FACTORS			Average: 29.525
DGM #1:		0.99693	Start: 29.45
DGM #2:		1.14783	End: 29.6
		DRY GAS METER VALUES	
VOLUMES SAMPLED		DGM #1	Final: 36.777
	DGM #1:	7.07349	Initial: 29.658
	DGM #2:	0.00000	
TOTAL TUNNEL VOLUME (scf):	19711	DGM #2	Final: 0.000
			Initial: 0.000
SAMPLE RATIOS		TEMPERATURES (DEG. RANKIN)	
	Sample Train 1:	2786.605	DGM #1: 529.626
	Sample Train 2:	#DIV/0!	DGM #2: 460.000
TOTAL EMISSIONS		CALIBRATION FACTORS	
	Sample Train 1 (g):	<b>10.589</b>	DGM #1: 1.0100
	Sample Train 2 (g):	<b>#DIV/0!</b>	DGM #2: 1.0110
EMISSION RATES		TUNNEL FLOW RATE:	
	Sample Train 1 (g/hr):	<b>10.59</b>	328.517
	Sample Train 2 (g/hr):	<b>#DIV/0!</b>	
		PARTICULATE CATCH (mg)	
		Total Sample Train 1:	3.8
		Total Sample Train 2:	0
		Filter and seal Sample Train 1:	<b>3.4</b>
		Filter and seal Sample Train 2:	
		Probe Sample Train 1:	0.4
		Probe Sample Train 2:	
DEVIATION:		#DIV/0!	

Time	Ambiant	Flue	Dilution T <sub>u</sub>	Firebox Top	Firebox Back	Firebox Right	Firebox Left	Firebox Botto
0	77.4767	283.1491084	113.2392	452.0312946	429.0944184	419.0757983	399.6923228	434.496015
10	76.3176	495.2785986	108.2387	740.6062827	389.3659502	399.0040813	376.5405354	433.923832
20	76.6314	465.2811385	105.9696	800.099709	368.362451	405.5564901	392.0433127	411.62258
30	74.6561	464.7163731	107.4896	823.3040399	369.5778773	410.5054299	409.5786667	382.241522
40	74.7657	438.6719985	105.0888	796.6508488	222.7829775	413.127325	421.2026856	350.811252
50	74.2432	432.6080111	104.2076	796.8541255	221.972748	418.7317646	427.0915225	330.778005
60	74.9691	406.3169937	102.2297	775.4723658	230.5698338	426.6903302	428.7335293	314.331316
70	77.7409	388.1018652	100.2138	749.7342713	242.4495531	434.652474	432.8398137	302.167594
80	79.02	352.6451048	97.67097	687.5937012	265.6177113	439.9610014	436.3470668	295.092203
90	78.5864	320.8128191	95.16053	616.8007998	267.0213512	436.1941385	431.8295624	288.757381
100	78.6688	299.3919266	93.13753	570.7001736	258.7416272	427.151786	421.0559651	285.207174
110	78.1745	283.249989	91.29544	535.8808573	247.1615519	414.965303	407.1960241	283.242945
120	76.988	279.809488	90.35212	530.7958417	248.1641005	411.0250026	397.7830672	282.620832
130	76.8111	256.6604125	88.65017	479.6209584	233.6774996	402.4818073	389.4695733	283.947064
140	76.2245	228.8110735	86.29138	419.7236039	214.31176	379.7739552	373.6697268	289.094679
150	75.7374	214.5991641	85.074	380.7772767	200.7686551	359.6093475	351.6810738	293.348136
160	74.6383	211.0403509	84.86774	356.1046186	196.3743514	347.329546	334.0306794	298.078954
170	75.5546	198.0868511	84.38672	349.1686449	193.7557766	339.493549	324.5173718	303.556718
180	81.0207	191.8578733	82.30916	344.0074095	193.9085727	331.1210471	320.7065357	305.97647
190	83.4107	189.0224918	82.49395	341.8175256	193.5118329	325.6685163	316.5944846	305.55326
200	84.9129	185.8924305	82.51904	335.2173744	192.3539003	320.7566502	312.4192558	304.433649
210	85.4138	183.7699105	82.06474	328.5930006	188.9540491	314.5609556	308.3700726	300.598673
220	85.1981	182.1716867	81.80643	322.6165283	187.7976262	309.4993076	305.0177027	297.374045
230	85.6814	181.7545325	81.63912	323.0450231	187.7681966	306.5302817	303.212052	295.675131
240	85.5916	180.8907325	81.66677	321.3224103	187.4208229	304.9705434	302.2517293	294.343333
250	85.5668	178.7670711	81.39509	317.0907922	185.5641435	302.1064578	301.5302763	293.218171
260	85.6783	177.6411496	81.32202	313.2256616	184.0209639	299.2182531	299.9131362	291.56404
270	85.3635	176.4500523	80.8972	309.8175349	183.5100169	297.3977866	297.6198733	289.102512
280	85.1737	175.5427445	80.73718	308.2087898	183.5901689	296.805956	295.8646448	287.006425
290	85.2295	174.1658334	80.89709	305.275104	182.5182625	295.9627202	293.9356902	285.120495
300	84.8725	171.8479918	80.381	300.1053638	180.2369052	294.1366444	290.9432285	283.977992
310	84.6506	169.2990111	80.23853	294.4189199	178.4381966	290.8644499	287.3344309	281.737591
320	84.2291	167.0146107	79.9948	289.0562737	176.0337253	286.8727713	283.5674219	277.739045
330	84.3958	164.9017516	79.56071	283.4638089	173.2131158	283.1774934	279.4844041	274.751031
340	84.153	162.6699665	79.25963	278.6711607	170.3541762	279.4351205	275.8940333	271.849909
350	83.6186	161.0125778	79.09555	272.0780126	167.8375126	275.4799085	272.0660358	269.149561
360	83.2854	159.4348936	78.13295	270.7556941	164.7248648	270.9076172	269.8773206	266.058665
370	83.153	157.7956317	78.04088	267.6738112	161.8663964	267.1781041	267.6123592	263.909264
380	83.0222	155.9433731	77.76329	259.9459506	159.1529697	263.2230619	263.980974	261.728365
390	82.9844	153.2864505	77.56179	245.8398394	156.9187155	258.8280892	259.9181824	259.434381
400	82.9063	150.3911606	77.50054	237.6289832	154.2434814	254.2827772	255.5397228	257.365254
410	82.7085	147.9274553	77.36947	231.2950532	151.8338836	249.552146	251.2572133	255.512708
420	82.4367	145.7585464	76.93947	225.6702111	149.4775607	244.7173888	247.2391672	253.970864
430	82.3666	144.0213776	76.68944	221.7676364	147.5708737	240.286568	243.5253443	252.567541
440	82.042	141.9714916	76.59598	217.3713639	145.2160683	235.7522695	240.1136072	251.336388
445	82.1562	140.9892482	76.41201	215.1399837	143.9458583	233.678305	238.5826049	250.979864

Time 10.0	Flue Temp 1	Room Temp 2	Tunnel Dry Bulb 3	DGM 1 In 13	DGM 1 Out 14	Filter 1 15	DGM 2 In 16	DGM 2 Out 17	Filter 2 18	DGM 3 In 19	Filter 3 20	Meter #1 21	Meter #2 22	Draft 23	Tunnel 24	CO % 25	CO2 % 25	O2 % 27	scale Lbs 28	0.0932828 Corrected Scale	Meter #1 Cu Ft	Meter #2 Cu Ft	Draft	Calculated Tunnel
0.0	283.1491	77.4767	113.2392	66.65145	66.78789	79.2607	66.88761	67.03614	78.02327			291.354	9.983	0.020266	0.089618				19.48	19.39	10.28	0.35	-0.244934	-0.2276
10.0	495.2786	76.31765	108.2387	67.20863	66.86443	84.23572	67.29498	67.20112	82.97832			292.540	11.208	0.083613	0.085131				17.49	17.39	10.33	0.40	-0.229097	-0.22872
20.0	465.2811	76.63143	105.9696	67.23974	66.85091	83.66632	67.27311	67.17841	81.60561			293.748	12.402	0.078461	0.085792				15.61	15.51	10.37	0.44	-0.230385	-0.22855
30.0	464.7164	74.65606	107.4896	67.45515	66.97207	81.86048	67.49603	67.28913	83.80881			294.940	13.598	0.07801	0.08444				13.58	13.48	10.41	0.48	-0.230497	-0.22889
40.0	438.672	74.76571	105.0888	67.48634	67.07294	84.41801	67.55141	67.40041	82.84412			296.131	14.803	0.075725	0.084792				11.74	11.65	10.45	0.52	-0.231069	-0.2288
50.0	432.608	74.24322	104.2076	67.67575	67.19814	85.79725	67.71621	67.52268	82.15776			297.331	16.008	0.075715	0.084722				10.06	9.96	10.50	0.57	-0.231071	-0.22882
60.0	406.317	74.96908	102.2297	67.73923	67.28374	86.05975	67.79512	67.5895	84.70225			298.528	17.221	0.07208	0.085824				8.54	8.45	10.54	0.61	-0.23198	-0.22854
70.0	388.1019	77.74092	100.2138	68.0629	67.46483	85.73125	68.07666	67.7985	85.99367			299.738	18.440	0.068092	0.08718				7.25	7.16	10.58	0.65	-0.232977	-0.2282
80.0	352.6451	79.01998	97.67097	67.99824	67.47732	84.93341	68.0537	67.85102	85.99365			300.936	19.651	0.063591	0.089658				6.35	6.26	10.62	0.69	-0.234102	-0.22759
90.0	320.8128	78.58642	95.16053	68.11739	67.59525	84.51194	68.13449	67.98645	85.85593			302.159	20.874	0.059384	0.089055				5.63	5.54	10.67	0.74	-0.235154	-0.22774
100.0	299.3919	78.66875	93.13753	68.09967	67.64759	83.83503	68.15263	68.0146	85.66478			303.358	22.079	0.055154	0.090403				5.05	4.95	10.71	0.78	-0.236211	-0.2274
110.0	283.25	78.17451	91.29544	68.11205	67.70335	83.0487	68.21087	68.06159	85.30091			304.579	23.303	0.053529	0.088807				4.53	4.44	10.75	0.82	-0.236618	-0.2278
120.0	279.8095	76.98805	90.35212	68.10179	67.68434	82.50869	68.16768	68.07928	85.1597			305.801	24.527	0.052698	0.090303				4.01	3.92	10.79	0.87	-0.236825	-0.22742
130.0	256.6604	76.81108	88.65017	68.03957	67.66048	82.3964	68.14924	68.06918	84.88012			307.037	25.761	0.048459	0.091424				3.68	3.59	10.84	0.91	-0.237885	-0.22714
140.0	228.8111	76.22447	86.29138	68.11856	67.65398	82.28686	68.17235	68.05559	84.37455			308.255	26.990	0.043296	0.091471				3.47	3.37	10.88	0.95	-0.239176	-0.22713
150.0	214.5992	75.73742	85.074	68.13461	67.66878	82.36201	68.19299	68.04246	84.12245			309.473	28.217	0.040979	0.091276				3.31	3.22	10.92	1.00	-0.239755	-0.22718
160.0	211.0404	74.63832	84.86774	68.16803	67.70095	82.4726	68.25476	68.05961	84.28216			310.711	29.461	0.039754	0.090765				3.05	2.96	10.97	1.04	-0.240061	-0.22731
170.0	198.0869	75.55459	84.38672	68.16961	67.69002	82.46838	68.24758	68.10915	84.15179			311.950	30.715	0.036894	0.091327				2.92	2.82	11.01	1.08	-0.240776	-0.22717
180.0	191.8579	81.02067	82.30916	68.14269	67.67853	85.46646	68.18272	68.06972	83.71471			313.184	31.967	0.035403	0.090911				2.66	2.57	11.06	1.13	-0.241149	-0.22727
190.0	189.0225	83.41073	82.49395	68.03149	67.63446	86.66039	68.10155	68.0169	83.55969			314.417	33.218	0.035533	0.090212				2.48	2.38	11.10	1.17	-0.241117	-0.22745
200.0	185.8924	84.91287	82.51904	68.06635	67.60759	86.45284	68.15058	68.02089	83.08322			315.649	34.464	0.036603	0.090564				2.34	2.24	11.14	1.22	-0.240849	-0.22736
210.0	183.7699	85.41383	82.06474	68.04873	67.61792	81.81668	68.12046	67.96658	82.93785			316.880	35.716	0.035939	0.092865				2.22	2.12	11.19	1.26	-0.241015	-0.22678
220.0	182.1717	85.19814	81.80643	68.12306	67.65013	82.60721	68.19478	68.02631	83.0468			318.152	37.002	0.034851	0.100316				2.09	2.00	11.23	1.31	-0.241287	-0.22492
230.0	181.7545	85.68137	81.63912	68.18812	67.68352	85.76981	68.23066	68.06469	83.11427			319.436	38.302	0.035009	0.098835				1.98	1.89	11.28	1.35	-0.241248	-0.22529
240.0	180.8907	85.59158	81.66677	68.07294	67.64046	86.18419	68.12756	68.0329	83.00491			320.725	39.598	0.034175	0.098618				1.87	1.77	11.32	1.40	-0.241456	-0.22535
250.0	178.7671	85.56682	81.39509	68.08798	67.63465	81.04296	68.16888	68.03002	82.31861			322.012	40.898	0.035465	0.098701				1.77	1.68	11.37	1.44	-0.241134	-0.22532
260.0	177.6411	85.67825	81.32202	68.09908	67.63658	82.44431	68.17664	68.00275	82.57223			323.308	42.203	0.03308	0.098823				1.66	1.57	11.41	1.49	-0.24173	-0.22529
270.0	176.4501	85.36354	80.8972	68.03636	67.59094	83.24797	68.09641	68.00758	82.81671			324.598	43.507	0.033261	0.099607				1.55	1.46	11.46	1.54	-0.241685	-0.2251
280.0	175.5427	85.17372	80.73718	67.94954	67.56835	83.40307	68.04546	67.9975	82.92632			325.885	44.806	0.033081	0.098398				1.44	1.35	11.50	1.58	-0.24173	-0.2254
290.0	174.1658	85.22949	80.89709	67.9812	67.50741	83.41421	68.0621	67.92323	82.67089			327.176	46.110	0.03387	0.09983				1.34	1.25	11.55	1.63	-0.241532	-0.22504
300.0	171.848	84.87253	80.381	67.91056	67.4989	83.24273	67.98687	67.87136	82.68356			328.453	47.413	0.031986	0.099991				1.25	1.15	11.59	1.67	-0.242004	-0.225
310.0	169.299	84.65059	80.23853	67.86688	67.43937	83.32105	67.89982	67.85562	82.57562			329.743	48.716	0.03077	0.100013				1.15	1.06	11.64	1.72	-0.242307	-0.225
320.0	167.0146	84.22915	79.9948	67.76469	67.37137	83.09508	67.85519	67.79806	82.51724			331.017	50.011	0.031034	0.101896				1.07	0.97	11.68	1.77	-0.242241	-0.22453
330.0	164.9018	84.39581	79.56071	67.76717	67.36175	82.77885	67.82973	67.7726	82.33961			332.305	51.316	0.031424	0.099383				0.98	0.88	11.73	1.81	-0.242144	-0.22515
340.0	162.67	84.15299	79.25963	67.76798	67.31083	82.57349	67.8589	67.7342	82.24767			333.600	52.628	0.030495	0.098659				0.90	0.80	11.78	1.86	-0.242376	-0.22534
350.0	161.0126	83.61864	79.09555	67.74935	67.31723	82.55625	67.85028	67.71223	82.25236			334.881	53.920	0.030629	0.099676				0.82	0.72	11.82	1.90	-0.242343	-0.22508
360.0	159.4349	83.28535	78.13295	67.74291	67.32622	82.75021	67.87053	67.69536	82.12381			336.181	55.241	0.029755	0.099579				0.72	0.63	11.87	1.95	-0.242561	-0.22511
370.0	157.7956	83.15298	78.04088	67.76715	67.3271	83.00978	67.84514	67.70083	82.53251			337.455	56.529	0.029124	0.100812				0.61	0.52	11.91	2.00	-0.242719	-0.2248
380.0	155.9434	83.02222	77.76329	67.74966	67.36005	83.01436	67.84433	67.71337	83.91889			338.743	57.827	0.028859	0.100727				0.52	0.43	11.96	2.04	-0.242785	-0.22482
390.0	153.2865	82.98436	77.56179	67.78574	67.38574	83.03278	67.86748	67.74695	84.57054			340.025	59.125	0.029262	0.101695				0.44	0.35	12.00	2.09	-0.242685	-0.22458
400.0	150.3912	82.90663	77.50054	67.78049	67.39468	82.80324	67.89018	67.75964	84.75928			341.315	60.428	0.026567	0.100494				0.37	0.28	12.05	2.13	-0.243358	-0.22488
410.0	147.9275	82.70855	77.36947	67.78977	67.4148	82.80913	67.88611	67.76933	84.87847			342.596	61.728	0.026799	0.101147				0.304521	0.21	12.09	2.18	-0.2433	-0.22471
420.0	145.7585	82.43665	76.93947	67.94875	67.46328	82.10004	68.00088	67.81655	84.84259			343.880	63.028	0.026379	0.104596				0.242525	0.15	12.14	2.22	-0.243405	-0.22385
430.0	144.0214	82.36662	76.68944	67.92116	67.50784	82.02957	68.01416	67.86403	84.59896			345.157	64.329	0.026001	0.100709				0.181746	0.09	12.18	2.27	-0.2435	-0.22482
440.0	141.9715	82.0	76.59598	68.0	67.6	82.2	68.1	67.9	84.7			346.5	65.6	0.0	0.1				0.118911	0.03	12.23	2.32	-0.243573	-0.22436
445.3	140.9892	82.2	76.41201	68.0	67.5	82.3	68.0	67.9	84.7			347.1												



**Intertek Testing Services**

**Manufacturer: SBI**

**Model: 1.4 Series**

**Date: 11-18-20**

**Run: 2**

**Project #: G104473478**

**Test Duration: 445.25  
(minutes)**

**RESULTS**

**Average emission rate:(gr/hr) 1.603**

Burn Rate (Dry kg/hr): 0.991

PRESSURE FACTOR: 1.00184

**BAROMETRIC PRESSURE**

Average: 29.975

**TEMPERATURE FACTORS**

Start: 29.95

DGM #1: 1.00063

End: 30

DGM #2: 1.00020

**DRY GAS METER VALUES**

**VOLUMES SAMPLED**

DGM #1 Final: 347.137

DGM #1: 56.47971

Initial: 291.354

DGM #2: 57.09025

DGM #2 Final: 66.337

TOTAL TUNNEL VOLUME (scf): 150105

Initial: 9.983

**SAMPLE RATIOS**

**TEMPERATURES (DEG. RANKIN)**

Sample Train 1: 2657.688

DGM #1: 527.670

Sample Train 2: 2629.266

DGM #2: 527.892

**TOTAL EMISSIONS**

**CALIBRATION FACTORS**

Sample Train 1 (g): **12.225**

DGM #1: 1.0100

Sample Train 2 (g): **11.569**

DGM #2: 1.0110

**EMISSION RATES**

TUNNEL FLOW RATE: 337.126

Sample Train 1 (g/hr): **1.65**

Sample Train 2 (g/hr): **1.56**

**PARTICULATE CATCH (mg)**

Total Sample Train 1: 4.6

Total Sample Train 2: 4.4

Filter and seal Sample Train 1: **3.3**

Filter and seal Sample Train 2: **3.4**

MAX Allowed 7.50%

Probe Sample Train 1: **1.3**

DEVIATION: 2.76%

Probe Sample Train 2: **1**

Room Temp		Bar Pressure		Relative Humidity		Air Velocity	
Before	After	Before	After	Before	After	Before	After
77	82	29.95	30.00	14.6	12.7	0	0
Average Dilution Tunnel Measurements						Sample Data	
Burn Time	Velocity (Ft/sec)	Flow Rate (dscf/min)	Temp (R)	Total Sample		Particulate Catch	
				1	2	1	2
445	16.98	337.13	546.41	56.48	57.09	4.60	4.40
Dilution Tunnel Dual Train Precision							
Sample Ratios			Total Emissions (g)				
Train 1	Train 2		Train 1	Train 2	Deviation (%)		
2657.69	2629.27		12.23	11.57	2.76%		
Burn Rate	Surface	Initial Draft	Run Time	Average Draft			
0.991	0.000	0.020	445.250	0.042			
Run	Date	Burn Rate	Emission				
2	2020-11-18	0.991	1.603				



# E&E Boiler Tunnel Traverse Worksheet

Static Pressure: **0.134**  
Barometer: 29.95

	TUNNEL VELOCITY	TUNNEL TEMP	SQUARE ROOT
A CENTER	0.085	110.900	0.2915
B CENTER	0.089	108.000	0.2983
A1	0.078	110.400	0.2793
A2	0.088	110.800	0.2966
A3	0.073	110.100	0.2702
A4	0.078	80.800	0.2793
B1	0.083	109.300	0.2881
B2	0.093	110.200	0.3050
B3	0.080	110.300	0.2828
B4	0.059	101.500	0.2429
AVERAGE		106.23	0.2834

**PITOT  
CONSTANT=** 0.9609

# E&E FUEL LOAD DATA SHEET

Test Load Weight:

	Lower	Ideal	Upper	
Firebox Volume: <input style="width: 80px;" type="text" value="1.55"/>	17.67	18.60	19.53	cu. ft

Load Volume:  cu. ft      Loading Density: 12.568 lbs./ft3

Number of Spacers:       Load Density: 12.568 lbs./ft3

Thick	Piece Size:			Weight lbs	Meter Moisture Content Dry Uncorrected %				
	x	Wide	x		Length				
2		4		16	3.36	16.70	21.60	21.00	84.00
2		4		16	3.44	16.50	23.40	16.10	84.00
2		4		16	4.22	19.40	20.70	14.70	84.00
2		4		16	5.26	19.80	21.80	20.90	84.00
2		4		16	3.21	20.20	19.50	19.60	84.00
									0.00
									0.00
									0.00
									0.00

**Test Load Weight**  lbs.

**Dry Weight**  kg.

**Average Moisture Content: %**

Dry:

Wet:

**Pre-test moisture content: %**

Wet:

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

Values to be input manually

For Usable Firebox Volumes up to 3.0 ft <sup>3</sup> - Low and Medium Fire				
Nominal Required Load Density (wet basis)	12	lb/ft <sup>3</sup>		
Usable Firebox Volume	1.55	ft <sup>3</sup>		
Total Nom. Load Wt. Target	18.6	lb		
Total Load Wt. Allowable Range	17.67	to 19.53	lb	
Core Target Wt. Allowable Range	8.37	to 12.09	lb	
Remainder Load Wt. Allowable Range	6.51	to 10.23	lb	
Core Load Fuel Pc. Wt. Allowable Range	2.79	to 4.65	lb	Mid-Point 3.72
Remainder Load Pc. Wt. Allowable Range	1.86	to 5.58	lb	3.72
Core Load Piece Wt. Actual	Pc. #			Ordre
	1	3.36	lb	In Range 5.000
	2	3.44	lb	In Range 4.000
	3	4.22	lb	In Range 3.000
Core Load Total. Wt. Actual		11.02	lb	In Range
Remainder Load Piece Wt.	Pc. #			
(2 or 3 Pcs.)	1	5.26	lb	In Range 1.000
	2	3.21	lb	In Range 2.000
	3		lb	NA
Remainder Load Piece Weight Ratio - Small/Large		61%		In Range ≤ 67%
Remainder Load Tot. Wt. Act		8.47	lb	In Range
Total Load Wt. Actual		19.48	lb	In Range
Core % of Total Wt.		57%		In Range 45-65%
Remainder % of Total Wt.		43%		In Range 35-55%
Actual Load % of Nominal Target		105%		In Range 95-105%
Actual Fuel Load Density		12.6	lb/ft <sup>3</sup>	
Allowable Charcoal Bed Wt. Range (lb)	2.0	to 3.8	lb	Mid-Point 2.9
Actual Charcoal Bed Wt.		3.8	lb	In Range
Actual Fuel Load Ending Wt.		0.1	lb	Valid Test ≥ 90%
Total Wt. of Fuel Burned During Test Run lb.		19.4	lb	

Fuel Piece Moisture Reading (%-dry basis)							
1	2	3	Ave.		Pc. Wt. Dry Basis		
16.7	21.6	21	19.8	In Range	2.80	1.27	
16.5	23.4	16.1	18.7	In Range	2.90	1.31	
19.4	20.7	14.7	18.3	In Range	3.57	1.62	
19.8	21.8	20.9	20.8	In Range	4.35	1.97	
20.2	19.5	19.6	19.8	In Range	2.68	1.22	
					0.00	0.00	
Total Load Ave. MC % (dry basis)				19.5	In Range		
Total Load Ave. MC % (wet basis)				16.3			
Total Test Load Weight (dry basis)						16.30	7.39
Total Fuel Weight Burned During Test Run (dry basis)						16.2	7.35

2.92215  
20.38  
3.82 braise

For Usable Firebox Volumes above 3.0 ft <sup>3</sup> - Low and Medium Fire				
Nominal Required Load Density (wet basis)	12	lb/ft <sup>3</sup>		
Usable Firebox Volume	0.00	ft <sup>3</sup>		
Total Nom. Load Wt. Target	0	lb		
Total Load Wt. Allowable Range	0.00	to 0.00	lb	
Core Target Wt. Allowable Range	0.00	to 0.00	lb	
Remainder Load Wt. Allowable Range	0.00	to 0.00	lb	
Core Load Fuel Pc. Wt. Allowable Range	0.00	to 0.00	lb	Mid-Point 0.00
Remainder Load Pc. Wt. Allowable Range	0.00	to 0.00	lb	0.00
Core Load Piece Wt. Actual	Pc. #			
	1		lb	In Range
	2		lb	In Range
	3		lb	In Range
Core Load Total. Wt. Actual		0.00	lb	In Range
Remainder Load Piece Wt.	Pc. #			
(3 or 4 Pcs.)	1		lb	In Range
	2		lb	In Range
	3		lb	In Range
	4		lb	NA
Remainder Load Piece Weight Ratio - Small/Large		#NOMBRE!		#NOMBRE! ≤ 67%
Remainder Load Tot. Wt. Act		0.00	lb	In Range
Total Load Wt. Actual		0.00	lb	In Range
Core % of Total Wt.		#DIV/0!		#DIV/0! 45-65%
Remainder % of Total Wt.		#DIV/0!		#DIV/0! 35-55%
Actual Load % of Nominal Target		#DIV/0!		#DIV/0! 95-105%
Actual Fuel Load Density		#DIV/0!	lb/ft <sup>3</sup>	
Allowable Charcoal Bed Wt. Range (lb)	0.1	to -0.1	lb	Mid-Point 0.0
Actual Charcoal Bed Wt.			lb	Out of Range 0.0
Actual Fuel Load Ending Wt.			lb	Valid Test ≥ 90%
Total Wt. of Fuel Burned During Test Run lb.		0.0	lb	

Fuel Piece Moisture Reading (%-dry basis)						
1	2	3	Ave.		Pc. Wt. Dry Basis	
			#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
			#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
			#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
			NA	NA	NA	NA
Total Load Ave. MC % (dry basis)				#DIV/0!	#DIV/0!	
Total Load Ave. MC % (wet basis)				#DIV/0!		
Total Test Load Weight (dry basis)						#DIV/0!
Total Fuel Weight Burned During Test Run (dry basis)						#DIV/0!

November 20 Adjunct to ASTM E XXXX Wood Heater Cordwood Test Method  
 Cordwood Fuel Load Calculators - 10 lb/ft<sup>3</sup> Nominal Load Density  
 Core 45-65% of Total Load Weight, Remainder 35-55% of Total Load Weight  
 Values to be input manually

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For All Usable Firebox Volumes - High Fire Test Only				
Nominal Required Load Density (wet basis)	10	lb/ft <sup>3</sup>		
Usable Firebox Volume	1.55	ft <sup>3</sup>		
Total Nom. Load Wt. Target	15.50	lb		
Total Load Wt. Allowable Range	14.70	to	16.30	lb
Core Target Wt. Allowable Range	7.00	to	10.10	lb
Remainder Load Wt. Allowable Range	5.40	to	8.50	lb
				Mid-Point
Core Load Pc. Wt. Allowable Range	2.30	to	3.90	lb
Remainder Load Pc. Wt. Allowable Range	1.60	to	8.50	lb
	Pc. #			
Core Load Piece Wt. Actual	1	3.21	lb	In Range
	2	3.38	lb	In Range
	3	3.48	lb	In Range
Core Load Total. Wt. Actual		10.07	lb	In Range
	Pc. #			
Remainder Load Piece Wt.	1	3.87	lb	In Range
(1 to 3 Pcs.)	2	2.30	lb	In Range
	3		lb	NA
Remainder Load Piece Weight Ratio - Small/Large		59%		In Range
Remainder Load Tot. Wt. Act		6.17	lb	In Range
Total Load Wt. Actual		16.24	lb	In Range
Core % of Total Wt.		62%		In Range
Remainder % of Total Wt.		38%		In Range
Actual Load % of Nominal Target		105%		In Range
Actual Fuel Load Density		10.5	lb/ft <sup>3</sup>	
<b>Kindling and Start-up Fuel</b>				
Maximum Kindling Wt. (20% of Tot. Load Wt.)		3.25	lb	
Actual Kindling Wt.		3.23	lb	In Range
Maximum Start-up Fuel Wt. (30% of Tot. Load Wt.)		4.87	lb	
Actual Start-up Fuel Wt.		4.80	lb	In Range
Allowable Residual Start-up Fuel Wt. Range	1.6	to	3.2	lb
Actual Residual Start-up Fuel Wt.		1.68	lb	In Range
Total Wt. All Fuel Added (wet basis)		24.27	lb	
<b>High Fire Test Run End Point Range</b>				
Based on Fuel Load Wt. (w/tares)	Low	1.5	to	High
				1.8
Actual Fuel Load Ending Wt.		NA	lb	Out of Range

Fuel Piece Moisture Reading (%-dry basis)							
1	2	3	Ave.		Pc. Wt. Dry Basis		
21.5	20.6	21.3	21.1	In Range	2.65	lb	1.20
22.4	19.3	22.8	21.5	In Range	2.79	lb	1.26
23.5	18.4	17.9	19.9	In Range	2.90	lb	1.32
20.1	29.2	22	23.8	In Range	3.13	lb	1.42
21.6	20.1	16.7	19.5	In Range	1.92	lb	0.87
					0.00	lb	0.00
Total Load Ave. MC (%-dry basis)				21.3	In Range		
Total Load Ave. MC % (wet basis)				17.6			
Total Test Load Weight (dry basis)					13.39	lb	6.07
<b>Kindling Moisture (%-dry basis)</b>							
10	10	10	10.0	In Range	2.93	lb	1.33
<b>Start-up Fuel Moisture Readings (%-dry basis)</b>							
28	25.3	17.4	23.6	In Range	3.89	lb	1.76
Total Wt. All Fuel Added (dry basis)					20.21	lb	9.16
Total Wt. All Fuel Burned (dry basis)					#VALEUR!	lb	#VALEUR!



Intertek Testing Services			
<b>Manufacturer: SBI</b>		<b>RESULTS</b>	
<b>Model: 1.4 Series</b>			
<b>Date: 11-18-20</b>		<b>Average emission rate:(gr/hr)</b>	<b>#DIV/0!</b>
<b>Run: 2 - First hour</b>			
<b>Project #: G104473478</b>		Burn Rate (Dry kg/hr):	3.521
<b>Test Duration: 60 (minutes)</b>			
PRESSURE FACTOR:		1.00184	BAROMETRIC PRESSURE
TEMPERATURE FACTORS			Average: 29.975
DGM #1:		0.99923	Start: 29.95
DGM #2:		1.14783	End: 30
		DRY GAS METER VALUES	
VOLUMES SAMPLED		DGM #1	Final: 44.124
	DGM #1:	7.28987	Initial: 36.914
	DGM #2:	0.00000	
		DGM #2	Final: 0.000
TOTAL TUNNEL VOLUME (scf):	18903		Initial: 0.000
SAMPLE RATIOS		TEMPERATURES (DEG. RANKIN)	
	Sample Train 1:	2593.048	DGM #1: 528.407
	Sample Train 2:	#DIV/0!	DGM #2: 460.000
TOTAL EMISSIONS		CALIBRATION FACTORS	
	Sample Train 1 (g):	9.076	DGM #1: 1.0100
	Sample Train 2 (g):	#DIV/0!	DGM #2: 1.0110
EMISSION RATES		TUNNEL FLOW RATE:	
	Sample Train 1 (g/hr):	9.08	315.050
	Sample Train 2 (g/hr):	#DIV/0!	
		PARTICULATE CATCH (mg)	
		Total Sample Train 1:	3.5
		Total Sample Train 2:	0
		Filter and seal Sample Train 1:	2.7
		Filter and seal Sample Train 2:	
		Probe Sample Train 1:	0.8
		Probe Sample Train 2:	
DEVIATION:		#DIV/0!	



Time	Ambiant	Flue	Dilution Tu	Firebox Top	Firebox Back	Firebox Right	Firebox Left	Firebox Botto
0	77.9436	291.8188316	101.3224	443.6664648	447.1599879	418.3180739	412.5774676	377.798137
10	76.042	476.2759544	107.7105	656.1301865	386.7806713	396.776145	379.4412743	376.716431
20	75.9736	406.0436307	101.5783	764.9666648	362.3659204	415.9626977	377.7743481	364.121041
30	79.9813	375.1528393	97.38237	708.5915768	350.8392397	413.9849768	373.7795596	353.308679
40	84.8726	382.7497366	96.45232	721.070983	352.0068163	416.2101637	375.5074662	338.141708
50	78.3611	401.4044728	101.209	747.6476663	228.2909819	420.3295961	373.4004861	308.422843
60	78.3645	411.8635246	101.0671	779.7887826	208.2284862	433.6521364	382.0959624	287.788966
70	77.3734	410.4881475	100.894	781.8329019	208.2478469	440.8819831	393.9841763	272.596072
80	78.2087	400.1068523	100.1861	777.1056488	211.8665151	444.1092956	404.2507868	262.697351
90	72.9248	379.1721538	98.09215	770.4854393	217.5550546	440.9327492	407.9702356	257.638096
100	72.9435	370.0115008	96.57096	767.0584221	226.449309	443.6366101	413.8609042	253.066028
110	72.0174	313.691136	92.58616	639.9208941	232.1174265	445.8833287	415.8471679	252.74896
120	71.9122	274.2275713	89.18584	556.2239296	233.3732785	430.7378187	407.529235	253.311461
130	71.0167	244.8311886	87.72237	485.4617832	230.0161349	415.1623013	392.159318	258.479272
140	71.001	227.6284071	84.88325	438.7094785	225.1913945	400.4193242	376.1575151	262.002436
150	70.2453	215.5113196	83.125	411.2098049	221.4892455	388.9029692	362.5264335	269.362096
160	70.0396	204.4227637	83.08868	386.651661	217.2079272	376.7588982	352.1211477	278.911851
170	70.2303	196.7871904	81.28944	367.4633537	208.1379457	361.9907093	342.104315	287.33781
180	69.6454	191.4454182	79.9382	354.2828993	201.3979589	350.0543543	333.4597402	292.942009
190	69.8822	187.0254216	79.21356	344.8210654	195.5021606	340.4712984	326.1904746	297.507313
200	69.0403	184.5259515	78.62774	340.5067441	192.2009366	330.9829178	319.5942185	298.815336
210	71.5071	183.59453	79.42226	332.2937072	189.3816773	325.3411941	315.5607725	301.960674
220	72.409	180.2297183	79.00999	324.1452192	186.6717853	320.1710455	310.2177016	303.119832
230	72.6486	176.6798862	78.72047	314.869364	183.7690275	315.6880491	304.7988079	303.055694
240	72.635	173.7907773	78.54298	307.5867382	181.3388681	311.13165	298.9271151	301.613885
250	72.9998	171.6265403	78.47739	301.202971	178.8531894	306.2904772	294.2721919	299.448806
260	74.2889	168.9391825	78.57059	299.0970839	179.5392821	303.232552	293.4439231	302.008359
270	75.1908	166.5113357	79.157	294.5034413	179.4771476	300.669554	293.1771182	304.952324
280	77.9661	164.6679997	77.74072	291.3338834	180.2142664	297.2498019	292.4838757	303.954312
290	74.5223	165.1761106	78.42686	283.4245275	175.0085433	292.5298058	286.2403864	295.971451
300	77.6103	161.7147226	77.08769	281.3604391	176.980206	290.5270416	288.4538826	296.315772
310	78.9332	161.3604667	77.53664	278.8871658	177.0283629	288.6707036	288.0757032	295.510723
320	79.5263	159.1892468	77.44663	275.2102861	176.4390086	286.1138486	286.2332755	293.751556
330	79.1987	156.6045695	77.4615	268.4768952	174.5725501	281.9040093	280.6314513	291.315715
340	79.8997	153.9084179	77.44768	261.7409602	171.6163145	276.8946272	274.3731096	288.308334
350	79.8365	151.414222	77.40645	254.7712525	168.6289101	271.669586	268.4597272	285.074089
360	80.1902	149.0202777	76.76017	248.6253032	166.0236427	266.333108	263.5688524	282.218252
370	80.0267	152.6864626	76.57767	251.8402319	167.1906175	262.4072973	261.6802247	278.976201
380	80.4645	153.2480804	76.49722	264.6551391	165.1338694	263.1853013	266.0860813	276.059172
390	80.5095	154.4425599	76.53732	270.7602627	162.8302559	263.8169678	268.4876242	272.570175
400	80.8538	154.1140218	76.50444	271.9910611	160.217181	262.9857235	268.7462305	268.770985
410	80.8755	153.0916349	76.43487	269.7887487	157.9444108	261.2542445	266.6689787	264.695471
420	80.9319	152.0604835	76.34643	267.1242158	155.6569586	258.8715781	264.2838792	261.75399
430	80.9777	151.3951128	76.39611	264.7171689	153.6735402	256.6245276	262.1811695	259.426297
440	80.9431	150.4203163	76.15787	261.7469848	151.5952369	254.4533407	259.6580567	256.819498
450	80.8826	149.3375763	76.1367	259.4017909	149.9259585	252.1033754	257.4398101	255.705447
460	80.7829	148.3047571	76.18084	257.3840057	148.6117069	249.9722211	255.0198824	253.762326
470	80.8272	145.6093255	75.80286	243.7370942	146.3953795	247.5650239	251.9011921	252.425275
480	80.8103	142.3703016	75.45143	232.8211164	143.2755474	243.6818917	246.8111526	251.703862

Time 10.0	Flue Temp 1	Room	Tunnel	DGM 1	DGM 1	Filter 1	DGM 2	DGM 2	Filter 2	DGM 3 In 19	Filter 3 20	Meter #1	Meter #2	Draft 23	Tunnel	CO	CO2	O2	scale Lbs 28	0.0751786		Meter	Meter	Draft	Calculated Tunnel
		Temp 2	Dry Bulb 3	In 13	Out 14	15	In 16	Out 17	18			24	% 25		% 25	% 27	Corrected Scale	#1 Cu Ft		#2 Cu Ft					
19.48	291.8188	77.94356	101.3224	65.38294	65.44222	83.29181	65.55704	65.81085	77.64974			347.516	66.468	0.052515	0.087035					19.48	19.40	12.27	2.35	-0.236871	-0.22824
17.73	476.276	76.04201	107.7105	65.86717	65.44845	81.48955	65.98822	65.86675	81.02931			348.731	67.702	0.081727	0.08524					17.73	17.65	12.31	2.39	-0.229568	-0.22869
15.94	406.0436	75.97363	101.5783	65.96625	65.51332	84.46309	66.07519	65.95122	83.3333			349.930	68.907	0.070275	0.085484					15.94	15.87	12.35	2.43	-0.232431	-0.22863
14.65	375.1528	79.98128	97.38237	66.2003	65.69273	85.85041	66.3013	66.14396	85.78966			351.153	70.131	0.070313	0.085847					14.65	14.58	12.40	2.48	-0.232422	-0.22854
13.25	382.7497	84.87257	96.45232	66.41293	65.83695	85.44515	66.5231	66.29649	86.28821			352.367	71.346	0.071765	0.088651					13.25	13.17	12.44	2.52	-0.232059	-0.22784
12.01	401.4045	78.36111	101.209	66.46918	65.94414	85.61702	66.59145	66.43246	83.54559			353.571	72.556	0.070855	0.088663					12.01	11.94	12.48	2.56	-0.232286	-0.22783
10.52	411.8635	78.36445	101.0671	66.54098	66.02347	83.00433	66.65908	66.50927	83.11318			354.779	73.766	0.072992	0.087888					10.52	10.44	12.52	2.60	-0.231752	-0.22803
9.01	410.4881	77.37337	100.894	66.59515	66.09935	83.2745	66.70656	66.57303	85.99428			356.002	75.012	0.073122	0.087147					9.01	8.93	12.57	2.65	-0.23172	-0.22821
7.58	400.1069	78.20874	100.1861	66.59594	66.1327	85.70206	66.72655	66.64393	85.22795			357.217	76.227	0.07081	0.086811					7.58	7.50	12.61	2.69	-0.232297	-0.2283
6.22	379.1722	72.92475	98.09215	66.6227	66.13609	86.3232	66.76666	66.64482	84.12101			358.414	77.445	0.067542	0.086072					6.22	6.15	12.65	2.73	-0.233115	-0.22848
5.06	370.0115	72.94347	96.57096	66.61102	66.22708	86.29965	66.76653	66.67653	83.40155			359.598	78.658	0.065773	0.087077					5.06	4.99	12.69	2.78	-0.233557	-0.22823
4.38	313.6911	72.01744	92.58618	66.62129	66.21565	85.98669	66.78652	66.65842	82.57154			360.823	79.893	0.05665	0.089017					4.38	4.31	12.74	2.82	-0.235838	-0.228
4.00	274.2276	71.91223	89.18584	66.62973	66.18486	85.41437	66.76784	66.66186	82.1957			362.029	81.114	0.051699	0.088285					4.00	3.93	12.78	2.86	-0.237075	-0.22793
3.76	244.8312	71.01667	87.72237	66.83582	66.24868	85.38457	66.95723	66.7144	83.33523			363.254	82.337	0.045883	0.088157					3.76	3.68	12.82	2.91	-0.238529	-0.22796
3.55	227.6284	71.00101	84.88325	66.80552	66.36277	84.46311	67.00913	66.81804	84.0102			364.485	83.588	0.043843	0.090322					3.55	3.47	12.87	2.95	-0.239039	-0.22742
3.35	215.5113	70.24531	83.125	66.85208	66.35384	84.16639	67.00687	66.86543	84.4464			365.737	84.850	0.04043	0.091196					3.35	3.27	12.91	3.00	-0.239892	-0.2272
3.16	204.4228	70.03961	83.08888	66.87513	66.37105	84.29885	67.02366	66.87471	84.40266			366.974	86.108	0.039374	0.090271					3.16	3.09	12.95	3.04	-0.240156	-0.22743
2.99	196.7872	70.23026	81.28944	67.1082	66.50903	84.18248	67.2538	66.98847	83.92973			368.211	87.361	0.037031	0.090068					2.99	2.91	13.00	3.08	-0.240742	-0.22748
2.84	191.4454	69.64543	79.9382	67.06702	66.58386	83.81816	67.22055	67.08079	83.75196			369.446	88.623	0.036755	0.090328					2.84	2.77	13.04	3.13	-0.240811	-0.22742
2.69	187.0254	69.88223	79.21356	67.03878	66.64658	84.60954	67.20065	67.0926	83.7252			370.699	89.888	0.035943	0.092704					2.69	2.61	13.09	3.17	-0.241014	-0.22682
2.52	184.526	69.04027	78.62774	67.06073	66.68313	84.66934	67.26056	67.14459	83.71428			371.958	91.155	0.035395	0.092869					2.52	2.45	13.13	3.22	-0.241151	-0.22678
2.44	183.5945	71.50705	79.42226	67.11024	66.64503	84.36732	67.21245	67.10732	83.62313			373.210	92.425	0.034581	0.094412					2.44	2.36	13.17	3.26	-0.241355	-0.22664
2.33	180.2297	72.40896	79.00999	67.01673	66.6554	84.52193	67.14565	67.10518	83.55314			374.458	93.692	0.03416	0.093607					2.33	2.26	13.22	3.31	-0.24146	-0.2266
2.22	176.6799	72.64864	78.72047	67.02966	66.61867	84.00822	67.15649	67.07347	83.68885			375.712	94.964	0.032896	0.092312					2.22	2.15	13.26	3.35	-0.241776	-0.22692
2.10	173.7908	72.63497	78.54298	67.03598	66.63543	84.59312	67.15947	67.02764	83.47376			376.965	96.229	0.032811	0.092704					2.10	2.02	13.31	3.40	-0.241797	-0.22682
1.98	171.6265	72.9998	78.47739	67.07974	66.60826	84.10669	67.16693	67.04303	83.13603			378.218	97.510	0.032267	0.09114					1.98	1.90	13.35	3.44	-0.241933	-0.22722
1.83	168.9392	74.28888	78.57059	67.19224	66.70784	83.79174	67.30654	67.10171	82.87224			379.459	98.771	0.032949	0.091829					1.83	1.76	13.39	3.49	-0.241763	-0.22704
1.69	166.5113	75.19077	79.157	67.14793	66.71235	83.88102	67.28226	67.12833	83.35803			380.709	100.038	0.030764	0.092318					1.69	1.62	13.44	3.53	-0.242309	-0.22692
1.57	164.668	77.96606	77.74072	67.17387	66.71326	83.33659	67.28067	67.15927	83.13754			381.960	101.311	0.030765	0.091178					1.57	1.50	13.48	3.58	-0.242309	-0.22721
1.55	165.1761	74.52234	78.42686	67.21416	66.76858	83.4618	67.3147	67.16577	83.2582			383.207	102.579	0.030084	0.090767					1.55	1.48	13.53	3.62	-0.242479	-0.22731
1.41	161.7147	77.6103	77.08769	67.19463	66.76657	83.12999	67.37151	67.21048	83.30421			384.453	103.853	0.031413	0.091834					1.41	1.34	13.57	3.67	-0.242147	-0.22704
1.28	161.3605	78.93324	77.53664	67.15605	66.73842	83.06192	67.32584	67.18776	83.4505			385.705	105.118	0.029546	0.092394					1.28	1.21	13.62	3.71	-0.242613	-0.2269
1.19	159.1892	79.52632	77.44663	67.19199	66.75934	82.83475	67.37012	67.1995	82.93905			386.959	106.391	0.02791	0.091995					1.19	1.11	13.66	3.76	-0.243023	-0.227
1.11	156.6046	79.19865	77.4615	67.15437	66.73882	82.79618	67.3325	67.19442	83.22537			388.210	107.663	0.028379	0.091165					1.11	1.03	13.70	3.80	-0.242905	-0.22721
1.03	153.9084	79.89968	77.44768	67.12964	66.70699	82.58205	67.3011	67.13882	83.00095			389.460	108.930	0.028723	0.093212					1.03	0.95	13.75	3.85	-0.242819	-0.2267
0.97	151.4142	78.83652	77.40645	67.16329	66.71144	83.40016	67.30221	67.16621	83.20236			390.721	110.215	0.027504	0.09276					0.97	0.89	13.79	3.89	-0.243124	-0.22681
0.92	149.0203	80.19024	76.76017	67.23057	66.76622	83.56993	67.36114	67.20679	83.40939			391.970	111.466	0.027777	0.091249					0.92	0.84	13.84	3.93	-0.243056	-0.22719
0.84	152.8885	80.02672	76.57767	67.27543	66.77436	83.69096	67.37721	67.21077	83.56766			393.217	112.743	0.028585	0.093425					0.84	0.77	13.88	3.98	-0.242854	-0.22664
0.74	153.2481	80.46452	76.49722	67.28763	66.85249	84.04602	67.38608	67.25635	82.68832			394.496	114.020	0.028987	0.100043					0.74	0.67	13.93	4.02	-0.242753	-0.22499
0.67	154.4426	80.50951	76.53732	67.36921	66.88402	84.25886	67.43261	67.28286	81.30877			395.797	115.336	0.027915	0.101558					0.67	0.59	13.97	4.07	-0.243021	-0.22461
0.60	154.114	80.8538	76.50444	67.44631	66.94946	84.49247	67.49553	67.35037	81.96932			397.101	116.656	0.028859	0.102515					0.60	0.52	14.02	4.12	-0.242785	-0.22437
0.52	153.0916	80.87555	76.43487	67.39145	66.92546	84.53526	67.50866	67.35474	82.32893			398.406	117.975	0.029005	0.101123					0.52	0.45	14.06	4.16	-0.242749	-0.22472
0.44	152.0605	80.93192	76.34643	67.35643	66.95051	84.53694	67.43027	67.35727	82.55707			399.710	119.301	0.029021	0.102377					0.44	0.37	14.11	4.21	-0.242745	-0.22441
0.38	151.3951	80.97774	76.39611	67.33625	66.96245	84.3271	67.48683	67.36753	82.61776			401.008	120.615	0.02913	0.102386					0.38	0.31	14.16	4.26	-0.242717	-0.2244
0.32	150.4203	80.9431	76.15787	67.40189	66.93757	84.48069	67.48073	67.37144	82.71602																

## Intertek Testing Services

**Manufacturer: SBI**

**Model: 1.4 Series**

**Date: 11-19-20**

**Run: 3**

**Project #: G104473478**

**Test Duration: 480  
(minutes)**

### RESULTS

**Average emission rate:(gr/hr) 1.224**

Burn Rate (Dry kg/hr): 0.913

PRESSURE FACTOR: 0.99850

#### BAROMETRIC PRESSURE

Average: 29.875

#### TEMPERATURE FACTORS

Start: 29.95

DGM #1: 1.00239

End: 29.8

DGM #2: 1.00185

#### DRY GAS METER VALUES

##### VOLUMES SAMPLED

DGM #1 Final: 407.556

DGM #1: 60.69405

Initial: 347.516

DGM #2: 61.45878

DGM #2 Final: 127.237

TOTAL TUNNEL VOLUME (scf): 159397

Initial: 66.468

##### SAMPLE RATIOS

##### TEMPERATURES (DEG. RANKIN)

Sample Train 1: 2626.235

DGM #1: 526.740

Sample Train 2: 2593.556

DGM #2: 527.023

##### TOTAL EMISSIONS

##### CALIBRATION FACTORS

Sample Train 1 (g): **10.242**

DGM #1: 1.0100

Sample Train 2 (g): **9.337**

DGM #2: 1.0110

##### EMISSION RATES

TUNNEL FLOW RATE: 332.077

Sample Train 1 (g/hr): **1.28**

Sample Train 2 (g/hr): **1.17**

##### PARTICULATE CATCH (mg)

Total Sample Train 1: 3.9

Total Sample Train 2: 3.6

Filter and seal Sample Train 1: **3**

Filter and seal Sample Train 2: **2.9**

MAX Allowed 7.50%

Probe Sample Train 1: **0.9**

Probe Sample Train 2: **0.7**

DEVIATION: 4.62%

	Room Temp		Bar Pressure		Relative Humidity	
	Before	After	Before	After	Before	After
	78	81	29.95	29.80	13.9	12.5
Average Dilution Tunnel Measurements						
Burn Time	Velocity (Ft/sec)	Flow Rate (dscf/min)	Temp (R)	Total Sample		Sample Date
				1	2	1
480	16.70	332.08	543.80	60.69	61.46	3.90
Dilution Tunnel Dual Train Precision						
Sample Ratios			Total Emissions (g)		Deviation (%)	
Train 1	Train 2	Train 1	Train 2	Deviation (%)		
2626.23	2593.56	10.24	9.34	4.62%		
Burn Rate	Surface	Initial Draft	Run Time			
0.913	0.000	0.053	480.000			
Run	Date	Burn Rate	Emission			
3	2020-11-19	0.913	1.224			



# E&E Boiler Tunnel Traverse Worksheet

Static Pressure: **0.134**  
Barometer: 29.95

	TUNNEL VELOCITY	TUNNEL TEMP	SQUARE ROOT
A CENTER	0.085	105.700	0.2915
B CENTER	0.090	107.100	0.3000
A1	0.073	111.100	0.2702
A2	0.089	112.200	0.2983
A3	0.076	111.600	0.2757
A4	0.080	79.500	0.2828
B1	0.086	109.400	0.2933
B2	0.092	110.900	0.3033
B3	0.076	110.600	0.2757
B4	0.056	97.600	0.2366
AVERAGE		105.57	0.2827

**PITOT  
CONSTANT=** 0.9560

# E&E FUEL LOAD DATA SHEET

Test Load Weight:

	Lower	Ideal	Upper	
Firebox Volume: <input style="width: 80px;" type="text" value="1.55"/>	17.67	18.60	19.53	cu. ft
Load Volume: <input style="width: 80px;" type="text" value="1.5500"/>	Loading Density: 12.567			lbs./ft3
Number of Spacers: <input style="width: 80px;" type="text"/>	Load Density: 12.567			lbs./ft3

Thick	Piece Size:			Weight lbs	Meter Moisture Content Dry Uncorrected %			
	x	Wide	x		Length			
2		4		16	3.52	28.00	22.90	13.00
2		4		16	3.51	30.60	14.10	16.50
2		4		16	3.79	24.10	16.10	15.90
2		4		16	5.45	27.90	14.20	17.30
2		4		16	3.21	18.00	27.30	19.80

84.00  
84.00  
84.00  
84.00  
84.00  
0.00  
0.00  
0.00  
0.00

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

**Average Moisture Content: %**

Dry:             Wet:

**Pre-test moisture content: %**

           Wet:

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

Values to be input manually

For Usable Firebox Volumes up to 3.0 ft <sup>3</sup> - Low and Medium Fire				
Nominal Required Load Density (wet basis)	12 lb/ft <sup>3</sup>			
Usable Firebox Volume	1.55 ft <sup>3</sup>			
Total Nom. Load Wt. Target	18.6 lb			
Total Load Wt. Allowable Range	17.67 to 19.53 lb			
Core Target Wt. Allowable Range	8.37 to 12.09 lb			
Remainder Load Wt. Allowable Range	6.51 to 10.23 lb			
Core Load Fuel Pc. Wt. Allowable Range	2.79	to	4.65 lb	Mid-Point 3.72
Remainder Load Pc. Wt. Allowable Range	1.86	to	5.58 lb	3.72
Core Load Piece Wt. Actual	Pc. #			Ordre
	1	3.52 lb	In Range	
	2	3.51 lb	In Range	
	3	3.79 lb	In Range	
Core Load Total. Wt. Actual		10.81 lb	In Range	
Remainder Load Piece Wt.	Pc. #			
(2 or 3 Pcs.)	1	5.45 lb	In Range	
	2	3.21 lb	In Range	
	3	lb	NA	
Remainder Load Piece Weight Ratio - Small/Large		59%	In Range	≤ 67%
Remainder Load Tot. Wt. Act		8.67 lb	In Range	
Total Load Wt. Actual		19.48 lb	In Range	
Core % of Total Wt.		56%	In Range	45-65%
Remainder % of Total Wt.		44%	In Range	35-55%
Actual Load % of Nominal Target		105%	In Range	95-105%
Actual Fuel Load Density		12.6 lb/ft <sup>3</sup>		
Allowable Charcoal Bed Wt. Range (lb)	2.0	to	3.8 lb	Mid-Point 2.9
Actual Charcoal Bed Wt.		3.8 lb	In Range	
Actual Fuel Load Ending Wt.		0.1 lb	lb	≥ 90%
Total Wt. of Fuel Burned During Test Run lb.		19.4 lb		

Fuel Piece Moisture Reading (%-dry basis)							
1	2	3	Ave.		Pc. Wt. Dry Basis		
28	22.9	13	21.3	In Range	2.90 lb	1.31 kg	
30.6	14.1	16.5	20.4	In Range	2.91 lb	1.32 kg	
24.1	16.1	15.9	18.7	In Range	3.19 lb	1.45 kg	
Total Load Ave. MC % (dry basis)				19.8	In Range	4.55 lb	2.06 kg
Total Load Ave. MC % (wet basis)				21.7	In Range	2.64 lb	1.20 kg
Total Test Load Weight (dry basis)						0.00 lb	0.00 kg
Total Fuel Weight Burned During Test Run (dry basis)						16.20 lb	7.35 kg

2.92185  
 20.38  
 3.82 braise

For Usable Firebox Volumes above 3.0 ft <sup>3</sup> - Low and Medium Fire				
Nominal Required Load Density (wet basis)	12 lb/ft <sup>3</sup>			
Usable Firebox Volume	0.00 ft <sup>3</sup>			
Total Nom. Load Wt. Target	0 lb			
Total Load Wt. Allowable Range	0.00 to 0.00 lb			
Core Target Wt. Allowable Range	0.00 to 0.00 lb			
Remainder Load Wt. Allowable Range	0.00 to 0.00 lb			
Core Load Fuel Pc. Wt. Allowable Range	0.00	to	0.00 lb	Mid-Point 0.00
Remainder Load Pc. Wt. Allowable Range	0.00	to	0.00 lb	0.00
Core Load Piece Wt. Actual	Pc. #			
	1	lb	In Range	
	2	lb	In Range	
	3	lb	In Range	
Core Load Total. Wt. Actual		0.00 lb	In Range	
Remainder Load Piece Wt.	Pc. #			
(3 or 4 Pcs.)	1	lb	In Range	
	2	lb	In Range	
	3	lb	In Range	
	4	lb	NA	
Remainder Load Piece Weight Ratio - Small/Large		#NOMBRE!	#NOMBRE!	≤ 67%
Remainder Load Tot. Wt. Act		0.00 lb	In Range	
Total Load Wt. Actual		0.00 lb	In Range	
Core % of Total Wt.		#DIV/0!	#DIV/0!	45-65%
Remainder % of Total Wt.		#DIV/0!	#DIV/0!	35-55%
Actual Load % of Nominal Target		#DIV/0!	#DIV/0!	95-105%
Actual Fuel Load Density		#DIV/0!	lb/ft <sup>3</sup>	
Allowable Charcoal Bed Wt. Range (lb)	0.1	to	-0.1 lb	Mid-Point 0.0
Actual Charcoal Bed Wt.		lb	Out of Range	0.0
Actual Fuel Load Ending Wt.		lb	Valid Test	≥ 90%
Total Wt. of Fuel Burned During Test Run lb.		0.0 lb		

Fuel Piece Moisture Reading (%-dry basis)							
1	2	3	Ave.		Pc. Wt. Dry Basis		
			#DIV/0!	#DIV/0!	#DIV/0! lb	#DIV/0! kg	
			#DIV/0!	#DIV/0!	#DIV/0! lb	#DIV/0! kg	
			#DIV/0!	#DIV/0!	#DIV/0! lb	#DIV/0! kg	
Total Load Ave. MC % (dry basis)				NA	NA	NA lb	NA kg
Total Load Ave. MC % (wet basis)				#DIV/0!	#DIV/0!	#DIV/0! lb	#DIV/0! kg
Total Test Load Weight (dry basis)						#DIV/0! lb	#DIV/0! kg
Total Fuel Weight Burned During Test Run (dry basis)						#DIV/0! lb	#DIV/0! kg

For All Usable Firebox Volumes - High Fire Test Only						
Nominal Required Load Density (wet basis)	10	lb/ft <sup>3</sup>				
Usable Firebox Volume	1.55	ft <sup>3</sup>				
Total Nom. Load Wt. Target	15.50	lb				
Total Load Wt. Allowable Range	14.70	to	16.90	lb		
Core Target Wt. Allowable Range	7.00	to	10.10	lb		
Remainder Load Wt. Allowable Range	5.40	to	8.50	lb		
Core Load Pc. Wt. Allowable Range	2.30	to	3.90	lb	Mid-Point	3.10
Remainder Load Pc. Wt. Allowable Range	1.60	to	8.50	lb		5.05
Core Load Piece Wt. Actual	Pc. #					
	1	3.79	lb	In Range		
	2	2.96	lb	In Range		
	3	3.20	lb	In Range		
Core Fuel Total. Wt. Actual		9.95	lb	In Range		
Remainder Load Piece Wt.	Pc. #					
	1	3.85	lb	In Range		
(1 to 3 Pcs.)	2	2.41	lb	In Range		
	3		lb	NA		
Remainder Load Piece Weight Ratio - Small/Large		63%		In Range		≤ 67%
Remainder Load Tot. Wt. Act		6.26	lb	In Range		
Total Load Wt. Actual		16.21	lb	In Range		
Core % of Total Wt.		61%		In Range		45-65%
Remainder % of Total Wt.		39%		In Range		35-55%
Actual Load % of Nominal Target		105%		In Range		95-105%
Actual Fuel Load Density		10.5	lb/ft <sup>3</sup>			
<b>Kindling and Start-up Fuel</b>						
Maximum Kindling Wt. (20% of Tot. Load Wt.)		3.24	lb			
Actual Kindling Wt.		3.20	lb	In Range		19.7%
Maximum Start-up Fuel Wt. (30% of Tot. Load Wt.)		4.86	lb			
Actual Start-up Fuel Wt.		4.81	lb	In Range		29.7%
Allowable Residual Start-up Fuel Wt. Range	1.6	to	3.2	lb	Mid-Point	
Actual Residual Start-up Fuel Wt.		1.62	lb	In Range		2.4
Total Wt. All Fuel Added (wet basis)		24.22	lb			
High Fire Test Run End Point Range	Low		High		Mid-Point	
Based on Fuel Load Wt. (w/tares)	1.5	to	1.8	lb		1.6
Actual Fuel Load Ending Wt.		NA	lb	Out of Range		

Fuel Piece Moisture Reading (%-dry basis)						
	1	2	3	Ave.		Pc. Wt. Dry Basis
	27.1	16.9	17.3	20.4	In Range	3.15 lb 1.43 kg
	20.8	23.9	18.3	21.0	In Range	2.45 lb 1.11 kg
	25.4	14.8	18	19.4	In Range	2.68 lb 1.21 kg
	19.2	25.4	23.6	22.7	In Range	3.14 lb 1.42 kg
	28.2	17.1	19.2	21.5	In Range	1.99 lb 0.90 kg
						0.00 lb 0.00 kg
Total Load Ave. MC (%-dry basis)				21.0	In Range	
Total Load Ave. MC % (wet basis)				17.4		
Total Test Load Weight (dry basis)						13.40 lb 6.08 kg
<b>Kindling Moisture (%-dry basis)</b>						
	10	10	10	10.0	In Range	2.91 lb 1.32 kg
<b>Start-up Fuel Moisture Readings (%-dry basis)</b>						
	23.7	25.9	20.6	23.4	In Range	3.90 lb 1.77 kg
Total Wt. All Fuel Added (dry basis)						20.20 lb 9.16 kg
Total Wt. All Fuel Burned (dry basis)						#VALEUR! lb #VALEUR! kg



Time	Flue Temp 1	Room	Tunnel	DGM 1	DGM 1	Filter 1	DGM 2	DGM 2	Filter 2	DGM 3	Filter 3	Meter #1	Meter #2	Draft	Tunnel	CO	CO2	O2	scale	10.516029	Meter	Meter	Draft	Calculated
		Temp 2	Dry Bulb 3	In 13	Out 14	15	In 16	Out 17	18	In 19	20	21	22	23	24	%	%	%	Lbs	Corrected	#1	#2		
0.0	291.8188	77.94356	101.3224	66.80246	66.80246	84.57009						44.158		0.052515	0.087035				19.48	8.96	1.56	0.00	-0.236871	-0.22824
10.0	476.276	76.04201	107.7105	66.84832	66.84832	83.52639						45.319		0.081727	0.08524				17.73	7.21	1.60		-0.229568	-0.22869
20.0	406.0436	75.97363	101.5783	67.05083	67.05083	82.87226						46.542		0.070275	0.085484				15.94	5.43	1.64		-0.232431	-0.22863
30.0	375.1528	79.98128	97.38237	67.20633	67.20633	82.55176						47.750		0.070313	0.085847				14.65	4.14	1.69		-0.232422	-0.22854
40.0	382.7497	84.87257	96.45232	67.40218	67.40218	81.94248						48.948		0.071765	0.088651				13.25	2.73	1.73		-0.232059	-0.22784
50.0	401.4045	78.36111	101.209	67.53975	67.53975	83.56793						50.142		0.070855	0.088663				12.01	1.49	1.77		-0.232286	-0.22783
60.0	411.8635	78.36445	101.0671	67.67699	67.67699	84.55246						51.340		0.072992	0.087888				10.52	0.00	1.81		-0.231752	-0.22803

Intertek Testing Services			
<b>Manufacturer: SBI</b>		<b>RESULTS</b>	
<b>Model: 1.4 Series</b>			
<b>Date: 11-19-20</b>		<b>Average emission rate:(gr/hr)</b>	<b>#DIV/0!</b>
<b>Run: 3 - First hour</b>			
<b>Project #: G104473478</b>		Burn Rate (Dry kg/hr):	2.570
<b>Test Duration: 60 (minutes)</b>			
PRESSURE FACTOR:		0.99850	BAROMETRIC PRESSURE
TEMPERATURE FACTORS		Average: 29.875	
DGM #1:		1.00148	Start: 29.95
DGM #2:		1.14783	End: 29.8
		DRY GAS METER VALUES	
VOLUMES SAMPLED		DGM #1	Final: 51.340
	DGM #1:	7.25365	Initial: 44.158
	DGM #2:	0.00000	
		DGM #2	Final: 0.000
TOTAL TUNNEL VOLUME (scf):	19002		Initial: 0.000
SAMPLE RATIOS		TEMPERATURES (DEG. RANKIN)	
	Sample Train 1:	2619.602	DGM #1: 527.218
	Sample Train 2:	#DIV/0!	DGM #2: 460.000
TOTAL EMISSIONS		CALIBRATION FACTORS	
	Sample Train 1 (g):	<b>6.811</b>	DGM #1: 1.0100
	Sample Train 2 (g):	<b>#DIV/0!</b>	DGM #2: 1.0110
EMISSION RATES		TUNNEL FLOW RATE: 316.695	
	Sample Train 1 (g/hr):	<b>6.81</b>	
	Sample Train 2 (g/hr):	<b>#DIV/0!</b>	
		PARTICULATE CATCH (mg)	
		Total Sample Train 1:	2.6
		Total Sample Train 2:	0
		Filter and seal Sample Train 1:	<b>1.9</b>
		Filter and seal Sample Train 2:	
		Probe Sample Train 1:	<b>0.7</b>
		Probe Sample Train 2:	
DEVIATION:		#DIV/0!	

Time	Ambiant	Flue	Dilution T <sub>u</sub>	Firebox Top	Firebox Back	Firebox Right	Firebox Left	Firebox Botto
0.00	68.354	68.97143293	69.22652	68.5037003	68.46659411	68.40280329	68.42448404	68.2547846
10.00	68.6501	311.8731189	80.68048	324.4757342	124.5959009	127.0304212	124.1705283	68.747649
20.00	69.4151	406.1683542	88.99083	632.7343617	180.0293494	215.5037838	217.1580741	80.5376414
30.00	70.4425	466.6533281	95.74525	767.5060588	254.4042828	296.380384	295.1677406	118.984487
40.00	71.9631	456.6001755	98.18411	781.6531561	326.7320112	370.525769	363.1209328	180.558399
50.00	72.3569	418.786967	99.44449	643.2779809	340.6737249	397.0126549	387.8104829	235.908553
60.00	71.9054	566.4371044	109.5623	863.2025552	327.0036578	410.3833525	381.5643416	257.904265
70.00	71.7857	566.9272815	109.3738	912.404892	174.2960315	443.6606493	398.2412591	267.617921
80.00	71.0356	549.1007142	108.7061	904.601905	176.5323957	469.452845	422.4192975	275.412767
90.00	71.2009	507.6891354	105.8265	885.2362753	188.0510829	486.3918524	441.730267	287.469939
100.00	70.7664	424.8134754	100.056	753.126081	195.1348749	487.2892939	451.9133664	304.159973
110.00	69.8377	371.9504589	95.03267	643.8733038	190.3866629	465.6653222	438.1642764	313.685995
120.00	70.3462	353.3753872	92.79383	606.3470471	185.6521475	444.3546054	423.7715072	322.067755
130.00	69.6635	345.2914097	91.25259	589.5781404	185.6414549	429.969346	411.5964392	329.715558
140.00	69.0663	323.6460016	89.40757	564.3503599	185.9765345	420.0795566	404.6967021	339.873917
150.00	68.5623	303.2493139	87.81961	518.8276527	184.5894395	402.9182864	400.7020088	349.345521
160.00	68.7496	276.0520112	85.97834	483.6605376	180.3328988	386.4317572	392.259742	357.796472
170.00	68.5673	245.3235467	83.73057	417.1343337	165.9669608	365.6593632	364.8283505	361.211577
180.00	70.7646	228.0760751	83.48242	352.5633285	157.7630406	347.6346589	342.0811965	345.099044
190.00	71.1976	215.5087243	82.27582	319.3124219	153.2684829	331.9135637	325.372906	345.609522
200.00	71.4737	207.2032572	81.31421	300.4171606	149.5915376	320.0695294	312.972413	348.189703
205.00	71.2675	203.2519596	80.95694	293.2025467	148.8860182	315.3685355	307.3918881	348.794099

Time	Flue Temp 1	Room Temp 2	Tunnel Dry Bulb 3	DGM 1 In 13	DGM 1 Out 14	Filter 1 15	DGM 2 In 16	DGM 2 Out 17	Filter 2 18	DGM 3 In 19	Filter 3 20	Meter #1 21	Meter #2 22	Draft 23	Tunnel 24	CO			scale Lbs 28	2.0224882 Corrected Scale	Meter #1 Cu Ft	Meter #2 Cu Ft	Draft	Calculated Tunnel
																% 25	% 25	% 27						
0.0	68.97143	68.35402	69.22652	67.78272	67.85654	82.30454	67.87823	68.12761	84.19946			407.655	127.271	0.00226	0.0933				7.92	5.90	14.39	4.49	-0.249435	-0.22668
10.0	311.8731	68.6501	80.68048	68.05886	67.80072	84.00842	68.08639	68.09473	82.75129			408.870	128.491	0.064944	0.091926				6.75	4.72	14.43	4.54	-0.233764	-0.22702
20.0	406.1684	69.41509	88.99083	67.99269	67.66156	82.77461	67.98144	67.97768	84.8018			410.082	129.707	0.072713	0.088603				5.15	3.12	14.48	4.58	-0.231822	-0.22785
30.0	466.6533	70.44253	95.74525	67.95517	67.62736	83.90101	67.95267	67.9118	87.26381			411.295	130.915	0.075715	0.088686				3.48	1.46	14.52	4.62	-0.231071	-0.22783
40.0	456.6002	71.96306	98.18411	67.9042	67.55094	86.60906	67.92213	67.89002	84.54368			412.510	132.132	0.073802	0.085881				2.02	0.00	14.56	4.66	-0.231549	-0.22853
50.0	418.787	72.35694	99.44449	67.92898	67.54527	84.39952	67.95358	67.83973	83.68347			413.723	133.344	0.076066	0.086518				16.69	14.67	14.60	4.71	-0.230984	-0.22837
60.0	566.4371	71.90538	109.5623	67.98069	67.57865	83.89654	68.02156	67.87477	82.63313			414.928	134.554	0.08874	0.084091				14.43	12.41	14.65	4.75	-0.227815	-0.22898
70.0	566.9273	71.78568	109.3738	68.0255	67.59676	85.88636	68.04593	67.90164	82.72769			416.129	135.768	0.08526	0.085755				12.12	10.10	14.69	4.79	-0.228685	-0.22896
80.0	549.1007	71.03562	108.7061	67.98022	67.60279	82.76016	68.02443	67.9085	82.08739			417.334	136.988	0.08457	0.085529				9.95	7.92	14.73	4.84	-0.228857	-0.22862
90.0	507.6891	71.20088	105.8265	68.1378	67.619	84.83115	68.10945	67.9318	82.83172			418.541	138.200	0.08122	0.085206				8.19	6.16	14.77	4.88	-0.229695	-0.2287
100.0	424.8135	70.7664	100.056	68.18144	67.68267	83.06377	68.1781	68.01339	85.30232			419.743	139.410	0.070929	0.088242				7.00	4.98	14.82	4.92	-0.232268	-0.22794
110.0	371.9505	69.83768	95.03267	68.27172	67.78381	86.13532	68.29215	68.092	86.58442			420.948	140.625	0.064954	0.088426				6.31	4.29	14.86	4.96	-0.233762	-0.22789
120.0	353.3754	70.34619	92.79383	68.25446	67.84704	83.94144	68.35787	68.17315	86.67266			422.158	141.850	0.060876	0.091773				5.68	3.65	14.90	5.01	-0.234781	-0.22706
130.0	345.2914	69.66355	91.25259	68.38684	67.89104	83.19894	68.43187	68.24674	86.80835			423.365	143.072	0.062378	0.088565				5.06	3.04	14.94	5.05	-0.234405	-0.22786
140.0	323.646	69.06633	89.40757	68.36472	67.89936	82.42364	68.44894	68.26799	86.35681			424.575	144.295	0.058149	0.091114				4.55	2.53	14.99	5.09	-0.235463	-0.22722
150.0	303.2493	68.56232	87.81961	68.40056	67.94187	82.15946	68.4731	68.32259	85.89564			425.793	145.520	0.056687	0.091813				4.12	2.10	15.03	5.14	-0.235828	-0.22705
160.0	276.052	68.74955	85.97834	68.47023	68.03908	82.87405	68.58071	68.40185	85.80808			427.012	146.745	0.051474	0.093848				3.77	1.75	15.07	5.18	-0.237132	-0.22694
170.0	245.3235	68.56729	83.73057	68.50934	68.0782	87.29025	68.61732	68.46389	85.96504			428.228	147.970	0.046129	0.08879				3.57	1.55	15.12	5.22	-0.238468	-0.2278
180.0	228.0761	70.76459	83.48242	68.52778	68.1004	82.05062	68.6245	68.47817	85.55929			429.455	149.202	0.042311	0.091583				3.43	1.41	15.16	5.27	-0.239422	-0.2271
190.0	215.5087	71.19763	82.27582	68.55984	68.0941	83.68098	68.58485	68.47687	85.82954			430.676	150.420	0.040258	0.091327				3.28	1.25	15.20	5.31	-0.239935	-0.22717
200.0	207.2033	71.47371	81.31421	68.45564	68.06411	84.97515	68.49191	68.44814	86.13248			431.900	151.644	0.037589	0.089922				3.13	1.10	15.25	5.35	-0.240603	-0.22752
205.0	203.252	71.26747	80.95694	68.4876	68.05896	85.48266	68.58265	68.48468	86.07531			432.521	152.259	0.038125	0.089954				3.05	1.03	15.27	5.37	-0.240469	-0.22751

**Intertek Testing Services**

**Manufacturer: SBI**

**Model: 1.4 Series**

**Date: 11-20-20**

**Run: 4**

**Project #: G104473478**

**Test Duration (min): 205**

**Duration w/o cold-start: 160**

**RESULTS**

**Average emission rate:(gr/hr) 2.22**

Burn Rate (Dry kg/hr): 2.02

PRESSURE FACTOR: 0.99181

BAROMETRIC PRESSURE

Average: 29.675

TEMPERATURE FACTORS

Start: 29.7

DGM #1: 0.99998

End: 29.65

DGM #2: 0.99961

DRY GAS METER VALUES

VOLUMES SAMPLED

DGM #1 Final: 432.521

DGM #1: 24.90843

Initial: 407.655

DGM #2: 25.04634

DGM #2 Final: 152.259

TOTAL TUNNEL VOLUME (scf): 66372

Initial: 127.271

SAMPLE RATIOS

TEMPERATURES (DEG. RANKIN)

Sample Train 1: 2664.620

DGM #1: 528.012

Sample Train 2: 2649.949

DGM #2: 528.204

TOTAL EMISSIONS

CALIBRATION FACTORS

Sample Train 1 (g): **7.461**

DGM #1: 1.0100

Sample Train 2 (g): **7.685**

DGM #2: 1.0110

EMISSION RATES

TUNNEL FLOW RATE: 323.763

Sample Train 1 (g/hr): **2.18**

Sample Train 2 (g/hr): **2.25**

PARTICULATE CATCH (mg)

Total Sample Train 1: 2.8

Total Sample Train 2: 2.9

MAX Allowed 7.50%

Filter and seal Sample Train 1: 2.5

Filter and seal Sample Train 2: 2.5

Probe Sample Train 1: 0.3

DEVIATION: 1.48%

Probe Sample Train 2: 0.4

Room Temp		Bar Pressure		Relative Humidity		Air Velocity	
Before	After	Before	After	Before	After	Before	After
68	71	29.70	29.65	25.9	26.2	0	0
Average Dilution Tunnel Measurements						Sample Data	
Burn Time	Velocity (Ft/sec)	Flow Rate (dscf/min)	Temp (R)	Total Sample		Particulate Catch	
				1	2	1	2
205	16.63	323.76	551.81	24.91	25.05	2.80	2.90
Dilution Tunnel Dual Train Precision							
Sample Ratios			Total Emissions (g)				
	Train 1	Train 2	Train 1	Train 2	Deviation (%)		
	2664.62	2649.95	7.46	7.68	1.48%		
Burn Rate		Surface		Initial Draft		Run Time	Average Draft
1.579		0.000		0.002		205.000	0.061
Run	Date	Burn Rate	Emission				
4	2020-11-20	1.579	2.216				



# E&E Boiler Tunnel Traverse Worksheet

Static Pressure: **0.141**  
Barometer: 29.7

	TUNNEL VELOCITY	TUNNEL TEMP	SQUARE ROOT
A CENTER	0.094	68.200	0.3066
B CENTER	0.098	68.100	0.3130
A1	0.084	68.200	0.2898
A2	0.096	68.200	0.3098
A3	0.084	68.100	0.2898
A4	0.088	67.200	0.2966
B1	0.093	68.200	0.3050
B2	0.099	68.200	0.3146
B3	0.087	68.200	0.2950
B4	0.066	68.000	0.2569
AVERAGE		68.06	0.2977

**PITOT**  
**CONSTANT=** 0.9610

# E&E FUEL LOAD DATA SHEET

Test Load Weight:

	Lower	Ideal	Upper	
Firebox Volume: <input style="width: 80px;" type="text" value="1.55"/>	17.67	18.60	19.53	cu. ft

Load Volume:  cu. ft      Loading Density: 10.290 lbs./ft3

Number of Spacers:       Load Density: 10.290 lbs./ft3

Thick	Piece Size:			Weight lbs	Meter Moisture Content Dry Uncorrected %		
	x	Wide	x Length				
2		4	16	3.20	15.00	24.60	17.80
2		4	16	3.80	25.70	17.80	17.00
2		4	16	2.97	16.70	21.00	19.00
2		4	16	5.98	26.20	18.70	16.10

84.00  
84.00  
84.00  
84.00  
0.00  
0.00  
0.00  
0.00  
0.00

Test Load Weight  lbs.      Dry Weight  kg.

**Average Moisture Content: %**

Dry:             Wet:

**Pre-test moisture content: %**

           Wet:

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



November 20 Adjunct to ASTM E XXXX Wood Heater Cordwood Test Method  
 Cordwood Fuel Load Calculators - 10 lb/ft<sup>3</sup> Nominal Load Density  
 Core 45-65% of Total Load Weight, Remainder 35-55% of Total Load Weight  
 Values to be input manually

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For All Usable Firebox Volumes - High Fire Test Only				
Nominal Required Load Density (wet basis)	10	lb/ft <sup>3</sup>		
Usable Firebox Volume	1.55	ft <sup>3</sup>		
Total Nom. Load Wt. Target	15.50	lb		
Total Load Wt. Allowable Range	14.70	to	16.30	lb
Core Target Wt. Allowable Range	7.00	to	10.10	lb
Remainder Load Wt. Allowable Range	5.40	to	8.50	lb
				Mid-Point
Core Load Pc. Wt. Allowable Range	2.30	to	3.90	lb
Remainder Load Pc. Wt. Allowable Range	1.60	to	8.50	lb
	Pc. #			
Core Load Piece Wt. Actual	1	3.20	lb	In Range
	2	3.80	lb	In Range
	3	2.97	lb	In Range
Core Load Total. Wt. Actual		9.97	lb	In Range
	Pc. #			
Remainder Load Piece Wt.	1	5.98	lb	In Range
(1 to 3 Pcs.)	2		lb	NA
	3		lb	NA
Remainder Load Piece Weight Ratio - Small/Large		100%		NA
Remainder Load Tot. Wt. Act		5.98	lb	In Range
Total Load Wt. Actual		15.95	lb	In Range
Core % of Total Wt.		63%		In Range 45-65%
Remainder % of Total Wt.		37%		In Range 35-55%
Actual Load % of Nominal Target		103%		In Range 95-105%
Actual Fuel Load Density		10.3	lb/ft <sup>3</sup>	
<b>Kindling and Start-up Fuel</b>				
Maximum Kindling Wt. (20% of Tot. Load Wt.)		3.19	lb	
Actual Kindling Wt.		3.15	lb	In Range 19.8%
Maximum Start-up Fuel Wt. (30% of Tot. Load Wt.)		4.79	lb	
Actual Start-up Fuel Wt.		4.69	lb	In Range 29.4%
Allowable Residual Start-up Fuel Wt. Range	1.6	to	3.2	lb
Actual Residual Start-up Fuel Wt.		1.61	lb	In Range 2.4
Total Wt. All Fuel Added (wet basis)		23.80	lb	
<b>High Fire Test Run End Point Range</b>				
Based on Fuel Load Wt. (w/tares)	Low	1.4	to	High 1.8
Actual Fuel Load Ending Wt.		1.44	lb	In Range 1.6

Fuel Piece Moisture Reading (%-dry basis)							
1	2	3	Ave.		Pc. Wt. Dry Basis		
15	24.6	17.8	19.1	In Range	2.69	lb	1.22
25.7	17.8	17	20.2	In Range	3.16	lb	1.43
16.7	21	19	18.9	In Range	2.50	lb	1.13
26.2	18.7	16.1	20.3	In Range	4.97	lb	2.25
					0.00	lb	0.00
					0.00	lb	0.00
Total Load Ave. MC (%-dry basis)			19.8	In Range			
Total Load Ave. MC % (wet basis)			16.5				
Total Test Load Weight (dry basis)					13.32	lb	6.04
<b>Kindling Moisture (%-dry basis)</b>							
10	10	10	10.0	In Range	2.87	lb	1.30
<b>Start-up Fuel Moisture Readings (%-dry basis)</b>							
23	24.2	16.2	21.1	In Range	3.87	lb	1.76
Total Wt. All Fuel Added (dry basis)					20.06	lb	9.10
Total Wt. All Fuel Burned (dry basis)					17.0	lb	7.7



Intertek Testing Services			
<b>Manufacturer: SBI</b>		<b>RESULTS</b>	
<b>Model: 1.4 Series</b>			
<b>Date: 11-20-20</b>		<b>Average emission rate:(gr/hr)</b>	<b>#DIV/0!</b>
<b>Run: 4 - First hour</b>			
<b>Project #: G104473478</b>		Burn Rate (Dry kg/hr):	6.778
<b>Test Duration: 60 (minutes)</b>			
PRESSURE FACTOR:		0.99181	BAROMETRIC PRESSURE
TEMPERATURE FACTORS		Average: 29.675	
DGM #1:		0.99897	Start: 29.7
DGM #2:		1.14783	End: 29.65
		DRY GAS METER VALUES	
VOLUMES SAMPLED		DGM #1	Final: 58.738
	DGM #1:	7.38211	Initial: 51.361
	DGM #2:	0.00000	
		DGM #2	Final: 0.000
TOTAL TUNNEL VOLUME (scf):	19349		Initial: 0.000
SAMPLE RATIOS		TEMPERATURES (DEG. RANKIN)	
	Sample Train 1:	2621.101	DGM #1: 528.547
	Sample Train 2:	#DIV/0!	DGM #2: 460.000
TOTAL EMISSIONS		CALIBRATION FACTORS	
	Sample Train 1 (g):	4.456	DGM #1: 1.0100
	Sample Train 2 (g):	#DIV/0!	DGM #2: 1.0110
EMISSION RATES		TUNNEL FLOW RATE: 322.488	
	Sample Train 1 (g/hr):	4.46	
	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: 1.7
	MAX Allowed	7.50%	Filter and seal Sample Train 2: 0
			Probe Sample Train 1: 0
DEVIATION:		#DIV/0!	Probe Sample Train 2: 0

# Filters pre-weights

## General information

Project:	G104473478
Project Engineer:	Claude Pelland
Scale ID:	SBI-206

Calibration Record	Date		2020-11-10		2020-11-12		2020-11-16		2020-11-17		2020-11-18		2020-11-19		2020-11-20	
	Pression barométrique		99.95		100.1		98.5		99.4		101.0		101.4		101.0	
SBI-237	0.1000	0.1000	0.0999		0.1000		0.1000		0.1000		0.1000		0.1000		0.0999	
SBI-238	10.0001	10.0001	10.0000		10.0001		10.0000		10.0000		10.0001		10.0000		10.0001	
SBI-238	200.0000	200.0000	200.0000		200.0000		200.0000		200.0000		200.0000		199.9999		200.0001	
Start Time	Temp. [°F]	13h31	72.3	9h00	73.5	8h46	68.3	9h35	68.8	10h25	68.7	10h21	68.4	8h30	68.9	
End Time	RH [%]	15h00	2.1	11h30	0	9h40	0.2	10h25	0.1	11h07	0.1	10h48	0.4	9h30	1.6	
	Filter ID	Weight (g)	Weight (g)	Weight (g)	Weight (g)	Weight (g)	Weight (g)	Weight (g)	Weight (g)	Weight (g)	Weight (g)	Weight (g)	Weight (g)	Weight (g)	Weight (g)	Weight (g)
front	1	183.3	183.3	183.3	183.3											
rear	2															
front	3	179.0	179.0	179.0	179.0											
rear	4															
front	5	183.5	183.5	183.5	183.5											
rear	6															
front	7	183.9	183.9	183.9	183.9				183.8							
rear	8															
front	9	184.3	184.3	184.3	184.3				184.3							
rear	10															
front	11	184.0	184.0	184.0	184.0				184.0							
rear	12															
front	17	182.4	182.4	182.4	182.4							182.4				
rear	18															
front	21	182.4	182.4	182.4	182.4							182.4				
rear	22															
front	23	183.7	183.7	183.7	183.7							183.6				
rear	24															
front	25	185.1	185.0	185.0	185.0											185.0
rear	26															
front	29	185.0	185.0	185.0	185.0											185.0
rear	30															
front	33	183.4	183.4	183.4	183.4											183.4
rear	34															



## Filters weights

### General information

<b>Project:</b>	G104473478
<b>Project Engineer:</b>	Claude Pelland
<b>Scale ID:</b>	SBI-206

		Date/Pressure [kPa]		2020-11-17/99.4		2020-11-17/99.4		2020-11-26/100.5		2020-11-30/100.1	
<b>Calibration Record</b>	SBI-237	0.1000	0.1000	0.1000	0.1000	0.0999	0.1000	0.0999	0.1000	0.1000	0.1000
	SBI-238	10.0001	10.0000	10.0000	10.0000	10.0001	10.0001	10.0001	10.0001	10.0001	10.0001
	SBI-238	200.0000	200.0000	200.0000	200.0000	200.0000	200.0000	200.0000	200.0000	199.9999	199.9999
	Start Time	Temp. [°F]	9h35	68.8	18h10	68.8	11h15	69.0	10h20	70.7	
	End Time	RH [%]	10h25	0.1	18h18	0.1	11h45	0.2	10h40	1.7	

Run	Sampling train	Filter ID	Pretest Weight (mg)	Post test Weight (mg)	Post test Weight (mg)	Post test Weight (mg)	Post test Weight (mg)
1	1	front	183.3	188.3	188.2	188.2	188.2
		rear					
	2	front	179.0	183.8	184	183.9	183.9
		rear					
	3 (1 hr)	front	183.5	187.4	186.9	186.9	186.9
		rear					

		Date/Pressure									
<b>Calibration Record</b>	SBI-237	0.1000									
	SBI-238	10.0001									
	SBI-238	200.0000									
	Start Time	Temp. [°F]									
	End Time	RH [%]									

Run	Sampling train	Filter ID	Post test Weight (mg)	Post test Weight (mg)	Post test Weight (mg)	Post test Weight (mg)
1	1	front				
		rear				
	2	front				
		rear				
	3 (1 hr)	front				
		rear				

		Date/Pressure									
<b>Calibration Record</b>	SBI-237	0.1000									
	SBI-238	10.0001									
	SBI-238	200.0000									
	Start Time	Temp. [°F]									
	End Time	RH [%]									

Run	Sampling train	Filter ID	Post test Weight (mg)	Post test Weight (mg)	Post test Weight (mg)	Post test Weight (mg)
	1	front				
		rear				
	2	front				
		rear				
	3 (1 hr)	front				
		rear				

## Filters weights

### General information

<b>Project:</b>	G104473478
<b>Project Engineer:</b>	Claude Pelland
<b>Scale ID:</b>	SBI-206

		Date/Pressure		2020-11-18/101.0		2020-11-18/101.0		2020-11-26/100.5		2020-11-30/100.1	
<b>Calibration Record</b>	SBI-237	0.1000	0.1000	0.1000	0.1000	0.0999	0.1000	0.0999	0.1000	0.1000	0.1000
	SBI-238	10.0001	10.0001	10.0001	10.0001	10.0001	10.0001	10.0001	10.0001	10.0001	10.0001
	SBI-238	200.0000	200.0000	200.0000	200.0000	200.0000	200.0000	200.0000	200.0000	199.9999	199.9999
	Start Time	Temp. [°F]	10h25	68.7	19h30	68.7	11h15	69.0	10h20	70.7	70.7
	End Time	RH [%]	11h07	0.1	19h40	0.1	11h45	0.2	10h40	1.7	1.7

Run	Sampling train	Filter ID	Pretest Weight (mg)	Post test Weight (mg)	Post test Weight (mg)	Post test Weight (mg)	Post test Weight (mg)
2	1	front	183.8	187.0	187.2	187.1	
		rear					
	2	front	184.3	187.6	187.6	187.7	
		rear					
	3 (1 hr)	front	184.0	186.8	186.7	186.7	
		rear					

		Date/Pressure									
<b>Calibration Record</b>	SBI-237	0.1000									
	SBI-238	10.0001									
	SBI-238	200.0000									
	Start Time	Temp. [°F]									
	End Time	RH [%]									

Run	Sampling train	Filter ID	Post test Weight (mg)	Post test Weight (mg)	Post test Weight (mg)	Post test Weight (mg)
2	1	front				
		rear				
	2	front				
		rear				
	3 (1 hr)	front				
		rear				

		Date/Pressure									
<b>Calibration Record</b>	SBI-237	0.1000									
	SBI-238	10.0001									
	SBI-238	200.0000									
	Start Time	Temp. [°F]									
	End Time	RH [%]									

Run	Sampling train	Filter ID	Post test Weight (mg)	Post test Weight (mg)	Post test Weight (mg)	Post test Weight (mg)
2	1	front				
		rear				
	2	front				
		rear				
	3 (1 hr)	front				
		rear				

## Filters weights

### General information

<b>Project:</b>	G104473478
<b>Project Engineer:</b>	Claude Pelland
<b>Scale ID:</b>	SBI-206

		Date/Pressure		2020-11-19/101.4		2020-11-19/101.4		2020-11-26/100.5		2020-11-30/100.1	
<b>Calibration Record</b>	SBI-237	0.1000	0.1000	0.1000	0.1000	0.0999	0.1000	0.0999	0.1000	0.1000	0.1000
	SBI-238	10.0001	10.0000	10.0000	10.0000	10.0001	10.0001	10.0001	10.0001	10.0001	10.0001
	SBI-238	200.0000	199.9999	199.9999	199.9999	200.0000	200.0000	200.0000	200.0000	199.9999	199.9999
	Start Time	Temp. [°F]	10h21	68.4	20h07	68.4	11h15	69.0	10h20	70.7	
	End Time	RH [%]	10h48	0.4	20h18	0.4	11h45	0.2	10h40	1.7	

Run	Sampling train	Filter ID	Pretest Weight (mg)	Post test Weight (mg)	Post test Weight (mg)	Post test Weight (mg)
	1	front	182.4	185.4	185.4	185.4
		rear				
3	2	front	182.4	185.3	185.3	185.3
		rear				
3 (1 hr)	3 (1 hr)	front	183.6	185.6	185.6	185.5
		rear				

		Date/Pressure									
<b>Calibration Record</b>	SBI-237	0.1000									
	SBI-238	10.0001									
	SBI-238	200.0000									
	Start Time	Temp. [°F]									
	End Time	RH [%]									

Run	Sampling train	Filter ID	Post test Weight (mg)	Post test Weight (mg)	Post test Weight (mg)	Post test Weight (mg)
	1	front				
		rear				
3	2	front				
		rear				
3 (1 hr)	3 (1 hr)	front				
		rear				

		Date/Pressure									
<b>Calibration Record</b>	SBI-237	0.1000									
	SBI-238	10.0001									
	SBI-238	200.0002									
	Start Time	Temp. [°F]									
	End Time	RH [%]									

Run	Sampling train	Filter ID	Post test Weight (mg)	Post test Weight (mg)	Post test Weight (mg)	Post test Weight (mg)
	1	front				
		rear				
2	2	front				
		rear				
3 (1 hr)	3 (1 hr)	front				
		rear				



## Filters weights

### General information

<b>Project:</b>	G104473478
<b>Project Engineer:</b>	Claude Pelland
<b>Scale ID:</b>	SBI-206

		Date/Pressure		2020-11-20/101.0		2020-11-20/101.0		2020-11-26/100.5		2020-11-30/100.1	
<b>Calibration Record</b>	SBI-237	0.1000	0.0999		0.0999		0.0999		0.1000		
	SBI-238	10.0001	10.0001		10.0001		10.0001		10.0001		
	SBI-238	200.0000	200.0001		200.0001		200.0000		199.9999		
	Start Time	Temp. [°F]	8H30	68.9	14h15	68.9	11h15	69.0	10h20	70.7	
	End Time	RH [%]	9H30	1.6	14h20	1.6	11h45	0.2	10h40	1.7	

Run	Sampling train	Filter ID	Pretest Weight (mg)	Post test Weight (mg)	Post test Weight (mg)	Post test Weight (mg)
4	1	front	185.0	187.5	187.4	187.5
		rear				
	2	front	185.0	187.4	187.6	187.5
		rear				
	3 (1 hr)	front	183.4	185.2	185.1	185.1
		rear				

		Date/Pressure									
<b>Calibration Record</b>	SBI-237	0.1000									
	SBI-238	10.0001									
	SBI-238	200.0000									
	Start Time	Temp. [°F]									
	End Time	RH [%]									

Run	Sampling train	Filter ID	Post test Weight (mg)	Post test Weight (mg)	Post test Weight (mg)	Post test Weight (mg)
4	1	front				
		rear				
	2	front				
		rear				
	3 (1 hr)	front				
		rear				

		Date/Pressure									
<b>Calibration Record</b>	SBI-237	0.1000									
	SBI-238	10.0001									
	SBI-238	200.0002									
	Start Time	Temp. [°F]									
	End Time	RH [%]									

Run	Sampling train	Filter ID	Post test Weight (mg)	Post test Weight (mg)	Post test Weight (mg)	Post test Weight (mg)
	1	front				
		rear				
	2	front				
		rear				
	3 (1 hr)	front				
		rear				

## Probes weights

### General information

<b>Project:</b>			G104473478					
<b>Project Engineer:</b>			Claude Pelland					
<b>Scale ID:</b>			SBI-206					

		<b>Date/Pressure</b>		2020-11-17/99.4		2020-11-17/99.4		2020-11-26/100.5		2020-11-30/100.1		
<b>Calibration Record</b>	SBI-237	0.1000	0.1000	0.1000	0.0999	0.1000						
	SBI-238	10.0001	10.0000	10.0000	10.0001	10.0001						
	SBI-238	200.0000	200.0000	200.0000	200.0000	199.9999						
Start Time		Temp. [°F]	9h35	68.8	18h10	68.8	11h15	69.0	10h20	70.7		
End Time		RH [%]	10h25	0.1	18h23	0.1	11h45	0.2	10h40	1.7		

Run	Sampling train	Probe ID	Pretest Weight (g)	Post test Weight (g)	Post test Weight (g)	Post test Weight (g)
1	1	59	94.3349	94.3349	94.3354	94.3354
	2	60	94.1210	94.1214	94.1218	94.1216
	3 (1 hr)	65	94.0269	94.0278	94.0273	94.0273

		<b>Date/Pressure</b>										
<b>Calibration Record</b>	SBI-237	0.1000										
	SBI-238	10.0001										
	SBI-238	200.0000										
Start Time		Temp. [°F]										
End Time		RH [%]										

Run	Sampling train	Probe ID	Post test weight (g)	Post test Weight (g)	Post test Weight (g)	Post test Weight (g)
1	1					
	2					
	3 (1 hr)					

		<b>Date/Pressure</b>										
<b>Calibration Record</b>	SBI-237	0.1000										
	SBI-238	10.0001										
	SBI-238	200.0000										
Start Time		Temp. [°F]										
End Time		RH [%]										

Run	Sampling train	Probe ID	Post test Weight (g)	Post test Weight (g)	Post test Weight (g)	Post test Weight (g)
1	1					
	2					
	3 (1 hr)					

## Probes weights

### General information

<b>Project:</b>	G104473478
<b>Project Engineer:</b>	Claude Pelland
<b>Scale ID:</b>	SBI-206

		Date/Pressure		2020-11-18/101.0		2020-11-18/101.0		2020-11-26/100.5		2020-11-30/100.1	
<b>Calibration Record</b>	SBI-237	0.1000	0.1000	0.1000	0.0999	0.1000					
	SBI-238	10.0001	10.0001	10.0001	10.0001	10.0001					
	SBI-238	200.0000	200.0000	200.0000	200.0000	199.9999					
	Start Time	Temp. [°F]	10h25	68.7	19h30	68.7	11h15	69.0	10h20	70.7	
	End Time	RH [%]	11h07	0.1	19h40	0.1	11h45	0.2	10h40	1.7	

Run	Sampling train	Probe ID	Pretest Weight (g)	Post test Weight (g)	Post test Weight (g)	Post test Weight (g)
2	1	2	79.7016	79.7021	79.7029	79.7029
	2	3	79.8830	79.8837	79.8839	79.8840
	3 (1 hr)	64	94.2245	94.2262	94.2251	94.2253

		Date/Pressure									
<b>Calibration Record</b>	SBI-237	0.1000									
	SBI-238	10.0001									
	SBI-238	200.0000									
	Start Time	Temp. [°F]									
	End Time	RH [%]									

Run	Sampling train	Probe ID	Post test weight (g)	Post test Weight (g)	Post test Weight (g)	Post test Weight (g)
2	1					
	2					
	3 (1 hr)					

		Date/Pressure									
<b>Calibration Record</b>	SBI-237	0.1000									
	SBI-238	10.0001									
	SBI-238	200.0000									
	Start Time	Temp. [°F]									
	End Time	RH [%]									

Run	Sampling train	Probe ID	Post test Weight (g)	Post test Weight (g)	Post test Weight (g)	Post test Weight (g)
2	1					
	2					
	3 (1 hr)					

## Probes weights

### General information

<b>Project:</b>	G104473478
<b>Project Engineer:</b>	Claude Pelland
<b>Scale ID:</b>	SBI-206

		Date/Pressure		2020-11-19/101.4		2020-11-19/101.4		2020-11-26/100.5		2020-11-30/100.1	
<b>Calibration Record</b>	SBI-237	0.1000	0.1000	0.1000	0.0999	0.1000					
	SBI-238	10.0001	10.0000	10.0000	10.0001	10.0001					
	SBI-238	200.0000	199.9999	199.9999	200.0000	199.9999					

Start Time	Temp. [°F]	10h21	68.4	20h07	68.4	11h15	69.0	10h20	70.7
End Time	RH [%]	10h48	0.4	20h18	0.4	11h45	0.2	10h40	1.7

Run	Sampling train	Probe ID	Pretest Weight (g)	Post test Weight (g)	Post test Weight (g)	Post test Weight (g)
3	1	10	80.1542	80.1561	80.1551	80.1551
	2	32	80.6799	80.6810	80.6806	80.6806
	3 (1 hr)	34	80.7719	80.7738	80.7726	80.7726

		Date/Pressure									
<b>Calibration Record</b>	SBI-237	0.1000									
	SBI-238	10.0001									
	SBI-238	200.0000									
Start Time	Temp. [°F]										
End Time	RH [%]										

Run	Sampling train	Probe ID	Post test weight (g)	Post test Weight (g)	Post test Weight (g)	Post test Weight (g)
3	1	60				
	2	58				
	3 (1 hr)	37				

		Date/Pressure									
<b>Calibration Record</b>	SBI-237	0.1000									
	SBI-238	10.0001									
	SBI-238	200.0000									
Start Time	Temp. [°F]										
End Time	RH [%]										

Run	Sampling train	Probe ID	Post test Weight (g)	Post test Weight (g)	Post test Weight (g)	Post test Weight (g)
3	1					
	2					
	3 (1 hr)					

## Probes weights

### General information

<b>Project:</b>	G104473478
<b>Project Engineer:</b>	Claude Pelland
<b>Scale ID:</b>	SBI-206

		Date/Pressure		2020-11-20/101.0		2020-11-20/101.0		2020-11-26/100.5		2020-11-30/100.1	
<b>Calibration Record</b>	SBI-237	0.1000	0.0999		0.0999		0.0999		0.1000		
	SBI-238	10.0001	10.0001		10.0001		10.0001		10.0001		
	SBI-238	200.0000	200.0001		200.0001		200.0000		199.9999		
	Start Time	Temp. [°F]	8H30	68.9	14h15	68.9	11h15	69.0	10h20	70.7	
	End Time	RH [%]	9H30	1.6	14h20	1.6	11h45	0.2	10h40	1.7	

Run	Sampling train	Probe ID	Pretest Weight (g)	Post test Weight (g)	Post test Weight (g)	Post test Weight (g)
4	1	5	80.6303	80.6306	80.6305	80.6306
	2	18	80.8797	80.8800	80.8801	80.8801
	3 (1 hr)	33	82.8743	82.8751	82.8745	82.8743

		Date/Pressure									
<b>Calibration Record</b>	SBI-237	0.1000									
	SBI-238	10.0001									
	SBI-238	200.0000									
	Start Time	Temp. [°F]									
	End Time	RH [%]									

Run	Sampling train	Probe ID	Post test weight (g)	Post test Weight (g)	Post test Weight (g)	Post test Weight (g)
4	1					
	2					
	3 (1 hr)					

		Date/Pressure									
<b>Calibration Record</b>	SBI-237	0.1000									
	SBI-238	10.0001									
	SBI-238	200.0000									
	Start Time	Temp. [°F]									
	End Time	RH [%]									

Run	Sampling train	Probe ID	Post test Weight (g)	Post test Weight (g)	Post test Weight (g)	Post test Weight (g)
4	1					
	2					
	3 (1 hr)					

**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 17025 Registered  
ANSI/NCSL Z540-1 Accredited

## Certificat de Calibration de Précision

### Accuracy Calibration Certificate

#### Client

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

#### Weighing Device

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

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

#### Procedure

**Instruction de Calibration:** EURAMET cg-18 v. 4.0 (11/2015)  
**Instruction de travail METTLER TOLEDO:** 30260953 Rev1.31

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: 19.0 °C	End: 19.0 °C
Tel que Laissé	Start: 19.0 °C	End: 19.0 °C

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

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

**Date calibration Tel que Trouvé:** 09-Mar-2020  
**Date calibration Tel que Laissé:** 09-Mar-2020  
**Date d'Émission:** 09-Mar-2020  
**Requested Next Calibration Date:** 31-Mar-2021

**Authorized A2LA Signatory:**

Dany Careau

## Résultats de Mesure

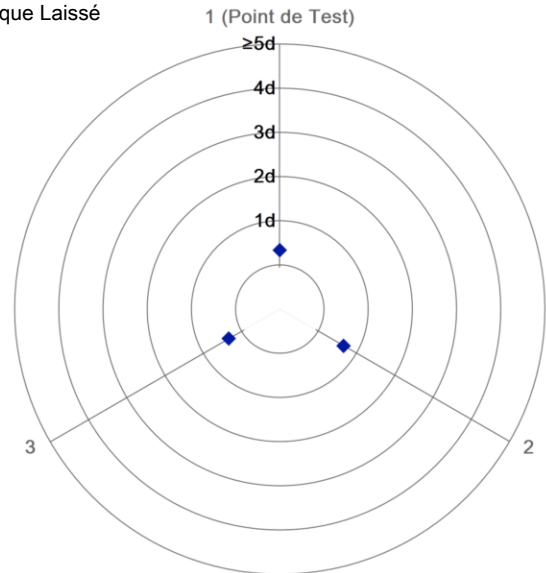
### Répétabilité

Charge de Test: 100 kg

	Tel que Trouvé	Tel que Laissé
1	N/D	100.00 kg
2	N/D	100.02 kg
3	N/D	100.00 kg

○ Tel que Trouvé  
◆ Tel que Laissé

Écart Type	N/D	0.012 kg
------------	-----	----------



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

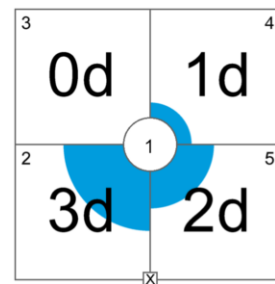
The results of this graph are based upon the absolute values of the differences from the mean value.

### Excentricité

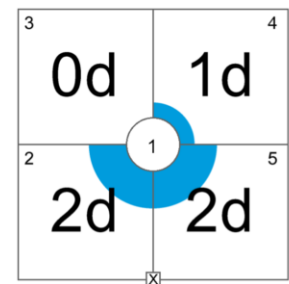
Charge de Test: 100 kg

Position	Tel que Trouvé	Tel que Laissé
1	99.96 kg	100.00 kg
2	99.90 kg	99.96 kg
3	99.96 kg	100.00 kg
4	99.98 kg	100.02 kg
5	100.00 kg	100.04 kg

Déviaton Maximale	0.06 kg	0.04 kg
-------------------	---------	---------



Tel que Trouvé



Tel que Laissé

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

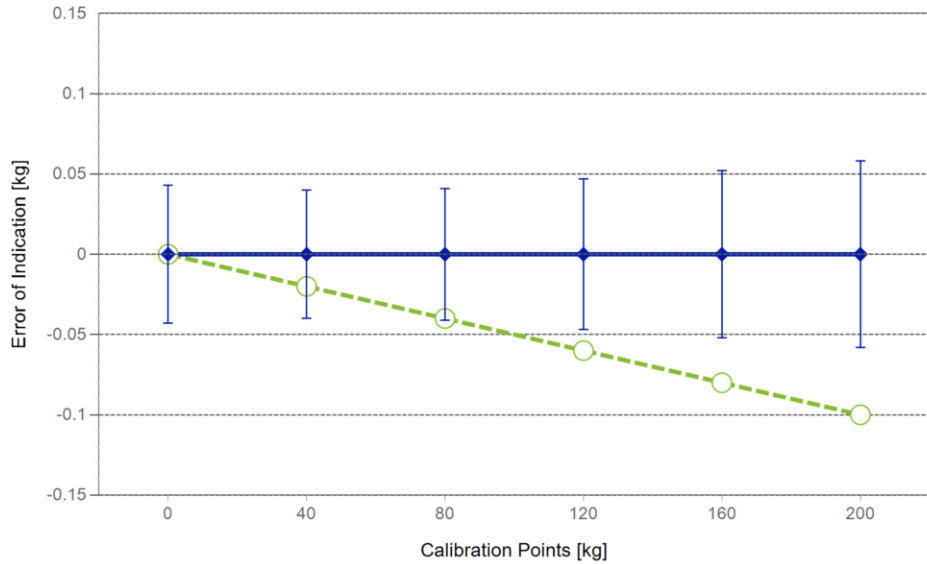
### Erreur d'indication

Tel que Trouvé

	Reference Value	Indication	Erreur d'indication	Incertitude Élargie	k
1	0 kg	0.00 kg	0.00 kg	N/D	N/D
2	40 kg	39.98 kg	-0.02 kg	N/D	N/D
3	80 kg	79.96 kg	-0.04 kg	N/D	N/D
4	120 kg	119.94 kg	-0.06 kg	N/D	N/D
5	160 kg	159.92 kg	-0.08 kg	N/D	N/D
6	200 kg	199.90 kg	-0.10 kg	N/D	N/D

**Tel que Laissé**

	Reference Value	Indication	Erreur d'indication	Incertitude Élargie	k
1	0 kg	0.00 kg	0.00 kg	0.043 kg	3.31
2	40 kg	40.00 kg	0.00 kg	0.040 kg	2.65
3	80 kg	80.00 kg	0.00 kg	0.041 kg	2.37
4	120 kg	120.00 kg	0.00 kg	0.047 kg	2.28
5	160 kg	160.00 kg	0.00 kg	0.052 kg	2.13
6	200 kg	200.00 kg	0.00 kg	0.058 kg	2.05



○ Tel que Trouvé

◆ Tel que Laissé

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

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

**Test Equipment**

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

**Jeu de Poids 1: OIML M1**

Weight Set Number:	Q1	Date d'Émission:	13-Mar-2019
# Certificat:	1415364	Date de Calibration Due:	13-Mar-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

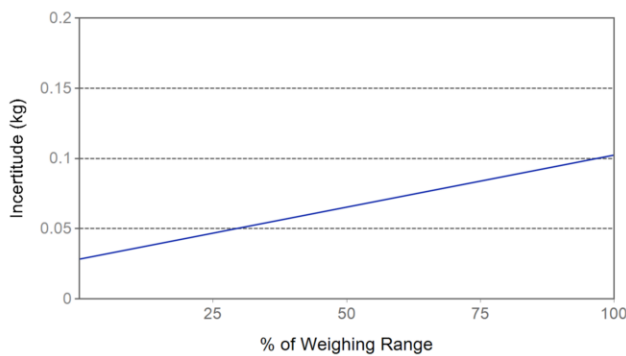
### Linéarisation de l'Équation d'Incertitude

	Plage	Tel que Trouvé	Tel que Laissé
1	0 kg - 500 kg	N/A	$U_1 = 28 \text{ g} + 0.371 \text{ g/kg} \cdot R$

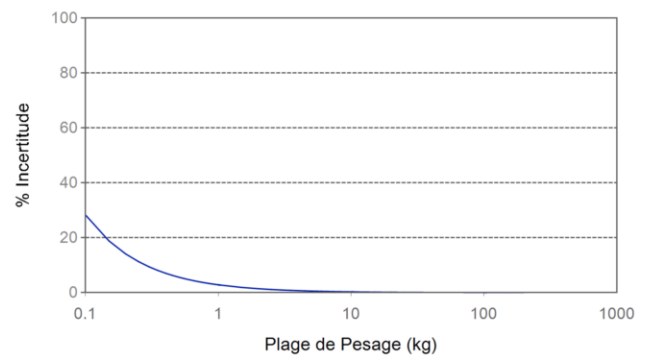
To optimize the stability of the linearization, besides of the zero load only increasing measurement points with a test load of 5% of the measurement range or larger are taken for the calculation of the linear equation.

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

Indication Net	Tel que Trouvé		Tel que Laissé	
0.20 kg	N/A	N/A	0.028 kg	14%
2.00 kg	N/A	N/A	0.029 kg	1.4%
20.00 kg	N/A	N/A	0.035 kg	0.18%
100.00 kg	N/A	N/A	0.065 kg	0.065%
200.00 kg	N/A	N/A	0.10 kg	0.051%



Tel que Trouvé



Tel que Laissé

# Handbook 44 Tolerance Assessment (Entretien)

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

Tel que Trouvé
Tel que Laissé

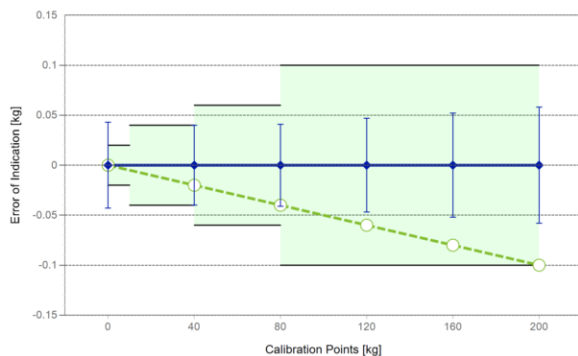
✔
✔
✘

= Passed  
 = Failed

## Global

### Weighing Device

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



Tolerances according to NIST Handbook 44

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

○ Tel que Trouvé

◆ Tel que Laissé

— Tolérance

### Eccentricity and Repeatability

Test	Test Load	Tolérance	As Found		As Left	
			Max. Error / Range	Result	Max. Error / Range	Result
Excentricité (Maximum Error)	100 kg	0.10 kg	0.1 kg	✔	0.04 kg	✔
Excentricité (Plage)	100 kg	0.1 kg	0.10 kg	✔	0.08 kg	✔
Répétabilité (Maximum Error)	100 kg	0.1 kg	N/D	N/D	0.02 kg	✔
Répétabilité (Plage)	100 kg	0.10 kg	N/D	N/D	0.02 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	✔



**Ulrich Métrologie Inc.**  
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[www.ulrich.ca](http://www.ulrich.ca)



# CALIBRATION CERTIFICATE

<b>Certificate no.:</b>	753379	<b>Calibration date:</b>	May 25, 2020
<b>Identification:</b>	SBI-096	<b>Certificate issued:</b>	May 25, 2020
<b>Description:</b>	CALIBRATOR, OMEGA CL23A	<b>Interval:</b>	12 months
<b>Size:</b>	TC KJJ/T	<b>Due date:</b>	May 25, 2021
<b>Manufacturer:</b>	OMEGA	<b>Procedure no.:</b>	MET/CAL
<b>Model no.:</b>	CL23A	<b>Environment:</b>	CLAS Type 2 Laboratory
<b>Serial no.:</b>	T-256137	<b>Temperature:</b>	23 ± 2°C
		<b>Humidity:</b>	35 - 55% RH
		<b>Metrologist:</b>	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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## CALIBRATION DATA

Certificate no.: 753379  
 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	2020/03/20	2021/03/31

### MEASUREMENT RESULTS (Per MET/CAL)

PARAMETER	TRUE VALUE	TEST RESULT	ACCEPTANCE LIMITS LOW	ACCEPTANCE 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		-199.8	-201.0	-199.0	PASS	1.7
-60.0degF		-59.7	-61.0	-59.0	PASS	3.1
-40.0degF		-39.9	-40.5	-39.5	PASS	1.5
32.0degF		32.2	31.5	32.5	PASS	1.7
300.0degF		300.2	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		1260.1	1259.5	1260.5	PASS	1.1
2500.0degF		2500.2	2499.0	2501.0	PASS	1.4
J Type Thermocouple						
-200.0degF		-200.1	-201.0	-199.0	PASS	2.1
-60.0degF		-59.9	-61.0	-59.0	PASS	3.5
-40.0degF		-40.0	-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		299.9	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		-200.1	-201.0	-199.0	PASS	2.3
-60.0degF		-59.9	-61.0	-59.0	PASS	2.3
-40.0degF		-40.0	-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		571.9	571.5	572.5	PASS	2.0
750.0degF		750.0	749.5	750.5	PASS	2.0



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PARAMETER	TRUE	TEST	ACCEPTANCE LIMITS		PASS/	TUR
	VALUE	RESULT	LOW	HIGH	FAIL	
CALIBRATOR CALIBRATION						
K Type Thermocouple						
-200.0degF		-199.5	-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		32.2	31.5	32.5	PASS	1.7
300.0degF		300.1	299.5	300.5	PASS	1.1
572.0degF		572.2	571.5	572.5	PASS	1.1
1240.0degF		1240.3	1239.5	1240.5	PASS	1.1
1260.0degF		1260.2	1259.5	1260.5	PASS	1.1
2500.0degF		2500.4	2499.0	2501.0	PASS	1.4
J Type Thermocouple						
-200.0degF		-199.7	-201.0	-199.0	PASS	2.1
-60.0degF		-60.0	-61.0	-59.0	PASS	3.5
-40.0degF		-39.8	-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		1260.1	1259.5	1260.5	PASS	1.6
1400.0degF		1399.9	1399.4	1400.6	PASS	1.8
T Type Thermocouple						
-200.0degF		-199.8	-201.0	-199.0	PASS	2.3
-60.0degF		-59.9	-61.0	-59.0	PASS	2.3
-40.0degF		-39.8	-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
750.0degF		750.0	749.5	750.5	PASS	2.0

*End of Test Data*

**CERTIFICAT D'ÉTALONNAGE # 13027**

Date d'étalonnage : 2020-10-13

Date d'émission du certificat : 2020-10-13

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

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

**CONFORMITÉ AU PROGRAMME DE QUALITÉ**

Tous les étalonnages sont effectués conformément au manuel d'assurance qualité de Polycontrols qui est conforme à la norme ISO/IEC 17025 – 2017, à la norme ISO 9001 – 2015 ainsi qu'à 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, ANSI/NCSL Z540-1-1994, ISO-10012-1, MIL-STD 45662A.

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

**APTITUDE EN MATIÈRE DE MESURE ET D'ÉTALONNAGE - CMC**


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



Bernard Poirier  
Métrologiste



Responsable du laboratoire

## Certificat d'étalonnage # 13027

Numéro de série:	07J264834	Station de mesure:	3
Date d'étalonnage:	2020-10-13	Procédure:	POS-CAL-005
Identification de l'instrument:	SBI-103	Règle de décision:	Méthode #2

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

Description	Modèle	# Série	Traçabilité	Date dû
DHI molbloc (30 slpm)	3E4-VCR-V-Q	2359	1500279712	2021-03-04
DHI molbox1	Molbox1	755	1500285062	2021-06-09
RTD Mist	Mist	L00295	2019008203	2020-12-13
Module 44.5 PSI avec Baro 163671	Module 30	160659	2020003156	2021-04-28

### Spécifications finales de l'appareil

### Condition d'étalonnage

Gaz	Air	Gaz	Air
Température d'opération		Température ambiante	22 °C
Pression à l'entrée		Pression ambiante	1017.71 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.		

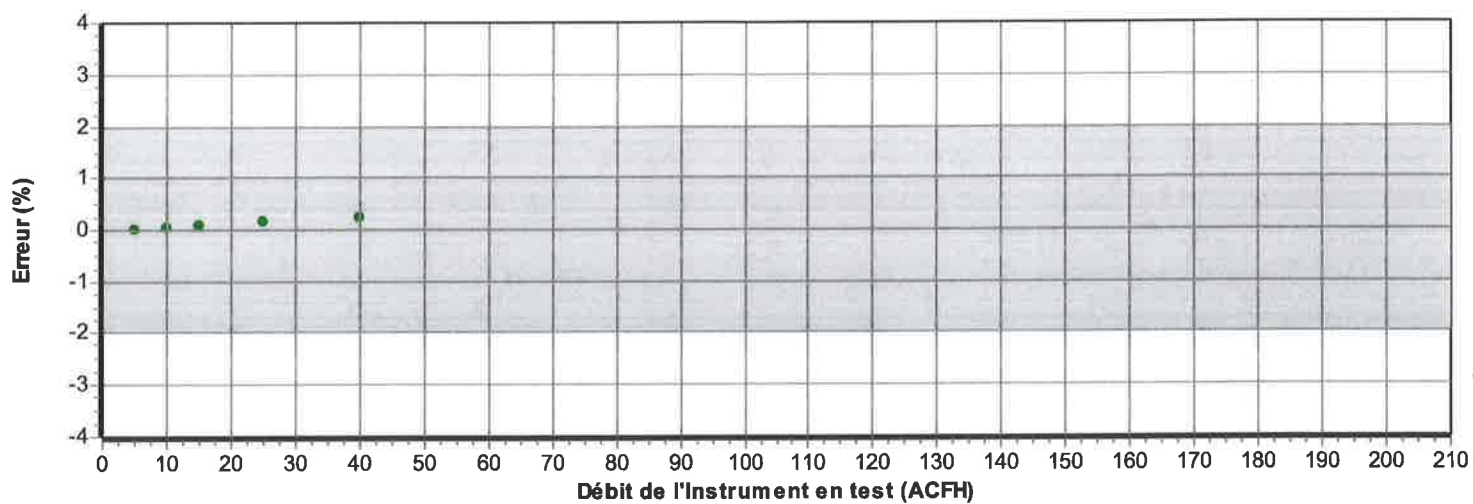
### Lectures finales

Débit du test ACFH	Instrument en test ft <sup>3</sup>	Valeurs mesurées			Référence calculée ft <sup>3</sup>	Erreur calculée ft <sup>3</sup>	Tolérance acceptable ft <sup>3</sup>	Incertitude k = 2 ft <sup>3</sup>	TUR
		Pression PSIA	Température °C	Référence ft <sup>3</sup>					
5.0012	0.8350	14.7006	22.19	0.8297	0.8325	0.0025	0.6658	0.0034	>4
10.0479	1.6910	14.6978	22.14	1.6681	1.6737	0.0173	0.6663	0.0056	>4
15.0460	2.5350	14.6960	22.09	2.4977	2.5060	0.0290	0.6662	0.0083	>4
25.0808	4.2250	14.6987	22.01	4.1601	4.1720	0.0530	0.6654	0.0139	>4
40.1053	6.7640	14.7066	21.93	6.6675	6.6813	0.0827	0.6664	0.0222	>4

## Certificat d'étalonnage # 13027

Numéro de série:	07J264834	Station de mesure:	3
Date d'étalonnage:	2020-10-13	Procédure:	POS-CAL-005
Identification de l'instrument:	SBI-103	Règle de décision:	Méthode #2

## Résultats finaux



Voir l'annexe pour la règle de décision





Fabricant de poêle international inc.  
Stove Builder International Inc.

# CERTIFICAT DE VÉRIFICATION

## VERIFICATION CERTIFICATE

**No. Certificat :** 20201028001

**Identification :** SBI-153

**Description :** Moisture content standard

**Manufacturier :** Delmhorst

**No. Modèle :** MCS-1

**No. Série :** 81808

**Propriété de :** SBI

250 de Copenhague

St-Augustin-de-Desmaures, QC G3A 2H3

**Date de vérification :** 28 octobre 2020

**Prochaine vérification :** 28 octobre 2021

**Méthode utilisée :** Cal-Temp\_01

**Température :** 69.8 °F

**Humidité :** 25.4 %

**État avant calibration :** Bon état

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

### MESURES D'INCERTITUDE

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

### REMARQUES

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

### ÉTALON UTILISÉ POUR VÉRIFIER L'ÉQUIPEMENT

No. de l'étalon utilisé	Description	No. de certificat	Date de calibration	Date d'échéance
SBI-194	Multimètre	724382	2019-10-30	2020-10-30



Fabricant de poêle international inc.  
Stove Builder International Inc.

# CERTIFICAT DE VÉRIFICATION

## VERIFICATION CERTIFICATE

### DONNÉES DE VÉRIFICATION

Unités : MΩ

Résultat : PASS

S.D.	0.00	%	
R.M.U.	0.91	%	
<b>O.M.U</b>	<b>98.18</b>	<b>%</b>	
	Ave A.D.	0.00	%
Standard	Reading	A.D.	
1.10	1.10	0.00	
1.10	1.10	0.00	
1.10	1.10	0.00	

S.D.	0.00	%	
R.M.U.	0.83	%	
<b>O.M.U</b>	<b>98.00</b>	<b>%</b>	
	Ave A.D.	0.56	%
Standard	Reading	A.D.	
120	120	0.00	
120	119	0.83	
120	119	0.83	

VÉRIFIÉ PAR :

Gabrielle Santerre

FIN DU CERTIFICAT

## 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  $\pm 0.2$  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**



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# CALIBRATION CERTIFICATE

**Certificate no.:** 724382  
**Identification:** SBI-194  
**Description:** MULTIMETER, RADIO SHACK 22-168A  
**Manufacturer:** RADIO SHACK  
**Model no.:** 22-168A  
**Serial no.:** FC388201

**Calibration date:** October 30, 2019  
**Certificate issued:** October 30, 2019  
**Interval:** 12 months  
**Due date:** October 30, 2020  
**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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## CALIBRATION DATA

**Certificate no.:** 724382  
**Identification:** SBI-194  
**Description:** MULTIMETER  
**Serial no.:** FC388201  
**Procedure:** MICRONTA 22-168A: 5520A-M

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

### CALIBRATION STANDARDS

Identification	Description	Manufacturer	Model no.	Cal. Date	Due Date
7870009	CALIBRATOR	FLUKE	5520A	2019/03/15	2020/03/31

### MEASUREMENT RESULTS (Per MET/CAL)

PARAMETER	TRUE VALUE	TEST RESULT	ACCEPTANCE LOW	LIMITS HIGH	PASS/FAIL	TUR
DC VOLTAGE CALIBRATION						
200 mV Range						
190.0mV		189.9	187.8	192.2	PASS	
2V Range						
1.900V		1.898	1.878	1.922	PASS	
-1.900V		-1.897	-1.922	-1.878	PASS	
20V Range						
19.00V		18.98	18.78	19.22	PASS	
200V Range						
190.0V		190.0	187.8	192.2	PASS	
1000V Range						
950V		949	938	962	PASS	
AC VOLTAGE CALIBRATION						
200 mV Range						
190.0mV @ 60Hz		185.8	185.8	194.2	PASS	
2V Range						
1.900V @ 60Hz		1.858	1.858	1.942	PASS	
20V Range						
19.00V @ 60Hz		18.58	18.58	19.42	PASS	
200V Range						
190.0V @ 60Hz		185.8	185.8	194.2	PASS	
750V Range						
700V @ 60Hz		683	678	723	PASS	
FREQUENCY CALIBRATION						
1.900kHz @ 5V		1.903	1.809	1.990	PASS	
RESISTANCE CALIBRATION						
200 Ohm Range						
190.0 Ohm		190.6	186.8	193.2	PASS	
2 kOhm Range						
1.900 kOhm		1.903	1.870	1.930	PASS	
20 kOhm Range						
19.00 kOhm		18.98	18.70	19.30	PASS	
200 kOhm Range						
190.0 kOhm		190.0	187.0	193.0	PASS	
2 MOhm Range						



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PARAMETER	TRUE	TEST	ACCEPTANCE LIMITS		PASS/	TUR
	VALUE	RESULT	LOW	HIGH	FAIL	
1.900 MOhm		1.900	1.870	1.930	PASS	
20 MOhm Range						
19.00 MOhm		19.00	18.50	19.50	PASS	
2000 MOhm Range						
1100 MOhm		1095	935	1266	PASS	
CONTINUITY CALIBRATION						
Is the beeper on when 30 Ohms resistance is applied?						
Result of Operator Evaluation					PASS	
Is the beeper off when 100 Ohms resistance is applied?						
Result of Operator Evaluation					PASS	
DC CURRENT CALIBRATION						
200 µA Range						
190.0uA		189.7	187.0	193.0	PASS	
2 mA Range						
1.900mA		1.899	1.870	1.930	PASS	
20 mA Range						
19.00mA		19.06	18.47	19.54	PASS	
200 mA Range						
190.0mA		191.6	184.7	195.3	PASS	
20 A Range						
10.00A		9.89	9.30	10.70	PASS	
AC CURRENT CALIBRATION						
200 µA Range						
190.0uA @ 60Hz		185.1	184.8	195.2	PASS	
2 mA Range						
1.900mA @ 60Hz		1.855	1.848	1.952	PASS	
20 mA Range						
19.00mA @ 60Hz		18.61	18.15	19.85	PASS	
200 mA Range						
190.0mA @ 60Hz		187.0	181.5	198.5	PASS	
20 A Range						
10.00A @ 60Hz		9.81	8.98	11.02	PASS	
CAPACITANCE CALIBRATION						
200 nF Range						
190.0nF		188.5	180.9	199.1	PASS	
20 µF Range						
19.00uF		18.47	17.30	20.70	PASS	
200 µF Range						
190.0uF		183.6	172.9	207.1	PASS	

*End of Test Data*



**Transcat Canada Inc.**  
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[www.transcat.ca](http://www.transcat.ca)



**ACCREDITATION**  
**ISO 17025**  
TM  
**SCC Scope Number 220**

# CALIBRATION CERTIFICATE

**Certificate no.:** 780975  
**Identification:** SBI-194  
**Description:** MULTIMETER, RADIO SHACK 22-168A  
**Manufacturer:** RADIO SHACK  
**Model no.:** 22-168A  
**Serial no.:** FC388201

**Calibration date:** November 24, 2020  
**Certificate issued:** November 25, 2020  
**Interval:** 12 months  
**Due date:** November 24, 2021  
**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.**  
9900, Côte-de-Liesse  
Montréal (Québec) H8T 1A1

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

## CALIBRATION DATA

**Certificate no.:** 780975  
**Identification:** SBI-194  
**Description:** MULTIMETER  
**Serial no.:** FC388201  
**Procedure:** MICRONTA 22-168A: 5520A-M

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

### CALIBRATION STANDARDS

Identification	Description	Manufacturer	Model no.	Cal. Date	Due Date
8608002	CALIBRATOR	FLUKE	5520A	2020/07/15	2021/07/31

### MEASUREMENT RESULTS (Per MET/CAL)

PARAMETER	TRUE VALUE	TEST RESULT	ACCEPTANCE LOW	LIMITS HIGH	PASS/FAIL	TUR
DC VOLTAGE CALIBRATION						
200 mV Range						
190.0mV		189.9	187.8	192.2	PASS	
2V Range						
1.900V		1.899	1.878	1.922	PASS	
-1.900V		-1.897	-1.922	-1.878	PASS	
20V Range						
19.00V		18.98	18.78	19.22	PASS	
200V Range						
190.0V		190.1	187.8	192.2	PASS	
1000V Range						
950V		950	938	962	PASS	
AC VOLTAGE CALIBRATION						
200 mV Range						
190.0mV @ 60Hz		185.8	185.8	194.2	PASS	
2V Range						
1.900V @ 60Hz		1.858	1.858	1.942	PASS	
20V Range						
19.00V @ 60Hz		18.58	18.58	19.42	PASS	
200V Range						
190.0V @ 60Hz		185.8	185.8	194.2	PASS	
750V Range						
700V @ 60Hz		683	678	723	PASS	
FREQUENCY CALIBRATION						
1.900kHz @ 5V		1.904	1.809	1.990	PASS	
RESISTANCE CALIBRATION						
200 Ohm Range						
190.0 Ohm		190.0	186.8	193.2	PASS	
2 kOhm Range						
1.900 kOhm		1.903	1.870	1.930	PASS	
20 kOhm Range						
19.00 kOhm		18.98	18.70	19.30	PASS	





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PARAMETER	TRUE VALUE	TEST RESULT	ACCEPTANCE LOW	LIMITS HIGH	PASS/FAIL	TUR
200 kOhm Range						
190.0 kOhm		190.0	187.0	193.0	PASS	
2 MOhm Range						
1.900 MOhm		1.899	1.870	1.930	PASS	
20 MOhm Range						
19.00 MOhm		19.02	18.50	19.50	PASS	
2000 MOhm Range						
1100 MOhm		1090	935	1266	PASS	
CONTINUITY CALIBRATION						
Is the beeper on when 30 Ohms resistance is applied?					PASS	
Result of Operator Evaluation					PASS	
Is the beeper off when 100 Ohms resistance is applied?					PASS	
Result of Operator Evaluation					PASS	
DC CURRENT CALIBRATION						
200 µA Range						
190.0uA		189.7	187.0	193.0	PASS	
2 mA Range						
1.900mA		1.900	1.870	1.930	PASS	
20 mA Range						
19.00mA		19.06	18.47	19.54	PASS	
200 mA Range						
190.0mA		191.6	184.7	195.3	PASS	
20 A Range						
10.00A		9.89	9.30	10.70	PASS	
AC CURRENT CALIBRATION						
200 µA Range						
190.0uA @ 60Hz		185.1	184.8	195.2	PASS	
2 mA Range						
1.900mA @ 60Hz		1.855	1.848	1.952	PASS	
20 mA Range						
19.00mA @ 60Hz		18.60	18.15	19.85	PASS	
200 mA Range						
190.0mA @ 60Hz		186.8	181.5	198.5	PASS	
20 A Range						
10.00A @ 60Hz		9.83	8.98	11.02	PASS	
CAPACITANCE CALIBRATION						
200 nF Range						
190.0nF		188.5	180.9	199.1	PASS	
20 µF Range						
19.00uF		18.46	17.30	20.70	PASS	
200 µF Range						
190.0uF		183.5	172.9	207.1	PASS	

*End of Test Data*



Fabricant de poêle international inc.  
Stove Builder International Inc.

# CERTIFICAT DE VÉRIFICATION

## VERIFICATION CERTIFICATE

**No. Certificat :** 20201103001

**Identification :** SBI-197

**Description :** EPA sampling banc 4

**Manufacturier :** Home made

**No. Modèle :** NA

**No. Série :** NA

**Propriété de :** SBI

250 de Copenhague

St-Augustin-de-Desmaures, QC G3A 2H3

**Date de vérification :** 3 novembre 2020

**Prochaine vérification :** 3 novembre 2021

**Méthode utilisée :** Cal-Temp\_01

**Température :** 67.5 °F

**Humidité :** 24.8 %

**État avant calibration :** Bon état

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

### MESURES D'INCERTITUDE

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

### REMARQUES

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

### ÉTALON UTILISÉ POUR VÉRIFIER L'ÉQUIPEMENT

No. de l'étalon utilisé	Description	No. de certificat	Date de calibration	Date d'échéance
SBI-096	Calibreur de température de référence	700929	2020-05-25	2021-05-25



Fabricant de poêle international inc.  
Stove Builder International Inc.

# CERTIFICAT DE VÉRIFICATION

## VERIFICATION CERTIFICATE

### DONNÉES DE VÉRIFICATION

Unités : °F

Résultat : PASS

S.D.	0.01	%	
R.M.U.	0.14	%	
<b>O.M.U</b>	<b>98.26</b>	<b>%</b>	
	Ave A.D.	0.86	%
Standard	Reading	A.D.	
70	70.6	0.86	
70	70.6	0.86	
70	70.6	0.86	

S.D.	0.00	%	
R.M.U.	0.05	%	
<b>O.M.U</b>	<b>99.49</b>	<b>%</b>	
	Ave A.D.	0.25	%
Standard	Reading	A.D.	
200	200.5	0.25	
200	200.5	0.25	
200	200.5	0.25	

S.D.	0.00	%	
R.M.U.	0.02	%	
<b>O.M.U</b>	<b>99.79</b>	<b>%</b>	
	Ave A.D.	0.11	%
Standard	Reading	A.D.	
600	600.7	0.12	
600	600.6	0.10	
600	600.6	0.10	

S.D.	0.00	%	
R.M.U.	0.01	%	
<b>O.M.U</b>	<b>99.85</b>	<b>%</b>	
	Ave A.D.	0.08	%
Standard	Reading	A.D.	
1000	1000.8	0.08	
1000	1000.8	0.08	
1000	1000.7	0.07	

S.D.	0.00	%	
R.M.U.	0.01	%	
<b>O.M.U</b>	<b>99.88</b>	<b>%</b>	
	Ave A.D.	0.06	%
Standard	Reading	A.D.	
1400	1400.9	0.06	
1400	1400.8	0.06	
1400	1400.8	0.06	

VÉRIFIÉ PAR : *Gabrielle Santerre*

Gabrielle Santerre

FIN DU CERTIFICAT



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



## Certificate of Calibration

Cert No. 551220083389043

Date: Dec 20, 2019

**Customer:**

STOVE BUILDERS INTERNATIONAL INC.  
 PORTES 11-12  
 250 DE COPENHAGUE  
 SAINT-AUGUSTIN-DE-DESMAURES QC G3A 2H3

MPC Control #: DB6309  
 Asset ID: SBI-204  
 Gage Type: PITOT STATIC TUBE  
 Manufacturer: DWYER INSTRUMENTS INC.  
 Model Number: 160S-24  
 Size: N/A  
 Temp/RH: 68.0°F / 45.0%  
 Location: Calibration performed at MPC facility

Work Order #: SAC-70105993  
 Purchase Order #: 62612  
 Serial Number: 1605-24 A5OU  
 Department: N/A  
 Performed By: TREVOR GOLD  
 Received Condition: IN TOLERANCE  
 Returned Condition: IN TOLERANCE  
 Cal. Date: December 20, 2019  
 Cal. Interval: 12 MONTHS  
 Cal. Due Date: December 20, 2020

**Calibration Notes:**

SEE ATTACHED FOR DATA SHEET

**Standards Used to Calibrate Equipment**

I.D.	Description.	Model	Serial	Manufacturer	Cal. Due Date	Traceability #
AW4419	MULTI-FUNCTION PRESSURE INDICATOR	DPI 145	14501283	DRUCK INC	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, 2021	551220083300219

**Procedures Used in this Event**

Procedure Name	Description
MPC-AIR-001 Rev. 00	Air Velocity, Temperature and Flow Meters, General, June-1-2017, rev00

Calibrating Technician:

*Trevor Gold*  
 TREVOR GOLD

QC Approval:

*Robert Means*  
 Robert Means

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

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

PASS - Compliant with specification;

FAIL - Not compliant with specification.

FAIL<sup>2</sup> - The measured value is not within the acceptance limits. However, a portion of the expanded uncertainty of measurement at 95% is within the specified tolerance.

PASS<sup>2</sup> - The measured value is within acceptance limits. However, a portion of the expanded uncertainty of measurement at 95% exceeds the specified tolerance.

The expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%, unless otherwise stated. This calibration report complies with ISO/IEC 17025:2017 and ANSI/NCSL Z540.3 Method 6-Guard Bands based on Test Uncertainty Ratio. Calibration cycles and resulting due dates were submitted/approved by the customer. Any number of factors may cause an instrument to drift out of tolerance before the next scheduled calibration. Recalibration cycles should be based on frequency of use, environmental conditions and customer's established systematic accuracy. All standards are traceable to SI through the National Institute of Standards and Technology (NIST) and/or recognized national or international standards laboratories. Services rendered include proper manufacturer's service instruction and are warranted for no less than thirty (30) days. The information on this report pertains only to the instrument identified. This may not be reproduced in part or in a whole without the prior written approval of the issuing MP Calibration Laboratory.



## Calibration Report of DWYER 160S-24 PITOT-STATIC PROBE

MPC Control #: <u>DB6309</u>	Serial Number: <u>1605-24 A5OU</u>
Asset ID: <u>SBI-204</u>	Calibration Date: <u>December 20, 2019</u>

### Velocity Accuracy

Range	Nominal	Lower Limit	As Found	As Left	Upper Limit	Result	Uncertainty (±)
0 - 50 mps	10.0 mps	9.0 mps	9.9 mps	9.9 mps	11.0 mps	PASS	0.57 mps
0 - 50 mps	20.0 mps	19.0 mps	19.8 mps	19.8 mps	21.0 mps	PASS	0.57 mps

### Statements of Pass or Fail Conformance

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

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

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

The expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95% , unless otherwise stated.

This calibration report complies with ISO/IEC 17025:2017 and ANSI/NCSL Z540.3 Method 6-Guard Bands based on Test Uncertainty Ratio.

**- End of Calibration Report -**

**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:** Gabrielle Santerre  
**Zip/Code Postal:** G3A 2H3  
**État/Province:** Quebec

#### Weighing Device

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

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

#### Procedure

**Instruction de Calibration:** EURAMET cg-18 v. 4.0 (11/2015)  
**Instruction de travail METTLER TOLEDO:** 30260953 Rev1.31

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

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

	Temperature	
Tel que Trouvé	Start: 66.5 °F	End: 66.5 °F
Tel que Laissé	Start: 66.7 °F	End: 67.1 °F

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

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

**Date calibration Tel que Trouvé:** 09-Mar-2020  
**Date calibration Tel que Laissé:** 09-Mar-2020  
**Date d'Émission:** 09-Mar-2020  
**Requested Next Calibration Date:** 31-Mar-2021

**Authorized A2LA Signatory:**

Dany Careau

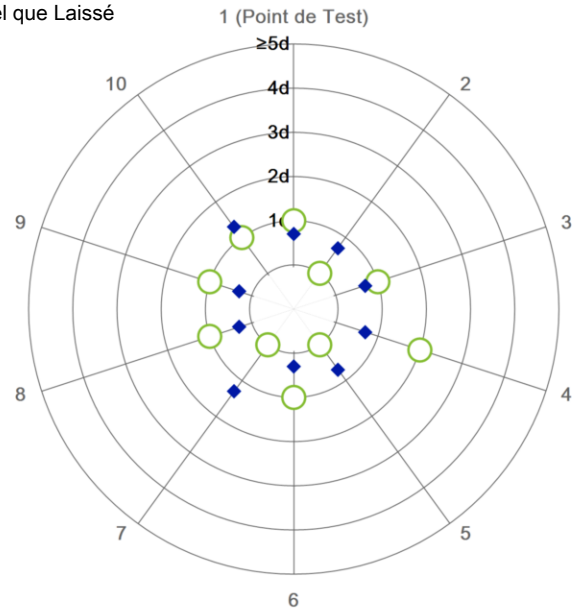
## Résultats de Mesure

### Répétabilité

Charge de Test: 100 g

	Tel que Trouvé	Tel que Laissé
1	99.9996 g	99.9999 g
2	99.9997 g	99.9999 g
3	99.9998 g	99.9999 g
4	99.9999 g	99.9999 g
5	99.9997 g	99.9999 g
6	99.9998 g	100.0000 g
7	99.9997 g	100.0001 g
8	99.9996 g	100.0000 g
9	99.9996 g	100.0000 g
10	99.9996 g	100.0001 g

○ Tel que Trouvé  
◆ Tel que Laissé



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

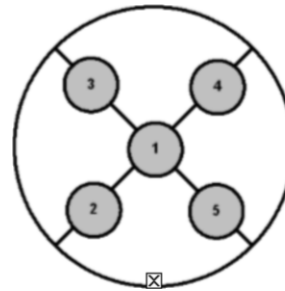
The results of this graph are based upon the absolute values of the differences from the mean value.

Écart Type	0.00011 g	0.00008 g
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### Excentricité

Charge de Test: 100 g

Position	Tel que Trouvé	Tel que Laissé
1	99.9997 g	99.9998 g
2	99.9998 g	99.9998 g
3	99.9997 g	99.9998 g
4	99.9997 g	99.9998 g
5	99.9999 g	99.9998 g



Déviaton Maximale	0.0002 g	0.0000 g
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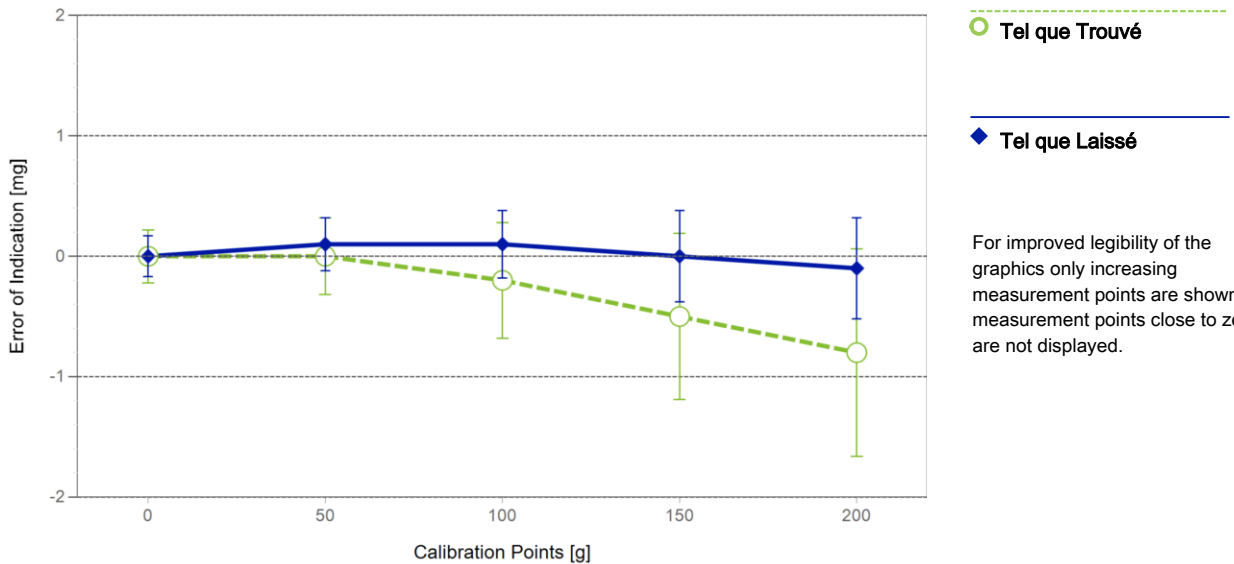
### Erreur d'indication

Tel que Trouvé

	Reference Value	Indication	Erreur d'indication	Incertitude Élargie	k
1	0.0000 g	0.0000 g	0.0000 g	0.22 mg	2
2	50.0000 g	50.0000 g	0.0000 g	0.32 mg	2
3	99.9999 g	99.9997 g	-0.0002 g	0.48 mg	2
4	149.9999 g	149.9994 g	-0.0005 g	0.69 mg	2
5	200.0001 g	199.9993 g	-0.0008 g	0.86 mg	2

**Tel que Laissé**

	Reference Value	Indication	Erreur d'indication	Incertitude Élargie	k
1	0.0000 g	0.0000 g	0.0000 g	0.17 mg	2
2	50.0000 g	50.0001 g	0.0001 g	0.22 mg	2
3	99.9999 g	100.0000 g	0.0001 g	0.28 mg	2
4	149.9999 g	149.9999 g	0.0000 g	0.38 mg	2
5	200.0001 g	200.0000 g	-0.0001 g	0.42 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:	434	Date d'Émission:	13-Mar-2020
# Certificat:	01124860-1	Date de Calibration Due:	28-Feb-2021

**Remarques**

N/D

**End of Accredited Section**

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



## Incertitude de Mesure du dispositif de pesage en opération

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

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

Plage d'opération sur le site pour l'évaluation de l'incertitude de mesure en opération:  $5 \text{ }^\circ\text{F}$

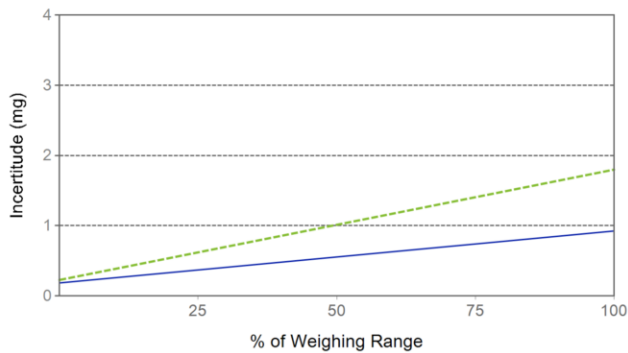
### Linéarisation de l'Équation d'Incertitude

	Plage	Tel que Trouvé	Tel que Laissé
1	0 g - 210 g	$U_1 = 0.23 \text{ mg} + 0.00749 \text{ mg/g} \cdot R$	$U_1 = 0.18 \text{ mg} + 0.00352 \text{ mg/g} \cdot R$

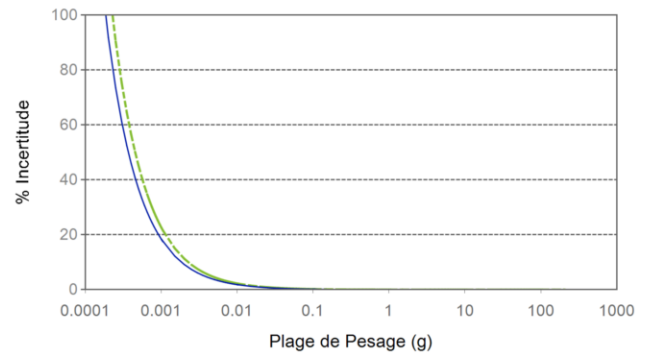
To optimize the stability of the linearization, besides of the zero load only increasing measurement points with a test load of 5% of the measurement range or larger are taken for the calculation of the linear equation.

### 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	0.23 mg	1.1%	0.18 mg	0.86%
0.2100 g	0.23 mg	0.11%	0.18 mg	0.086%
2.1000 g	0.25 mg	0.012%	0.19 mg	0.0089%
21.0000 g	0.39 mg	0.0018%	0.25 mg	0.0012%
210.0000 g	1.8 mg	0.00086%	0.92 mg	0.00044%



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:



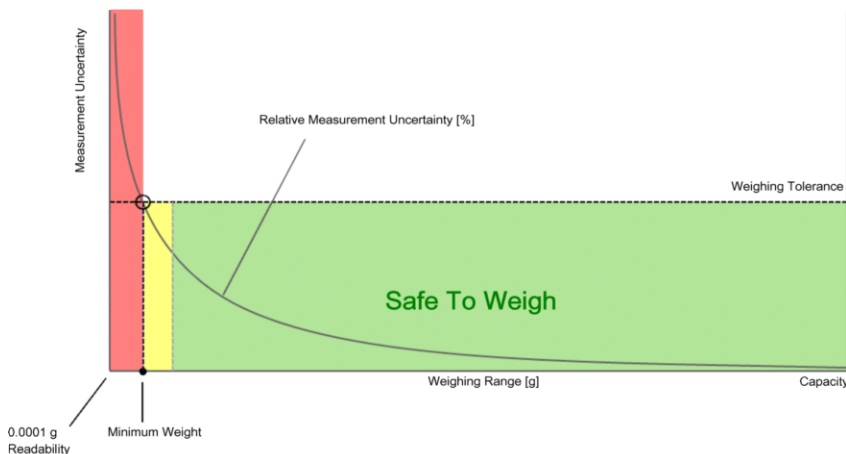
## Process Requirements

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%	0.22778 g	0.45903 g	0.69382 g	1.17436 g	2.44377 g
0.2%	0.11346 g	0.22778 g	0.34297 g	0.57598 g	1.17436 g
0.5%	0.04528 g	0.09070 g	0.13626 g	0.22778 g	0.45903 g
1%	0.02262 g	0.04528 g	0.06798 g	0.11346 g	0.22778 g
2%	0.01131 g	0.02262 g	0.03395 g	0.05663 g	0.11346 g
5%	0.00452 g	0.00905 g	0.01357 g	0.02262 g	0.04528 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%	0.18444 g	0.37018 g	0.55725 g	0.93542 g	1.90502 g
0.2%	0.09206 g	0.18444 g	0.27715 g	0.46355 g	0.93542 g
0.5%	0.03678 g	0.07362 g	0.11051 g	0.18444 g	0.37018 g
1%	0.01839 g	0.03678 g	0.05519 g	0.09206 g	0.18444 g
2%	0.00919 g	0.01839 g	0.02758 g	0.04599 g	0.09206 g
5%	0.00368 g	0.00735 g	0.01103 g	0.01839 g	0.03678 g

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

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

### Notes on minimum weight values in above table:

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

# Résultats de Mesure

## Results Summary

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

✓ = Passed

✗ = Failed

⚠ = Safety Factor not met

**Répétabilité**

Charge de Test: 100 g

Tolérance	Control Limit	Tel que Trouvé		Tel que Laissé	
		Std. Deviation	Result	Std. Deviation	Result
0.1%	N/D	0.00011 g	N/D	0.00008 g	N/D
0.2%	N/D		N/D		N/D
0.5%	N/D		N/D		N/D
1%	N/D		N/D		N/D
2%	N/D		N/D		N/D
5%	N/D		N/D		N/D

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

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

**Excentricité**

Charge de Test: 100 g

Tolérance	Control Limit	Tel que Trouvé		Tel que Laissé	
		Deviation	Result	Deviation	Result
0.1%	0.0500 g	0.0002 g	✓	0.0000 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
99.9999 g	-0.0002 g	0.0500 g	0.1000 g	0.2500 g	0.5000 g	1.0000 g	2.5000 g
149.9999 g	-0.0005 g	0.0750 g	0.1500 g	0.3750 g	0.7500 g	1.5000 g	3.7500 g
200.0001 g	-0.0008 g	0.1000 g	0.2000 g	0.5000 g	1.0000 g	2.0000 g	5.0000 g
<b>Result</b>		✓	✓	✓	✓	✓	✓

## 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
99.9999 g	0.0001 g	0.0500 g	0.1000 g	0.2500 g	0.5000 g	1.0000 g	2.5000 g
149.9999 g	0.0000 g	0.0750 g	0.1500 g	0.3750 g	0.7500 g	1.5000 g	3.7500 g
200.0001 g	-0.0001 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.

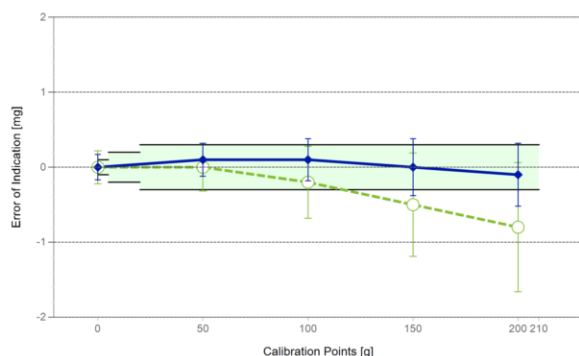
# Handbook 44 Tolerance Assessment (Entretien)

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	0.0002 g	✔	0.0001 g	✔
Excentricité (Plage)	100 g	0.0003 g	0.0002 g	✔	0.0000 g	✔
Répétabilité (Maximum Error)	100 g	0.0003 g	0.0003 g	✔	0.0002 g	✔
Répétabilité (Plage)	100 g	0.0003 g	0.0003 g	✔	0.0002 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	99.9999 g	0.0003 g	-0.0002 g	✔	0.0001 g	✔
4	149.9999 g	0.0003 g	-0.0005 g	✗	0.0000 g	✔
5	200.0001 g	0.0003 g	-0.0008 g	✗	-0.0001 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

<b>Certificate no.:</b>	769847	<b>Calibration date:</b>	September 10, 2020
<b>Identification:</b>	SBI-212	<b>Certificate issued:</b>	September 10, 2020
<b>Description:</b>	THERMO-HYGROMETER, AMPROBE TH-3	<b>Interval:</b>	12 months
<b>Manufacturer:</b>	AMPROBE	<b>Due date:</b>	September 10, 2021
<b>Model no.:</b>	TH-3	<b>Procedure no.:</b>	MET/CAL
<b>Serial no.:</b>	100906351	<b>Environment:</b>	CLAS Type 2 Laboratory
		<b>Temperature:</b>	23 ± 2°C
		<b>Humidity:</b>	35 - 55% RH
		<b>Metrologist:</b>	NFS

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

**Approved by:**   
 David Llorens, Quality Manager

*This calibration certificate is issued in accordance with the applicable requirements of ISO/IEC 17025 and Ulrich Metrology's quality manual QM-09 Revision 9. Measurement results provided are traceable to either the National Research Council Canada (NRC), the National Institute of Standards and Technology (NIST), a national laboratory of another country signatory to the CIPM Mutual Recognition Arrangement (MRA), or a calibration laboratory accredited by an accrediting body with which Canada has an equivalence agreement.*

## CALIBRATION STANDARDS

See notes below.

## MEASUREMENT UNCERTAINTY

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

## CALIBRATION DATA

See next page for measurement results.

### Notes:

9V battery replaced.





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

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

## CALIBRATION DATA

**Certificate no.:** 769847  
**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	2019/07/23	2021/01/31

### MEASUREMENT RESULTS (Per MET/CAL)

PARAMETER	TRUE VALUE	TEST RESULT	ACCEPTANCE LOW	LIMITS HIGH	PASS/FAIL	TUR
TEMPERATURE CALIBRATION						
23°C						
23.10degC		23.60	22.30	23.90	PASS	
RELATIVE HUMIDITY CALIBRATION AT 23°C						
20% RH						
20.00%		20.90	17.00	23.00	PASS	
50% RH						
50.00%		49.90	47.00	53.00	PASS	
80% RH						
79.94%		77.00	76.94	82.94	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 17025 Registered  
ANSI/NCSL Z540-1 Accredited

## Certificat de Calibration de Précision

### Accuracy Calibration Certificate

#### Client

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

#### Weighing Device

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

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

#### Procedure

**Instruction de Calibration:** EURAMET cg-18 v. 4.0 (11/2015)  
**Instruction de travail METTLER TOLEDO:** 30260953 Rev1.31

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

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

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

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

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

**Date calibration Tel que Trouvé:** 09-Mar-2020  
**Date calibration Tel que Laissé:** 09-Mar-2020  
**Date d'Émission:** 09-Mar-2020  
**Requested Next Calibration Date:** 31-Mar-2021

**Authorized A2LA Signatory:**

Dany Careau

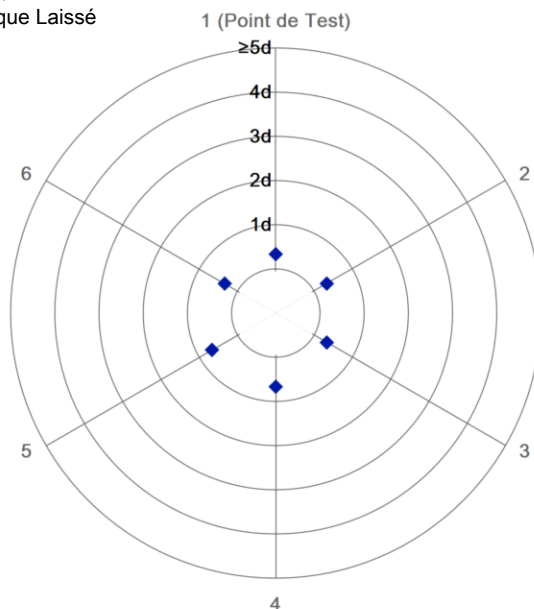
## Résultats de Mesure

### Répétabilité

Charge de Test: 10000 g

	Tel que Trouvé	Tel que Laissé
1	N/D	10000 g
2	N/D	10000 g
3	N/D	10000 g
4	N/D	10001 g
5	N/D	10001 g
6	N/D	10000 g

○ Tel que Trouvé  
◆ Tel que Laissé



Écart Type	N/D	0.5 g
------------	-----	-------

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

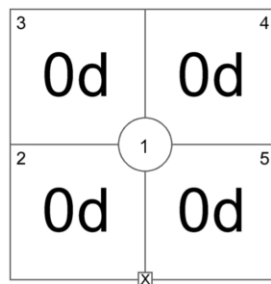
The results of this graph are based upon the absolute values of the differences from the mean value.

### Excentricité

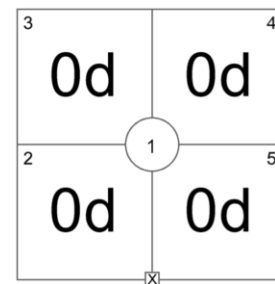
Charge de Test: 5000 g

Position	Tel que Trouvé	Tel que Laissé
1	5001 g	5000 g
2	5001 g	5000 g
3	5001 g	5000 g
4	5001 g	5000 g
5	5001 g	5000 g

Déviatiion Maximale	0 g	0 g
---------------------	-----	-----



Tel que Trouvé



Tel que Laissé

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

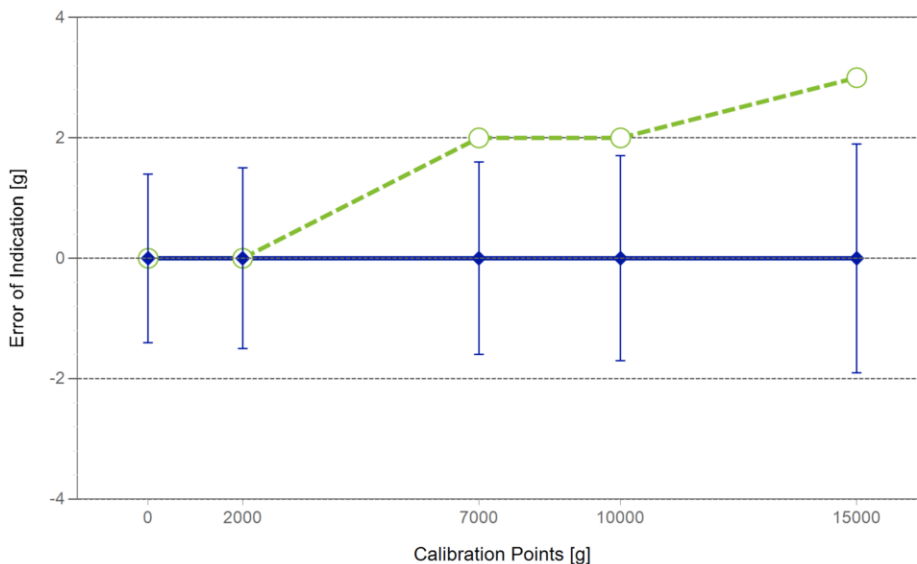
### Erreur d'indication

Tel que Trouvé

	Reference Value	Indication	Erreur d'indication	Incertitude Élargie	k
1	0 g	0 g	0 g	N/D	N/D
2	2000 g	2000 g	0 g	N/D	N/D
3	7000 g	7002 g	2 g	N/D	N/D
4	10000 g	10002 g	2 g	N/D	N/D
5	15000 g	15003 g	3 g	N/D	N/D

**Tel que Laissé**

	Reference Value	Indication	Erreur d'indication	Incertitude Élargie	k
1	0 g	0 g	0 g	1.4 g	2.37
2	2000 g	2000 g	0 g	1.5 g	2.28
3	7000 g	7000 g	0 g	1.6 g	2.28
4	10000 g	10000 g	0 g	1.7 g	2.13
5	15000 g	15000 g	0 g	1.9 g	2.13



○ Tel que Trouvé

◆ Tel que Laissé

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

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

**Test Equipment**

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

**Jeu de Poids 1: OIML M1**

Weight Set Number:	22940	Date d'Émission:	12-Jul-2019
# Certificat:	M19-0315	Date de Calibration Due:	12-Jul-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

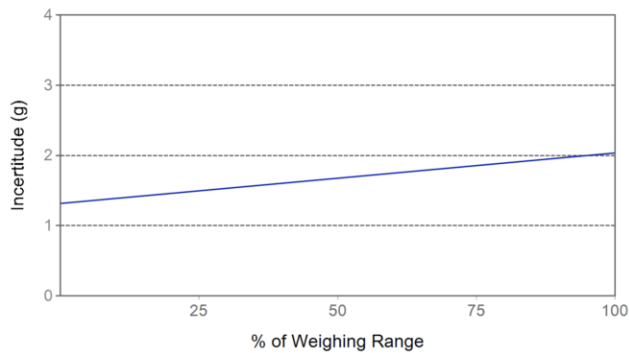
### Linéarisation de l'Équation d'Incertitude

	Plage	Tel que Trouvé	Tel que Laissé
1	0 g - 15000 g	N/A	$U_1 = 1317 \text{ mg} + 0.0480 \text{ mg/g} \cdot R$

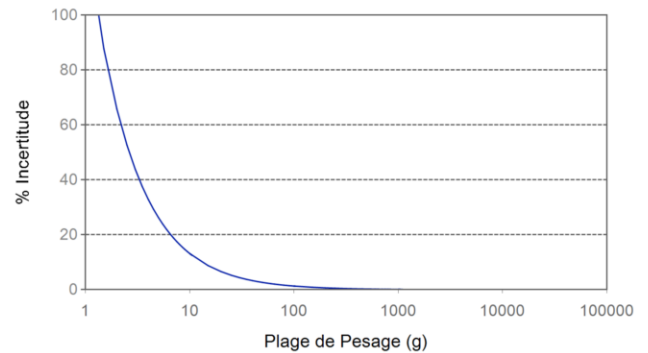
To optimize the stability of the linearization, besides of the zero load only increasing measurement points with a test load of 5% of the measurement range or larger are taken for the calculation of the linear equation.

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

Indication Net	Tel que Trouvé		Tel que Laissé	
15 g	N/A	N/A	1.3 g	8.8%
150 g	N/A	N/A	1.3 g	0.88%
1500 g	N/A	N/A	1.4 g	0.093%
7500 g	N/A	N/A	1.7 g	0.022%
15000 g	N/A	N/A	2.0 g	0.014%



Tel que Trouvé



Tel que Laissé

# Handbook 44 Tolerance Assessment (Entretien)

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

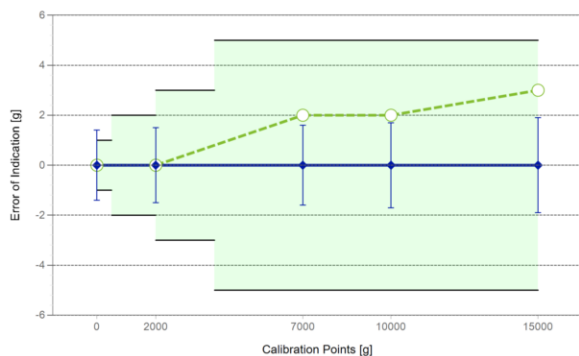
Tel que Trouvé
Tel que Laissé

✔
✔
✘ = Passed  
✘ = Failed

**Global**

## Weighing Device

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



Tolerances according to NIST Handbook 44

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

○ Tel que Trouvé  
◆ Tel que Laissé  
— Tolérance

## Eccentricity and Repeatability

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

**Max. Error:** Maximum of the absolute values of the individual errors.

**Range:** Difference between largest and smallest measurement value.

## Error of Indication

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

Certificate No: 01037944A-1

# METTLER TOLEDO

## METTLER-TOLEDO, LLC

201 Wolf Dr  
Thorofare NJ 08086  
1-800-METTLER



## 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

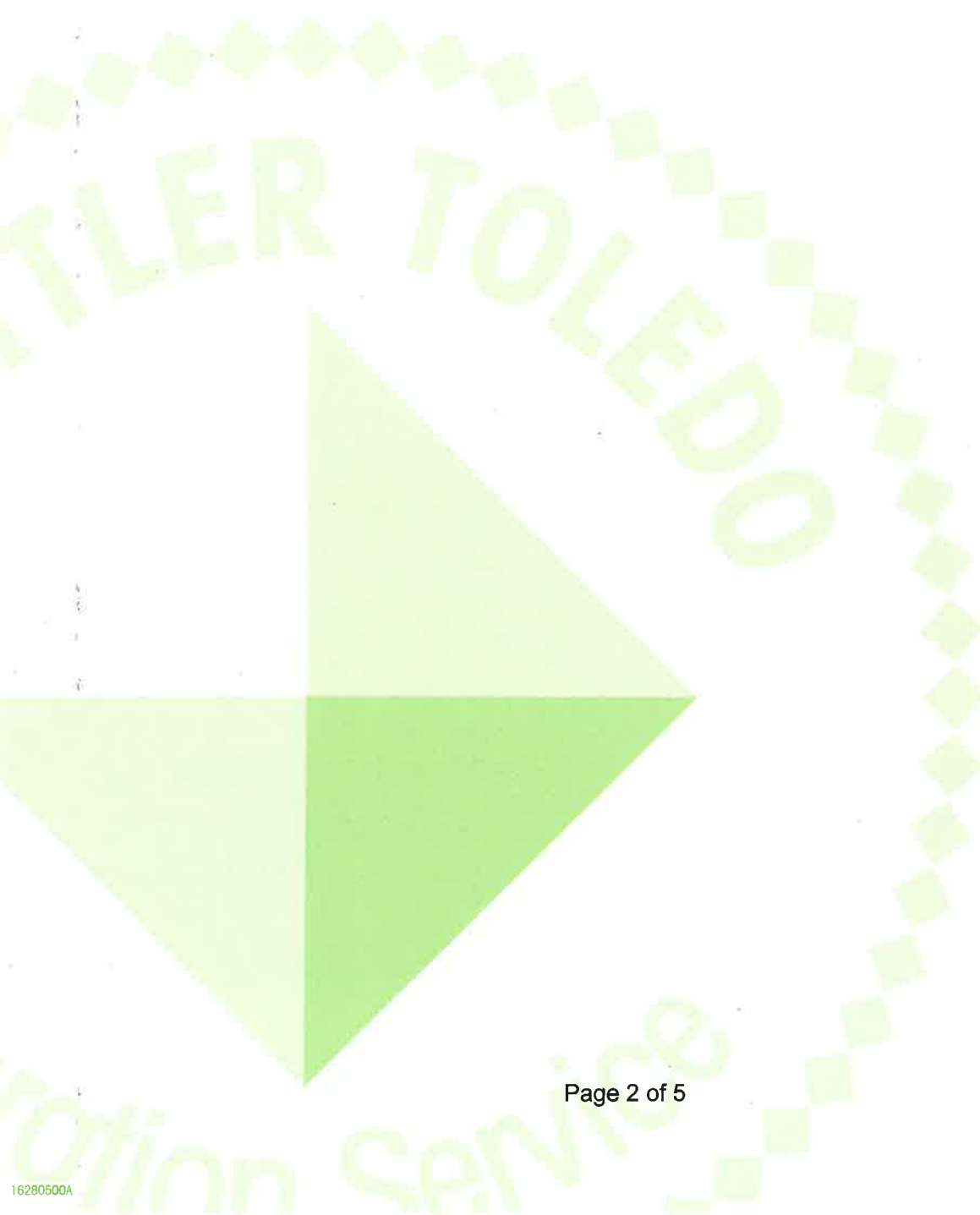
Approved Signatory

10-OCT-2018

Certificate No: 01037944A-1

**As Found Data**

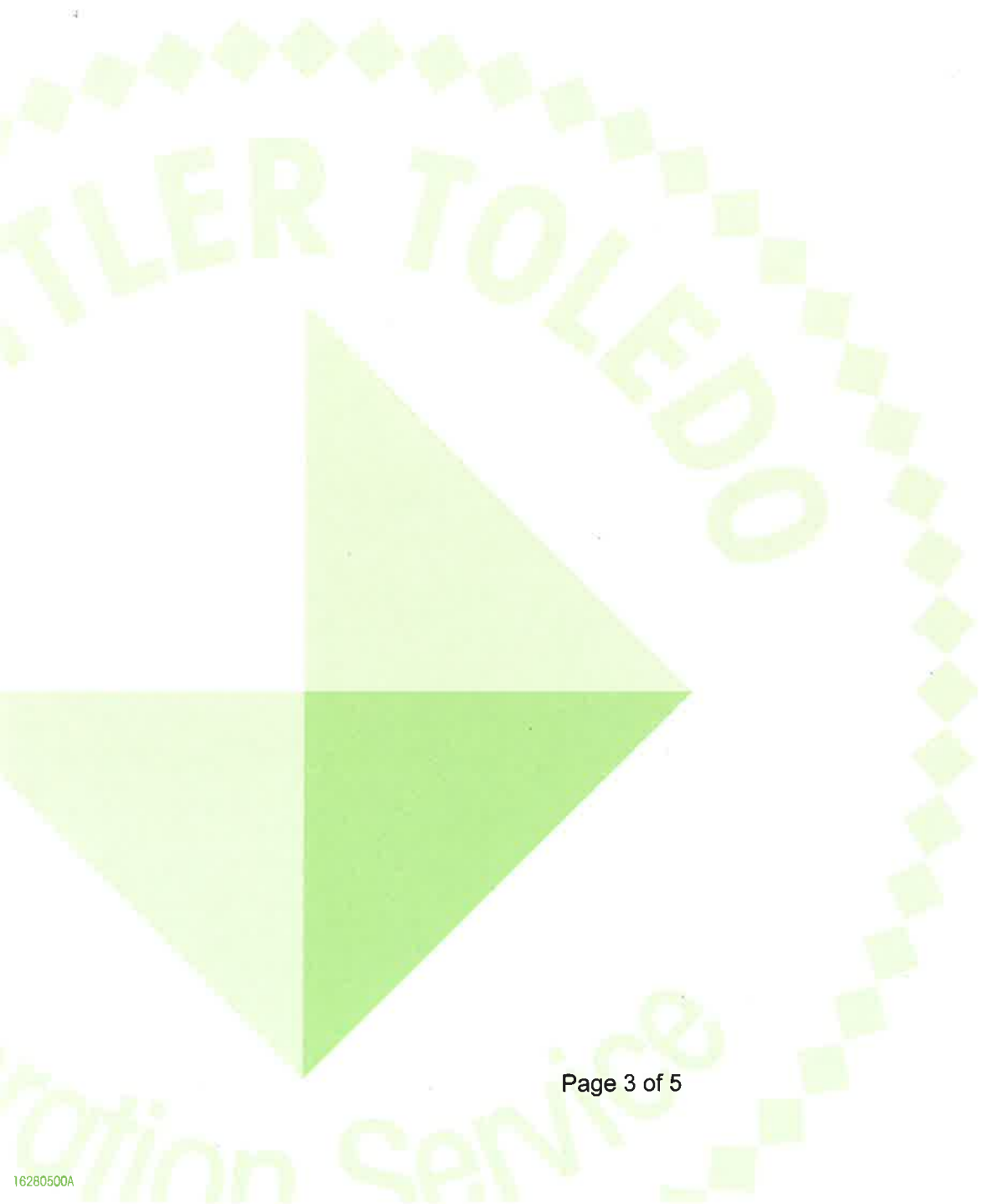
Nominal Value&Suffix	Serial Number	True Mass (g)	Conv. Mass (g)	Uncertainty (mg, k = 2)	Tolerance (mg)	Density (g/cm <sup>3</sup> )
100 mg	B316238717	0.0999983	0.0999983	0.0025	0.0160	8.00



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





---

Certificate No: 01037944A-1

---

**Standards and Comparators Used**

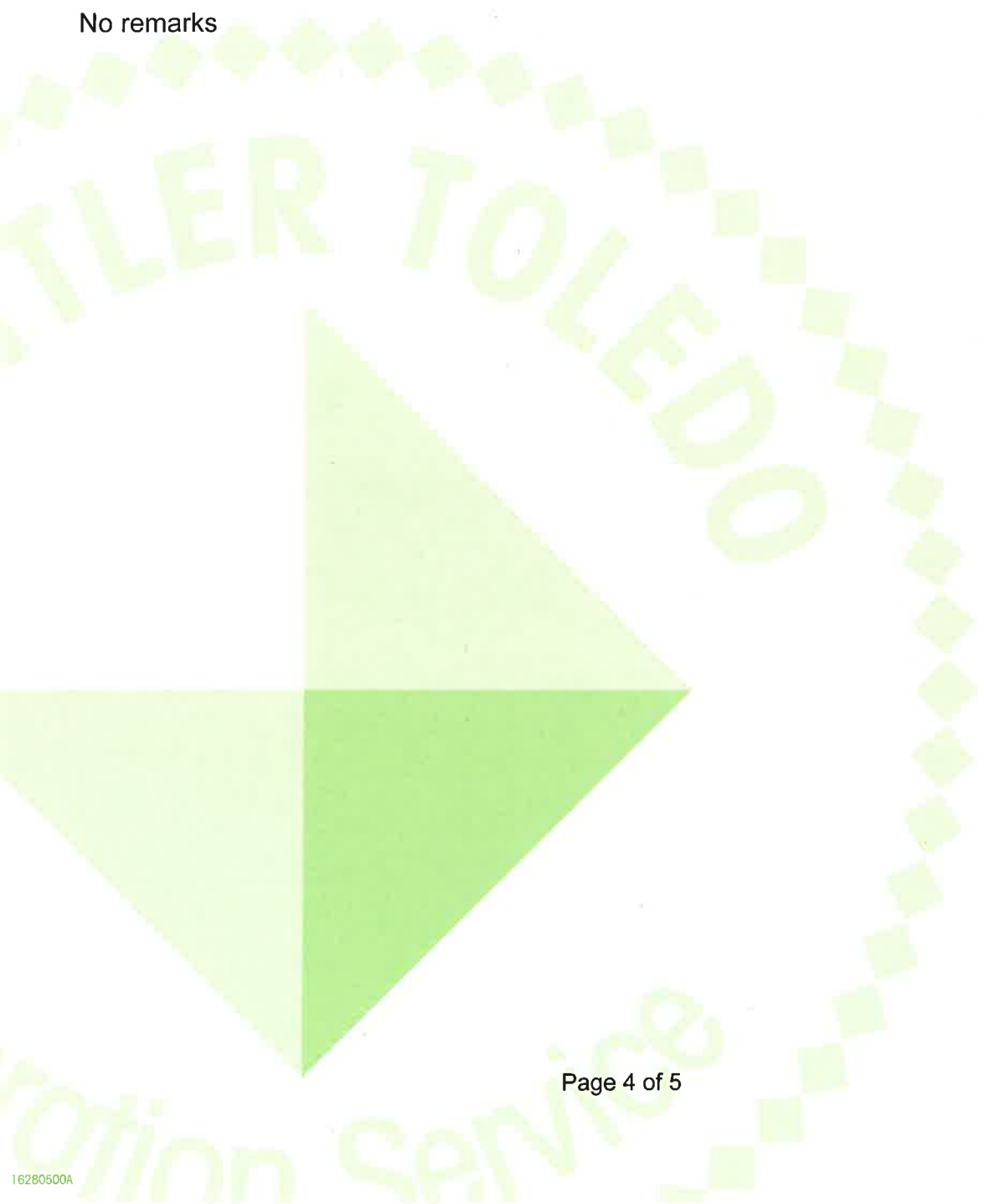
---

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

**Comments**

---

No remarks



---

Certificate No: 01037944A-1

---

## Definitions

---

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

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

**Conventional Mass** - For a mass at 20 °C, "Conventional Mass" is the mass of a reference standard of density 8000 kg/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.



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



# Certificate of Calibration

Date: Mar 3, 2020

Cert No. 551220083500445

**Customer:**

STOVE BUILDERS INTERNATIONAL INC.  
 PORTES 11-12  
 250 DE COPENHAGUE  
 SAINT-AUGUSTIN-DE-DESMAURES QC G3A 2H3

Work Order #: SAC-70107380  
 Purchase Order #: 63318  
 Serial Number: 16425450039  
 Department: N/A  
 Performed By: JACK WERTZ III  
 Received Condition: IN TOLERANCE  
 Returned Condition: IN TOLERANCE  
 Cal. Date: March 02, 2020  
 Cal. Interval: 12 MONTHS  
 Cal. Due Date: March 02, 2021

MPC Control #: DA0650  
 Asset ID: SBI-241  
 Gage Type: DIGITAL VANE/HOT-WIRE ANEMOMETER  
 Manufacturer: TPI, INC.  
 Model Number: 575  
 Size: N/A  
 Temp/RH: 68.0°F / 40.0%  
 Location: Calibration performed at MPC facility

**Calibration Notes:**

See attached calibration data. (1 page)

**Standards Used to Calibrate Equipment**

I.D.	Description.	Model	Serial	Manufacturer	Cal. Due Date	Traceability #
CJ5100	WIND TUNNEL WITH CONTROLLER	JS-500	375/305	INTERACTIVE INSTRUMENTS	Oct 31, 2021	551220083300219
DA8367	PRECISION PLATINUM RESISTANCE THERMOMETER SPRT W/ CASE	8167-25	180322	LEEDS & NORTHRUP CO.	Oct 31, 2022	551220083240044
DF8059	DIGITAL MULTIMETER	34401A	US36090404	HEWLETT PACKARD	Sep 30, 2020	551220083194555
DS2399	AIR VELOCITY TRANSDUCER	8455-03	56020622	TSI	Oct 3, 2021	800406957

**Procedures Used in this Event**

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

Calibrating Technician:

JACK WERTZ III

QC Approval:

MARVIN ILAO

Statements of Pass or Fail Conformance: The uncertainty of measurement has been taken into account when determining compliance with specification, as per ILAC-G8:03/2009. All measurements and test results guard banded to ensure the probability of false-accept does not exceed 2% in compliance with ANSI/NCSL Z540.3-2008.

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

PASS - Compliant with specification;  
 FAIL - Not compliant with specification.

FAIL<sup>2</sup> - The measured value is not within the acceptance limits. However, a portion of the expanded uncertainty of measurement at 95% is within the specified tolerance.

PASS<sup>2</sup> - The measured value is within acceptance limits. However, a portion of the expanded uncertainty of measurement at 95% exceeds the specified tolerance.

The expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%, unless otherwise stated. This calibration report complies with ISO/IEC 17025:2017 and ANSI/NCSL Z540.3 Method 6-Guard Bands based on Test Uncertainty Ratio. Calibration cycles and resulting due dates were submitted/approved by the customer. Any number of factors may cause an instrument to drift out of tolerance before the next scheduled calibration. Recalibration cycles should be based on frequency of use, environmental conditions and customer's established systematic accuracy. All standards are traceable to SI through the National Institute of Standards and Technology (NIST) and/or recognized national or international standards laboratories. Services rendered include proper manufacturer's service instruction and are warranted for no less than thirty (30) days. The information on this report pertains only to the instrument identified, this may not be reproduced in part or in a whole without the prior written approval of the Issuing MP Calibration Laboratory.



## Calibration Report of TPI 575 Vane/Hotwire Air Velocity Meter

MPC Control #:	DA0650	Serial Number:	16425450039
Asset ID:	SBI-241	Calibration Date:	March 02, 2020

### Velocity Measurement Hot Wire

Range	Nominal	Lower Limit	As Found	As Left	Upper Limit	Result	Uncertainty (±)
0.2 to 20 m/s	5.0 m/s	4.7 m/s	4.9 m/s	4.9 m/s	5.3 m/s	PASS	0.15 m/s
	10.0 m/s	9.7 m/s	9.9 m/s	9.9 m/s	10.4 m/s	PASS <sup>2</sup>	0.29 m/s
	15.0 m/s	14.6 m/s	14.9 m/s	14.9 m/s	15.4 m/s	PASS <sup>2</sup>	0.44 m/s
	19.0 m/s	18.6 m/s	18.8 m/s	18.8 m/s	19.4 m/s	PASS <sup>2</sup>	0.38 m/s

### Vane

Range	Nominal	Lower Limit	As Found	As Left	Upper Limit	Result	Uncertainty (±)
0.4 to 25 m/s	6.3 m/s	5.8 m/s	6.3 m/s	6.3 m/s	6.7 m/s	PASS	0.18 m/s
	12.5 m/s	12.0 m/s	12.3 m/s	12.3 m/s	13.1 m/s	PASS <sup>2</sup>	0.36 m/s
	18.8 m/s	18.1 m/s	18.9 m/s	18.9 m/s	19.4 m/s	PASS	0.38 m/s
	23.8 m/s	23.0 m/s	23.9 m/s	23.9 m/s	24.5 m/s	PASS	0.48 m/s

### Temperature Measurement

Range	Nominal	Lower Limit	As Found	As Left	Upper Limit	Result	Uncertainty (±)
-20°C to 80°C	20.0 °C	19.3 °C	20.2 °C	20.2 °C	20.7 °C	PASS	0.0090 °C
	40.0 °C	39.1 °C	40.2 °C	40.2 °C	40.9 °C	PASS	0.0090 °C
	60.0 °C	58.9 °C	60.1 °C	60.1 °C	61.1 °C	PASS	0.0090 °C
	76.0 °C	74.7 °C	76.2 °C	76.2 °C	77.3 °C	PASS	0.0090 °C

### Statements of Pass or Fail Conformance

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

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

**PASS** - Compliant with specification

**FAIL** - Not compliant with specification.

**FAIL<sup>2</sup>** - The measured value is not within the acceptance limits. However, a portion of the expanded uncertainty of measurement at 95% is within the specified tolerance.

**PASS<sup>2</sup>** - The measured value is within acceptance limits. However, a portion of the expanded uncertainty of measurement at 95% exceeds the specified tolerance.

The expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%, unless otherwise stated.

This calibration report complies with ISO/IEC 17025:2017 and ANSI/NC SL Z540.3 Method 6-Guard Bands based on Test Uncertainty Ratio.

**- End of Calibration Report -**



# CERTIFICATE OF CALIBRATION



Certificate Number: 2020005339

Page 1 of 2

**Manufacturer:** Dwyer Instruments Inc.  
**Model:** MS-121-LCD  
**Description:** Digital Pressure Gauge  
**Serial:** E51U01003410  
**ID:** SBI-247  
**Customer:** STOVE BUILDER INTERNATIONAL INC.  
 250 RUE DE COPENHAGUE  
 ST-AUGUSTIN-DE-DESMAURES QC  
 G3A 2H3

**RMA:** AC20071072  
**Workorder:** 2020005339  
**Barcode:** AL0015068-P  
**Received Conditions:** In Tolerance  
**Calibration Date:** 17-Jul-2020  
**Calibration Due:** 17-Jul-2021  
**Temperature:** 22.39°C  
**Humidity:** 55.3%RH

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

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

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

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	09-Jan-2020	09-Jan-2021
Low Pressure Calibrator	Ruska 7250LP	PRE-CAL-06	17-Nov-2019	17-Nov-2020

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

Performed by:

Sree Chukka

Technician

(digitally signed on 17-Jul-2020 1:17 pm)

QA Reviewed by:

Slava Peciurov

Lab Manager

(digitally signed on 17-Jul-2020 2:17 pm)

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						4.03	
0.0000 inH2O	0.0000 inH2O	0.0009 inH2O	±0.0050 inH2O	-0.0050 inH2O	0.0050 inH2O	Pass	0.00015 inH2O
Display Reading						0.1238	
Output @ 0.1250 inH2O, mA						7.982	
0.1250 inH2O	0.1250 inH2O	0.1244 inH2O	±0.0050 inH2O	0.1200 inH2O	0.1300 inH2O	Pass	0.00015 inH2O
Display Reading						0.2485	
Output @ 0.2500 inH2O, mA						11.982	
0.2500 inH2O	0.2500 inH2O	0.2494 inH2O	±0.0050 inH2O	0.2450 inH2O	0.2550 inH2O	Pass	0.00015 inH2O
Display Reading						0.3730	
Output @ 0.3750 inH2O, mA						15.941	
0.3750 inH2O	0.3750 inH2O	0.3732 inH2O	±0.0050 inH2O	0.3700 inH2O	0.3800 inH2O	Pass	0.00015 inH2O
Display Reading						0.4976	
Output @ 0.5000 inH2O, mA						19.925	
0.5000 inH2O	0.5000 inH2O	0.4977 inH2O	±0.0050 inH2O	0.4950 inH2O	0.5050 inH2O	Pass	0.00015 inH2O
Display Reading						0.3760	
Output @ 0.3750 inH2O, mA						16.037	
0.3750 inH2O	0.3750 inH2O	0.3762 inH2O	±0.0050 inH2O	0.3700 inH2O	0.3800 inH2O	Pass	0.00015 inH2O
Display Reading						0.2517	
Output @ 0.2500 inH2O, mA						12.046	
0.2500 inH2O	0.2500 inH2O	0.2514 inH2O	±0.0050 inH2O	0.2450 inH2O	0.2550 inH2O	Pass	0.00015 inH2O
Display Reading						0.1262	
Output @ 0.1250 inH2O, mA						8.036	
0.1250 inH2O	0.1250 inH2O	0.1261 inH2O	±0.0050 inH2O	0.1200 inH2O	0.1300 inH2O	Pass	0.00015 inH2O
Display Reading						0.0012	
Output @ 0.0000 inH2O, mA						4.040	
0.000 inH2O	0.0000 inH2O	0.0013 inH2O	±0.0050 inH2O	-0.0050 inH2O	0.0050 inH2O	Pass	0.00015 inH2O

END OF CERTIFICATE



# CERTIFICATE OF CALIBRATION



Certificate Number: 2020005338

Page 1 of 3

**Manufacturer:** Dwyer Instruments Inc.  
**Model:** MS-121-LCD  
**Description:** Digital Pressure Gauge  
**Serial:** E52U01007512  
**ID:** SBI-254  
**Customer:** STOVE BUILDER INTERNATIONAL INC,  
 250 RUE DE COPENHAGUE  
 ST-AUGUSTIN-DE-DESMAURES QC  
 G3A 2H3

**RMA:** AC20071072  
**Workorder:** 2020005338  
**Barcode:** AL0015074-P  
**Received Conditions:** Out of Tolerance  
**Calibration Date:** 17-Jul-2020  
**Calibration Due:** 17-Jul-2021  
**Temperature:** 22.75°C  
**Humidity:** 56.1%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-17025:2017 and ANSI/NCSL Z540-1.

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

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

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	09-Jan-2020	09-Jan-2021
Low Pressure Calibrator	Ruska 7250LP	PRE-CAL-06	17-Nov-2019	17-Nov-2020

**Notes:** Adjusted trim pots.

**Performed by:** Sree Chukka  
 Technician  
 (digitally signed on 17-Jul-2020 2:10 pm)

**QA Reviewed by:** Slava Peciurov  
 Lab Manager  
 (digitally signed on 17-Jul-2020 2:16 pm)

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)

As Found (Fail)

Test Description	True Value	Test Results	Tolerance	Lower Limit	Upper Limit	Status	Uncertainty
Range: 0 to 0.5 inH2O							
Output signal: 4 to 20 mA							
PRESSURE TEST							
Display Reading						0	
Output @ 0.0000 inH2O, mA						4.013	
0.0000 inH2O	0.0000 inH2O	0.0004 inH2O	±0.0050 inH2O	-0.0050 inH2O	0.0050 inH2O	Pass	0.00015 inH2O
Display Reading						0.1223	
Output @ 0.1250 inH2O, mA						7.915	
0.1250 inH2O	0.1250 inH2O	0.1223 inH2O	±0.0050 inH2O	0.1200 inH2O	0.1300 inH2O	Pass	0.00015 inH2O
Display Reading						0.2439	
Output @ 0.2500 inH2O, mA						11.794	
0.2500 inH2O	0.2500 inH2O	0.2436 inH2O	±0.0050 inH2O	0.2450 inH2O	0.2550 inH2O	Fail	0.00015 inH2O
Display Reading						0.3679	
Output @ 0.3750 inH2O, mA						15.767	
0.3750 inH2O	0.3750 inH2O	0.3677 inH2O	±0.0050 inH2O	0.3700 inH2O	0.3800 inH2O	Fail	0.00015 inH2O
Display Reading						0.4912	
Output @ 0.5000 inH2O, mA						19.709	
0.5000 inH2O	0.5000 inH2O	0.4909 inH2O	±0.0050 inH2O	0.4950 inH2O	0.5050 inH2O	Fail	0.00015 inH2O
Display Reading						0.3699	
Output @ 0.3750 inH2O, mA						15.811	
0.3750 inH2O	0.3750 inH2O	0.3691 inH2O	±0.0050 inH2O	0.3700 inH2O	0.3800 inH2O	Fail	0.00015 inH2O
Display Reading						0.2463	
Output @ 0.2500 inH2O, mA						11.879	
0.2500 inH2O	0.2500 inH2O	0.2462 inH2O	±0.0050 inH2O	0.2450 inH2O	0.2550 inH2O	Pass	0.00015 inH2O
Display Reading						0.1250	
Output @ 0.1250 inH2O, mA						8.001	
0.1250 inH2O	0.1250 inH2O	0.1250 inH2O	±0.0050 inH2O	0.1200 inH2O	0.1300 inH2O	Pass	0.00015 inH2O
Display Reading						0.0012	
Output @ 0.0000 inH2O, mA						4.048	
0.000 inH2O	0.0000 inH2O	0.0015 inH2O	±0.0050 inH2O	-0.0050 inH2O	0.0050 inH2O	Pass	0.00015 inH2O

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

As Left (Pass)

Test Description	True Value	Test Results	Tolerance	Lower Limit	Upper Limit	Status	Uncertainty
Range: 0 to 0.5 inH2O							
Output signal: 4 to 20 mA							
PRESSURE TEST							
Display Reading						0.0012	
Output @ 0.0000 inH2O, mA						4.021	
0.0000 inH2O	0.0000 inH2O	0.0007 inH2O	±0.0050 inH2O	-0.0050 inH2O	0.0050 inH2O	Pass	0.00015 inH2O
Display Reading						0.1257	
Output @ 0.1250 inH2O, mA						8.019	
0.1250 inH2O	0.1250 inH2O	0.1256 inH2O	±0.0050 inH2O	0.1200 inH2O	0.1300 inH2O	Pass	0.00015 inH2O
Display Reading						0.2493	
Output @ 0.2500 inH2O, mA						11.956	

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



Test Description	True Value	Test Results	Tolerance	Lower Limit	Upper Limit	Status	Uncertainty
0.2500 inH2O	0.2500 inH2O	0.2486 inH2O	±0.0050 inH2O	0.2450 inH2O	0.2550 inH2O	Pass	0.00015 inH2O
Display Reading						0.3748	
Output @ 0.3750 inH2O, mA						15.987	
0.3750 inH2O	0.3750 inH2O	0.3746 inH2O	±0.0050 inH2O	0.3700 inH2O	0.3800 inH2O	Pass	0.00015 inH2O
Display Reading						0.4998	
Output @ 0.5000 inH2O, mA						19.972	
0.5000 inH2O	0.5000 inH2O	0.4991 inH2O	±0.0050 inH2O	0.4950 inH2O	0.5050 inH2O	Pass	0.00015 inH2O
Display Reading						0.3762	
Output @ 0.3750 inH2O, mA						16.021	
0.3750 inH2O	0.3750 inH2O	0.3757 inH2O	±0.0050 inH2O	0.3700 inH2O	0.3800 inH2O	Pass	0.00015 inH2O
Display Reading						0.2515	
Output @ 0.2500 inH2O, mA						12.001	
0.2500 inH2O	0.2500 inH2O	0.2500 inH2O	±0.0050 inH2O	0.2450 inH2O	0.2550 inH2O	Pass	0.00015 inH2O
Display Reading						0.1270	
Output @ 0.1250 inH2O, mA						8.058	
0.1250 inH2O	0.1250 inH2O	0.1268 inH2O	±0.0050 inH2O	0.1200 inH2O	0.1300 inH2O	Pass	0.00015 inH2O
Display Reading						0.0005	
Output @ 0.0000 inH2O, mA						4.013	
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: 2020005340

Page 1 of 2

**Manufacturer:** Dwyer Instruments Inc.  
**Model:** 626-06-GH-P1-E1-S1  
**Description:** Pressure Transmitter  
**Serial:** N/A  
**ID:** SBI-294  
**Customer:** STOVE BUILDER INTERNATIONAL INC.  
 250 RUE DE COPENHAGUE  
 ST-AUGUSTIN-DE-DESMAURES QC  
 G3A 2H3

**RMA:** AC20071072  
**Workorder:** 2020005340  
**Barcode:** AL00023151-P  
**Received Conditions:** In Tolerance  
**Calibration Date:** 17-Jul-2020  
**Calibration Due:** 17-Jul-2021  
**Temperature:** 21.96°C  
**Humidity:** 57%RH

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

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

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

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	09-Jan-2020	09-Jan-2021
Pressure Controller/Calibrator	DH Instruments PPC3	PRE-CAL-04	16-Jun-2020	16-Jun-2021

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

**Performed by:** Sree Chukka  
 Technician  
 (digitally signed on 17-Jul-2020 10:31 am)

**QA Reviewed by:** Slava Peciurov  
 Lab Manager  
 (digitally signed on 17-Jul-2020 2:18 pm)

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=4.045 mA							
0.0000 psi	0.0000 psi	0.014 psi	±0.0600 psi	-0.060 psi	0.060 psi	Pass	4.5e-003 psi
Output=8.023 mA							
1.2500 psi	1.2500 psi	1.257 psi	±0.0600 psi	1.190 psi	1.310 psi	Pass	5.8e-003 psi
Output=12.015 mA							
2.5000 psi	2.5000 psi	2.505 psi	±0.0600 psi	2.440 psi	2.560 psi	Pass	7.0e-003 psi
Output=16.031 mA							
3.7500 psi	3.7500 psi	3.760 psi	±0.0600 psi	3.690 psi	3.810 psi	Pass	8.2e-003 psi
Output=20.059 mA							
5.0000 psi	5.0000 psi	5.018 psi	±0.0600 psi	4.940 psi	5.060 psi	Pass	9.5e-003 psi
Output=16 mA							
3.7500 psi	3.7500 psi	3.750 psi	±0.0600 psi	3.690 psi	3.810 psi	Pass	8.2e-003 psi
Output=11.981 mA							
2.5000 psi	2.5000 psi	2.494 psi	±0.0600 psi	2.440 psi	2.560 psi	Pass	7.0e-003 psi
Output=8.019 mA							
1.2500 psi	1.2500 psi	1.255 psi	±0.0600 psi	1.190 psi	1.310 psi	Pass	5.8e-003 psi
Output=4.096 mA							
0.0000 psi	0.0000 psi	0.030 psi	±0.0600 psi	-0.060 psi	0.060 psi	Pass	4.6e-003 psi

END OF CERTIFICATE



# CERTIFICATE OF CALIBRATION



Certificate Number: 2020005341

Page 1 of 2

**Manufacturer:** Dwyer Instruments Inc.  
**Model:** 626-06-GH-PA-E1-S1  
**Description:** Pressure Transmitter  
**Serial:** N/A  
**ID:** SBI-297  
**Customer:** STOVE BUILDER INTERNATIONAL INC.  
 250 RUE DE COPENHAGUE  
 ST-AUGUSTIN-DE-DESMAURES QC  
 G3A 2H3

**RMA:** AC20071072  
**Workorder:** 2020005341  
**Barcode:** AL00023422-P  
**Received Conditions:** In Tolerance  
**Calibration Date:** 17-Jul-2020  
**Calibration Due:** 17-Jul-2021  
**Temperature:** 22.11°C  
**Humidity:** 56.6%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-17025:2017 and ANSI/NCSL Z540-1.

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

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

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	09-Jan-2020	09-Jan-2021
Pressure Controller/Calibrator	DH Instruments PPC3	PRE-CAL-04	16-Jun-2020	16-Jun-2021

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

Performed by:

Sree Chukka

Technician

(digitally signed on 17-Jul-2020 11:05 am)

QA Reviewed by:

Slava Peciurow

Lab Manager

(digitally signed on 17-Jul-2020 2:18 pm)

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=4.051 mA							
0.0000 psi	0.0000 psi	0.016 psi	±0.0300 psi	-0.030 psi	0.030 psi	Pass	4.6e-003 psi
Output=8.023 mA							
1.2500 psi	1.2500 psi	1.257 psi	±0.0300 psi	1.220 psi	1.280 psi	Pass	5.8e-003 psi
Output=12.017 mA							
2.5000 psi	2.5000 psi	2.505 psi	±0.0300 psi	2.470 psi	2.530 psi	Pass	7.0e-003 psi
Output=16.027 mA							
3.7500 psi	3.7500 psi	3.758 psi	±0.0300 psi	3.720 psi	3.780 psi	Pass	8.2e-003 psi
Output=20.058 mA							
5.0000 psi	5.0000 psi	5.018 psi	±0.0300 psi	4.970 psi	5.030 psi	Pass	9.5e-003 psi
Output=16.027 mA							
3.7500 psi	3.7500 psi	3.759 psi	±0.0300 psi	3.720 psi	3.780 psi	Pass	8.2e-003 psi
Output=12.011 mA							
2.5000 psi	2.5000 psi	2.503 psi	±0.0300 psi	2.470 psi	2.530 psi	Pass	7.0e-003 psi
Output=8.01 mA							
1.2500 psi	1.2500 psi	1.253 psi	±0.0300 psi	1.220 psi	1.280 psi	Pass	5.8e-003 psi
Output=4.026 mA							
0.0000 psi	0.0000 psi	0.008 psi	±0.0300 psi	-0.030 psi	0.030 psi	Pass	4.5e-003 psi

END OF CERTIFICATE



# CERTIFICATE OF CALIBRATION



Certificate Number: 2020005343

Page 1 of 2

**Manufacturer:** Dwyer Instruments Inc.  
**Model:** 628-00C-GH-P1-E1-S1  
**Description:** Pressure Transmitter  
**Serial:** N/A  
**ID:** SBI-301  
**Customer:** STOVE BUILDER INTERNATIONAL INC.  
 250 RUE DE COPENHAGUE  
 ST-AUGUSTIN-DE-DESMAURES QC  
 G3A 2H3

**RMA:** AC20071072  
**Workorder:** 2020005343  
**Barcode:** AL00023153-P  
**Received Conditions:** In Tolerance  
**Calibration Date:** 27-Jul-2020  
**Calibration Due:** 27-Jul-2021  
**Temperature:** 22.78°C  
**Humidity:** 68%RH

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

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

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

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	16-Jun-2020	16-Jun-2021
Reference Pressure Monitor	Fluke RPM4	PRE-MTR-04	13-May-2020	13-May-2021

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

Performed by:

Sree Chukka

Technician

(digitally signed on 27-Jul-2020 9:35 am)

QA Reviewed by:

Slava Pecurov

Lab Manager

(digitally signed on 27-Jul-2020 10:30 am)

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							
-28.500	-28.500	-28.26	±0.400	-28.90	-28.10	Pass	6.1e-003
OUT = 7.843 mA							
-23.000	-23.000	-22.79	±0.400	-23.40	-22.60	Pass	6.1e-003
OUT = 11.035 mA							
-17.000	-17.000	-16.81	±0.400	-17.40	-16.60	Pass	6.1e-003
OUT = 14.248 mA							
-11.000	-11.000	-10.79	±0.400	-11.40	-10.60	Pass	6.1e-003
OUT = 16.941 mA							
-6.000	-6.000	-5.74	±0.400	-6.40	-5.60	Pass	6.1e-003
OUT = 20.145 mA							
0.000	0.000	0.27	±0.400	-0.40	0.40	Pass	6.1e-003
OUT = 16.963 mA							
-6.000	-6.000	-5.69	±0.400	-6.40	-5.60	Pass	6.1e-003
OUT = 14.305 mA							
-11.000	-11.000	-10.68	±0.400	-11.40	-10.60	Pass	6.1e-003
OUT = 11.11 mA							
-17.000	-17.000	-16.67	±0.400	-17.40	-16.60	Pass	6.1e-003
OUT = 7.913 mA							
-23.000	-23.000	-22.66	±0.400	-23.40	-22.60	Pass	6.1e-003
OUT = 4.961 mA							
-28.500	-28.500	-28.19	±0.400	-28.90	-28.10	Pass	6.1e-003

END OF CERTIFICATE





# CERTIFICATE OF CALIBRATION



Certificate Number: 2020005342

Page 1 of 2

**Manufacturer:** Dwyer Instruments Inc.  
**Model:** 628-00C-GH-P1-E1-S1  
**Description:** Pressure Transmitter  
**Serial:** N/A  
**ID:** SBI-305  
**Customer:** STOVE BUILDER INTERNATIONAL INC.  
 250 RUE DE COPENHAGUE  
 ST-AUGUSTIN-DE-DESMAURES QC  
 G3A 2H3

**RMA:** AC20071072  
**Workorder:** 2020005342  
**Barcode:** AL00023737-P  
**Received Conditions:** In Tolerance  
**Calibration Date:** 27-Jul-2020  
**Calibration Due:** 27-Jul-2021  
**Temperature:** 22.82°C  
**Humidity:** 69%RH

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

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

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

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	16-Jun-2020	16-Jun-2021
Reference Pressure Monitor	Fluke RPM4	PRE-MTR-04	13-May-2020	13-May-2021

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

Performed by:

Sree Chukka

Technician

(digitally signed on 27-Jul-2020 9:29 am)

QA Reviewed by:

Slava Peciurov

Lab Manager

(digitally signed on 27-Jul-2020 10:30 am)

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 = 4.882 mA							
-28.50	-28.50	-28.3	±0.40	-28.9	-28.1	Pass	5.8e-002
OUT = 7.813 mA							
-23.00	-23.00	-22.9	±0.40	-23.4	-22.6	Pass	5.8e-002
OUT = 11.004 mA							
-17.00	-17.00	-16.9	±0.40	-17.4	-16.6	Pass	5.8e-002
OUT = 14.207 mA							
-11.00	-11.00	-10.9	±0.40	-11.4	-10.6	Pass	5.8e-002
OUT = 16.902 mA							
-6.00	-6.00	-5.8	±0.40	-6.4	-5.6	Pass	5.8e-002
OUT = 20.117 mA							
0.00	0.00	0.2	±0.40	-0.4	0.4	Pass	5.8e-002
OUT = 16.935 mA							
-6.00	-6.00	-5.8	±0.40	-6.4	-5.6	Pass	5.8e-002
OUT = 14.287 mA							
-11.00	-11.00	-10.7	±0.40	-11.4	-10.6	Pass	5.8e-002
OUT = 11.094 mA							
-17.00	-17.00	-16.7	±0.40	-17.4	-16.6	Pass	5.8e-002
OUT = 7.896 mA							
-23.00	-23.00	-22.7	±0.40	-23.4	-22.6	Pass	5.8e-002
OUT = 4.939 mA							
-28.50	-28.50	-28.2	±0.40	-28.9	-28.1	Pass	5.8e-002

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

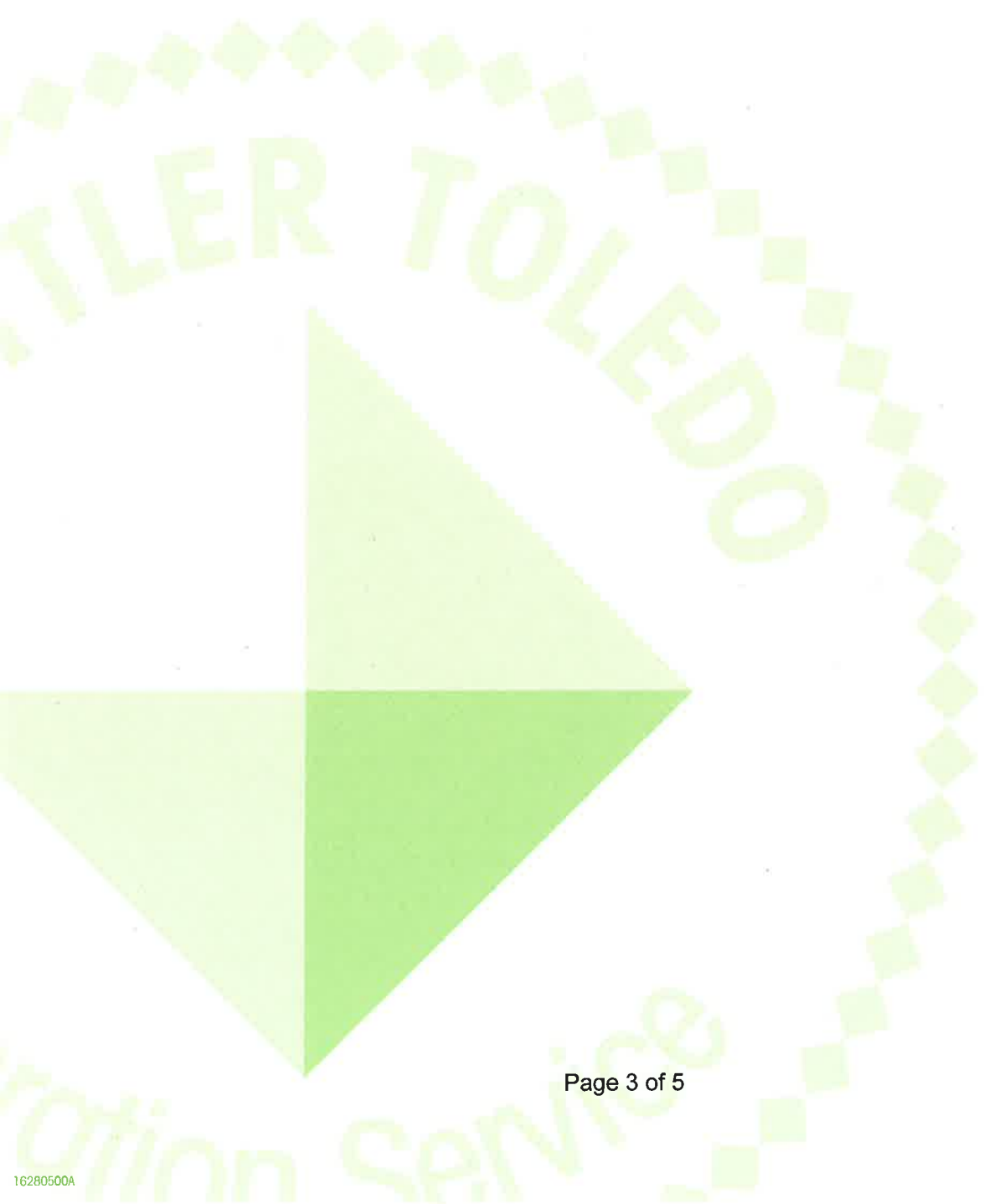
**As Found Data**

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

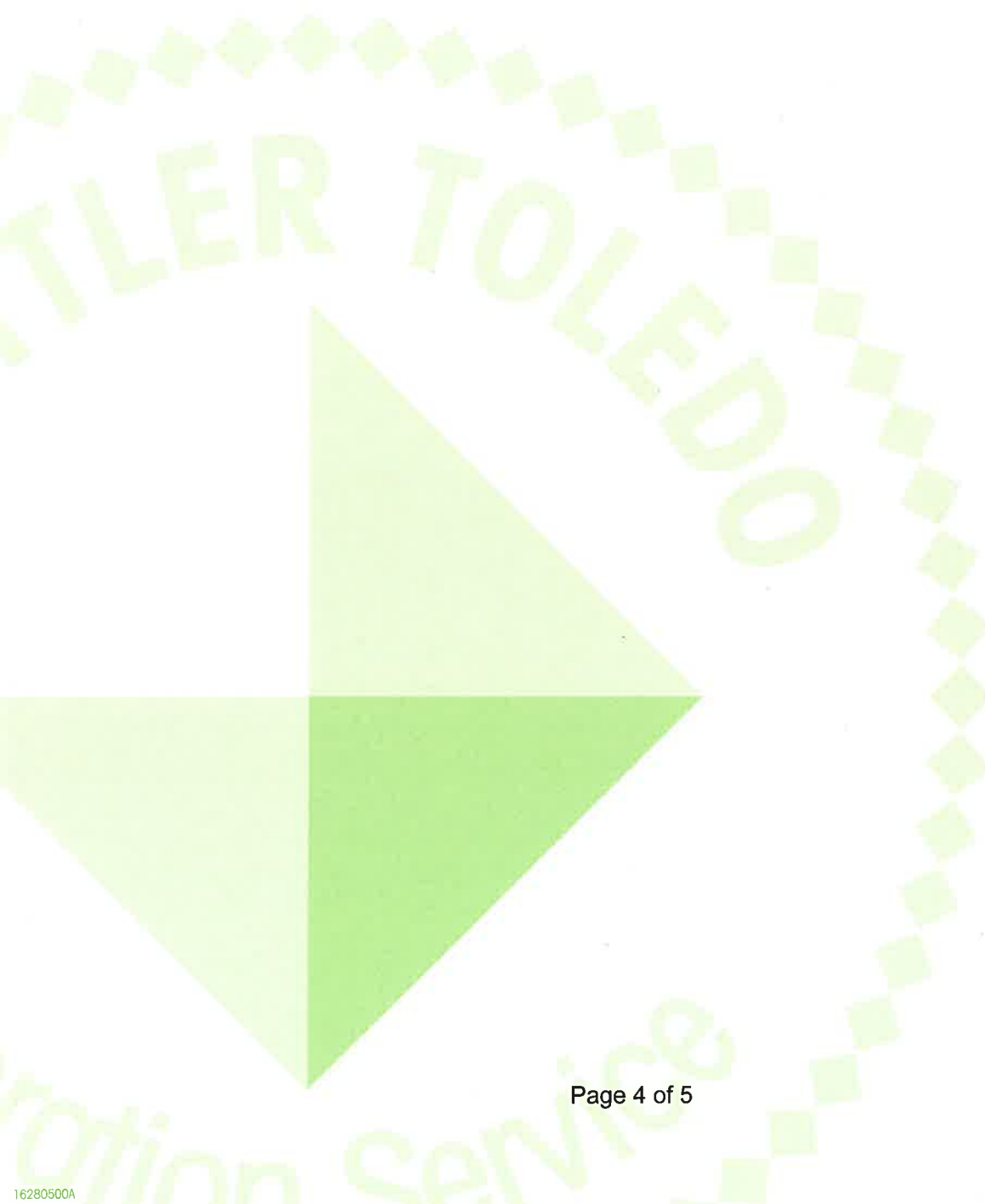


Certificate No: 01037944-1

**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

---

**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.



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



Cert. No.: 4199-11583105

Traceable® Certificate of Calibration for Dial Barometer

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

Instrument Identification: SB1-331

Model: 4199,

S/N: 200586704

Manufacturer: Control Company

Standards/Equipment:

Table with 4 columns: Description, Serial Number, Due Date, NIST Traceable Reference. Row 1: Digital Barometer, D4540001, 01 Nov 2020, 1000447551

Certificate Information:

Technician: 57

Procedure: CAL-33

Cal Date: 01 Oct 2020

Cal Due Date: 01 Oct 2022

Test Conditions: 44.14%RH 23.01°C 1018mBar

Calibration Data: (New Instrument)

Table with 11 columns: Unit(s), Nominal, As Found, In Tol, Nominal, As Left, In Tol, Min, Max, ±U, TUR. Rows for mb/hPa at different points.

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

A Test Uncertainty Ratio of at least 4:1 is maintained unless otherwise stated and is calculated using the expanded measurement uncertainty. Uncertainty evaluation includes the instrument under test and is calculated in accordance with the ISO 'Guide to the Expression of Uncertainty in Measurement': (GUM). The uncertainty represents an expanded uncertainty using a coverage factor k=2 to approximate a 95% confidence level.

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

Nicol Rodriguez signature

Nicol Rodriguez, Quality Manager

Marisa Elms signature

Marisa Elms, Technical Manager

Note :

Maintaining Accuracy:

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

Recalibration:

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

Issue Date : 01 Oct 2020

CONTROL COMPANY 12554 Galveston RD Suite B230 Webster TX USA 77598 Phone 281 482-1714 Fax 281 482-9448 sales@control3.com www.traceable.com

Control Company is an ISO/IEC 17025:2017 Calibration Laboratory Accredited by (A2LA) American Association for Laboratory Accreditation, Certificate No. 1750.01. Control Company is ISO 9001:2015 Quality Certified by DNV GL, Certificate No. CERT-01805-2006-AQ-HOU-ANAB. International Laboratory Accreditation Cooperation - Multilateral Recognition Arrangement (ILAC-MRA).





## CERTIFICATE OF ANALYSIS

**Customer:** SBI FABRICANT DE POELES  
INTERNATIONAL INC  
250 RUE DE COPENHAGUE  
SAINT-AUGUSTIN-DE-DESMAURES QC  
G3A 2H3

**Analysis Date:** 3/26/2020 11:21:38AM  
**Product code:** A1310737  
**Grade:** CERTIFIED  
**Size:** 7AL  
**CGA #:** 590

**Servitrax barcode No:** T2UMTNM  
**Work order number:** 1301047  
**Pressure:** 1450 psig  
**Volume:** .58 M3  
**Expiry date:** 03/26/2023

COMPONENTS	NOMINAL CONCENTRATION	ANALYSIS RESULTS
CARBON DIOXIDE	16.0000 % Molar	16.1 % Molar
CARBON MONOXIDE	3.0000 % Molar	2.99 % Molar
OXYGEN	18.0000 % Molar	17.9 % Molar
NITROGEN	BALANCE	BALANCE

Analysis performed by:

*Ross A. Crichton*

ROSS CRICHTON - LAB TECHNICIAN

This Air Liquide Canada mixture is traceable to NIST

### METHOD OF ANALYSIS:

Method of analysis is based on principles of gas chromatography and as documented in Air Liquide Canada operating procedure, where applicable, FID, TCD, PDHID, FT-IR, FPD, NO/NO<sub>x</sub> and SO<sub>2</sub> chemiluminescence, hygrometer, and electrochemical cells and paramagnetic cell. Detectors were used in conjunction with packed or capillary columns calibrated flow meters and dilution calibrated system.

### ANALYTICAL ACCURACY:

Quality	Concentration	Blend Tolerance	AA
PRIMARY	5%-50%	+/-1%	+/-1%
	0.5%-5%	+/-2%	
	1ppm-0.5%	+/-5%	
CERTIFIED	5%-50%	+/-5%	+/-2%
	0.5%-5%	+/-10%	
	1ppm-0.5%	+/-20%	
UNANALYZE	5%-50%	+/-10%	+/-5%
	<5%	+/-20%	

This mixture was certified by a combination of weight and analysis (depending on component) using scales certified against weights traceable to the Institute for National Measurement Standards (INMS) of the National Research Council of Canada (NRCC), Report # W-021221-13857 (MTL) and W-35174-20727 (Calgary) or calibration standards prepared in that manner.

### How to contact us & order



E-mail within your region:

specgas.atlantic@airliquide.com  
specgas.qc@airliquide.com

specgas.on@airliquide.com  
specgas.ab@airliquide.com

specgas.midwest@airliquide.com  
specgas.pacific@airliquide.com



Customer Solution Center: 1 800 217-2688



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## CERTIFICATE OF ANALYSIS

**Customer:** SBI FABRICANT DE POELES  
INTERNATIONAL INC  
250 RUE DE COPENHAGUE  
SAINT-AUGUSTIN-DE-DESMAURES QC  
G3A 2H3

**Analysis Date:** 3/31/2020 2:27:55PM  
**Product code:** A1310736  
**Grade:** CERTIFIED  
**Size:** 7AL  
**CGA #:** 590

**Servitrax barcode No:** T2M5LHF  
**Work order number:** 1301048  
**Pressure:** 2000 psig  
**Volume:** .9 M3  
**Expiry date:** 03/31/2023

COMPONENTS	NOMINAL CONCENTRATION	ANALYSIS RESULTS
CARBON DIOXIDE	16.0000 % Molar	16.0 % Molar
CARBON MONOXIDE	5,500.0000 ppm Molar	5569 ppm Molar
OXYGEN	18.0000 % Molar	18.0 % Molar
NITROGEN	BALANCE	BALANCE

Analysis performed by:

  
Aymen Oueslati

This Air Liquide Canada mixture is traceable to NIST

**METHOD OF ANALYSIS:**

Method of analysis is based on principles of gas chromatography and as documented in Air Liquide Canada operating procedure, where applicable, FID, TCD, PDHID, FT-IR, FPD,NO/NOx and SO2 chemiluminescence, hygrometer, and electrochemical cells and paramagnetic cell. Detectors were used in conjunction with packed or capillary columns calibrated flow meters and dilution calibrated system.

**ANALYTICAL ACCURACY:**

Quality	Concentration	Blend Tolerance	AA
PRIMARY	5%-50%	+/-1%	+/-1%
	0.5%-5%	+/-2%	
	1ppm-0.5%	+/-5%	
CERTIFIED	5%-50%	+/-5%	+/-2%
	0.5%-5%	+/-10%	
	1ppm-0.5%	+/-20%	
UNANALYZE	5%-50%	+/-10%	+/-5%
	<5%	+/-20%	

This mixture was certified by a combination of weight and analysis (depending on component) using scales certified against weights traceable to the Institute for National Measurement Standards (INMS) of the National Research Council of Canada (NRCC), Report # W-021221-13857 (MTL) and W-35174-20727(Calgary) or calibration standards prepared in that manner.

**How to contact us & order**



E-mail within your region: [specgas.atlantic@airliquide.com](mailto:specgas.atlantic@airliquide.com)  
[specgas.qc@airliquide.com](mailto:specgas.qc@airliquide.com)

[specgas.on@airliquide.com](mailto:specgas.on@airliquide.com)  
[specgas.ab@airliquide.com](mailto:specgas.ab@airliquide.com)

[specgas.midwest@airliquide.com](mailto:specgas.midwest@airliquide.com)  
[specgas.pacific@airliquide.com](mailto:specgas.pacific@airliquide.com)



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## CERTIFICATE OF ANALYSIS

**Customer:** SBI FABRICANT DE POELES  
INTERNATIONAL INC  
250 RUE DE COPENHAGUE  
SAINT-AUGUSTIN-DE-DESMAURES QC  
G3A 2H3

**Analysis Date:** 9/11/2019 8:34:56AM  
**Product code:** A0923375  
**Grade:** CERTIFIED  
**Size:** 7AL  
**CGA #:** 580

**Servitrax barcode No:** T2L7XUG  
**Work order number:** 1191003  
**Pressure:** 2000 psig  
**Volume:** 0.85 M3  
**Expiry date:** 09/11/2022

COMPONENTS	NOMINAL CONCENTRATION	ANALYSIS RESULTS
CARBON DIOXIDE	8.0000 % Molar	8.03 % Molar
CARBON MONOXIDE	600.0000 ppm Molar	616 ppm Molar
OXYGEN	4.0000 % Molar	4.02 % Molar
NITROGEN	BALANCE	BALANCE

Analysis performed by:

  
Aymen Oueslati

This Air Liquide Canada mixture is traceable to NIST

### METHOD OF ANALYSIS:

Method of analysis is based on principles of gas chromatography and as documented in Air Liquide Canada operating procedure, where applicable, FID, TCD, PDHID, FT-IR, FPD, NO/NOx and SO2 chemiluminescence, hygrometer, and electrochemical cells and paramagnetic cell. Detectors were used in conjunction with packed or capillary columns calibrated flow meters and dilution calibrated system.

### ANALYTICAL ACCURACY:

Quality	Concentration	Blend Tolerance	AA
PRIMARY	5%-50%	+/-1%	+/-1%
	0.5%-5%	+/-2%	
	1ppm-0.5%	+/-5%	
CERTIFIED	5%-50%	+/-5%	+/-2%
	0.5%-5%	+/-10%	+/-2%
	1ppm-0.5%	+/-20%	+/-5%
UNANALYZE	5%-50%	+/-10%	
	<5%	+/-20%	

This mixture was certified by a combination of weight and analysis (depending on component) using scales certified against weights traceable to the Institute for National Measurement Standards (INMS) of the National Research Council of Canada (NRCC), Report # W-021221-13857 (MTL) and W-35174-20727 (Calgary) or calibration standards prepared in that manner.

### How to contact us & order



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[specgas.ab@airliquide.com](mailto:specgas.ab@airliquide.com)

[specgas.midwest@airliquide.com](mailto:specgas.midwest@airliquide.com)  
[specgas.pacific@airliquide.com](mailto:specgas.pacific@airliquide.com)



Customer Solution Center: 1 800 217-2688



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Air Liquide Mobile App

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

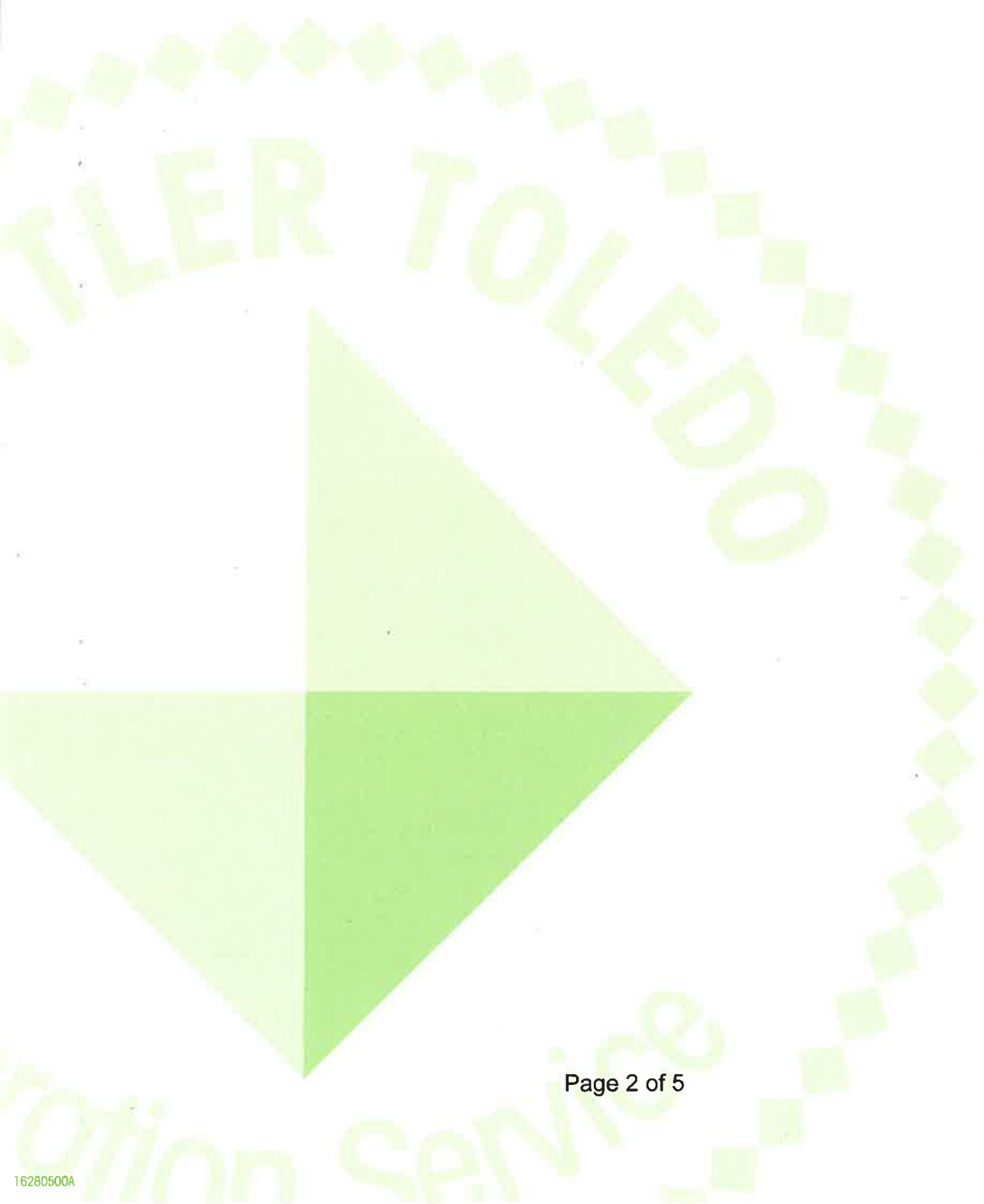
*Calibration Technician:* Robotic Calibration

*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

---

Certificate No: 01037944B-1

---

**Standards and Comparators Used**

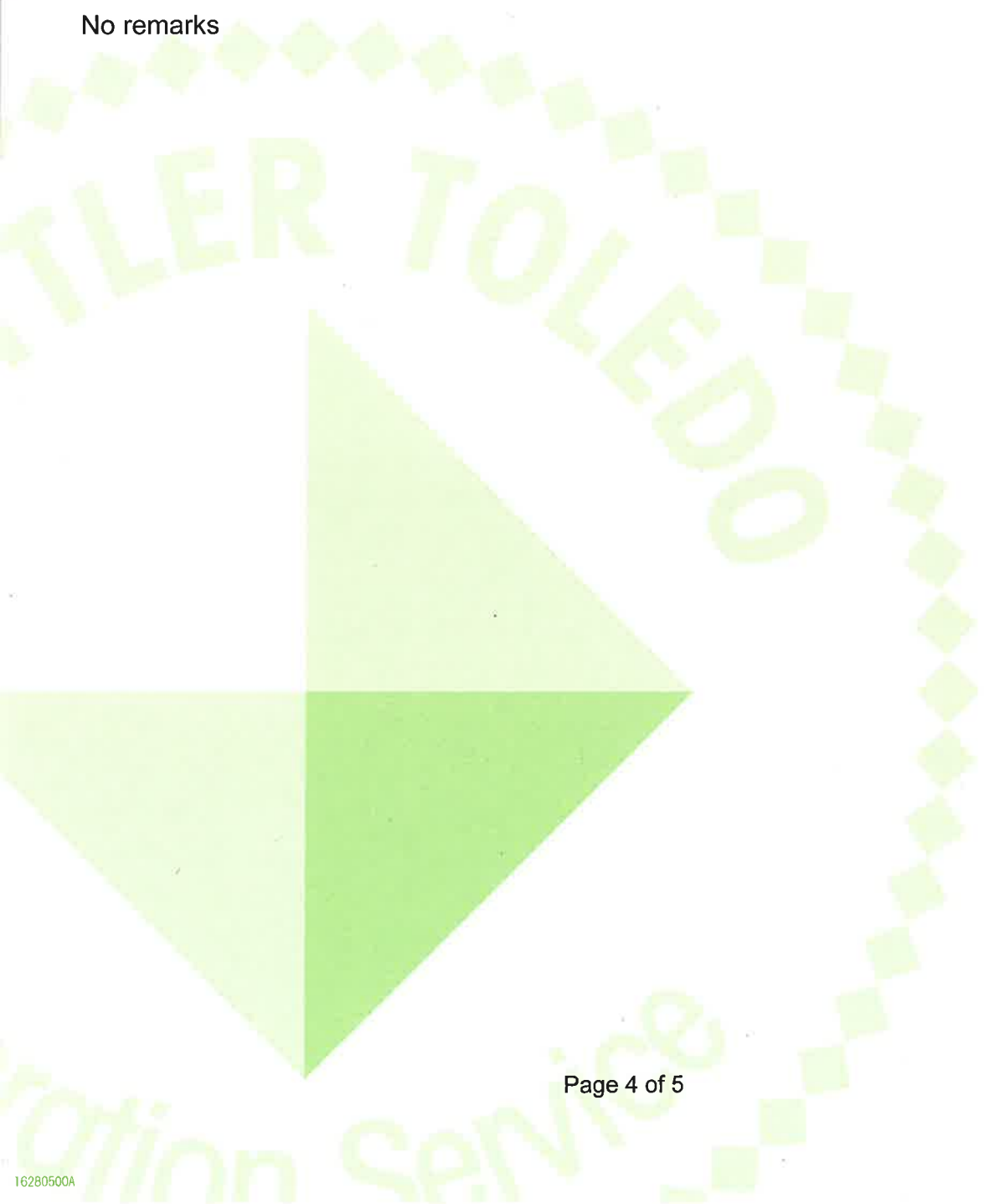
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Nominal Value&Suffix	Serial Number	Standard Set No.	Cal Due	Comparator Used	Cal Due	Procedure Used
10 g	B316238717	MS002	08/01/19	A200XXL 132	01/01/19	Multi A-B

**Comments**

---

No remarks



## Definitions

---

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

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

**Conventional Mass** - For a mass at 20 °C, "Conventional Mass" is the mass of a reference standard of density 8000 kg/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.





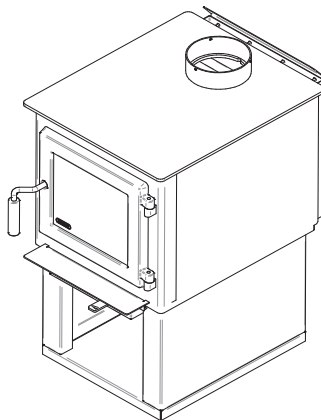
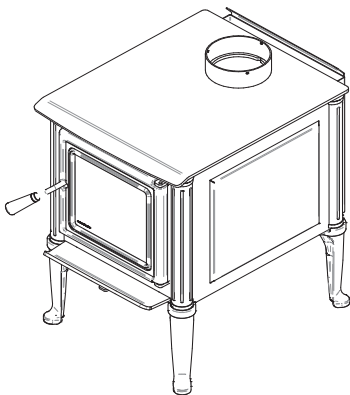
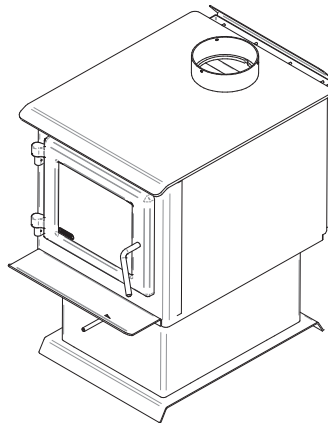
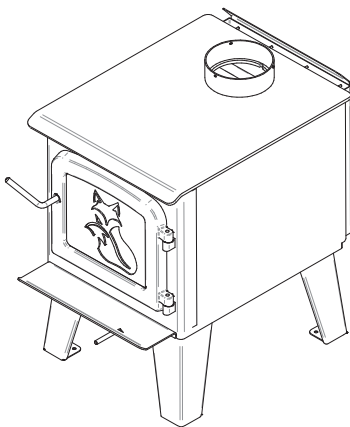
# Installation and Operation Manual

## 1.4 SERIES

S250  
Escape 1200  
Fox

Déco Nano  
Spark II  
Solution 1.4  
Harmony 1.4

Osburn 950  
Gateway 1400  
HES140



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

EPA  
 $\leq 2.5$  g/h

ENGLISH

CONTACT LOCAL BUILDING OR FIRE OFFICIALS ABOUT RESTRICTIONS AND INSTALLATION INSPECTION REQUIREMENTS IN LOCAL AREA.

READ THIS ENTIRE MANUAL BEFORE INSTALLATION AND USE OF THIS WOOD STOVE. FAILURE TO FOLLOW THESE INSTRUCTIONS COULD RESULT IN PROPERTY DAMAGE, BODILY INJURY OR EVEN DEATH.

**READ AND KEEP THIS MANUAL FOR REFERENCE**

Dealer: \_\_\_\_\_

Installer: \_\_\_\_\_

Phone Number: \_\_\_\_\_

**Serial Number:** \_\_\_\_\_



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# 1. CERTIFICATION PLATE



Intertek

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

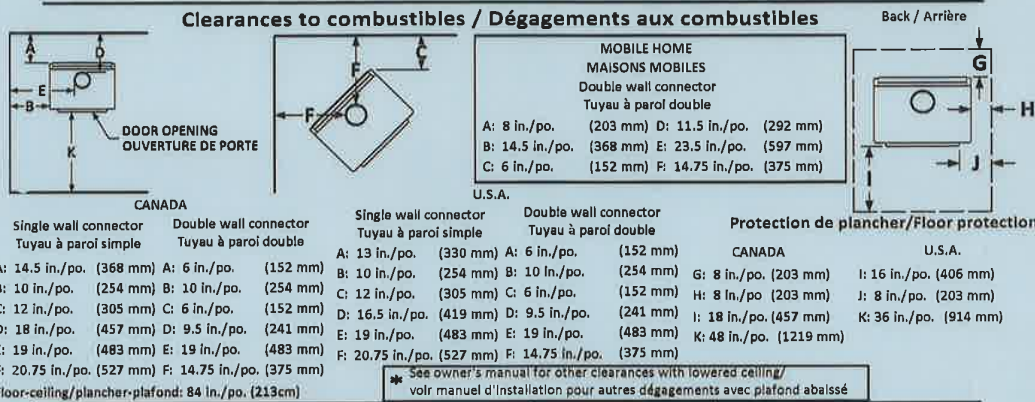
POÊLE À COMBUSTIBLE SOLIDE HOMOLOGUÉ

MODEL / MODÈLE :

DECO NANO

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 1.52 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.
- For use with solid fuel 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.
- 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 galvanisée.
- 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.
- Pour l'usage avec du combustible solide 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.
- 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 violation de la loi fédérale (USA).

Optional blower: (115V, 0.8A, 60Hz)

Option ventilateur: (115V, 0.8A, 60Hz)

U.S. ENVIRONMENTAL PROTECTION AGENCY Certified to comply with 2020 particulate emission standards using cordwood.

AGENCE DE PROTECTION DE L'ENVIRONNEMENT DES É.-U. Conforme aux normes d'émission de particules de 2020 avec bûche de bois.

Weighted average emission rate / Moyenne pondérée des émissions : 1.8 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  
08/12/2020 (# test)



Fabricant de poêles international  
Stove Builder International

Fabriqué à St-Augustin-de-Desmaures (Qc), Canada  
08/12/2020 (# test)

27866



REFER TO INTERTEK'S DIRECTORY OF BUILDING PRODUCTS FOR DETAILED INFORMATION  
SE RÉFÉRER AU RÉPERTOIRE DES PRODUITS HOMOLOGUÉS D'INTERTEK POUR PLUS D'INFORMATION

STANDARDS / NORMES D'ESSAI:

LISTED SOLID FUEL BURNING APPLIANCE

POÊLE À COMBUSTIBLE SOLIDE HOMOLOGUÉ

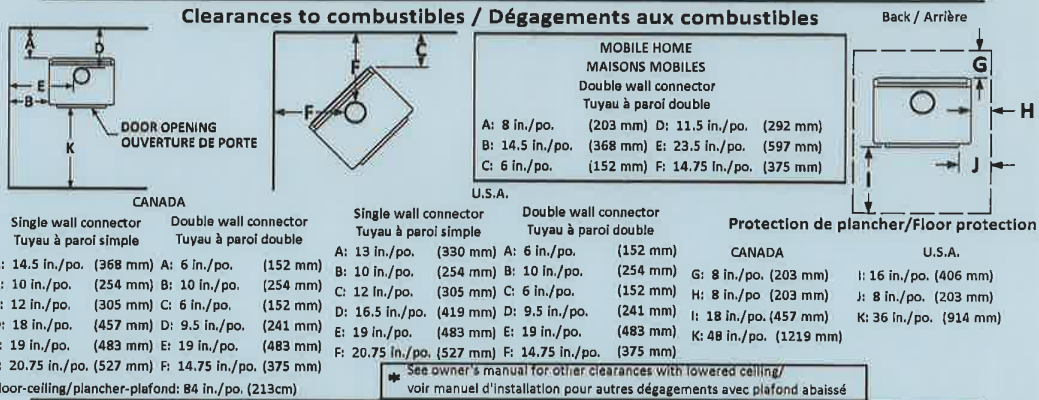
MODEL / MODÈLE :

SPARK II

Control number: 4002461

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

Serial Number / No. de Série: 1



**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.
- For use with solid fuel 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.
- 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 déservant un autre appareil.
- Pour l'usage avec du combustible solide 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.
- 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 constitue une violation de la loi fédérale (USA).

Optional blower: (115V, 0.8A, 60Hz)

Option ventilateur: (115V, 0.8A, 60Hz)

U.S. ENVIRONMENTAL PROTECTION AGENCY Certified to comply with 2020 particulate emission standards using cordwood.

AGENCE DE PROTECTION DE L'ENVIRONNEMENT DES É.-U. Conforme aux normes d'émission de particules de 2020 avec bûche de bois.

Weighted average emission rate / Moyenne pondérée des émissions : 1.8 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**

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- UN CONTACT AVEC LA PEAU PEUT OCCASIONNER DES BRÛLURES. VOIR LES INSTRUCTIONS.

Made in St-Augustin-de-Desmaures (Qc), Canada

08/12/2020

(# test)



Fabricant de poêles international  
Stove Builder International

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

08/12/2020

(# test)

27867

ENGLISH



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

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)

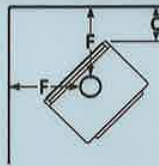
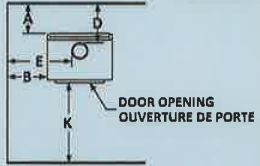
LISTED SOLID FUEL BURNING APPLIANCE

POÊLE À COMBUSTIBLE SOLIDE HOMOLOGUÉ

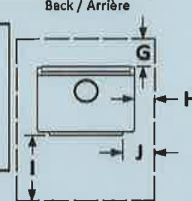
MODEL / MODÈLE :  
ESCAPE 1200

Serial Number / No. de Série: 1

Clearances to combustibles / Dégagements aux combustibles



MOBILE HOME MAISONS MOBILES Double wall connector Tuyau à paroi double	
A: 8 in./po. (203 mm)	D: 11.5 in./po. (292 mm)
B: 14.5 in./po. (368 mm)	E: 23.5 in./po. (597 mm)
C: 6 in./po. (152 mm)	F: 14.75 in./po. (375 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: 14.5 in./po. (368 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: 10 in./po. (254 mm)	B: 10 in./po. (254 mm)	B: 10 in./po. (254 mm)	B: 10 in./po. (254 mm)	H: 8 in./po. (203 mm)	J: 8 in./po. (203 mm)
C: 12 in./po. (305 mm)	C: 6 in./po. (152 mm)	C: 12 in./po. (305 mm)	C: 6 in./po. (152 mm)	I: 18 in./po. (457 mm)	K: 36 in./po. (914 mm)
D: 18 in./po. (457 mm)	D: 9.5 in./po. (241 mm)	D: 16.5 in./po. (419 mm)	D: 9.5 in./po. (241 mm)	K: 48 in./po. (1219 mm)	
E: 19 in./po. (483 mm)	E: 19 in./po. (483 mm)	E: 19 in./po. (483 mm)	E: 19 in./po. (483 mm)		
F: 20.75 in./po. (527 mm)	F: 14.75 in./po. (375 mm)	F: 20.75 in./po. (527 mm)	F: 14.75 in./po. (375 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.
- For use with solid fuel 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.
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- 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.
- 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.
- Pour l'usage avec du combustible solide 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.
- Les entrées d'air servant à la combustion ne doivent pas être obstruées.
- Cet appareil de chauffage requiert des inspections et réparations périodiques. Consulter le manuel de l'utilisateur pour plus d'information. Opérer cet appareil de chauffage de façon inconsistente par rapport au manuel de l'utilisateur consiste une violation de la loi fédérale (USA).

Optional blower: (115V, 0.8A, 60Hz)

Option ventilateur: (115V, 0.8A, 60Hz)

U.S. ENVIRONMENTAL PROTECTION AGENCY Certified to comply with 2020 particulate emission standards using cordwood.

AGENCE DE PROTECTION DE L'ENVIRONNEMENT DES É.-U. Conforme aux normes d'émission de particules de 2020 avec bûche de bois.

Weighted average emission rate / Moyenne pondérée des émissions : 1.8 g/h

Tested and certified in compliance with CFR 40 part 60, subpart AAA, section 60.534(e)(1)(ii)



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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  
08/12/2020 (# test)



Fabricant de poêles international  
Stove Builder International

Fabriqué à St-Augustin-de-Desmaures (Qc), Canada  
08/12/2020 (# test)

27864

ENGLISH



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

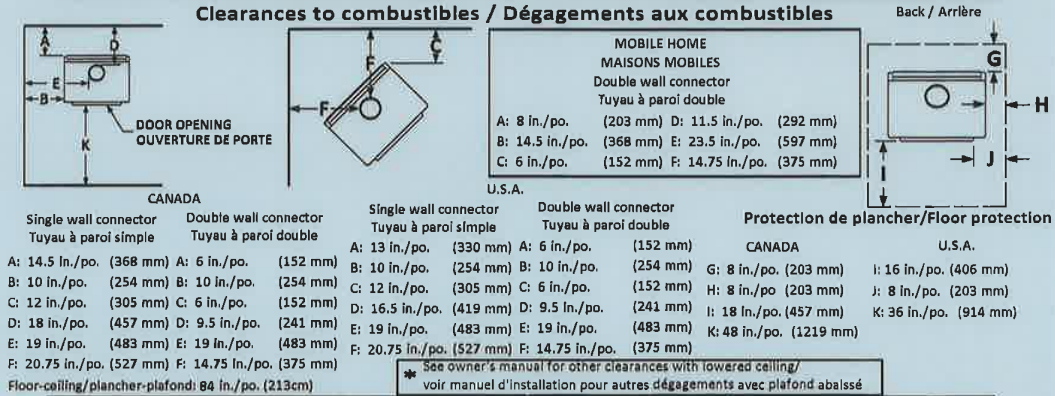
POÊLE À COMBUSTIBLE SOLIDE HOMOLOGUÉ

MODEL / MODÈLE :

FOX

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 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.
- For use with solid fuel 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.
- 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.
- Pour l'usage avec du combustible solide 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.
- 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)

Optlon ventilateur: (115V, 0.8A, 60Hz)

U.S. ENVIRONMENTAL PROTECTION AGENCY Certified to comply with 2020 particulate emission standards using cordwood.

AGENCE DE PROTECTION DE L'ENVIRONNEMENT DES É.-U. Conforme aux normes d'émission de particules de 2020 avec bûche de bois.

Weighted average emission rate / Moyenne pondérée des émissions : 1.8 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  
08/12/2020 (# test)



Fabricant de poêles International  
Stove Builder International

Fabriqué à St-Augustin-de-Desmaures (Qc), Canada  
08/12/2020 (# test)

27865

ENGLISH



Intertek

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:

LISTED SOLID FUEL BURNING APPLIANCE

POÈLE À COMBUSTIBLE SOLIDE HOMOLOGUÉ

MODEL / MODÈLE :

GATEWAY 1400

Certified to/Certifié selon CSA B415.1-10

Certified to/Certifié selon ASTM E3053-17

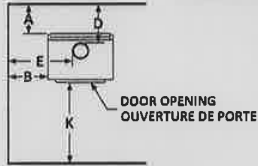
Certified to/Certifié selon ASTM E2515-11 (R2017)

Serial Number

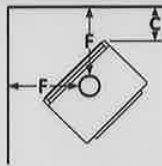
No. de Série

1

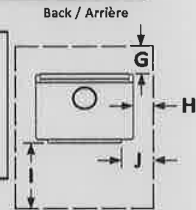
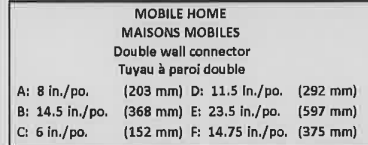
Clearances to combustibles / Dégagements aux combustibles



CANADA



U.S.A.



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: 14.5 in./po. (368 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: 10 in./po. (254 mm)	B: 10 in./po. (254 mm)	B: 10 in./po. (254 mm)	B: 10 in./po. (254 mm)	H: 8 in./po. (203 mm)	J: 8 in./po. (203 mm)		
C: 12 in./po. (305 mm)	C: 6 in./po. (152 mm)	C: 12 in./po. (305 mm)	C: 6 in./po. (152 mm)	I: 18 in./po. (457 mm)	K: 36 in./po. (914 mm)		
D: 18 in./po. (457 mm)	D: 9.5 in./po. (241 mm)	D: 16.5 in./po. (419 mm)	D: 9.5 in./po. (241 mm)				
E: 19 in./po. (483 mm)	E: 19 in./po. (483 mm)	E: 19 in./po. (483 mm)	E: 19 in./po. (483 mm)				
F: 20.75 in./po. (527 mm)	F: 14.75 in./po. (375 mm)	F: 20.75 in./po. (527 mm)	F: 14.75 in./po. (375 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.
- For use with solid fuel 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.
- 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.
- Pour l'usage avec du combustible solide 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 créosote peut être rapide.
- Remplacer la vitre seulement avec un verre de céramique.
- Installer l'appareil sur une plaque non combustible tel qu'indiqué sur l'étiquette.
- Poêle approuvé pour maison mobile.
- Les entrées d'air servant à la combustion ne doivent pas être obstruées.
- Cet appareil de chauffage requiert des inspections et réparations périodiques. Consulter le manuel de l'utilisateur pour plus d'information. Opérer cet appareil de chauffage de façon inconsistente par rapport au manuel de l'utilisateur consiste une violation de la loi fédérale (USA).

Optional blower: (115V, 0.8A, 60Hz)

Option ventilateur: (115V, 0.8A, 60Hz)

U.S. ENVIRONMENTAL PROTECTION AGENCY Certified to comply with 2020 particulate emission standards using cordwood.

AGENCE DE PROTECTION DE L'ENVIRONNEMENT DES É.-U. Conforme aux normes d'émission de particules de 2020 avec bûche de bois.

Weighted average emission rate / Moyenne pondérée des émissions : 1.8 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

08/12/2020

(# test)



SINCE 1932

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

08/12/2020

(# test)

27870

ENGLISH





Intertek

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:

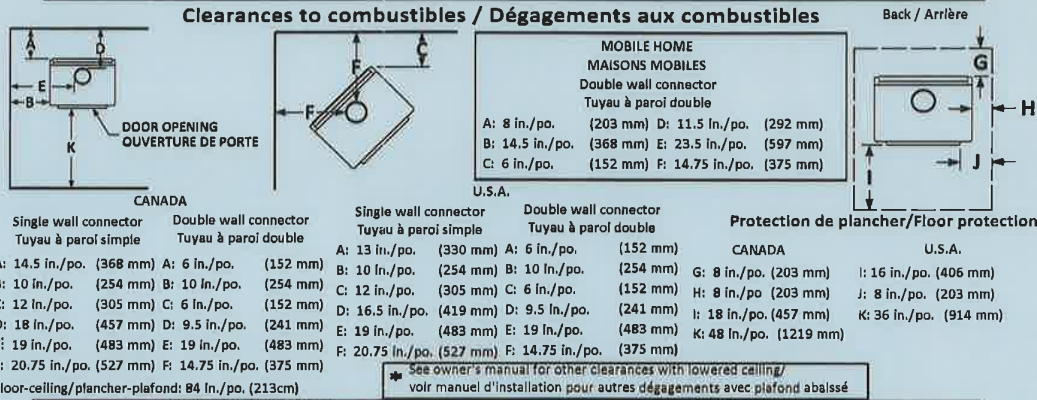
Certified to/Certifié selon CSA B415.1-10  
Certified to/Certifié selon ASTM E3053-17  
Certified to/Certifié selon ASTM E2515-11 (R2017)

LISTED SOLID FUEL BURNING APPLIANCE

POÊLE À COMBUSTIBLE SOLIDE HOMOLOGUÉ

MODEL / MODÈLE :  
HARMONY 1.4

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 1.52 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.
- For use with solid fuel 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.
- 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.
- Pour l'usage avec du combustible solide 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 crasse 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.
- 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 de bois.

Weighted average emission rate / Moyenne pondérée des émissions : 1.8 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  
08/12/2020 (# test)



Fabricant de poêles international  
Stove Builder International

Fabriqué à St-Augustin-de-Desmaures (Qc), Canada  
08/12/2020 (# test)

27869

ENGLISH



Intertek

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 :

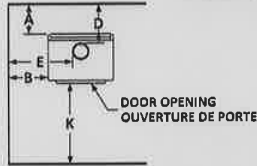
HES140

Serial Number

No. de Série

1

Clearances to combustibles / Dégagements aux combustibles



CANADA

Single wall connector  
Tuyau à paroi simple

A: 14.5 in./po. (368 mm)  
B: 10 in./po. (254 mm)  
C: 12 in./po. (305 mm)  
D: 18 in./po. (457 mm)  
E: 19 in./po. (483 mm)  
F: 20.75 in./po. (527 mm)  
K: 84 in./po. (213cm)

Double wall connector  
Tuyau à paroi double

A: 6 in./po. (152 mm)  
B: 10 in./po. (254 mm)  
C: 6 in./po. (152 mm)  
D: 9.5 in./po. (241 mm)  
E: 19 in./po. (483 mm)  
F: 14.75 in./po. (375 mm)



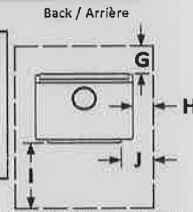
U.S.A.

Single wall connector  
Tuyau à paroi simple

A: 13 in./po. (330 mm)  
B: 10 in./po. (254 mm)  
C: 12 in./po. (305 mm)  
D: 16.5 in./po. (419 mm)  
E: 19 in./po. (483 mm)  
F: 20.75 in./po. (527 mm)

Double wall connector  
Tuyau à paroi double

A: 6 in./po. (152 mm)  
B: 10 in./po. (254 mm)  
C: 6 in./po. (152 mm)  
D: 9.5 in./po. (241 mm)  
E: 19 in./po. (483 mm)  
F: 14.75 in./po. (375 mm)



Back / Arrière

Protection de plancher/Floor protection

CANADA

G: 8 in./po. (203 mm)  
H: 8 in./po. (203 mm)  
I: 18 in./po. (457 mm)  
K: 48 in./po. (1219 mm)

U.S.A.

J: 8 in./po. (203 mm)  
K: 36 in./po. (914 mm)

- PREVENT HOUSE FIRES**
- Install and use only in accordance with the manufacturer's installation and operating instructions.
  - Contact local building or fire officials about restrictions and installation inspection in your area.
  - Use listed 1.52 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.
  - For use with solid fuel 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.
  - 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.
  - Voilà 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.
  - Pour l'usage avec du combustible solide 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 crasse 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.
  - 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 de bois.

Weighted average emission rate / Moyenne pondérée des émissions : 1.8 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  
08/12/2020 (# test)



Fabriqué à St-Augustin-de-Desmaures (Qc), Canada  
08/12/2020 (# test)

27871

ENGLISH



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 E9053-17  
Certified to/Certifié selon ASTM E2515-11 (R2017)

Control number: 4002461

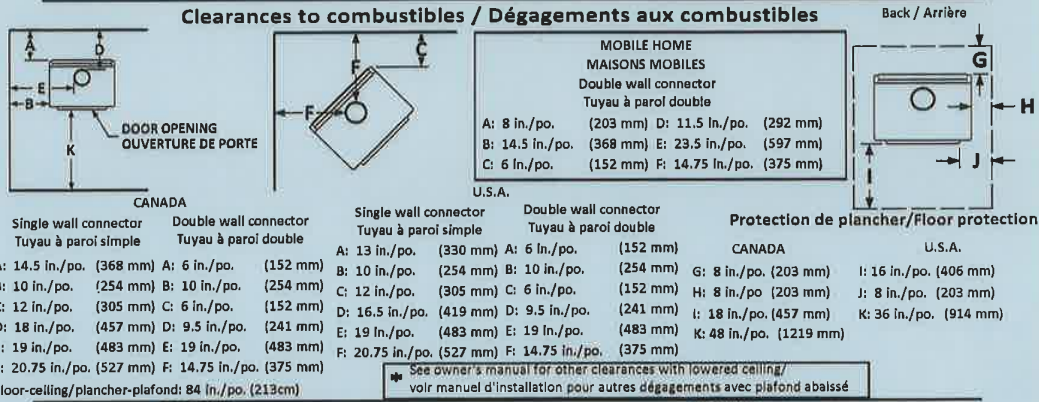
LISTED SOLID FUEL BURNING APPLIANCE

POÊLE À COMBUSTIBLE SOLIDE HOMOLOGUÉE

MODEL / MODÈLE :

OSBURN 950

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 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.
- For use with solid fuel 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.
- 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.
- Pour l'usage avec du combustible solide 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.
- Les entrées d'air servant à la combustion ne doivent pas être obstruées.
- Cet appareil de chauffage requiert des inspections et réparations périodiques. Consulter le manuel de l'utilisateur pour plus d'information. Opérer cet appareil de chauffage de façon inconsistente par rapport au manuel de l'utilisateur consiste une violation de la loi fédérale (USA).

Optional blower: (115V, 0.8A, 60Hz)

Option ventilateur: (115V, 0.8A, 60Hz)

U.S. ENVIRONMENTAL PROTECTION AGENCY Certified to comply with 2020 particulate emission standards using cordwood.

AGENCE DE PROTECTION DE L'ENVIRONNEMENT DES É.-U. Conforme aux normes d'émission de particules de 2020 avec bûche de bois.

Weighted average emission rate / Moyenne pondérée des émissions : 1.8 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  
08/12/2020 (# test)



Fabricant de poêles international  
Stove Builder International

Fabriqué à St-Augustin-de-Desmaures (Qc), Canada  
08/12/2020 (# test)

27862

ENGLISH



REFER TO INTERTEK'S DIRECTORY OF BUILDING PRODUCTS FOR DETAILED INFORMATION  
SE REFERER AU RÉPERTOIRE DES PRODUITS HOMOLOGUÉS D'INTERTEK POUR PLUS D'INFORMATION

STANDARDS / NORMES D'ESSAI:

Intertek

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)

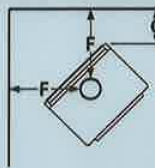
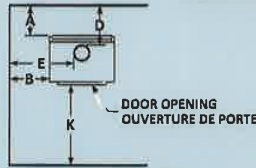
LISTED SOLID FUEL BURNING APPLIANCE

POÊLE À COMBUSTIBLE SOLIDE HOMOLOGUÉ

MODEL / MODÈLE :

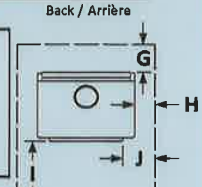
S250

Serial Number / No. de Série: 1



MOBILE HOME  
MAISONS MOBILES  
Double wall connector  
Tuyau à paroi double

A: 8 in./po. (203 mm) D: 11.5 in./po. (292 mm)  
B: 14.5 in./po. (368 mm) E: 23.5 in./po. (597 mm)  
C: 6 in./po. (152 mm) F: 14.75 in./po. (375 mm)



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: 14.5 in./po. (368 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: 10 in./po. (254 mm)	B: 10 in./po. (254 mm)	B: 10 in./po. (254 mm)	B: 10 in./po. (254 mm)	H: 8 in./po. (203 mm)	J: 8 in./po. (203 mm)		
C: 12 in./po. (305 mm)	C: 6 in./po. (152 mm)	C: 12 in./po. (305 mm)	C: 6 in./po. (152 mm)	I: 18 in./po. (457 mm)	K: 36 in./po. (914 mm)		
D: 18 in./po. (457 mm)	D: 9.5 in./po. (241 mm)	D: 16.5 in./po. (419 mm)	D: 9.5 in./po. (241 mm)	K: 48 in./po. (1219 mm)			
E: 19 in./po. (483 mm)	E: 19 in./po. (483 mm)	E: 19 in./po. (483 mm)	E: 19 in./po. (483 mm)				
F: 20.75 in./po. (527 mm)	F: 14.75 in./po. (375 mm)	F: 20.75 in./po. (527 mm)	F: 14.75 in./po. (375 mm)				

See owner's manual for other clearances with lowered ceiling / voir manuel d'installation pour autres dégagements avec plafond abaissé

PREVENT HOUSE FIRES

- Install and use only in accordance with the manufacturer's installation and operating instructions.
- Contact local building or fire officials about restrictions and installation inspection in your area.
- Use listed 152 mm / 6 in. diameter single or double wall connectors with prefabricated chimneys approved UL 103 HT (US) and UL 629 (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.
- For use with solid fuel 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.
- 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 UL 629 (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.
- Pour l'usage avec du combustible solide 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.
- Les entrées d'air servant à la combustion ne doivent pas être obstruées.
- Cet appareil de chauffage requiert des inspections et réparations périodiques. Consulter le manuel de l'utilisateur pour plus d'information. Opérer cet appareil de chauffage de façon inconsistente par rapport au manuel de l'utilisateur consiste une violation de la loi fédérale (USA).

Optional blower: (115V, 0.8A, 60Hz)

Option ventilateur: (115V, 0.8A, 60Hz)

U.S. ENVIRONMENTAL PROTECTION AGENCY Certified to comply with 2020 particulate emission standards using cordwood.  
AGENCE DE PROTECTION DE L'ENVIRONNEMENT DES É.-U. Conforme aux normes d'émission de particules de 2020 avec bûche de bois.

Weighted average emission rate / Moyenne pondérée des émissions : 1.8 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  
08/12/2020 (# test)



Fabricant de poêles international  
Stove Builder International

Fabriqué à St-Augustin-de-Desmaures (Qc), Canada  
08/12/2020 (# test)

27863



Intertek

Control number: 4002461

REFER TO INTERTEK'S DIRECTORY OF BUILDING PRODUCTS FOR DETAILED INFORMATION  
SE REFERER 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 1.4

Serial Number / No. de Série: 1

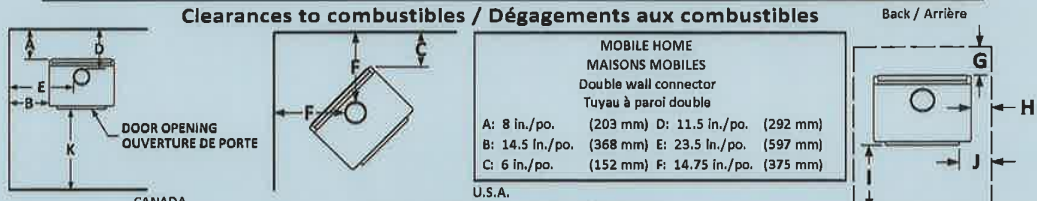


Table with columns for Canada and U.S.A. for single and double wall connectors, and floor protection dimensions. Includes a note: \* See owner's manual for other clearances with lowered ceiling / voir manuel d'installation pour autres dégagements avec plafond abaissé

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 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 solid fuel 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.
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 déservant un autre appareil.
Pour l'usage avec du combustible solide 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.
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 de bois.

Weighted average emission rate / Moyenne pondérée des émissions : 1.8 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

08/12/2020

(# test)



Fabricant de poêles international
Stove Builder International

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

08/12/2020

(# test)

27868

ENGLISH

## 2. General Information

### 2.1 Performances

Values are as measured per test method, except for the recommended heating area, firebox volume, maximum burn time and maximum heat output.

Model	S250, Escape 1200, Fox, Déco Nano, Spark II, Solution 1.4, Harmony 1.4, Osburn 950, Gateway 1400, HES140	
Fuel Type	Dry Cordwood	
Recommended heating area (sq. ft.) <sup>1</sup>	250 to 1,000 ft <sup>2</sup> (23 to 93 m <sup>2</sup> )	
Nominal firebox volume	1.7 ft <sup>3</sup> (0.0481 m <sup>3</sup> )	
EPA loading volume	1.55 ft <sup>3</sup> (0.0439 m <sup>3</sup> )	
Maximum burn time <sup>1</sup>	8 hours	
Maximum heat output (dry cordwood) <sup>2</sup>	65,000 BTU/h (19 kW)	
Overall heat output rate (min. to max.) <sup>2 3</sup>	12,124 BTU/h to 26,700 BTU/h (3.55 kW to 7.83 kW)	
Average overall efficiency <sup>3</sup> (Dry cordwood)	74 % (HHV) <sup>4</sup>	79 % (LVH) <sup>5</sup>
Optimum efficiency <sup>6</sup>	80 %	
Average particulate emissions rate <sup>7</sup>	1.8 g/h (EPA / CSA B415.1-10) <sup>8</sup>	
Average CO <sup>9</sup>	74 g/h	

<sup>1</sup> Recommended heating area and maximum burn time may vary subject to location in home, chimney draft, heat loss factors, climate, fuel type and other variables. The recommended heated area for a given appliance is defined by the manufacturer as its capacity to maintain a minimum acceptable temperature in the designated area in case of a power failure.

<sup>2</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>3</sup> As measured per CSA B415.1-10 stack loss method.

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

<sup>5</sup> Lower Heating Value of the fuel.

<sup>6</sup> Optimum overall efficiency at a specific burn rate (LHV).

<sup>7</sup> This appliance is officially tested and certified by an independent agency.

<sup>8</sup> Tested and certified in compliance with CFR 40 part 60, subpart AAA, section 60.534(a)(1)(ii) and ASTM E3053-17 based on the ALT-125 sent by EPA on February 28<sup>th</sup>, 2018.

<sup>9</sup> Carbon monoxide.

## 2.2 Specifications

Maximum log length <sup>10</sup>	17 in (432 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
Approved for alcove installation	X
Approved for mobile home installation <sup>11</sup>	X
Type of door	Simple, glazed or not, with cast iron frame
Type of glass	Ceramic glass
Blower	Included or Optional (up to 100 CFM)
Particulate emission standard <sup>12</sup>	EPA / CSA B415.1-10

<sup>10</sup> North-south: ends of the logs visible, East-west: sides of the logs visible.

<sup>11</sup> Mobile homes (Canada) or manufactured homes (USA): The US Department of Housing and Urban Development describes “manufactured homes” better known as “mobile homes” as follows; buildings built on fixed wheels and those transported on temporary wheels/axles and set on a permanent foundation. In Canada, a mobile home is a dwelling for which the manufacture and assembly of each component is completed or substantially completed prior to being moved to a site for installation on a foundation and connection to service facilities and which conforms to the CAN/CSA-Z240 MH standard.

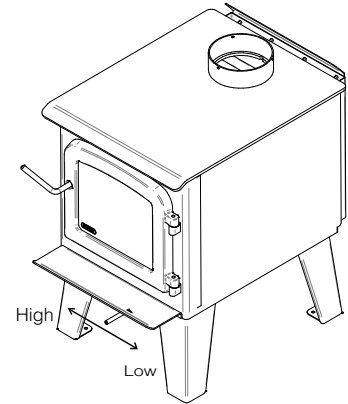
<sup>12</sup> Tested and certified in compliance with CFR 40 part 60, subpart AAA, section 60.534(a)(1)(ii) and ASTM E3053-17 based on the ALT-125 sent by EPA on February 28<sup>th</sup>, 2018.

## 2.3 EPA loading

The charging methods shown below are those that were used during emissions certification.

### 2.3.1 Air control

The air control is located underneath the ash shelf. To open the air control, push the air control handle completely to the left (High). This will increase the burn rate. To close the air control, push the air control handle completely to the right (Low). This will decrease the burn rate.



### 2.3.2 High burn rate (primary air control open)

Open the air control completely. Place six small pieces (2"x2") of wood in the firebox crossing them at the greatest possible angle.

Criss cross fifteen kindling wood pieces on the small pieces of wood in three layers at the greatest possible angle. Tie knot with five sheets of paper and place them on top of the kindling wood. Light up the paper and let the door ajar at 90° until all the kindling wood is on fire and the first row of small pieces of wood is on fire too. Close the door.

When there is no more fire in the front of the firebox and there are only faint flames on the wood in the back of the firebox, break ashes, level the coal bed and put four logs in the firebox. Place the biggest log (about 5"x5") and a medium log (about 4"x4") on the coal bed with a north-south orientation. Place two other medium logs on the first two with the greatest possible angle. Their should be air space between each logs and between the logs and the bricks. Let the door ajar at 90° for approximately two minutes and then close the door.

### 2.3.3 Medium and low burn rate

On a 2" coal bed that is still slightly red, place five logs of approximately 4"x4" or 3"x3" with a north-south orientation. Place three logs on the coal bed and the other two on top with the greatest possible angle. Their should be air space between each logs and between the logs and the bricks. Let the door ajar at 90° for approximately 5 min. Then, close the door with the primary air control open. Leave to burn with the primary air control open for approximately 10 minutes and then close the primary air control completely for the low burn rate and halfway for the medium burn rate.



## 2.4 Dimensions

### 2.4.1 Stove Dimensions with Square Legs

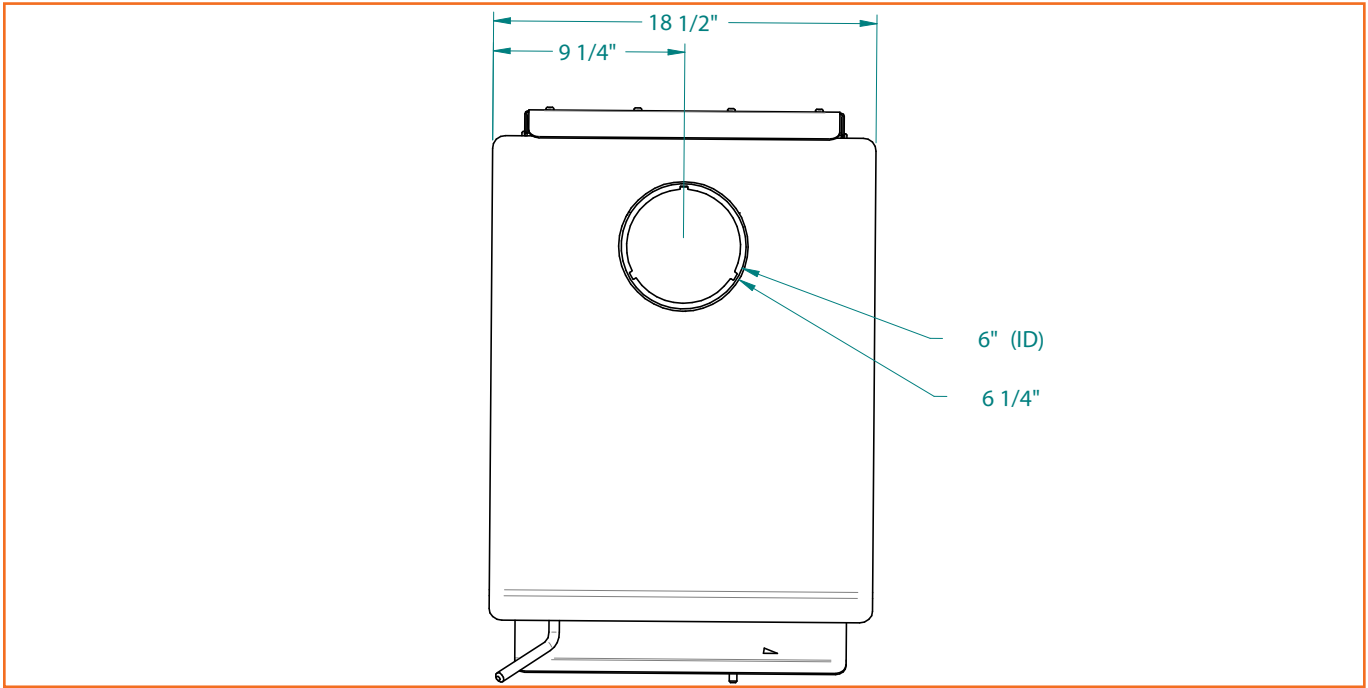


Figure 1: Top View

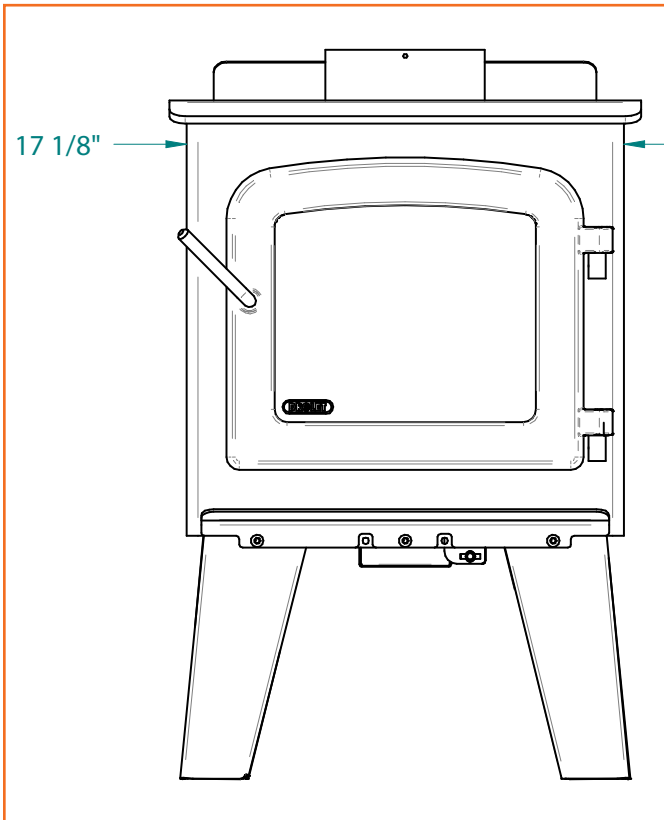


Figure 2: Front View

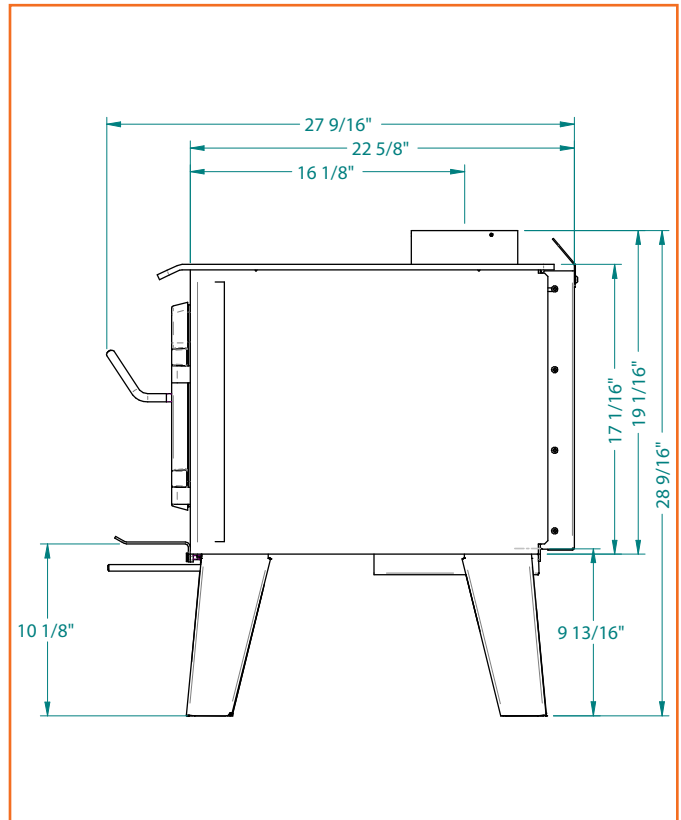


Figure 3: Side View

## 2.4.2 Combustion Chamber Dimensions

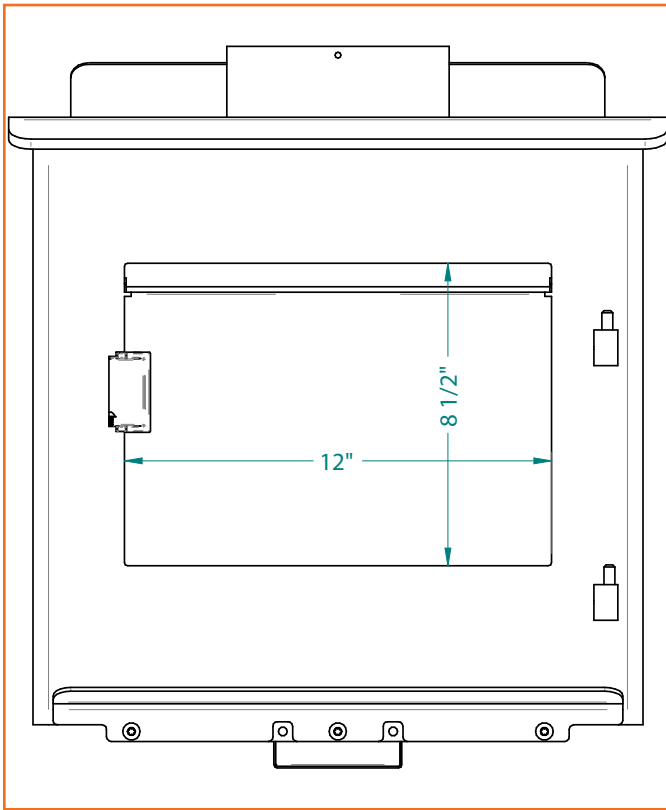


Figure 4: Door Opening

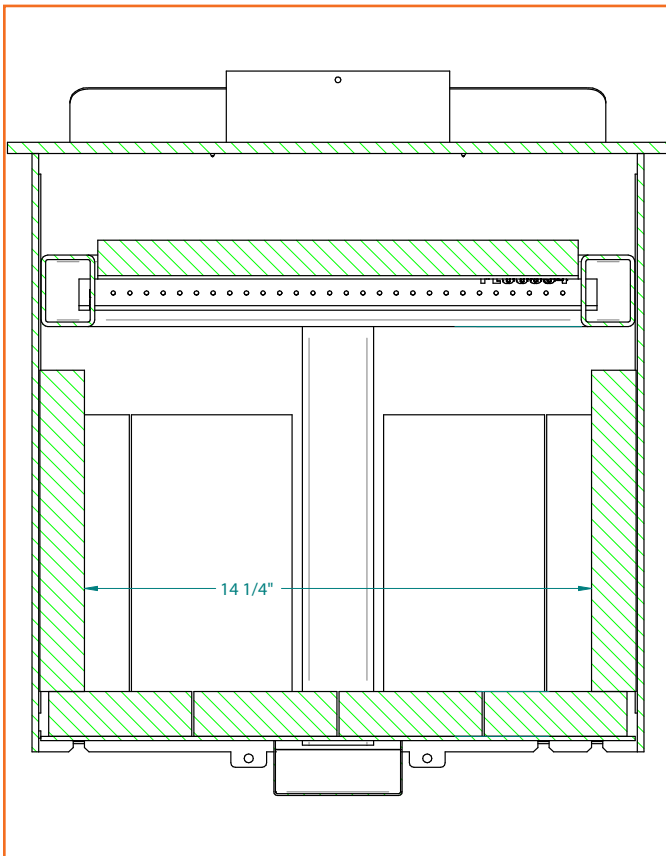


Figure 5: Front View - Combustion Chamber

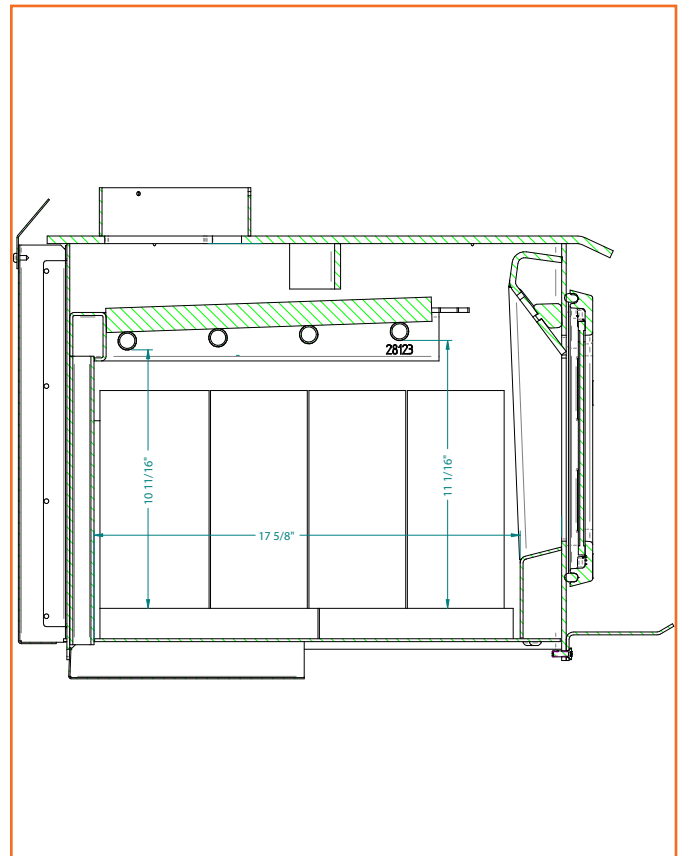


Figure 6: Side View - Combustion Chamber

### 3. Clearances to Combustible Material

**No part of the stove or flue pipe may be located closer to combustibles than the minimum clearance figures given.**

The clearances to combustible walls may be slightly different in Canada and the U.S.A. and may also differ depending on whether single or double wall flue pipe is used. Make sure to choose the correct clearance for the stove location and type of flue pipe.

The clearances of the appliance and the flue pipes must be met individually, meaning the appliance cannot be installed closer to the combustible materials than the single or double wall pipe allows. For a safe way to reduce clearances refer to section "5. Reducing Wall and Ceiling Clearances Safely"

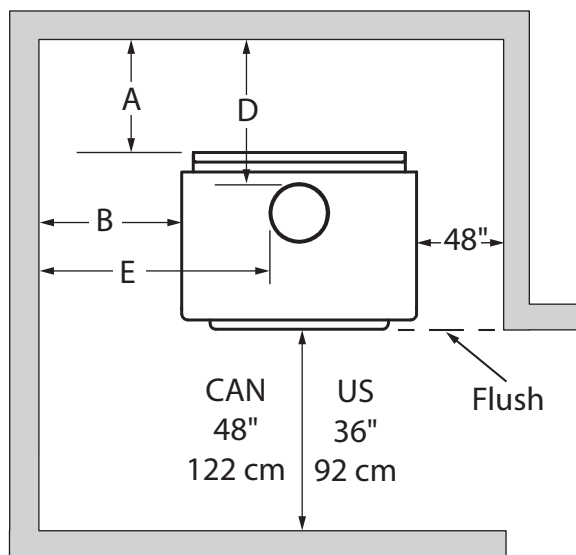


Figure 7: Clearances - Top

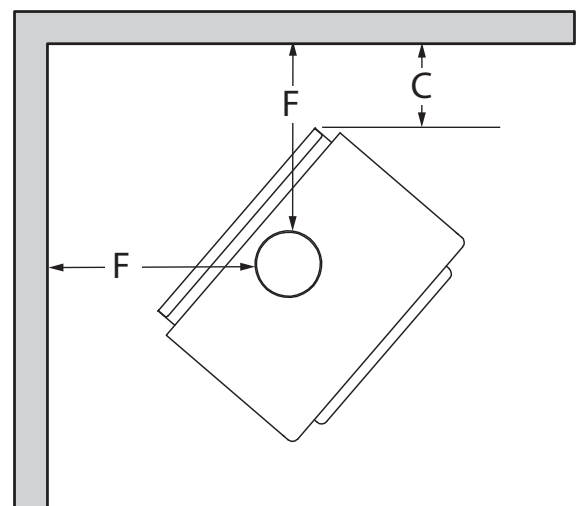


Figure 8: Clearances - Corner

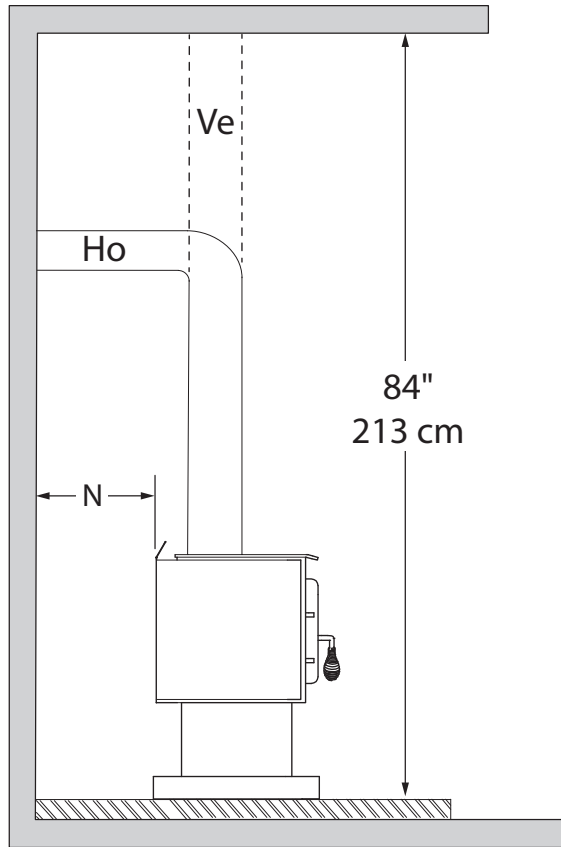


Figure 9: Clearances - Side

### 3.1 Clearances

	APPLIANCE CLEARANCES WITH SINGLE WALL PIPE CONNECTOR	
	Canada	USA
<b>A</b>	XX" (XXX mm)	XX" (XXX mm)
<b>B</b>	XX" (XXX mm)	XX" (XXX mm)
<b>C</b>	XX" (XXX mm)	XX" (XXX mm)

	APPLIANCE CLEARANCES WITH DOUBLE WALL PIPE CONNECTOR	
	Canada	USA
<b>A</b>	XX" (XXX mm)	XX" (XXX mm)
<b>B</b>	XX" (XXX mm)	XX" (XXX mm)
<b>C</b>	XX" (XXX mm)	XX" (XXX mm)

If the above clearances are met, then the distances measured from the flue outlet will be:

	DISTANCES <sup>13</sup> FROM PIPE CONNECTOR WITH SINGLE WALL PIPE CONNECTOR	
	Canada	USA
<b>D</b>	XX" (XXX mm)	XX" (XXX mm)
<b>E</b>	XX" (XXX mm)	XX" (XXX mm)
<b>F</b>	XX" (XXX mm)	XX" (XXX mm)

	DISTANCES <sup>13</sup> FROM PIPE CONNECTOR WITH DOUBLE WALL PIPE CONNECTORE	
	Canada	USA
<b>D</b>	XX" (XXX mm)	XX" (XXX mm)
<b>E</b>	XX" (XXX mm)	XX" (XXX mm)
<b>F</b>	XX" (XXX mm)	XX" (XXX mm)

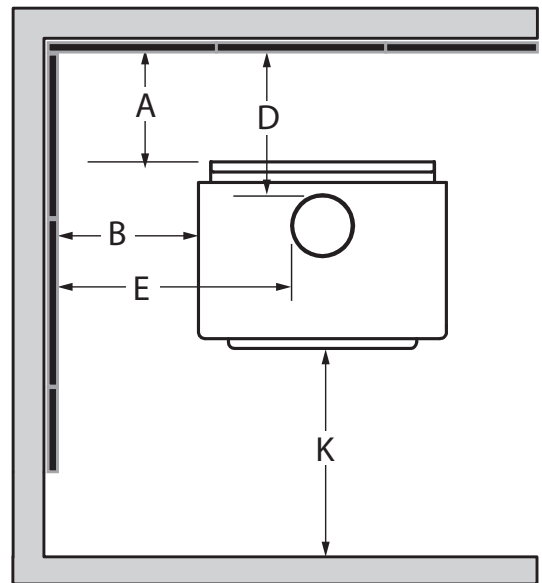
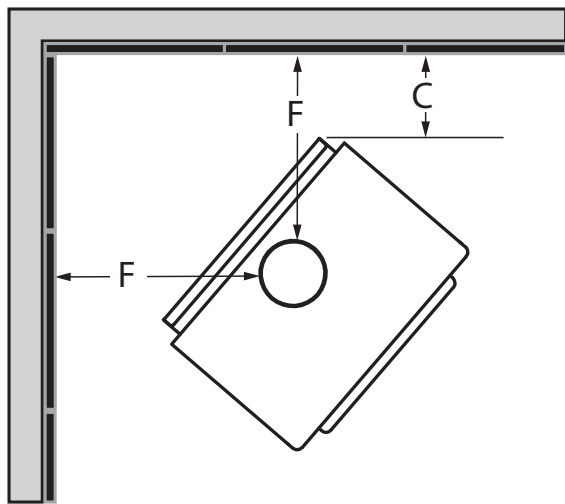
<sup>13</sup> The pipe distances listed in this table refer to the distances obtained when the stove is installed in accordance with the appliance clearances above mentioned.

### 3.1.1 With Heat Shield AC02710<sup>14</sup>

To reduce the clearances of an appliance using a single wall pipe connector, the use of a heat shield certified with the single wall pipe connector to be used as close as 6" from combustible materials must be used. Only in this case, the same clearances as a certified double wall pipe connector can be used. Refer to the booklet present in the screen options to obtain the dimensions to be respected.

	APPLIANCE CLEARANCES WITH DOUBLE WALL PIPE CONNECTOR	
	Canada	USA
<b>A</b>	XX" (XXX mm)	XX" (XXX mm)
<b>B</b>	XX" (XXX mm)	XX" (XXX mm)
<b>C</b>	XX" (XXX mm)	XX" (XXX mm)

	DISTANCES <sup>13</sup> FROM DOUBLE WALL PIPE CONNECTOR	
	Canada	USA
<b>D</b>	XX" (XXX mm)	XX" (XXX mm)
<b>E</b>	XX" (XXX mm)	XX" (XXX mm)
<b>F</b>	XX" (XXX mm)	XX" (XXX mm)



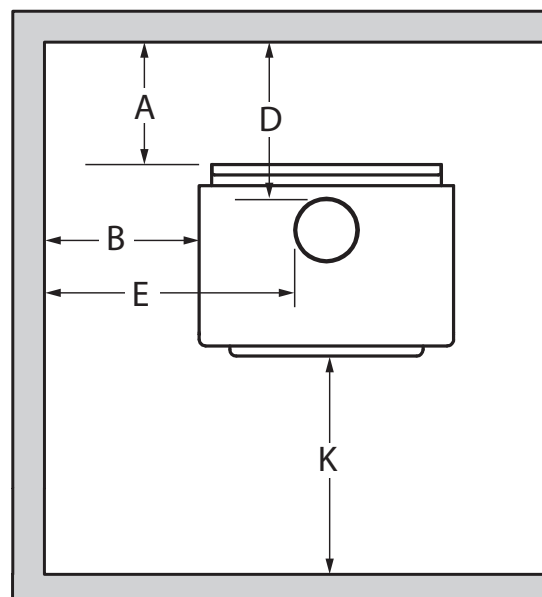
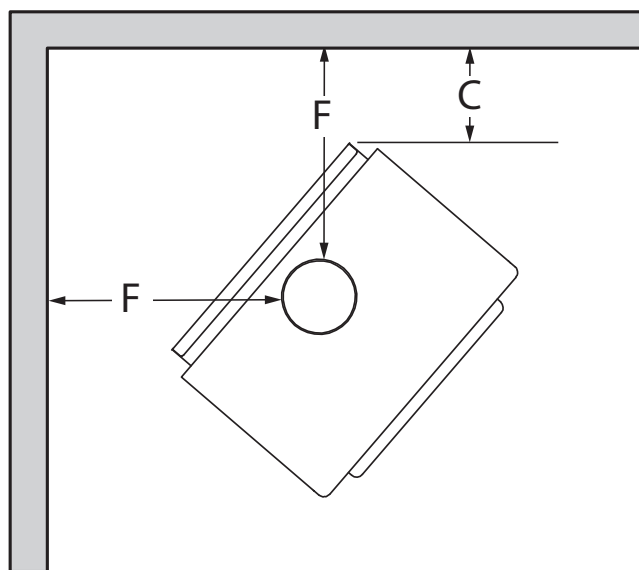
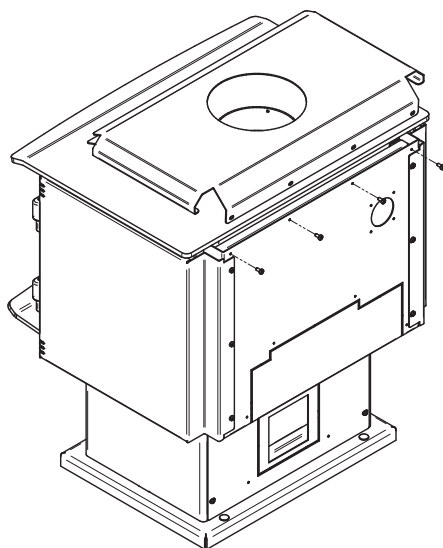
<sup>14</sup> Note that to reduce the clearances of an appliance using a single wall pipe connector, the use of a heat shield certified with the single wall pipe connector to be used as close as 6" from combustible materials must be used. Only in this case, the same clearances as a certified double wall pipe connector can be used.

### 3.1.2 With Airmate<sup>14</sup>

	APPLIANCE CLEARANCES WITH DOUBLE WALL PIPE CONNECTOR	
	Canada	USA
<b>A</b>	XX" (XXX mm)	XX" (XXX mm)
<b>B</b>	XX" (XXX mm)	XX" (XXX mm)
<b>C</b>	XX" (XXX mm)	XX" (XXX mm)

	DISTANCES <sup>15</sup> FROM DOUBLE WALL PIPE CONNECTOR	
	Canada	USA
<b>D</b>	XX" (XXX mm)	XX" (XXX mm)
<b>E</b>	XX" (XXX mm)	XX" (XXX mm)
<b>F</b>	XX" (XXX mm)	XX" (XXX mm)

It is possible to install a single wall pipe. For clearances, refer to the dimensions in 3.1.

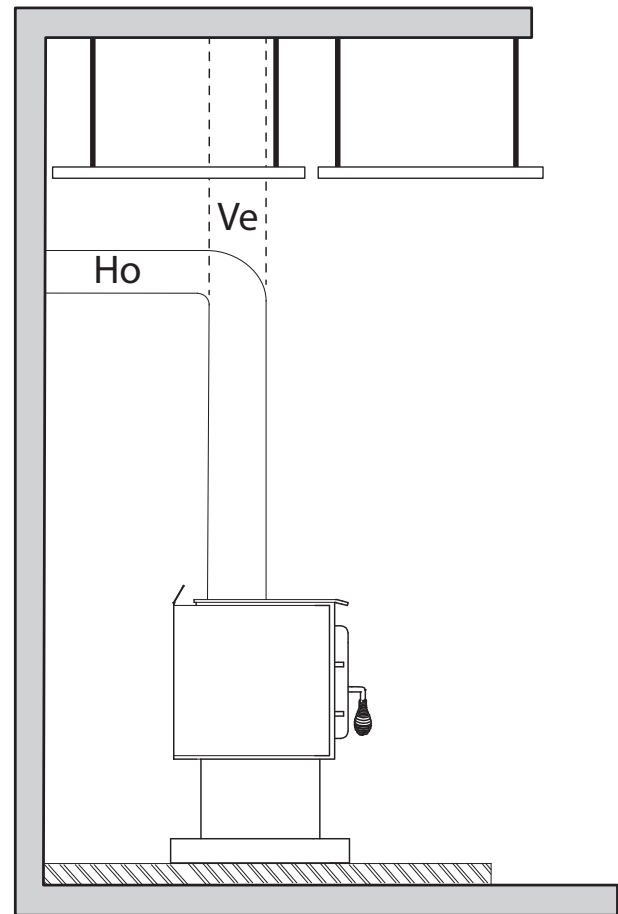


<sup>15</sup>Note that to reduce the clearances of an appliance using a single wall pipe connector, the use of a heat shield certified with the single wall pipe connector to be used as close as 6" from combustible materials must be used. Only in this case, the same clearances as a certified double wall pipe connector can be used.

### 3.1.3 With Lowered Ceiling

	APPLIANCE CLEARANCES WITH SINGLE WALL PIPE CONNECTOR	
	Canada	USA
<b>A</b>	XX" (XXX mm)	XX" (XXX mm)
<b>B</b>	XX" (XXX mm)	XX" (XXX mm)
<b>C</b>	XX" (XXX mm)	XX" (XXX mm)
<b>L</b>	XX" (XXXX mm)	XX" (XXXX mm)

	APPLIANCE CLEARANCES WITH DOUBLE WALL PIPE CONNECTOR	
	Canada	USA
<b>A</b>	XX" (XXX mm)	XX" (XXX mm)
<b>B</b>	XX" (XXX mm)	XX" (XXX mm)
<b>C</b>	XX" (XXX mm)	XX" (XXX mm)
<b>L</b>	XX" (XXXX mm)	XX" (XXXX mm)



If the above clearances are met, then the distances measured from the flue outlet will be:

	DISTANCES <sup>16</sup> FROM PIPE CONNECTOR WITH SINGLE WALL PIPE CONNECTOR	
	Canada	USA
<b>D</b>	XX" (XXX mm)	XX" (XXX mm)
<b>E</b>	XX" (XXX mm)	XX" (XXX mm)
<b>F</b>	XX" (XXX mm)	XX" (XXX mm)

	DISTANCES <sup>15</sup> FROM PIPE CONNECTOR WITH DOUBLE WALL PIPE CONNECTOR	
	Canada	USA
<b>D</b>	XX" (XXX mm)	XX" (XXX mm)
<b>E</b>	XX" (XXX mm)	XX" (XXX mm)
<b>F</b>	XX" (XXX mm)	XX" (XXX mm)

<sup>16</sup> The pipe distances listed in this table refer to the distances obtained when the stove is installed in accordance with the appliance clearances above mentioned.

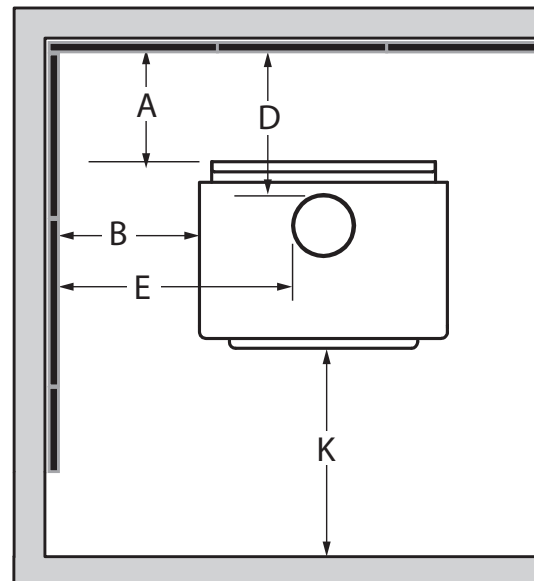
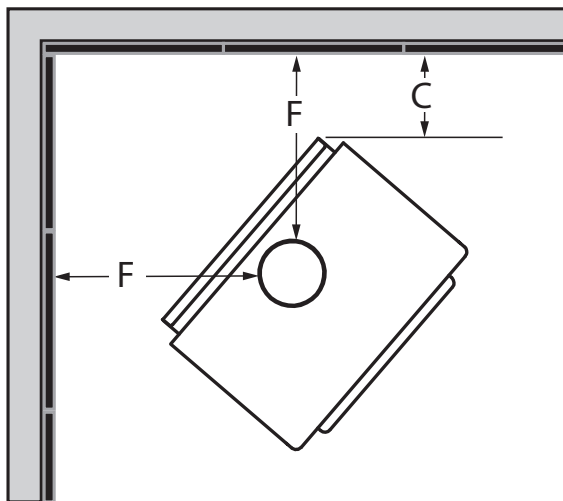
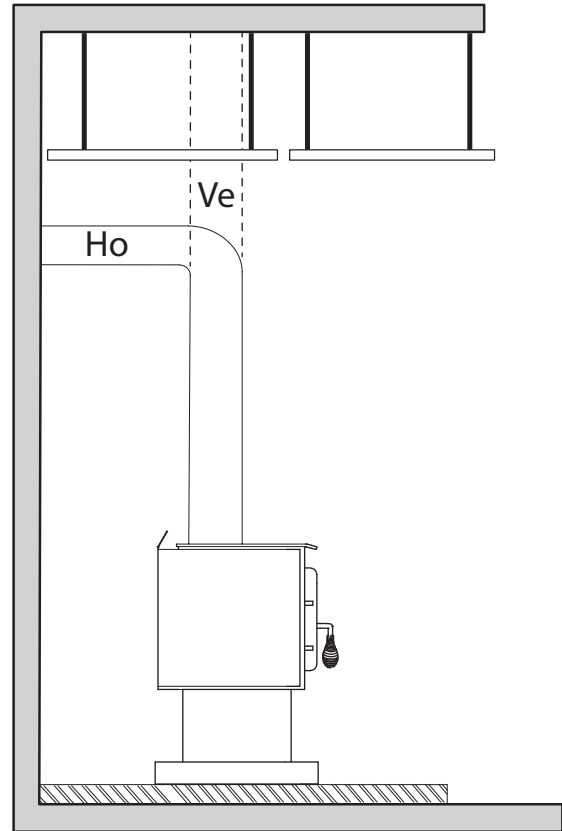


### 3.1.4 With Heat Shield AC02710 and Lowered Ceiling

To reduce the clearances of an appliance using a single wall pipe connector, the use of a heat shield certified with the single wall pipe connector to be used as close as 6" from combustible materials must be used. Only in this case, the same clearances as a certified double wall pipe connector can be used. Refer to the booklet present in the screen options to obtain the dimensions to be respected.

	APPLIANCE CLEARANCES WITH DOUBLE WALL PIPE CONNECTOR	
	Canada	USA
<b>A</b>	XX" (XXX mm)	XX" (XXX mm)
<b>B</b>	XX" (XXX mm)	XX" (XXX mm)
<b>C</b>	XX" (XXX mm)	XX" (XXX mm)
<b>L</b>	XX" (XXXX mm)	XX" (XXXX mm)

	DISTANCES <sup>15</sup> FROM PIPE CONNECTOR WITH DOUBLE WALL PIPE CONNECTOR	
	Canada	USA
<b>D</b>	XX" (XXX mm)	XX" (XXX mm)
<b>E</b>	XX" (XXX mm)	XX" (XXX mm)
<b>F</b>	XX" (XXX mm)	XX" (XXX mm)



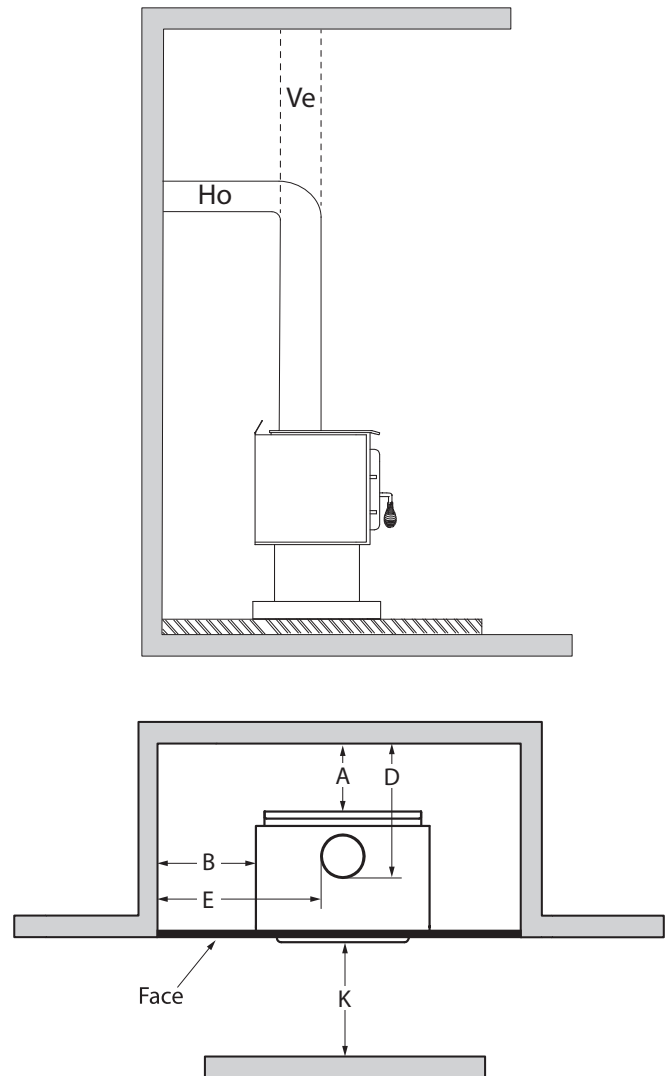
ENGLISH

### 3.1.5 Inside an Alcove

See section 3.1 for single wall pipe installation.

	APPLIANCE CLEARANCES WITH DOUBLE WALL PIPE CONNECTOR	
	Canada	USA
<b>A</b>	XX" (XXX mm)	XX" (XXX mm)
<b>B</b>	XX" (XXX mm)	XX" (XXX mm)
<b>K</b>	XX" (XXX mm)	XX" (XXX mm)
<b>L</b>	XX" (XXXX mm)	XX" (XXXX mm)

	DISTANCES <sup>16</sup> FROM PIPE CONNECTOR WITH DOUBLE WALL PIPE CONNECTOR	
	Canada	USA
<b>D</b>	XX" (XXX mm)	XX" (XXX mm)
<b>E</b>	XX" (XXX mm)	XX" (XXX mm)



### 3.1.6 Mobile Home

It is strictly **forbidden** to install a unit with a **single wall pipe** in a **mobile home**.

	APPLIANCE CLEARANCES WITH DOUBLE WALL PIPE CONNECTOR	
	Canada	USA
<b>A</b>	XX" (XXX mm)	XX" (XXX mm)
<b>B</b>	XX" (XXX mm)	XX" (XXX mm)
<b>C</b>	XX" (XXX mm)	XX" (XXX mm)

	DISTANCES <sup>17</sup> FROM PIPE CONNECTOR WITH DOUBLE WALL PIPE CONNECTOR	
	Canada	USA
<b>D</b>	XX" (XXX mm)	XX" (XXX mm)
<b>E</b>	XX" (XXX mm)	XX" (XXX mm)
<b>F</b>	XX" (XXX mm)	XX" (XXX mm)

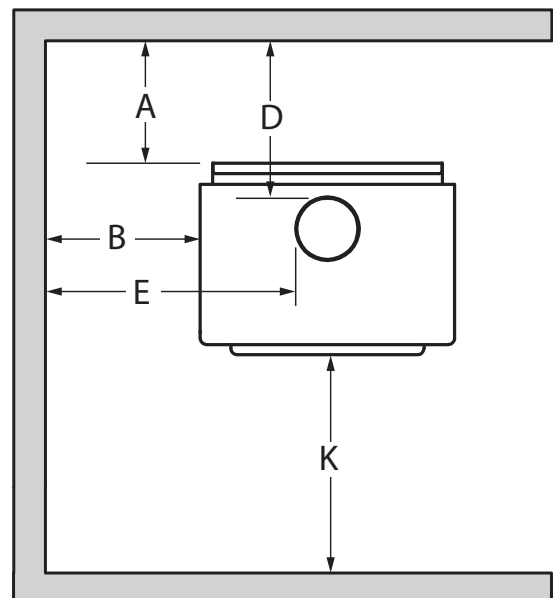
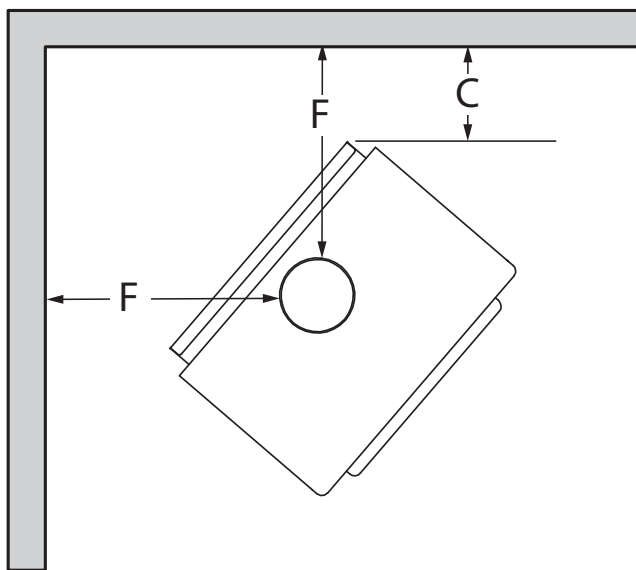
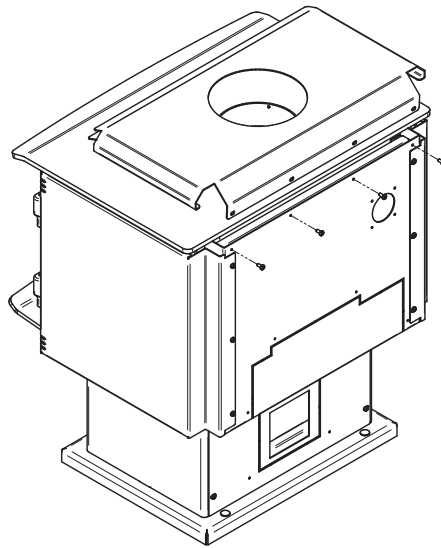
<sup>17</sup> The pipe distances listed in this table refer to the distances obtained when the stove is installed in accordance with the appliance clearances above mentioned.

### 3.1.7 Mobile Home with Airmate

It is strictly **forbidden** to install a unit with a **single wall pipe** in a **mobile home**.

	APPLIANCE CLEARANCES WITH DOUBLE WALL PIPE CONNECTOR	
	Canada	USA
<b>A</b>	XX" (XXX mm)	XX" (XXX mm)
<b>B</b>	XX" (XXX mm)	XX" (XXX mm)
<b>C</b>	XX" (XXX mm)	XX" (XXX mm)

	DISTANCES <sup>16</sup> FROM PIPE CONNECTOR WITH DOUBLE WALL PIPE CONNECTOR	
	Canada	USA
<b>D</b>	XX" (XXX mm)	XX" (XXX mm)
<b>E</b>	XX" (XXX mm)	XX" (XXX mm)
<b>F</b>	XX" (XXX mm)	XX" (XXX mm)



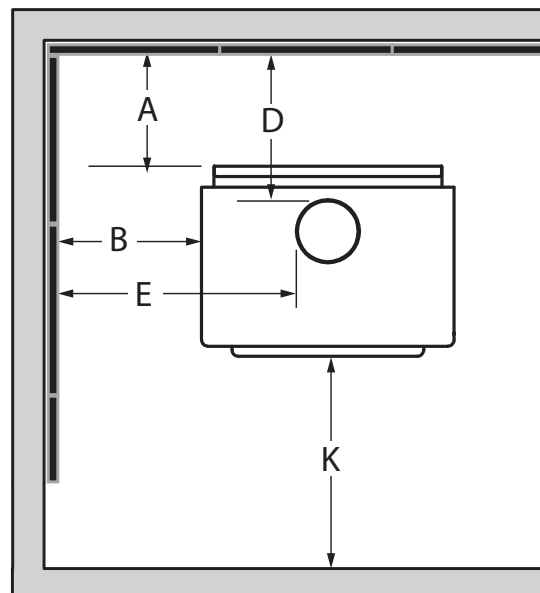
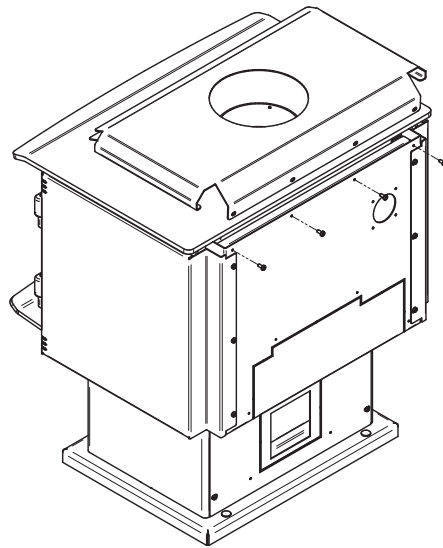
ENGLISH

### 3.1.8 Mobile Home With Heat Shield AC02710

It is strictly **forbidden** to install a unit with a **single wall pipe** in a **mobile home**.

	APPLIANCE CLEARANCES WITH DOUBLE WALL PIPE CONNECTOR	
	Canada	USA
<b>A</b>	XX" (XXX mm)	XX" (XXX mm)
<b>B</b>	XX" (XXX mm)	XX" (XXX mm)
<b>C</b>	XX" (XXX mm)	XX" (XXX mm)

	DISTANCES <sup>18</sup> FROM PIPE CONNECTOR WITH DOUBLE WALL PIPE CONNECTOR	
	Canada	USA
<b>D</b>	XX" (XXX mm)	XX" (XXX mm)
<b>E</b>	XX" (XXX mm)	XX" (XXX mm)
<b>F</b>	XX" (XXX mm)	XX" (XXX mm)



ENGLISH

<sup>18</sup> Les distances de tuyau listées dans ce tableau se réfèrent aux distances obtenues lorsque le poêle est installé en accord avec les dégagements de l'appareil mentionnés ci-dessus.

## 4. Floor Protection

This stove is designed to prevent the floor from overheating. However, it must be placed on a non-flammable surface to protect the floor from hot embers that may fall during loading.

Any type of tile will require a continuous non-combustible sheet beneath to prevent the possibility of embers falling through to the combustible floor if cracks or separation should occur in the finished surface. Check local codes for approved alternatives.

No protection is required if the unit is installed on a non-combustible floor (ex: concrete).

	FLOOR PROTECTION	
	Canada	USA
<b>G<sup>19</sup></b>	X" (XXX mm)	N/A
<b>H</b>	X" (XXX mm)	N/A
<b>I</b>	XX" (XXX mm) From door opening	XX" (XXX mm) From door opening
<b>J</b>	N/A	X" (XXX mm)
<b>N<sup>20</sup></b>	N/A	See note 19

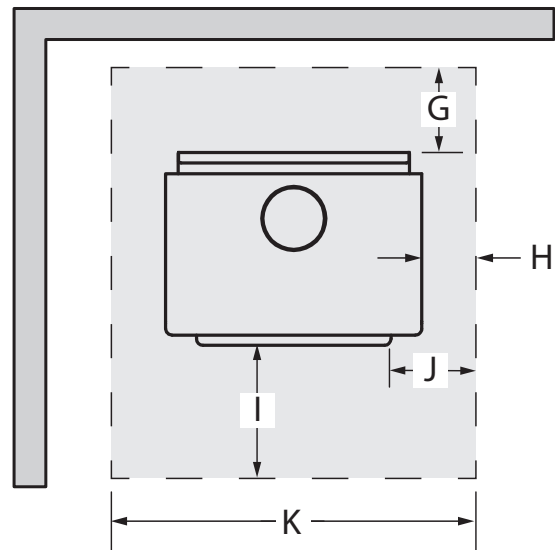
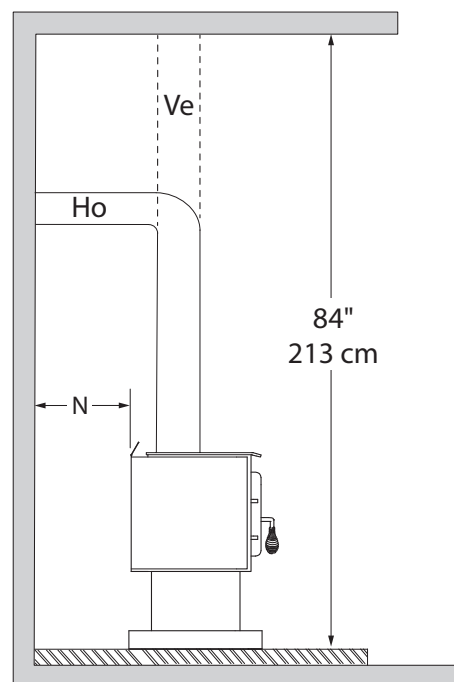
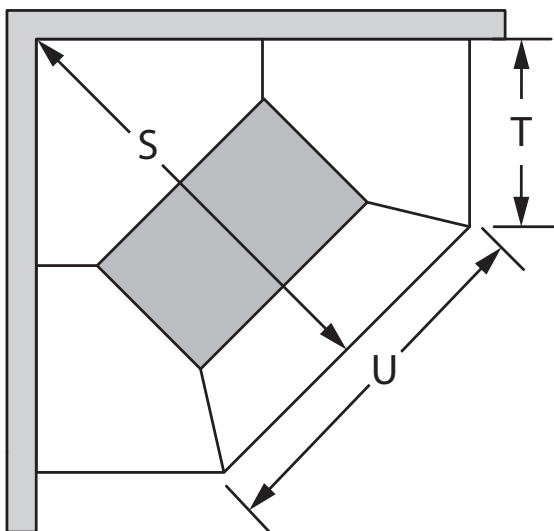


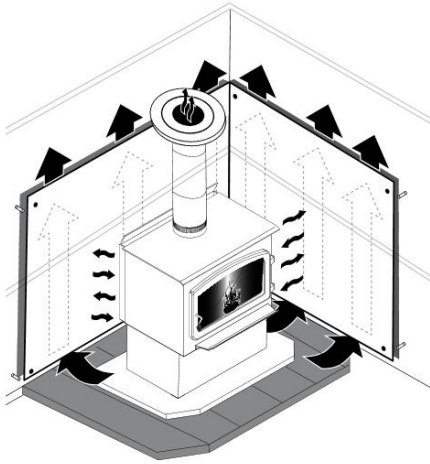
Figure 10: Floor Protection



<sup>19</sup> The floor protection at the back of the stove is limited to the stove's required clearance if such clearance is smaller than 8 inches (203 mm).

<sup>20</sup> Only required under the horizontal section (Ho) of the connector. Must exceed each side of the connector by at least 2 inches (51 mm). See «Figure 22: Clearances - Side»

## 5. Reducing Wall and Ceiling Clearances Safely



It is often desired to use as little space as possible when installing a wood stove. To do this, it is possible to reduce the clearances safely and install the stove closer to the walls by permanently installing a heat shield between the stove and the flammable material.

The rules for heat shields are sometimes complicated. Read and apply the instructions carefully. Some regions may have different regulations. Consult the local building code or contact the fire department for restrictions, inspection and installation requirements in the area.

### 5.1 Shield Construction Rules

- Adhesives used in shield construction must not ignite or lose adhesive qualities at temperatures likely to be encountered.
- Mounting hardware which extends from the shield surface into combustibles may be used only at the edges of the shield.
- Mounting hardware must allow full vertical ventilation.

- A) Minimum clearance between the appliance top and an unshielded combustible ceiling: XX" (XXXX mm)
- B) Shield extension above the appliance: XX" (XXX mm)
- C) Minimum space behind the shield: 1" (25 mm). In Canada 7/8" (21 mm)
- D) Clearance along the bottom of the shield: minimum 1" (25 mm) and maximum 3" (75 mm)
- E) Minimum clearance along the top of the shield: 3" (75 mm)
- F) Mounting hardware must not be located closer than 8" (200 mm) from the vertical centre line of the appliance.
- G) Edge clearance for ceiling shields to side and back walls: 3" (75 mm)
- H) Shield extension beyond each side of the appliance: 18" (450 mm)

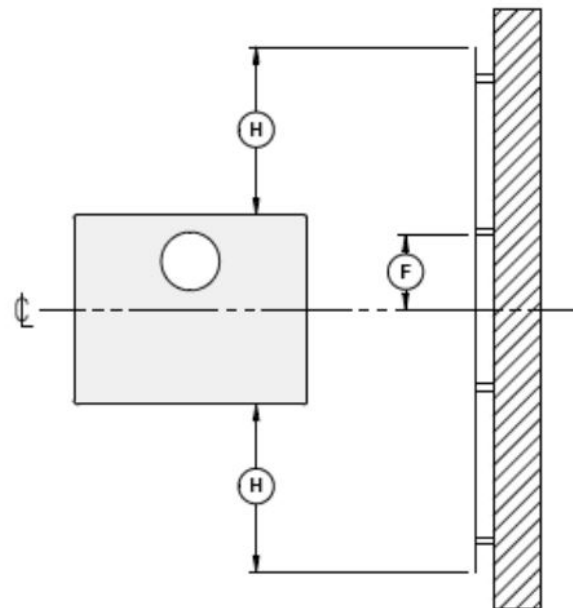


Figure 11: Heat shield clearances

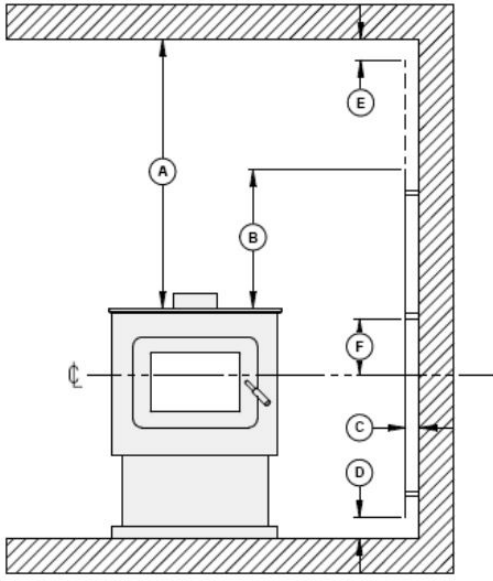


Figure 12: Heat shield clearances

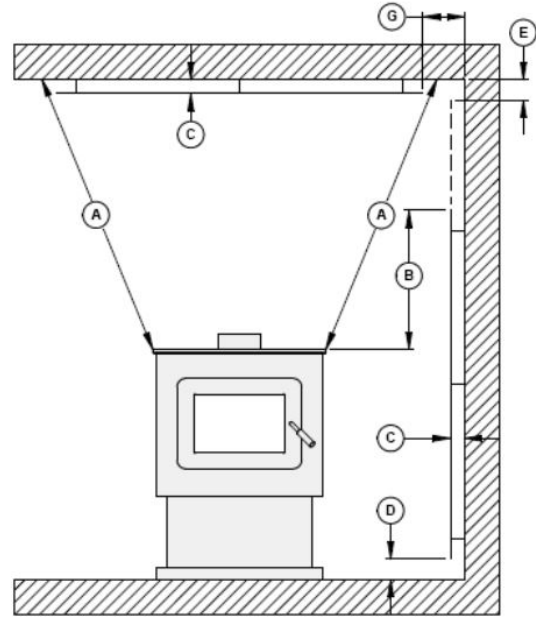
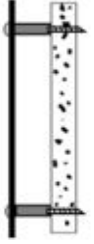
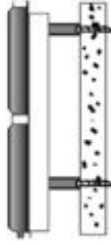

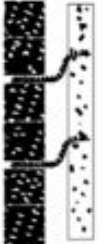
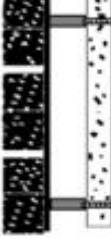


Figure 13: Heat shield clearances

TYPE OF SHIELD	CLEARANCES MAY BE REDUCED BY THESE PERCENTAGES				
	SIDES AND REAR		TOP (CEILING)		
	CAN / USA (%)	USA MIN.	CAN / USA (%)	USA MIN.	
Sheet metal, a minimum of 24 gauge (0.61 mm) in thickness , spaced out at least 1" (25 mm)* by non-combustible spacers	67	12" (305 mm)	50	18" (457 mm)	
Ceramic tiles, or equivalent non-combustible material, on non-combustible board spaced out at least 1" (25 mm)* by non-combustible spacers	50	18" (457 mm)	33	24" (610 mm)	
Ceramic tiles, or equivalent non-combustible material, on non-combustible board, with a minimum of 24 gauge (0.61 mm) sheet metal backing spaced out at least 1" (25 mm)* by non-combustible spacers	67	12" (305 mm)	50	24" (610 mm)	
Brick, spaced out at least 1" (25 mm)* by non-combustible spacers	50	18" (457 mm)	N/A	N/A	
Brick, with a minimum of 24 gauge (0.61 mm) sheet metal backing, spaced out at least 1" (25 mm)* by non-combustible spacers	67	12" (305 mm)	N/A	N/A	

\* In Canada this space can be 7/8" (21 mm)

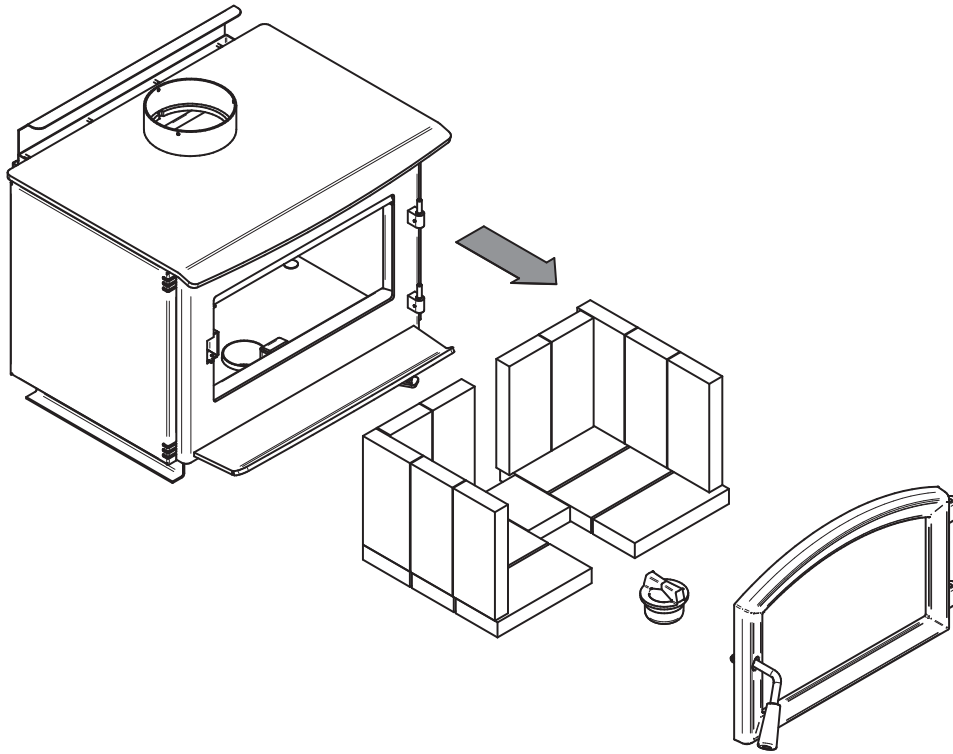


## 6. OPTIONS INSTALLATION ON YOUR PRODUCT

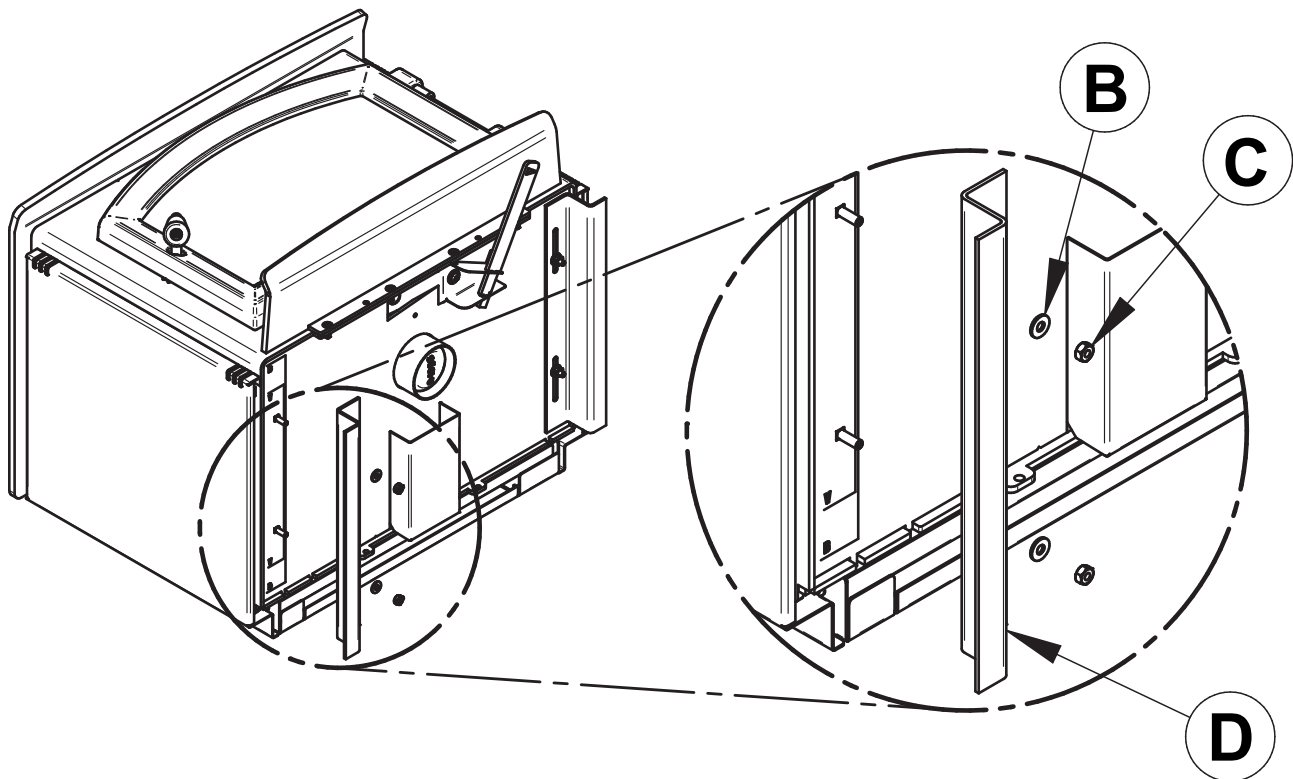
## 6.1 Legs Installation (If present on your product)

THE IMAGES SHOWN ARE INDICATIVE ONLY AND MAY DIFFER OF YOUR PRODUCT, BUT THE ASSEMBLY REMAINS THE SAME.

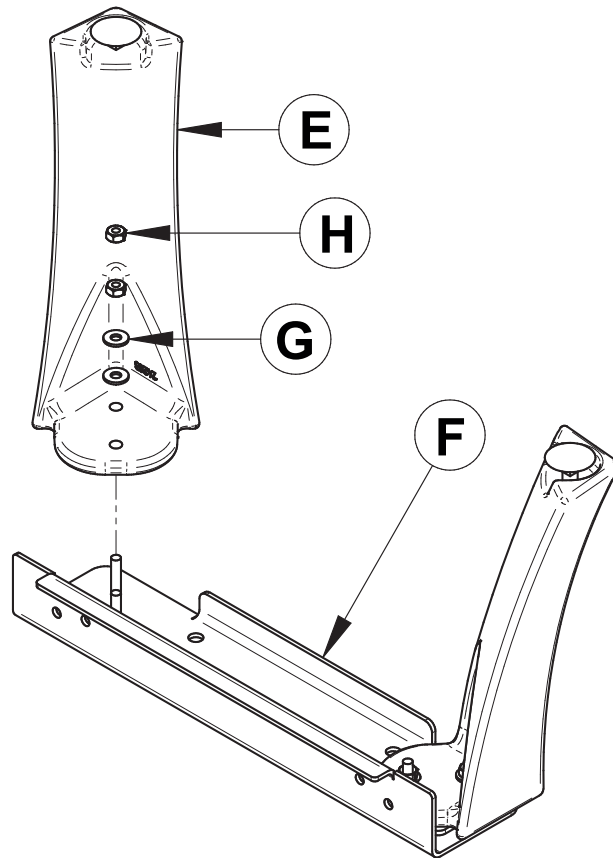
1. Remove the door, the firebricks, and the ash plug from the stove.



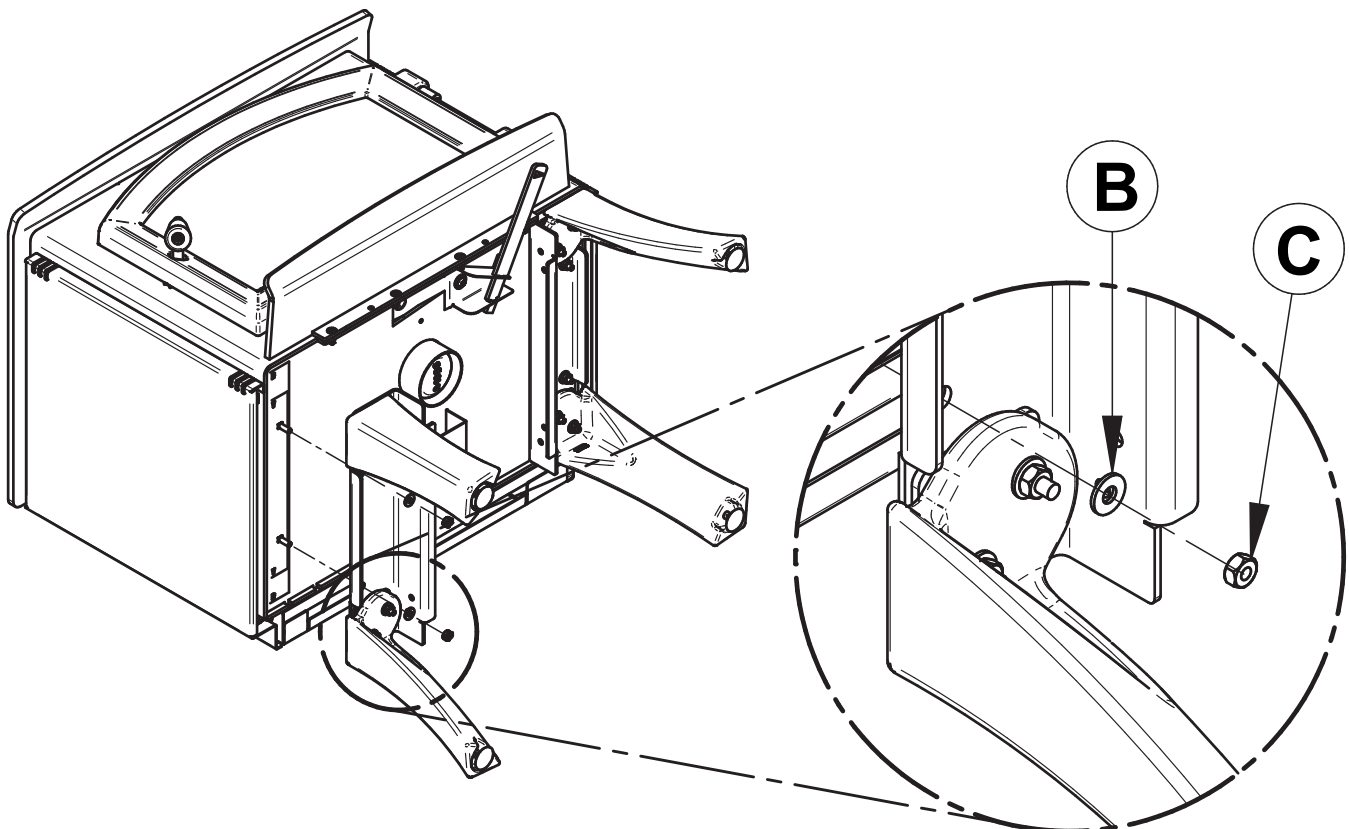
2. Put the stove on its back. Remove and dispose of the two freight supports **(D)**. Keep the nuts **(C)** and washers **(B)** for step 4.



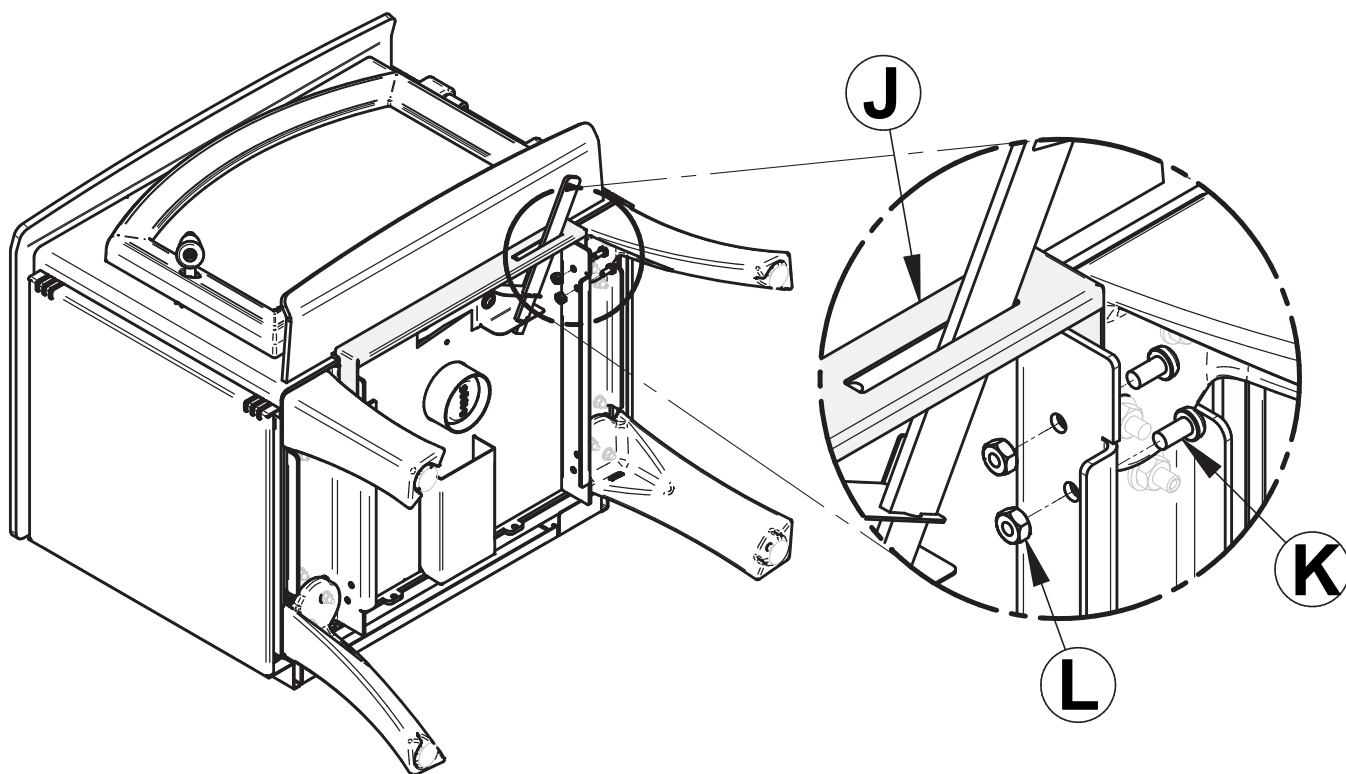
3. Install the legs **(E)** on the legs supports **(F)**. Secure with the washers **(G)** and nuts **(H)** supplied with the leg assembly.



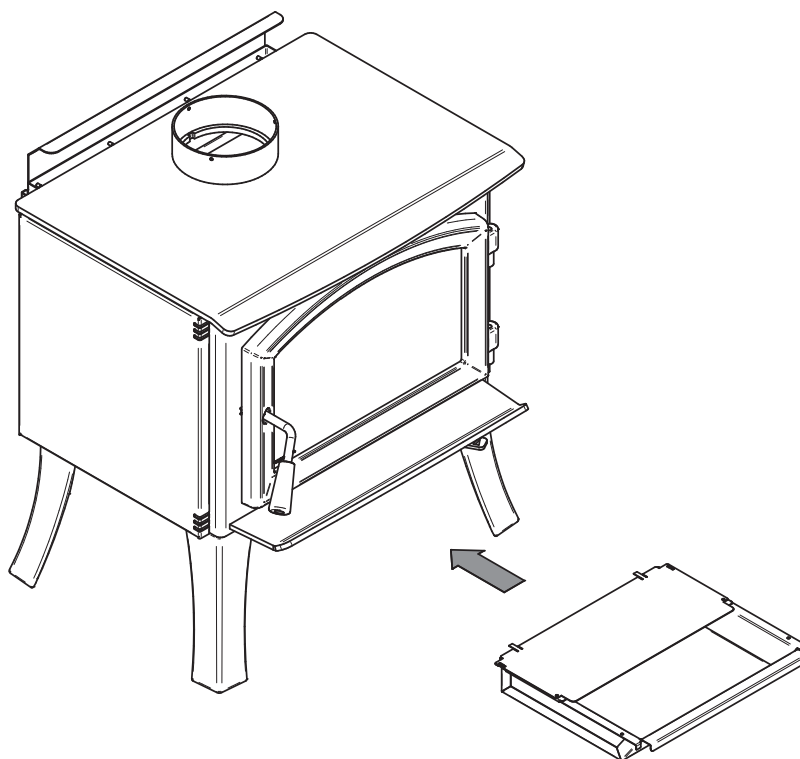
4. With the nuts **(C)** and washers **(B)** removed in step 2, secure both leg assemblies to the stove.



5. Install the air control cover (**J**) with screws (**K**) and nuts (**L**). This step may not be required for your product.



6. Put the stove on its legs, install the ash drawer included with the kit. Put back the firebricks, the ash plug and the door on the stove. (See step 1)

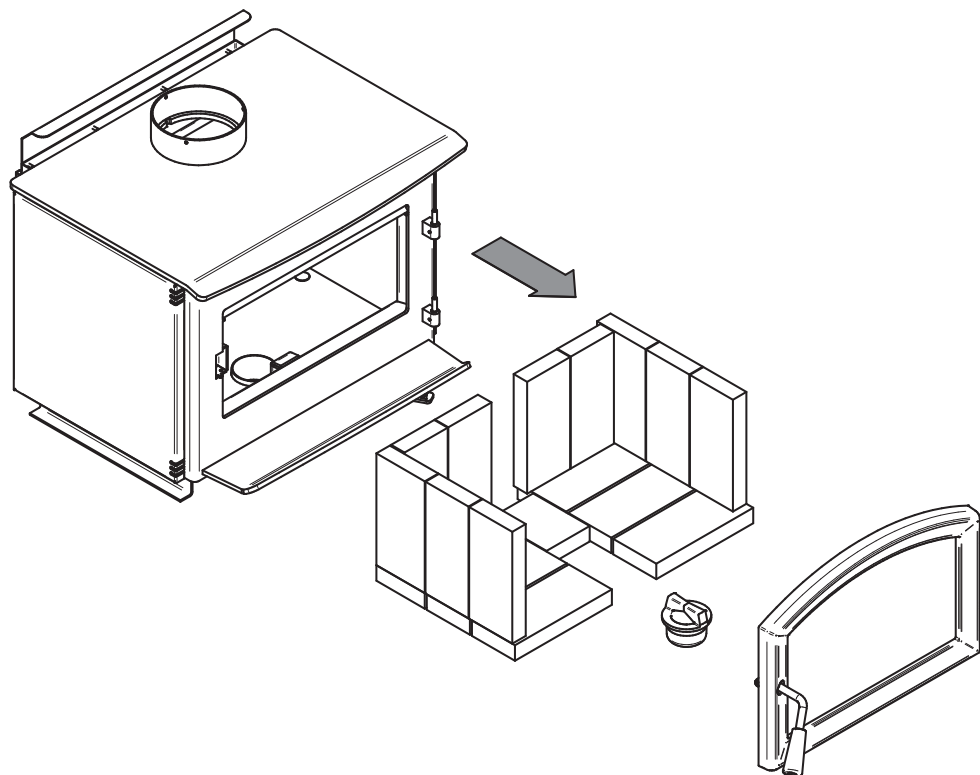


*The baffle and the bricks must be put back in the right place after the final positioning of the stove.*

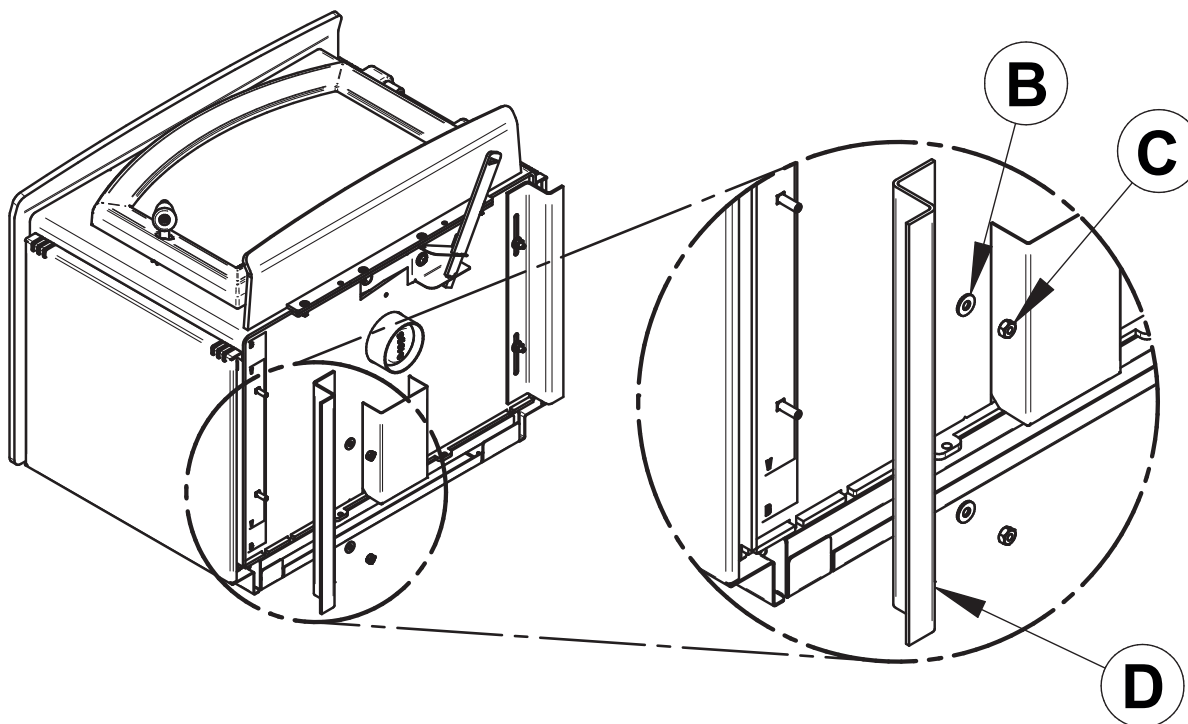
## 6.2 Pedestal Installation

THE IMAGES SHOWN ARE INDICATIVE ONLY AND MAY DIFFER OF YOUR PRODUCT, BUT THE ASSEMBLY REMAINS THE SAME.

1. Remove the door, the firebricks and the ash plug<sup>21</sup> from the stove.

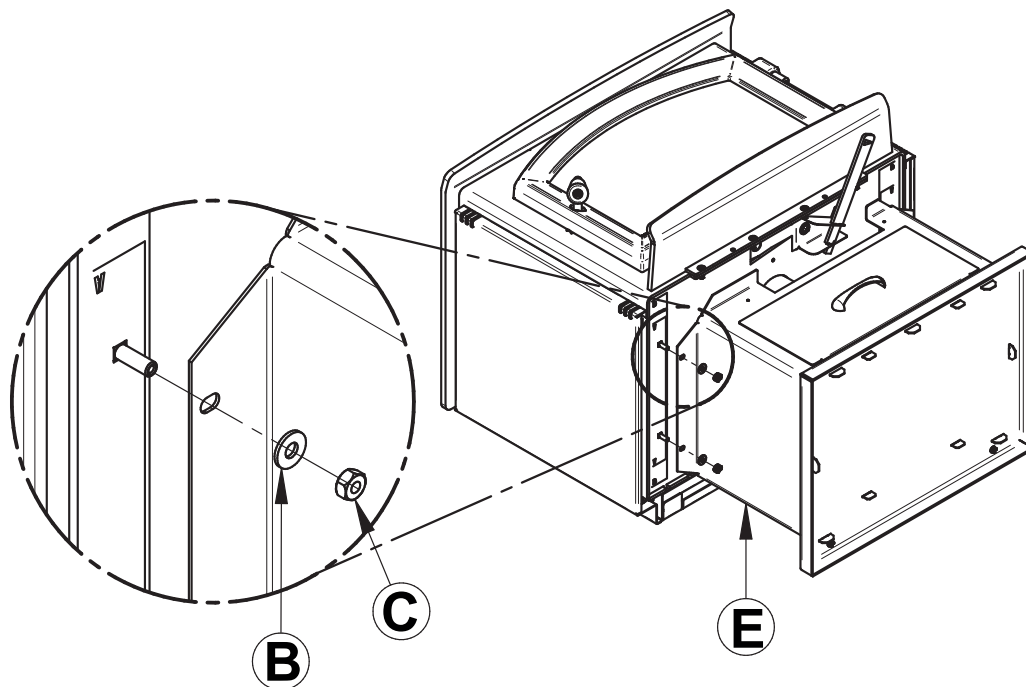


2. Put the stove on its back. Remove and dispose of the two freight supports **(D)**. Keep the nuts **(C)** and washers **(B)** for step 3.

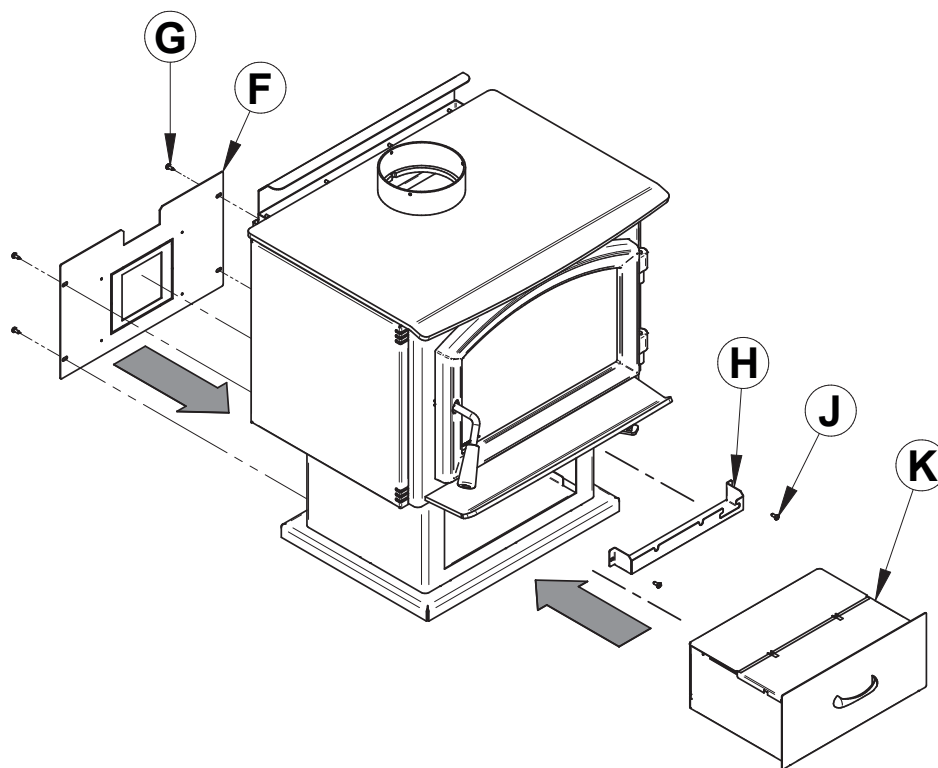


<sup>21</sup> If present on your product

3. Install the pedestal **(E)** on the stove and screw it in place using washers **(B)** and nuts **(C)**.



4. Put the stove on its pedestal and install the fresh air panel **(F)** with the screws **(G)**, the air control cover **(H)** with the screws **(J)** and install the ash drawer **(K)**. Put back the bricks, the spacers, the ash plug<sup>22</sup> and the door on the stove. (See step 1)



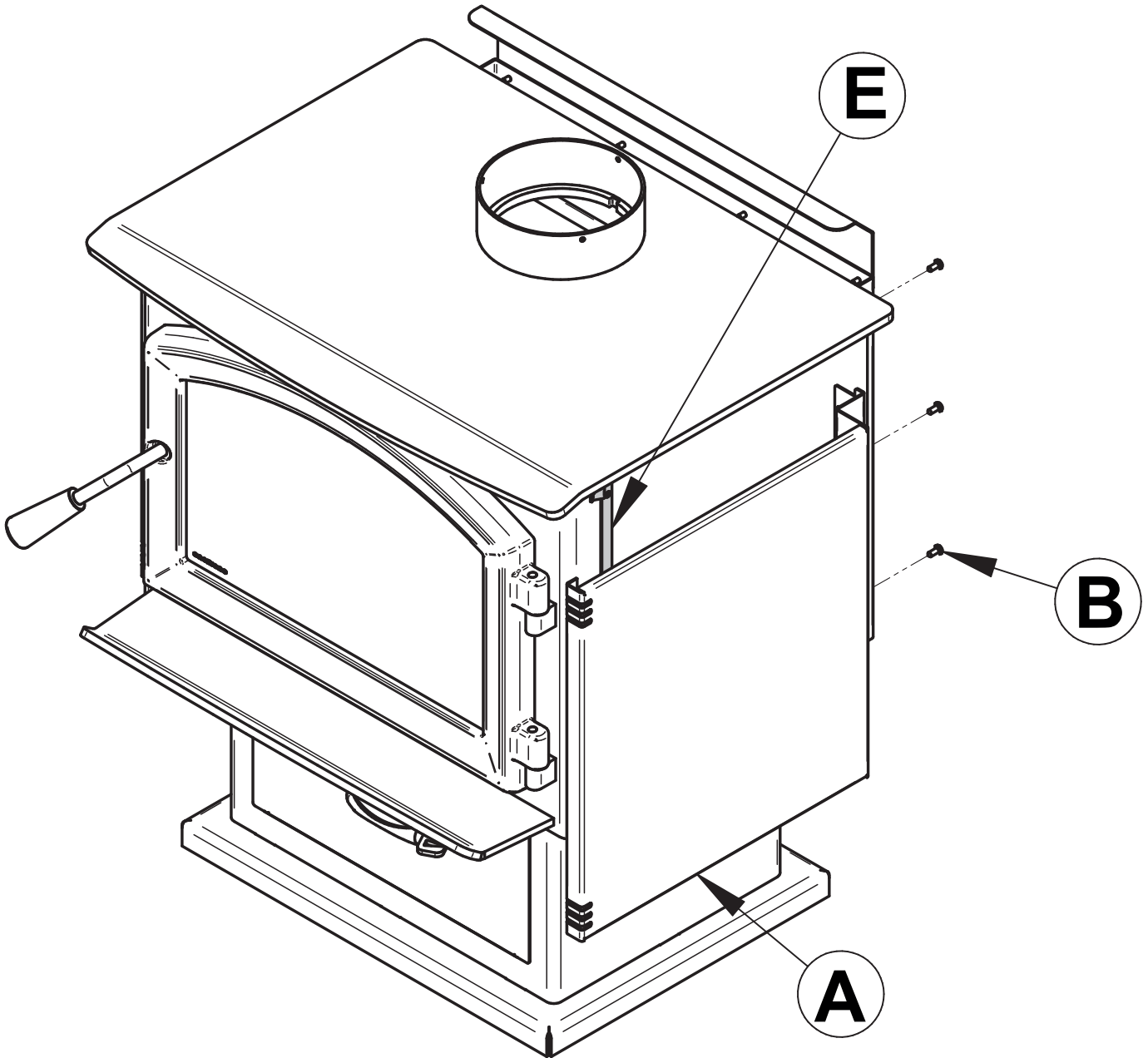
*The baffle<sup>22</sup> and the bricks must be put back in the right place after the final positioning of the stove.*

<sup>22</sup> If present on your product

### 6.3 Decorative Panels

THE IMAGES SHOWN ARE INDICATIVE ONLY AND MAY DIFFER OF YOUR PRODUCT, BUT THE ASSEMBLY REMAINS THE SAME.

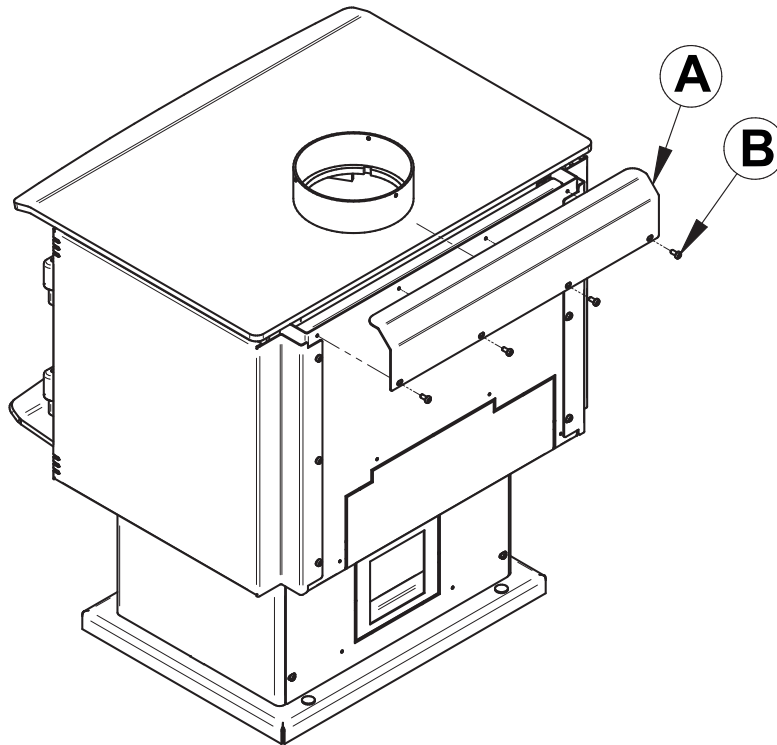
To remove the decorative panel **(A)**, remove the screws **(B)** and push forward on the panel to unhook it from the bracket **(E)**.



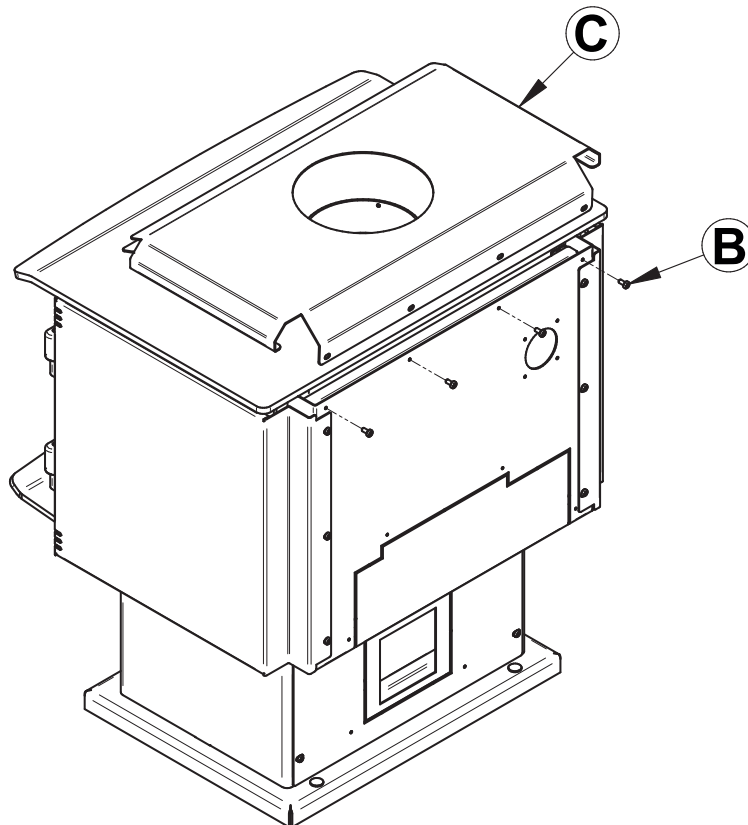
## 6.4 Optional Airmate Installation

THE IMAGES SHOWN ARE INDICATIVE ONLY AND MAY DIFFER OF YOUR PRODUCT, BUT THE ASSEMBLY REMAINS THE SAME.

1. Remove the deflector **(A)** and keep the screws **(B)**.



2. Install the airmate **(C)** with the screws kept from the previous step **(B)**.



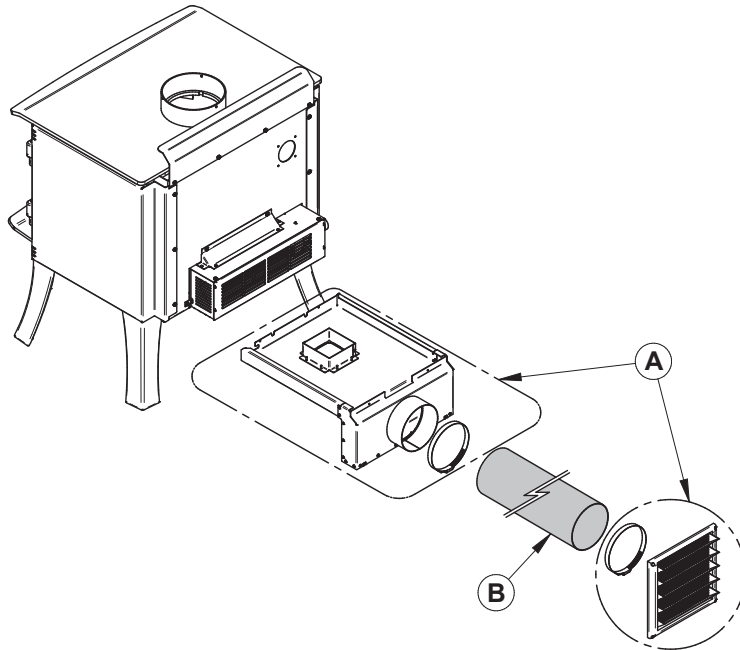


## 6.5 Optional Fresh Air Intake Kit Installation

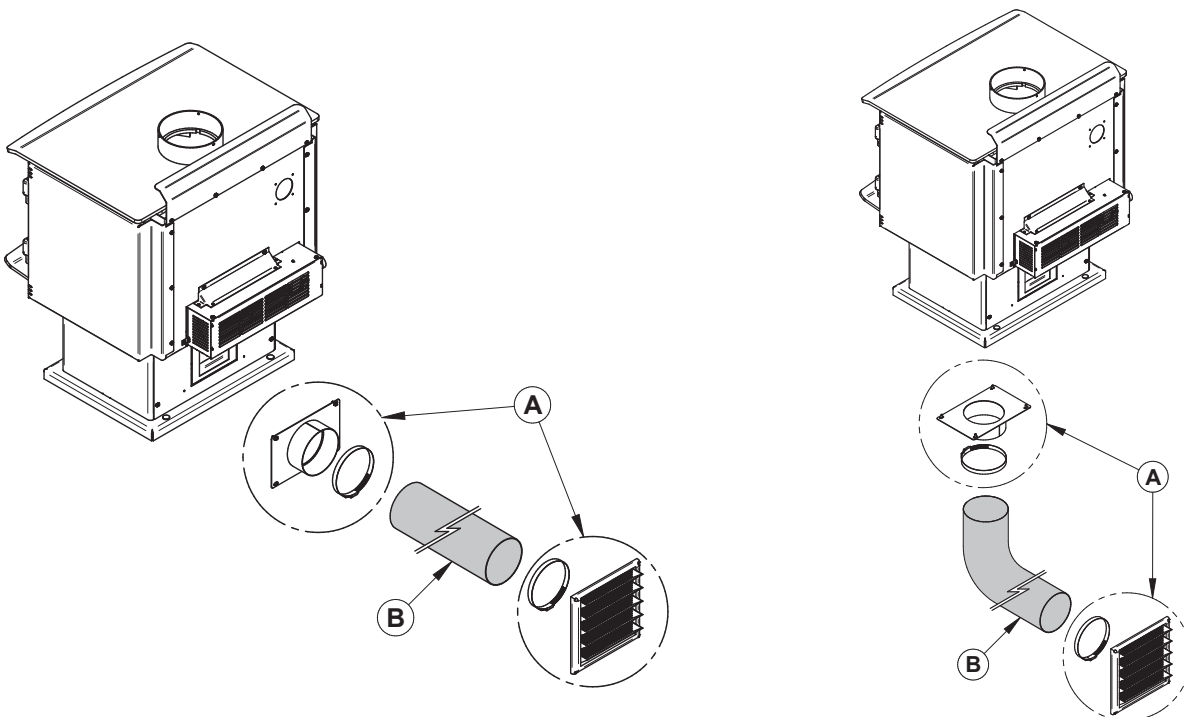
THE IMAGES SHOWN ARE INDICATIVE ONLY AND MAY DIFFER OF YOUR PRODUCT, BUT THE ASSEMBLY REMAINS THE SAME.

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

### *Installation with legs*



### *Installation with pedestal*

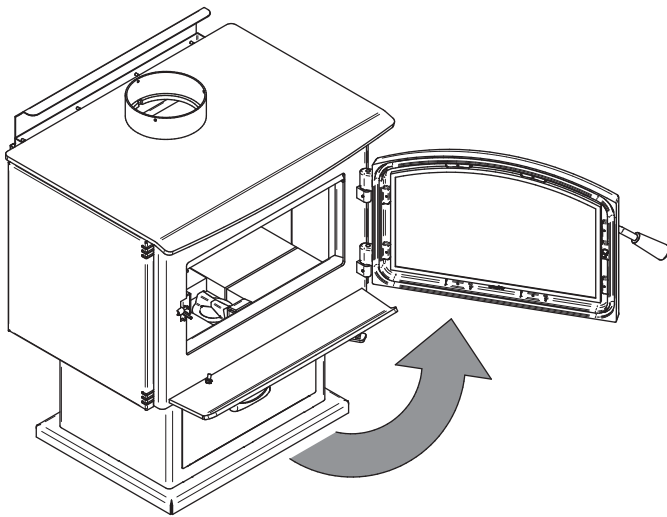


## 6.6 Optional Fire Screen Installation

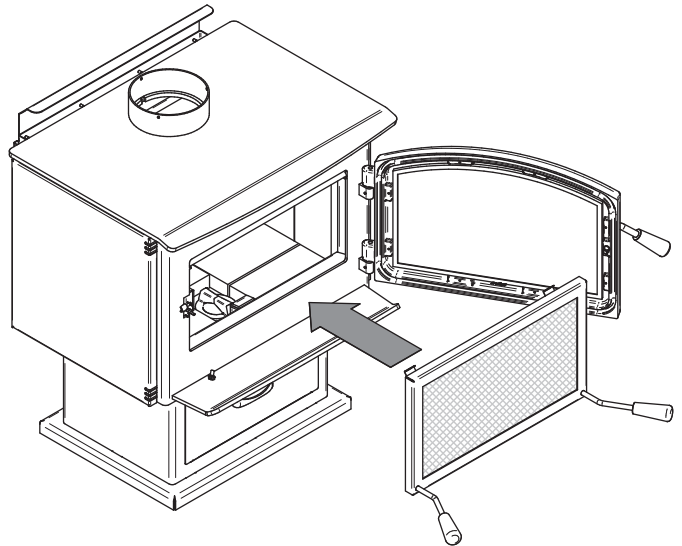
THE IMAGES SHOWN ARE INDICATIVE ONLY AND MAY DIFFER OF YOUR PRODUCT, BUT THE ASSEMBLY REMAINS THE SAME.

**In the United States or in provinces with a particulate emission limit (eg US EPA), the use of wood stoves with open door with and fire screen is prohibited.**

1. Open the door.

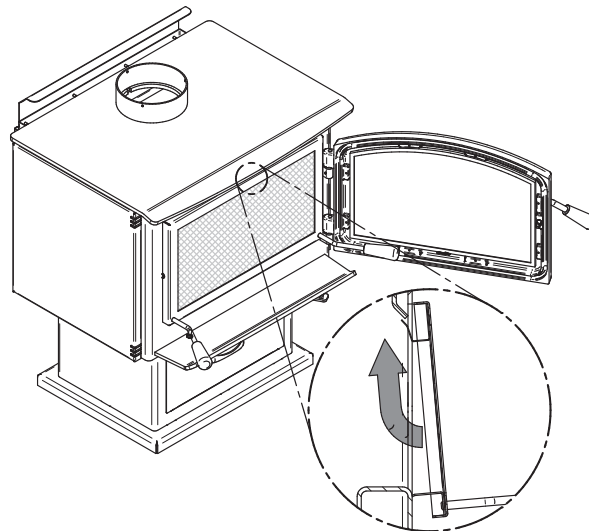


2. Hold the fire screen by the two handles and bring it close to the door opening.



3. Lean the upper part of the fire screen against the top door opening making sure to shove the top fire screen brackets behind the primary air deflector.
4. Lift the fire screen upwards and push the bottom part towards the stove then let the fire screen rest on the bottom of the door opening.

**Warning: Never leave the stove unattended while in use with the fire screen.**

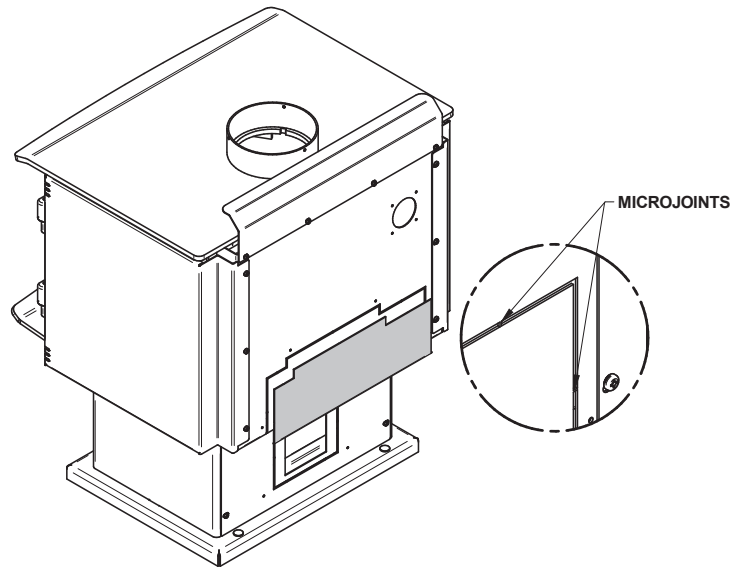


## 6.7 Optional Blower And Thermodisc Installation

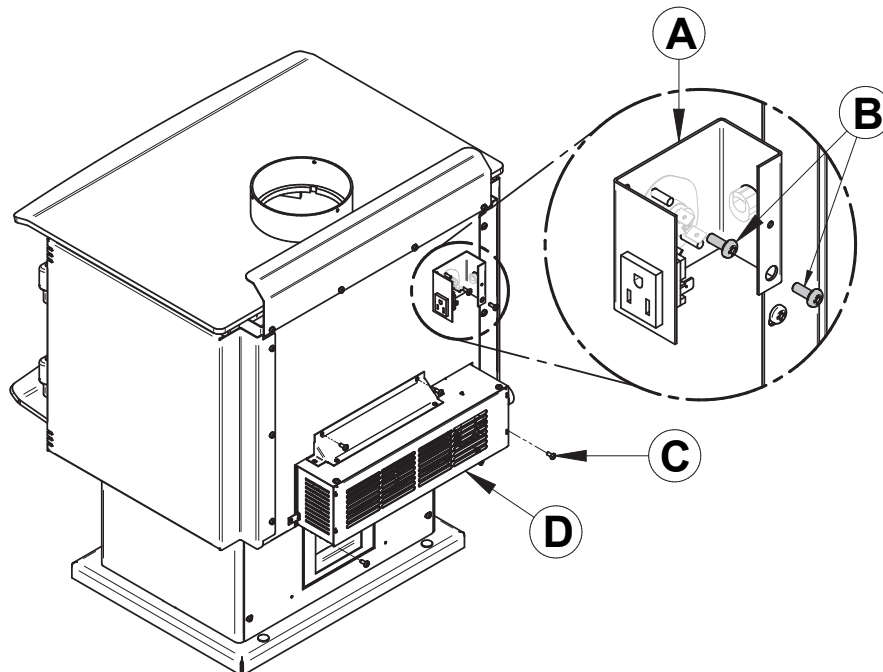
THE IMAGES SHOWN ARE INDICATIVE ONLY AND MAY DIFFER OF YOUR PRODUCT, BUT THE ASSEMBLY REMAINS THE SAME.

A blower and a thermodisc, sold separately, can be installed on the stove. The installation of the blower is identical for a stove on legs or pedestal. Thermodisc allows the blower to operate only when the stove is hot enough. See the instructions provided with the thermodisc for more details.

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

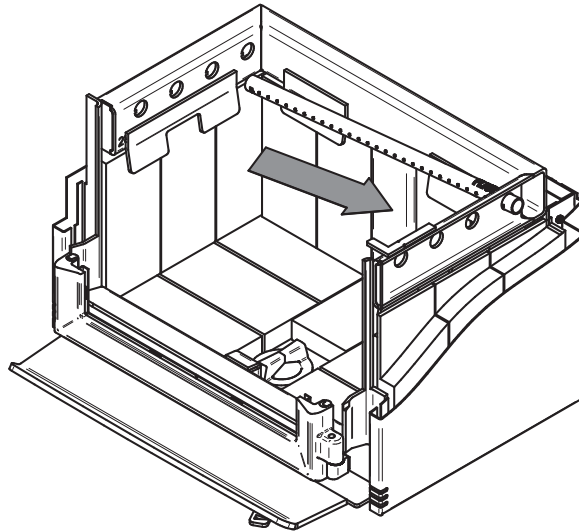


2. Screw the blower **(D)** in place using the screws **(C)** included in the installation manual. Screw the thermodisc **(A)** with the screws **(B)** supplied with the thermodisc on the back of the stove. **Ensure that the blower's power cord is not in contact with any surface of the stove to prevent electrical shock or fire damage. Do not run the power cord beneath the stove.**

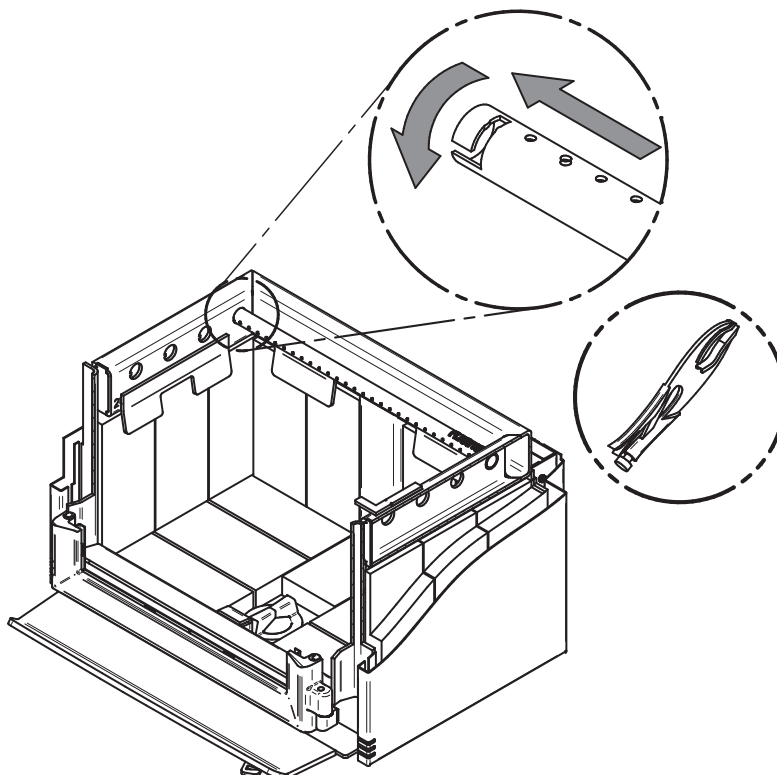


## 6.8 Air Tubes And Baffle Installation

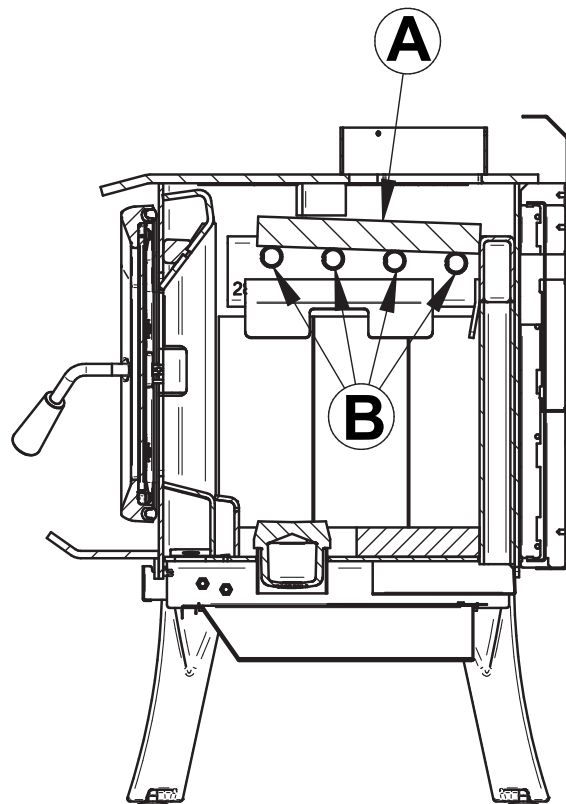
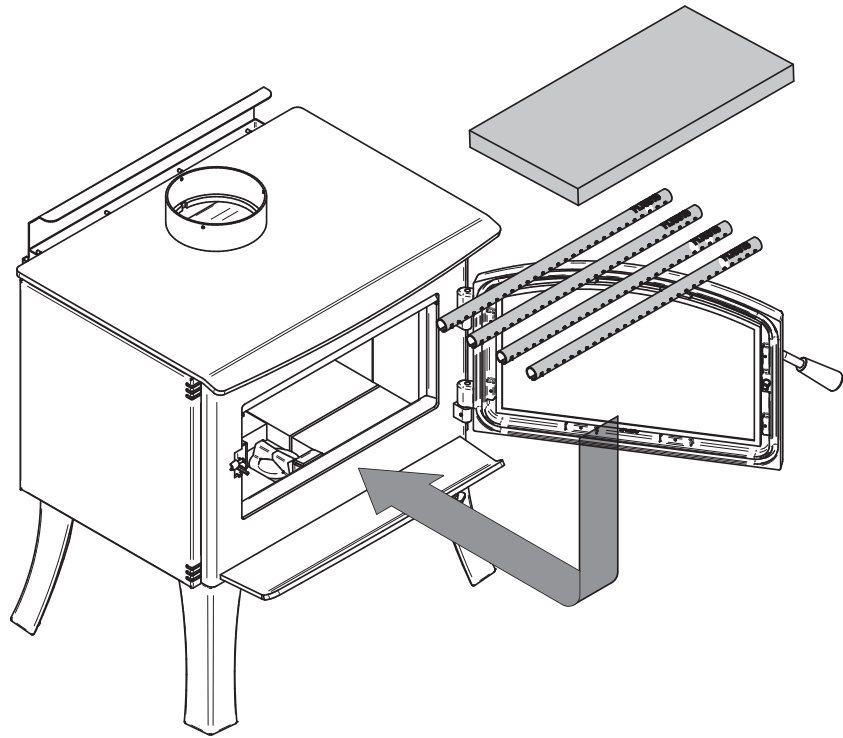
1. Starting with the rear tube, lean and insert the right end of the secondary air tube into the rear right channel hole. Then lift and insert the left end of the tube into the rear left channel.



2. Align the notch in the left end of the tube with the key of the left air channel hole. Using a Vise 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.



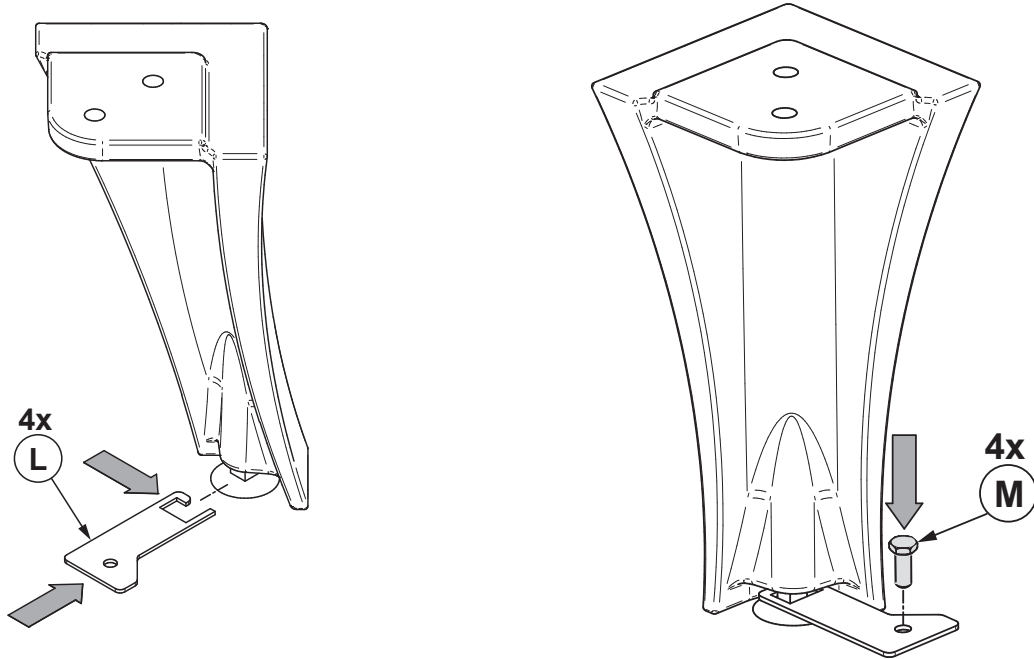
Note that secondary air tubes (B) can be replaced without removing the baffle board (A) and that all tubes are identical.



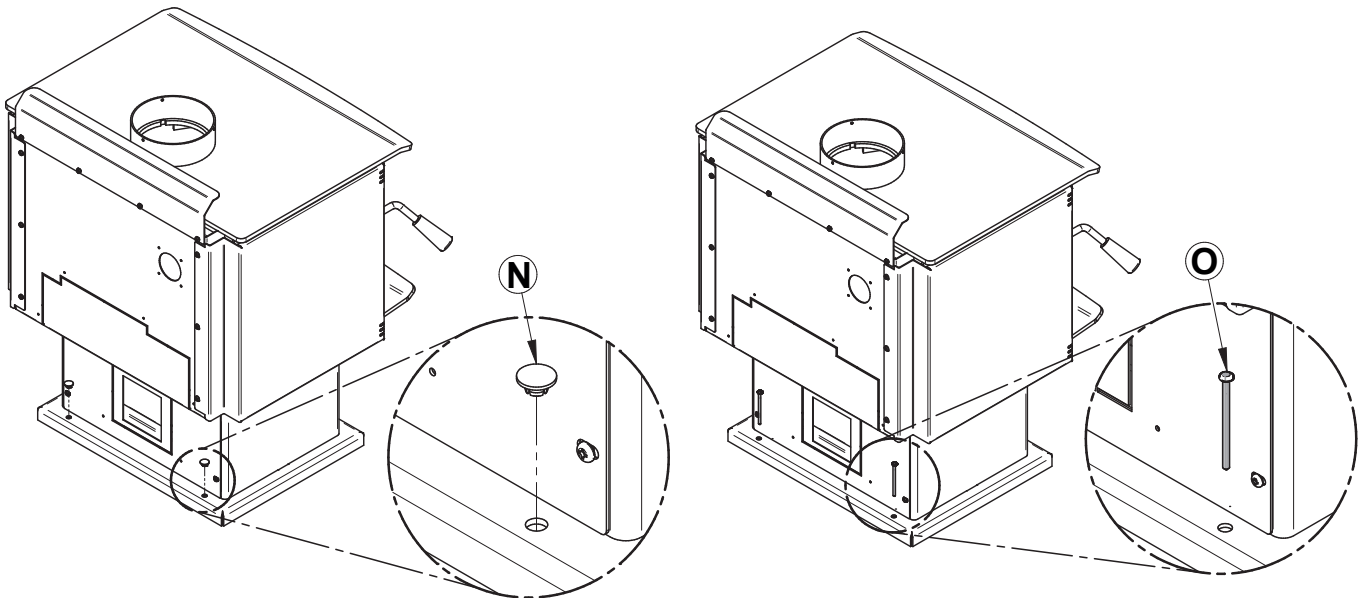
## 6.9 Mobile Home Installation

THE IMAGES SHOWN ARE INDICATIVE ONLY AND MAY DIFFER OF YOUR PRODUCT, BUT THE ASSEMBLY REMAINS THE SAME.

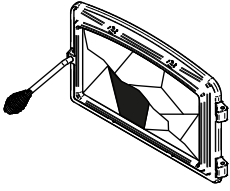
1. For a stove on legs, install a plate (**L**) on each leg and screw it in place with the proper hardware (**M**).



2. For a stove on a pedestal, remove the plugs (**N**) and screw the base on the floor with the proper hardware (**O**).



## 7. Maintenance/Parts Replacement



**Do not clean the glass when the stove is hot.**

**Do not abuse the glass door by striking or slamming shut.**

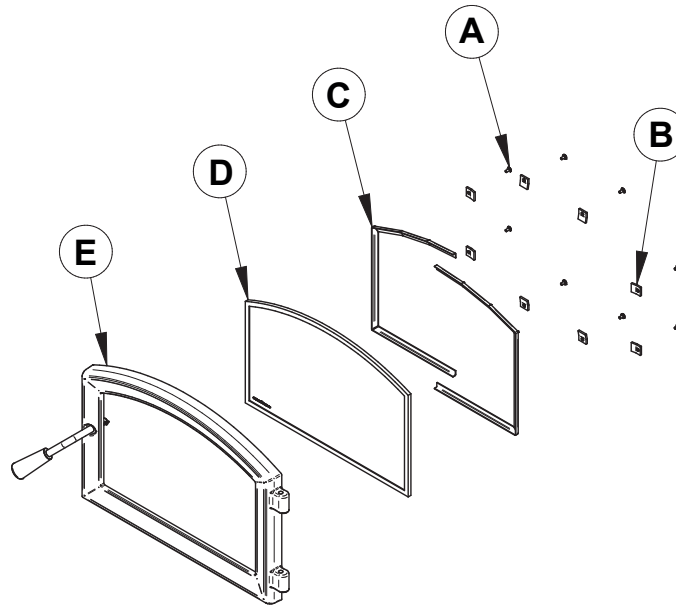
**Do not use the stove if the glass is broken.**

### 7.1 Replacement

The glass used is a ceramic glass, 5/32" (4 mm) thick, 15 7/8" x 9 7/8" (403 mm x 251 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):

THE IMAGES SHOWN ARE INDICATIVE ONLY AND MAY DIFFER OF YOUR PRODUCT, BUT THE ASSEMBLY REMAINS THE SAME.

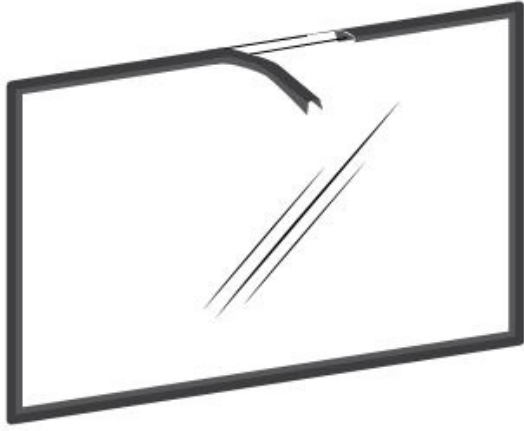


1. Remove the door **(E)** from its hinges and lay it on a soft, flat surface.
2. Remove the eight screws **(A)**, the eight glass retainers **(B)**, and the metal frames **(C)**.
3. Remove the glass **(D)**. If it is damaged install a new one in place. The replacement glass must have a gasket all around (see procedure below).
4. Reinstall the glass, being careful to centre the glass in the door and not to over-tightening the retaining screw.

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

## 7.2 Gasket

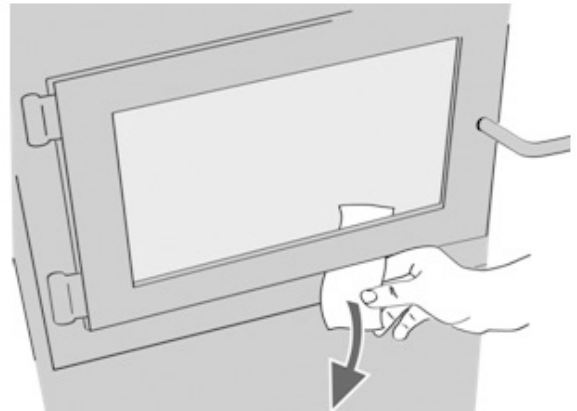
The glass gasket is flat, adhesive-backed, woven fibreglass. The gasket must be centred on the edge of the glass.



1. Follow the steps of the previous section to remove the glass.
2. Remove the old gasket and clean the glass thoroughly.
3. Peel back a section of the paper covering the adhesive and place the gasket on a table with the adhesive side up.
4. Stick the end of the gasket to the middle of one edge, then press the edge of the glass down onto the gasket, taking care that it is perfectly centred on the gasket.
5. Peel off more of the backing and rotate the glass. The gasket must not be stretched during installation.
6. Cut the gasket to the required length.
7. Pinch the gasket onto the glass in a U shape, all around the glass.

## 7.3 Door

In order for the stove to burn at its best efficiency, the door must provide a perfect seal with the firebox. The tightness of the door seal can be verified by closing and latching the door on a strip of paper. The test must be performed all around the door. If the paper slips out easily anywhere, either adjust the door or replace the gasket.





### 7.3.1 Adjustment

In order for the stove to burn at its best efficiency, the door must provide a perfect seal with the firebox. Therefore, the gasket should be inspected periodically to check for a good seal. The gasket seal may be improved with a simple latch mechanism adjustment:

1. Remove the split pin by pulling and turning it using pliers.
2. Turn the handle one counterclockwise turn to increase pressure.
3. Reinstall the split pin with a small hammer.

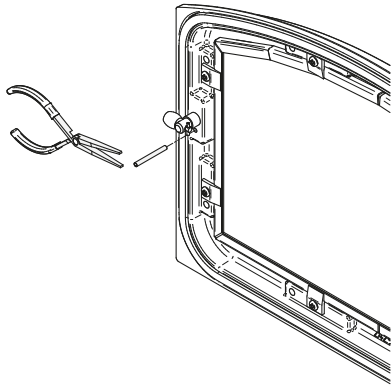


Figure 14: Removing the split pin

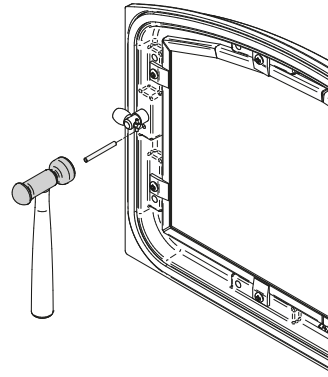
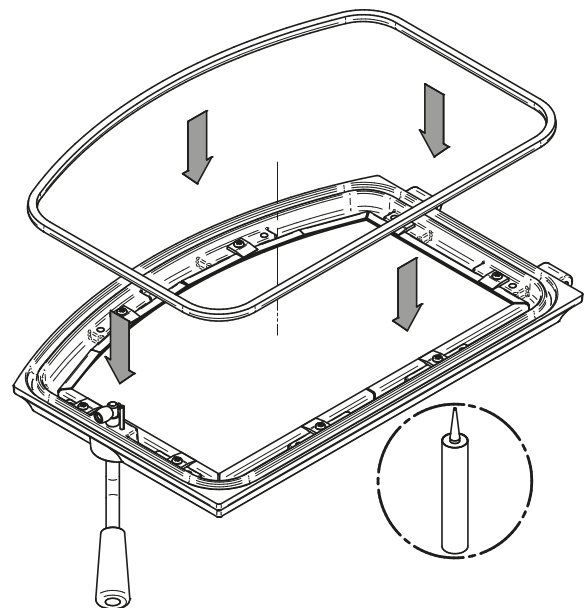


Figure 15: Installing the split pin

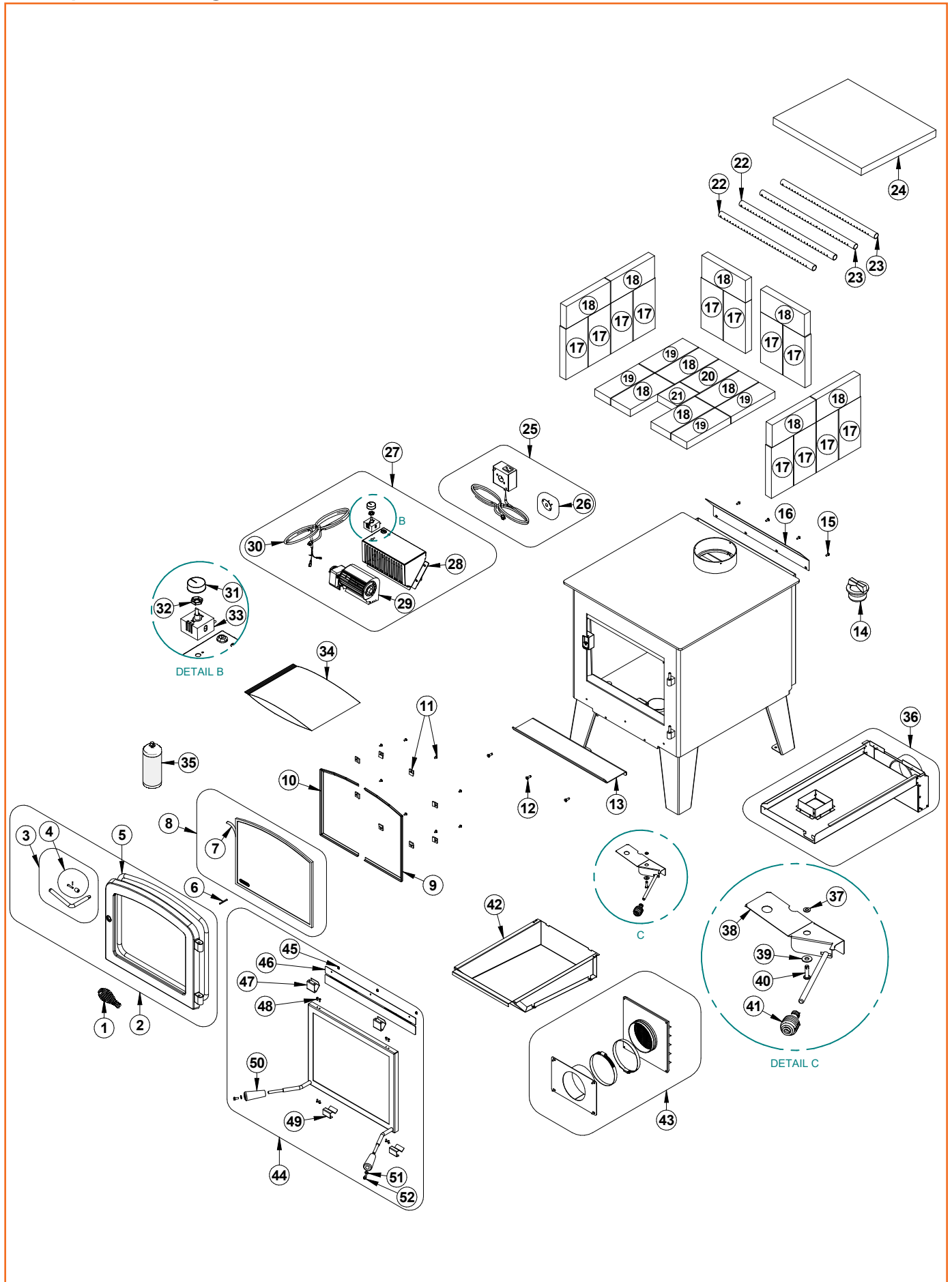
### 7.3.2 Gasket

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" 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.



## 8. Exploded Diagram and Parts List



IMPORTANT: THIS IS DATED INFORMATION. When requesting service or replacement parts for your stove, please provide the model number and serial number. We reserve the right to change parts due to technology upgrade or availability. Contact an authorized dealer to obtain one of these parts. Never use substitute materials. The use of unapproved parts can cause poor performance and risk to your safety.

#	Item	Description	Qty
1	AC07867	1/2" CHROME PLATED COIL HANDLE	1
2	SE24327	DROLET SERIAL 3.3 CAST IRON DOOR	1
3	SE70697	REPLACEMENT HANDLE WITH LATCH KIT	1
4	AC09185	DOOR LATCH KIT	1
5	AC06500	SILICONE AND 5/8" X 8' BLACK DOOR GASKET KIT	1
6	30101	SPRING TENSION PIN 5/32"Ø X 1 1/2"L	1
7	AC06400	3/4" (FLAT) X 6' BLACK SELF-ADHESIVE GLASS GASKET	1
8	SE72531	GLASS	1
9	PL72531	RIGHT GLASS FRAME	1
10	PL72532	LEFT GLASS FRAME	1
11	SE53585	GLASS RETAINER KIT WITH SCREWS (12 PER KIT)	1
12	30507	BLACK TORX SCREW WITH FLAT HEAD TYPE F 1/4-20 X 3/4"	3
13	PL30592	ASHPAN	1
14	24096	ROUND CAST IRON ASH PLUG	1
15	30154	BLACK SCREW #10 X 5/8" QUADREX #2 TYPE A	4
16	PL72588	AIR DEFLECTOR	1
17	29010	4 1/2" X 9" X 1 1/4" REFRACTORY BRICK	12
18	29015	4" X 9" X 1 1/4" REFRACTORY BRICK	10
19	29007	3 1/4" X 9" X 1 1/4" REFRACTORY BRICK	4
20	29000	4" X 8" X 1 1/4" REFRACTORY BRICK	1
21	29004	4" X 4 1/2" X 1 1/4" REFRACTORY BRICK	1
22	PL72516	FRONT SECONDARY AIR TUBE	2
23	PL72515	BACK SECONDARY TUBE	2
24	21598	VERMICULITE BAFFLE	1
25	AC02055	QUICK CONNECT THERMODISC KIT	1
26	44028	CERAMIC THERMODISC F110-20F	1
27	AC02050	BLOWER ASSEMBLY WITH VARIABLE SPEED CONTROL (UP TO 100 CFM)	1
28	PL09909-02	BLOWER HOUSING	1
29	44073	CROSSFLOW BLOWER 115V-60Hz-39W 100 CFM	1
30	60013	POWER CORD 96" X 18-3 type SJT (50 pcs per carton)	1
31	44085	RHEOSTAT KNOB	1
32	44087	RHEOSTAT NUT	1
33	44080	RHEOSTAT WITHOUT NUT (MODEL KBMS-13BV)	1

ENGLISH

#	Item	Description	Qty
34	SE46142	AUSTRAL III MANUAL KIT	1
35	AC05959	METALLIC BLACK STOVE PAINT - 342 g (12oz) AEROSOL	1
36	AC01204	AIR FRESH KIT	1
37	30187	STAINLESS WASHER ID 17/64" X OD 1/2"	1
38	SE72530	AIR CONTROL DAMPER ASS.	1
39	30206	ZINC WASHER 5/16"ID X 3/4"OD	1
40	30506	SCREW PAN TORX TYPE F 1/4-20 X 1" BLACK	1
41	30429	3/8" NICKEL COIL HANDLE	1
42	SE72538	DROLET ASH DRAWER	1
43	AC01336	5"Ø FRESH AIR INTAKE KIT FOR WOOD STOVE ON PEDESTAL	1
44	AC01397	RIGID FIRESCREEN	1
45	30417	BLACK HEX NUT #8-32	3
46	PL72582	SMOKE DEFLECTOR	1
47	PL72584	LOWER HOOK FIRE SCREEN	2
48	30021	SELF TAPPING SCREW 8-32 "F" TYPE X 7/16" FLAT HEAD PHILLIPS BLACK	8
49	PL72074	TOP FIRESCREEN HOOK	2
50	30898	ROUND WOODEN BLACK HANDLE DULL BLACK FINISH	2
51	30187	STAINLESS WASHER ID 17/64" X OD 1/2"	2
52	30025	1/4-20 X 1/2" PAN-HEAD QUADREX BLACK SCREW	2

## 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 SBI 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 SBI 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 SBI dealer. Any merchandise shipped to our plant without authorization will be refused automatically and returned to the sender.*



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St-Augustin-de-Desmaures (Québec) Canada  
G3A 2H3  
418-908-8002  
[www.sbi-international.com](http://www.sbi-international.com)  
[tech@sbi-international.com](mailto:tech@sbi-international.com)



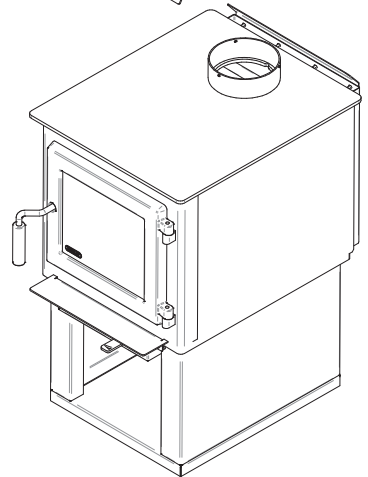
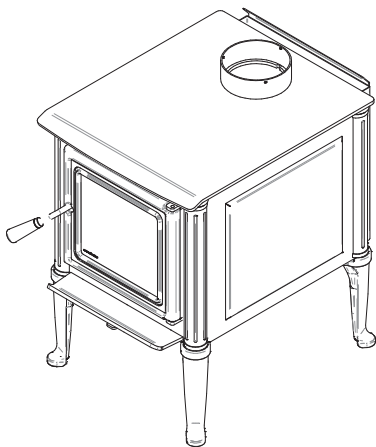
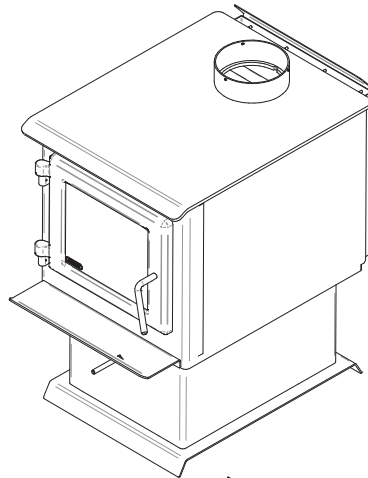
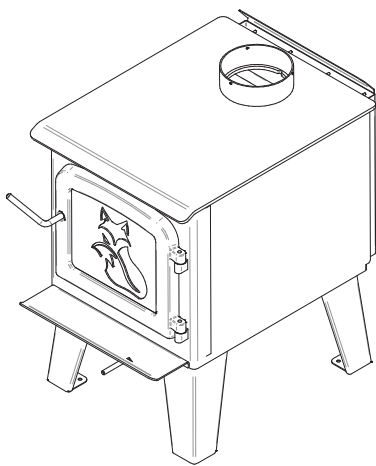
# Manuel d'installation et d'utilisation

## SÉRIE 1.4

S250  
Escape 1200  
Fox

Déco Nano  
Spark II  
Solution 1.4  
Harmony 1.4

Osburn 950  
Gateway 1400  
HES140



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  
≤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**



Détaillant: \_\_\_\_\_

\_\_\_\_\_

Installateur: \_\_\_\_\_

\_\_\_\_\_

Téléphone: \_\_\_\_\_

**Numéro de série:** \_\_\_\_\_



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# 1. PLAQUE D'HOMOLOGATION



Intertek

Control number: 4002461

REFER TO INTERTEK'S DIRECTORY OF BUILDING PRODUCTS FOR DETAILED INFORMATION  
SE REFERER AU RÉPERTOIRE DES PRODUITS HOMOLOGUÉS D'INTERTEK POUR PLUS D'INFORMATION

STANDARDS / NORMES D'ESSAI:

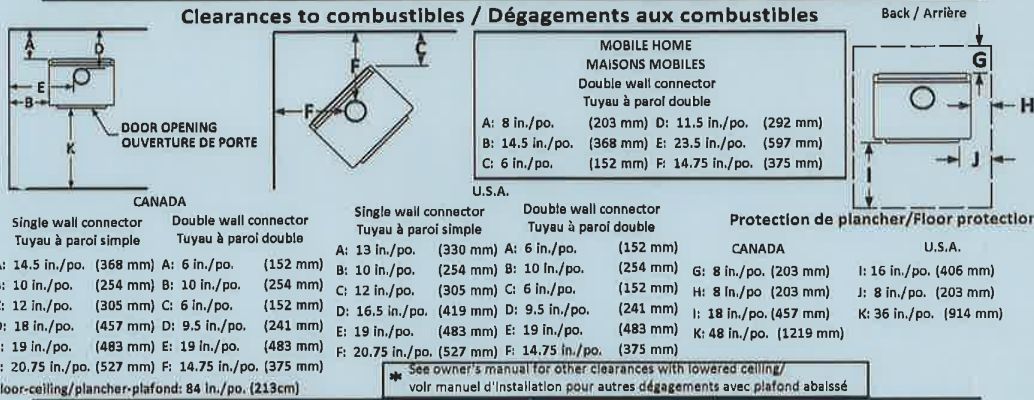
Certified to/Certifié selon CSA B415.1-10  
Certified to/Certifié selon ASTM E3053-17  
Certified to/Certifié selon ASTM E2515-11 (R2017)

LISTED SOLID FUEL BURNING APPLIANCE

POÊLE À COMBUSTIBLE SOLIDE HOMOLOGUÉ

MODEL / MODÈLE :  
DÉCO NANO

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 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.
- For use with solid fuel 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.
- 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 galinée.
- 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.
- Pour l'usage avec du combustible solide seulement. Ne pas utiliser d'autres combustibles.
- Garder la porte fermée ou le pare-étincelle en place en tout temps. Ouvrir la porte ou retirer le pare-étincelle que lors du chargement.
- Ne rien entreposer sous l'appareil.
- Ne pas utiliser de grilles ou de chenets pour surélever le feu. Préparer le feu directement sur l'âtre.
- Ne pas surchauffer. Si l'appareil ou le tuyau rougit, il y a surchauffe.
- Inspecter et nettoyer la cheminée fréquemment. Sous certaines conditions, l'accumulation de créosote peut être rapide.
- Remplacer la vitre seulement avec un verre de céramique.
- Installer l'appareil sur une plaque non combustible tel qu'indiqué sur l'étiquette.
- Poêle approuvé pour maison mobile.
- 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 : 1.8 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  
08/12/2020 (# test)



Fabricant de poêles international  
Stove Builder International

Fabriqué à St-Augustin-de-Desmaures (Qc), Canada  
08/12/2020 (# test)

27866



REFER TO INTERTEK'S DIRECTORY OF BUILDING PRODUCTS FOR DETAILED INFORMATION  
SE REFERER 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

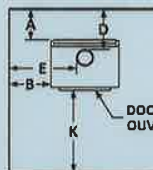
MODEL / MODÈLE :  
ESCAPE 1200

Control number: 4002461

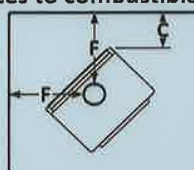
Serial Number  
No. de Série

1

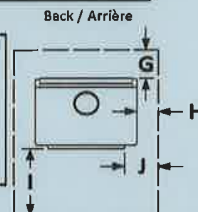
Clearances to combustibles / Dégagements aux combustibles



DOOR OPENING  
OUVERTURE DE PORTE



MOBILE HOME MAISONS MOBILES	
Double wall connector Tuyau à paroi double	
A: 8 in./po. (203 mm)	D: 11.5 in./po. (292 mm)
B: 14.5 in./po. (368 mm)	E: 23.5 in./po. (597 mm)
C: 6 in./po. (152 mm)	F: 14.75 in./po. (375 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: 14.5 in./po. (368 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: 10 in./po. (254 mm)	B: 10 in./po. (254 mm)	B: 10 in./po. (254 mm)	B: 10 in./po. (254 mm)	H: 8 in./po. (203 mm)	J: 8 in./po. (203 mm)
C: 12 in./po. (305 mm)	C: 6 in./po. (152 mm)	C: 12 in./po. (305 mm)	C: 6 in./po. (152 mm)	I: 18 in./po. (457 mm)	K: 36 in./po. (914 mm)
D: 18 in./po. (457 mm)	D: 9.5 in./po. (241 mm)	D: 16.5 in./po. (419 mm)	D: 9.5 in./po. (241 mm)	J: 8 in./po. (203 mm)	
E: 19 in./po. (483 mm)	E: 19 in./po. (483 mm)	E: 19 in./po. (483 mm)	E: 19 in./po. (483 mm)	K: 48 in./po. (1219 mm)	
F: 20.75 in./po. (527 mm)	F: 14.75 in./po. (375 mm)	F: 20.75 in./po. (527 mm)	F: 14.75 in./po. (375 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.
- For use with solid fuel 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 grates 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.
- 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.
- Pour l'usage avec du combustible solide 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.
- 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 en violation de la loi fédérale (USA).

Optional blower: (115V, 0.8A, 60Hz)

Option ventilateur: (115V, 0.8A, 60Hz)

U.S. ENVIRONMENTAL PROTECTION AGENCY Certified to comply with 2020 particulate emission standards using cordwood.  
AGENCE DE PROTECTION DE L'ENVIRONNEMENT DES É.-U. Conforme aux normes d'émission de particules de 2020 avec bûche de bois.

Weighted average emission rate / Moyenne pondérée des émissions : 1.8 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  
08/12/2020 (# test)



Fabricant de poêles international  
Stove Builder International

Fabriqué à St-Augustin-de-Desmaures (Qc), Canada  
08/12/2020 (# test)

27864

FRANÇAIS



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)

Control number: 4002461

LISTED SOLID FUEL BURNING APPLIANCE

POÊLE À COMBUSTIBLE SOLIDE HOMOLOGUÉ

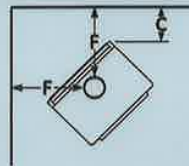
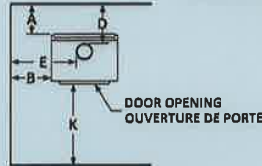
MODEL / MODÈLE :

FOX

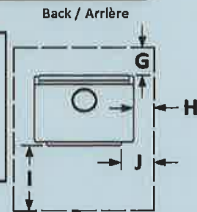
Serial Number  
No. de Série

1

Clearances to combustibles / Dégagements aux combustibles



MOBILE HOME MAISONS MOBILES Double wall connector Tuyau à paroi double			
A: 8 in./po. (203 mm)	D: 11.5 in./po. (292 mm)		
B: 14.5 in./po. (368 mm)	E: 23.5 in./po. (597 mm)		
C: 6 in./po. (152 mm)	F: 14.75 in./po. (375 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.
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B: 10 in./po. (254 mm)	B: 10 in./po. (254 mm)	B: 10 in./po. (254 mm)	B: 10 in./po. (254 mm)	H: 8 in./po. (203 mm)	J: 8 in./po. (203 mm)
C: 12 in./po. (305 mm)	C: 6 in./po. (152 mm)	C: 12 in./po. (305 mm)	C: 6 in./po. (152 mm)	I: 18 in./po. (457 mm)	K: 36 in./po. (914 mm)
D: 18 in./po. (457 mm)	D: 9.5 in./po. (241 mm)	D: 16.5 in./po. (419 mm)	D: 9.5 in./po. (241 mm)	J: 8 in./po. (203 mm)	
E: 19 in./po. (483 mm)	E: 19 in./po. (483 mm)	E: 19 in./po. (483 mm)	E: 19 in./po. (483 mm)	K: 48 in./po. (1219 mm)	
F: 20.75 in./po. (527 mm)	F: 14.75 in./po. (375 mm)	F: 20.75 in./po. (527 mm)	F: 14.75 in./po. (375 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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- For use with solid fuel 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.
- 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.

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- Ne pas raccorder cet appareil à une cheminée déservant un autre appareil.
- Pour l'usage avec du combustible solide 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.
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- 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 de bois.  
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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  
08/12/2020 (# test)



Fabricant de poêles international  
Stove Builder International

Fabriqué à St-Augustin-de-Desmaures (Qc), Canada  
08/12/2020 (# test)

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Intertek

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

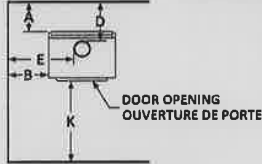
MODEL / MODÈLE :

GATEWAY 1400

Serial Number / No. de Série

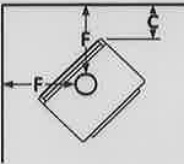
1

Clearances to combustibles / Dégage ments aux combustibles



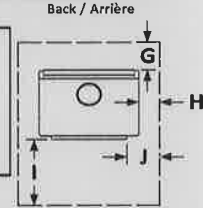
CANADA

Table with 2 columns: Single wall connector (Tuyau à paroi simple) and Double wall connector (Tuyau à paroi double). Rows A through F with dimensions in inches and millimeters.



U.S.A.

Table with 2 columns: Single wall connector (Tuyau à paroi simple) and Double wall connector (Tuyau à paroi double). Rows A through F with dimensions in inches and millimeters.



Protection de plancher/Floor protection

CANADA

Table with 2 columns: Single wall connector (Tuyau à paroi simple) and Double wall connector (Tuyau à paroi double). Rows G through K with dimensions in inches and millimeters.

U.S.A.

Table with 2 columns: Single wall connector (Tuyau à paroi simple) and Double wall connector (Tuyau à paroi double). Rows G through K with dimensions in inches and millimeters.

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

\* See owner's manual for other clearances with lowered ceiling / voir manuel d'installation pour autres dégage ments 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.
For use with solid fuel 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.
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.
Pour l'usage avec du combustible solide 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.
Installer l'appareil sur une plaque non combustible tel qu'indiqué sur l'étiquette.
Poêle approuvé pour maison mobile.
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 de bois.

Weighted average emission rate / Moyenne pondérée des émissions : 1.8 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
08/12/2020 (# test)



Fabriqué à St-Augustin-de-Desmaures (Qc), Canada
08/12/2020 (# test)

27870

FRANÇAIS



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 :

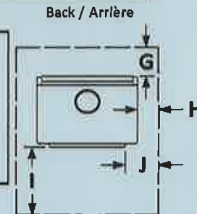
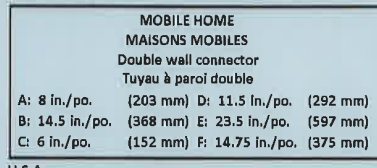
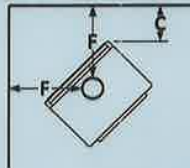
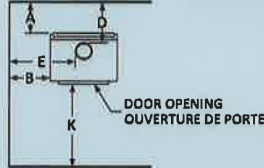
HARMONY 1.4

Serial Number  
No. de Série

1

Control number: 4002461

Clearances to combustibles / Dégagements aux combustibles



CANADA

Single wall connector Tuyau à paroi simple	Double wall connector Tuyau à paroi double
A: 14.5 in./po. (368 mm)	A: 6 in./po. (152 mm)
B: 10 in./po. (254 mm)	B: 10 in./po. (254 mm)
C: 12 in./po. (305 mm)	C: 6 in./po. (152 mm)
D: 18 in./po. (457 mm)	D: 9.5 in./po. (241 mm)
E: 19 in./po. (483 mm)	E: 19 in./po. (483 mm)
F: 20.75 in./po. (527 mm)	F: 14.75 in./po. (375 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: 10 in./po. (254 mm)	B: 10 in./po. (254 mm)
C: 12 in./po. (305 mm)	C: 6 in./po. (152 mm)
D: 16.5 in./po. (419 mm)	D: 9.5 in./po. (241 mm)
E: 19 in./po. (483 mm)	E: 19 in./po. (483 mm)
F: 20.75 in./po. (527 mm)	F: 14.75 in./po. (375 mm)

Protection de plancher/Floor protection

CANADA	U.S.A.
G: 8 in./po. (203 mm)	I: 16 in./po. (406 mm)
H: 8 in./po. (203 mm)	J: 8 in./po. (203 mm)
I: 18 in./po. (457 mm)	K: 36 in./po. (914 mm)
K: 48 in./po. (1219 mm)	

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.
- For use with solid fuel 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.
- 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.
- Pour l'usage avec du combustible solide seulement. Ne pas utiliser d'autres combustibles.
- Garder la porte fermée ou le para-étincelle en place en tout temps. Ouvrir la porte ou retirer le para-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 surchauffa.
- 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.
- 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 de bois.

Weighted average emission rate / Moyenne pondérée des émissions : 1.8 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  
08/12/2020 (# test)



Fabricant de poêles international  
Stove Builder International

Fabriqué à St-Augustin-de-Desmaures (Qc), Canada  
08/12/2020 (# test)

27869



Intertek

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 :

HES140

Serial Number  
No. de Série

1

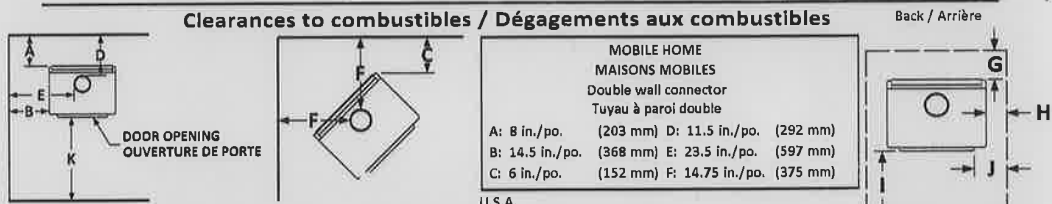


Table with columns for CANADA, U.S.A., and Protection de plancher/Floor protection. It lists dimensions for single and double wall connectors in inches and millimeters. Includes a note: '\* See owner's manual for other clearances with lowered ceiling / voir manuel d'installation pour autres dégagements 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.
For use with solid fuel 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.
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.
Pour l'usage avec du combustible solide 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.
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 de bois.

Weighted average emission rate / Moyenne pondérée des émissions : 1.8 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
08/12/2020 (# test)



Fabriqué à St-Augustin-de-Desmaures (Qc), Canada
08/12/2020 (# test)

27871

FRANÇAIS





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

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

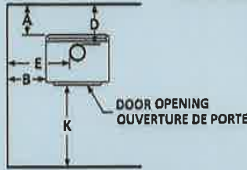
POÈLE À COMBUSTIBLE SOLIDE HOMOLOGUÉ

MODEL / MODÈLE :

OSBURN 950

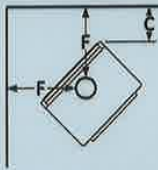
Serial Number / No. de Série: 1

Clearances to combustibles / Dégagements aux combustibles



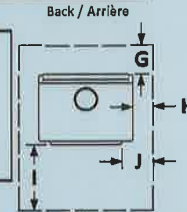
CANADA

Single wall connector Tuyau à paroi simple	Double wall connector Tuyau à paroi double
A: 14.5 in./po. (368 mm)	A: 6 in./po. (152 mm)
B: 10 in./po. (254 mm)	B: 10 in./po. (254 mm)
C: 12 in./po. (305 mm)	C: 6 in./po. (152 mm)
D: 18 in./po. (457 mm)	D: 9.5 in./po. (241 mm)
E: 19 in./po. (483 mm)	E: 19 in./po. (483 mm)
F: 20.75 in./po. (527 mm)	F: 14.75 in./po. (375 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: 10 in./po. (254 mm)	B: 10 in./po. (254 mm)
C: 12 in./po. (305 mm)	C: 6 in./po. (152 mm)
D: 16.5 in./po. (419 mm)	D: 9.5 in./po. (241 mm)
E: 19 in./po. (483 mm)	E: 19 in./po. (483 mm)
F: 20.75 in./po. (527 mm)	F: 14.75 in./po. (375 mm)



Protection de plancher/Floor protection

CANADA U.S.A.

G: 8 in./po. (203 mm)	I: 16 in./po. (406 mm)
H: 8 in./po. (203 mm)	J: 8 in./po. (203 mm)
I: 18 in./po. (457 mm)	K: 36 in./po. (914 mm)
K: 48 in./po. (1219 mm)	

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.
- For use with solid fuel 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.
- 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.
- Pour l'usage avec du combustible solide 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.
- 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 constitue une violation de la loi fédérale (USA).

Optional blower: (115V, 0.8A, 60Hz)

Option ventilateur: (115V, 0.8A, 60Hz)

U.S. ENVIRONMENTAL PROTECTION AGENCY Certified to comply with 2020 particulate emission standards using cordwood.

AGENCE DE PROTECTION DE L'ENVIRONNEMENT DES É.-U. Conforme aux normes d'émission de particules de 2020 avec bûche de bois.

Weighted average emission rate / Moyenne pondérée des émissions : 1.8 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

08/12/2020

(# test)



Fabricant de poêles international  
Stove Builder International

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

08/12/2020

(# test)

27862



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)

Control number: 4002461

LISTED SOLID FUEL BURNING APPLIANCE

POÊLE À COMBUSTIBLE SOLIDE HOMOLOGUÉ

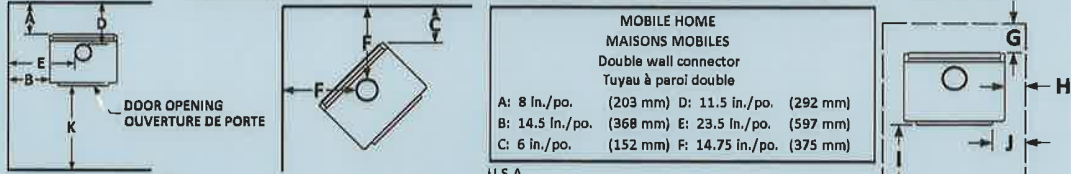
MODEL / MODÈLE :

S250

Serial Number  
No. de Série

1

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: 14.5 in./po. (368 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: 10 in./po. (254 mm)	B: 10 in./po. (254 mm)	B: 10 in./po. (254 mm)	B: 10 in./po. (254 mm)	H: 8 in./po. (203 mm)	J: 8 in./po. (203 mm)
C: 12 in./po. (305 mm)	C: 6 in./po. (152 mm)	C: 12 in./po. (305 mm)	C: 6 in./po. (152 mm)	I: 18 in./po. (457 mm)	K: 36 in./po. (914 mm)
D: 18 in./po. (457 mm)	D: 9.5 in./po. (241 mm)	D: 16.5 in./po. (419 mm)	D: 9.5 in./po. (241 mm)	K: 48 in./po. (1219 mm)	
E: 19 in./po. (483 mm)	E: 19 in./po. (483 mm)	E: 19 in./po. (483 mm)	E: 19 in./po. (483 mm)		
F: 20.75 in./po. (527 mm)	F: 14.75 in./po. (375 mm)	F: 20.75 in./po. (527 mm)	F: 14.75 in./po. (375 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.
- For use with solid fuel 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.
- 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.
- Pour l'usage avec du combustible solide 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.
- 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 de bois.

Weighted average emission rate / Moyenne pondérée des émissions : 1.8 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  
08/12/2020 (# test)



Fabricant de poêles international  
Stove Builder International

Fabriqué à St-Augustin-de-Desmaures (Qc), Canada  
08/12/2020 (# test)

27863

FRANÇAIS



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

Control number: 4002461

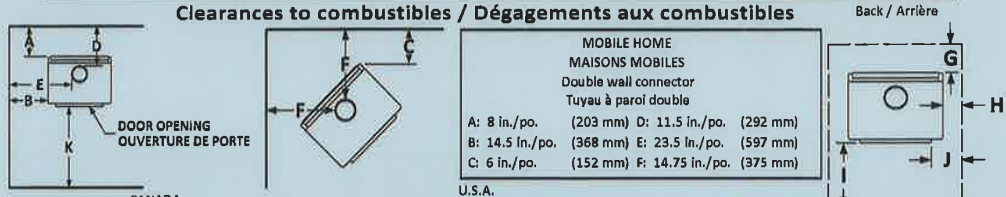
Certified to/Certifié selon CSA B415.1-10  
Certified to/Certifié selon ASTM E3053-17  
Certified to/Certifié selon ASTM E2515-11 (R2017)

LISTED SOLID FUEL BURNING APPLIANCE

POÊLE À COMBUSTIBLE SOLIDE HOMOLOGUÉ

MODEL / MODÈLE :  
SOLUTION 1.4

Serial Number / No. de Série: 1



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: 14.5 in./po. (368 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: 10 in./po. (254 mm)	B: 10 in./po. (254 mm)	B: 10 in./po. (254 mm)	B: 10 in./po. (254 mm)	H: 8 in./po. (203 mm)	J: 8 in./po. (203 mm)		
C: 12 in./po. (305 mm)	C: 6 in./po. (152 mm)	C: 12 in./po. (305 mm)	C: 6 in./po. (152 mm)	I: 18 in./po. (457 mm)	K: 36 in./po. (914 mm)		
D: 18 in./po. (457 mm)	D: 9.5 in./po. (241 mm)	D: 16.5 in./po. (419 mm)	D: 9.5 in./po. (241 mm)				
E: 19 in./po. (483 mm)	E: 19 in./po. (483 mm)	E: 19 in./po. (483 mm)	E: 19 in./po. (483 mm)				
F: 20.75 in./po. (527 mm)	F: 14.75 in./po. (375 mm)	F: 20.75 in./po. (527 mm)	F: 14.75 in./po. (375 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 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.
- For use with solid fuel 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.
- 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.
- Pour l'usage avec du combustible solide 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.
- 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 de bois.

Weighted average emission rate / Moyenne pondérée des émissions : 1.8 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  
08/12/2020 (# test)



Fabricant de poêles international  
Stove Builder International

Fabriqué à St-Augustin-de-Desmaures (Qc), Canada  
08/12/2020 (# test)

27868

FRANÇAIS



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 :

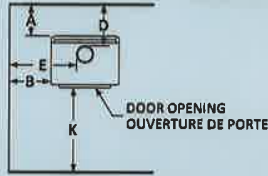
SPARK II

Control number: 4002461

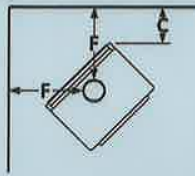
Serial Number  
No. de Série

1

Clearances to combustibles / Dégagements aux combustibles



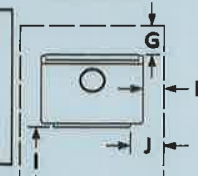
CANADA



U.S.A.

MOBILE HOME MAISONS MOBILES Double wall connector Tuyau à paroi double	
A: 8 in./po. (203 mm)	D: 11.5 in./po. (292 mm)
B: 14.5 in./po. (368 mm)	E: 23.5 in./po. (597 mm)
C: 6 in./po. (152 mm)	F: 14.75 in./po. (375 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: 14.5 in./po. (368 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: 10 in./po. (254 mm)	B: 10 in./po. (254 mm)	B: 10 in./po. (254 mm)	B: 10 in./po. (254 mm)	H: 8 in./po. (203 mm)	J: 8 in./po. (203 mm)
C: 12 in./po. (305 mm)	C: 6 in./po. (152 mm)	C: 12 in./po. (305 mm)	C: 6 in./po. (152 mm)	I: 18 in./po. (457 mm)	K: 36 in./po. (914 mm)
D: 18 in./po. (457 mm)	D: 9.5 in./po. (241 mm)	D: 16.5 in./po. (419 mm)	D: 9.5 in./po. (241 mm)	K: 48 in./po. (1219 mm)	
E: 19 in./po. (483 mm)	E: 19 in./po. (483 mm)	E: 19 in./po. (483 mm)	E: 19 in./po. (483 mm)		
F: 20.75 in./po. (527 mm)	F: 14.75 in./po. (375 mm)	F: 20.75 in./po. (527 mm)	F: 14.75 in./po. (375 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.
- For use with solid fuel 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.
- 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.
- Pour l'usage avec du combustible solide 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.
- 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 de bois.

Weighted average emission rate / Moyenne pondérée des émissions : 1.8 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  
08/12/2020 (# test)



Fabricant de poêles international  
Stove Builder International

Fabriqué à St-Augustin-de-Desmaures (Qc), Canada  
08/12/2020 (# test)

27867

FRANÇAIS

## 2. Informations générales

### 2.1 Performances

Valeurs telles qu'obtenues en test, à l'exception de la superficie de chauffage recommandée, le volume de la chambre à combustion, le temps de combustion maximal et la puissance thermique maximale.

Modèle	S250, Escape 1200, Fox, Déco Nano, Spark II, Solution 1.4, Harmony 1.4, Osburn 950, Gateway 1400, HES140	
Type de combustible	Bûches de bois sec	
Superficie de chauffage recommandée (pi <sup>2</sup> ) <sup>1</sup>	250 à 1,000 pi <sup>2</sup> (23 à 93 m <sup>2</sup> )	
Volume nominal de la chambre à combustion	1.7 pi <sup>3</sup> (0.0481 m <sup>3</sup> )	
Volume de chargement EPA	1.55 pi <sup>3</sup> (0.0439 m <sup>3</sup> )	
Temps de combustion maximal <sup>1</sup>	8 heures	
Puissance thermique maximale (bûches de bois sec) <sup>2</sup>	65,000 BTU/h (19 kW)	
Puissance thermique globale (min. à max.) <sup>2 3</sup>	12,124 BTU/h à 26,700 BTU/h (3.55 kW à 7.83 kW)	
Rendement moyen global <sup>3</sup> (Bûches de bois sec)	74 % (PCS) <sup>4</sup>	79 % (PCI) <sup>5</sup>
Rendement optimal <sup>6</sup>	80 %	
Taux moyen d'émission de particules <sup>7</sup>	1.8 g/h (EPA / CSA B415.1-10) <sup>8</sup>	
Taux moyen de CO <sup>9</sup>	74 g/h	

<sup>1</sup> La superficie de chauffage recommandée et l'autonomie de combustion peuvent varier selon la localisation de l'appareil dans l'habitation, la qualité du tirage de la cheminée, le climat, les facteurs de perte de chaleur ou le type de bois utilisé et d'autres variables. La superficie de chauffage recommandée pour un appareil est définie par le fabricant comme sa capacité à conserver une température minimale acceptable dans l'espace désignée en cas de panne de courant.

<sup>2</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>3</sup> Telle que mesurée selon CSA B415.1-10.

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

<sup>5</sup> Pouvoir calorifique inférieur du combustible.

<sup>6</sup> Rendement optimal à un taux de combustion donné (PCI).

<sup>7</sup> Cet appareil est officiellement testé et certifié par un organisme indépendant.

<sup>8</sup> Testé et certifié selon CFR 40 part 60, subpart AAA, section 60.534(a)(1)(ii) et ASTM E3053-17 basé sur la ALT-125 envoyé par EPA le 28 février 2018.

<sup>9</sup> Monoxyde de carbone.

## 2.2 Spécifications

Longueur maximale des bûches <sup>10</sup>	17 po (432 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
Approuvé pour installation en alcôve	X
Approuvé pour installation en maison mobile <sup>11</sup>	X
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>12</sup>	EPA / CSA B415.1-10

<sup>10</sup> Orientation est-ouest : côté longitudinal des bûches visible; orientation nord-sud : extrémité des bûches visible.

<sup>11</sup> Maison mobile (Canada) ou maison préfabriquée (É.-U.) : Le département américain du logement et du développement urbain décrit « maisons préfabriquées » mieux connues pour « maisons mobiles » comme suit ; bâtiments construits sur des roues fixes et ceux transportés sur des roues/essieux temporaires installées sur une fondation permanente. Au Canada, une maison mobile est une habitation dont l'assemblage de chaque composante est achevé ou achevé en grande partie avant le déplacement de celle-ci jusqu'à un emplacement pour y être placée sur des fondations, raccordé à des installations de service et qui rencontre la norme CAN/CSA-Z240 MH.

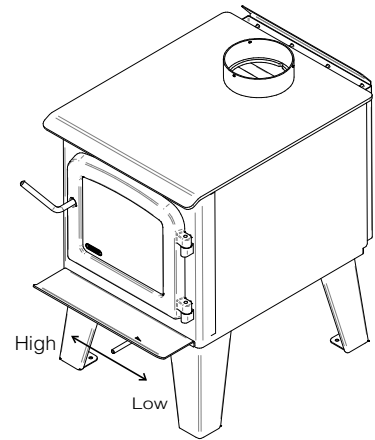
<sup>12</sup> Testé et certifié selon CFR 40 part 60, subpart AAA, section 60.534(a)(1)(ii) et ASTM E3053-17 basé sur la ALT-125 envoyé par EPA le 28 février 2018..

## 2.3 Charge EPA

Les méthodes de charge indiquées ci-dessous sont celles qui ont été utilisées lors de la certification des émissions.

### 2.3.1 Contrôle d'air

Le contrôle de l'air est situé sous la tablette à cendres. Pour ouvrir le contrôle d'air, poussez la poignée de contrôle d'air complètement vers la gauche (High). Cela augmentera le taux de combustion. Pour fermer le contrôle d'air, poussez la poignée de contrôle d'air complètement vers la droite (Low). Cela diminuera le taux de combustion.



### 2.3.2 Taux de combustion élevé (contrôle d'air primaire ouvert)

Ouvrir le contrôle d'air complètement. Placer six petits morceaux (2"x2") de bois dans la chambre de combustion en les croisant avec le plus grand angle possible. Disposer quinze morceaux de bois d'allumage sur les petits morceaux de bois en trois étages avec le plus grand angle possible entre chaque étage. Faire un nœud avec cinq feuilles de papier et placer-les sur le bois d'allumage. Allumer le papier et laisser la porte entrouverte à 90° jusqu'à ce que tout le bois d'allumage soit en feu et que la première rangée de petits morceaux de bois soit également en feu. Fermer la porte.

Lorsqu'il n'y a plus de feu à l'avant de la chambre de combustion et qu'il n'y a que de faibles flammes sur le bois à l'arrière de la chambre de combustion, casser les cendres, niveler le lit de braise et placer quatre bûches dans la chambre de combustion. Placer la plus grosse bûche (environ 5"x5") et une bûche moyenne (environ 4"x4") sur le lit de braise avec une orientation nord-sud. Placer deux autres bûches moyennes sur les deux premières bûches avec le plus grand angle possible. Il doit y avoir un espace d'air entre chaque bûches et entre les bûches et les briques. Laisser la porte entrouverte à 90° pendant une minute maximum, puis fermer la porte.

### 2.3.3 Taux de combustion moyen et bas

Sur un lit de braise d'environ 2" qui est encore légèrement rouge, placer cinq bûches d'environ 4"x4" ou 3"x3" avec une orientation nord-sud dans le poêle. Placer la plus petite bûche et une moyenne bûche sur le lit de braise l'une contre l'autre à environ 1" du côté droit de la chambre de combustion. Placer une bûche moyenne à leur gauche, en laissant autant d'espace que possible au milieu. Placer les deux autres bûches sur les trois premières bûches avec un angle d'environ 20°. Laisser la porte entrouverte à 90° pendant 3 minutes 30 secondes et jusqu'à ce que le feu monte aux tubes d'air secondaire. Fermer ensuite la porte. La commande d'air primaire est ouverte. Laisser brûler pendant environ 4 minutes, puis fermer la commande d'air primaire de 1/2". Après cinq autres minutes, fermer la commande d'air primaire d'un autre 1/2". Attendre encore deux minutes et fermer progressivement la commande d'air primaire jusqu'à un peu moins de la moitié de son ouverture maximale.

## 2.4 Dimensions

### 2.4.1 Dimensions du poêle avec les pattes carrées

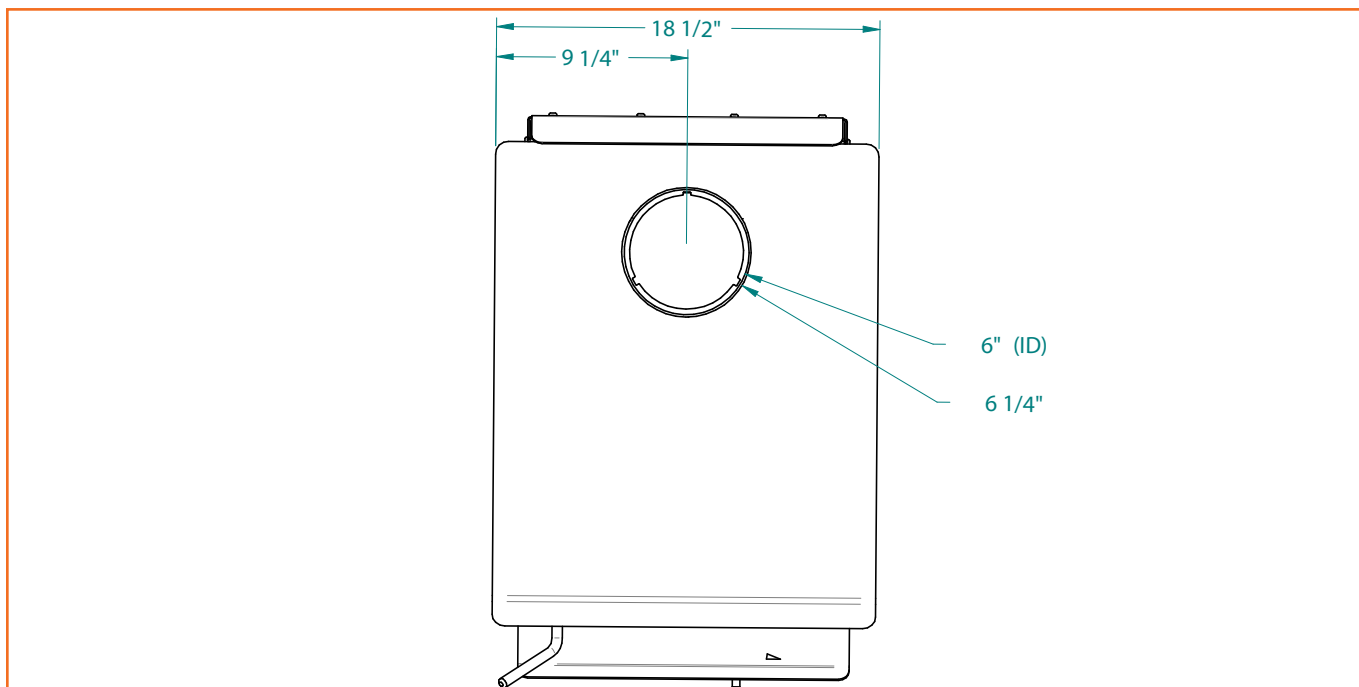


Figure 1: Vue de dessus

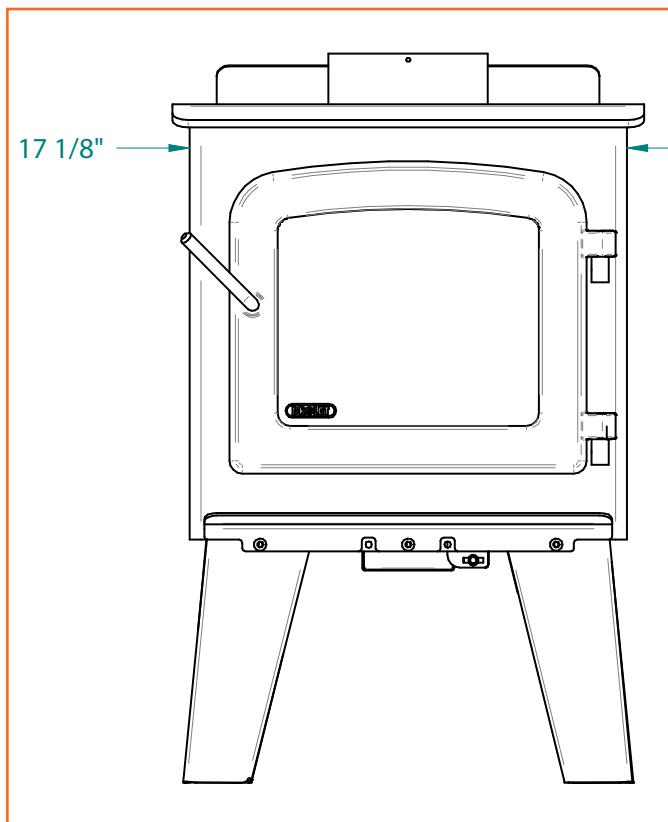


Figure 2: Vue de face

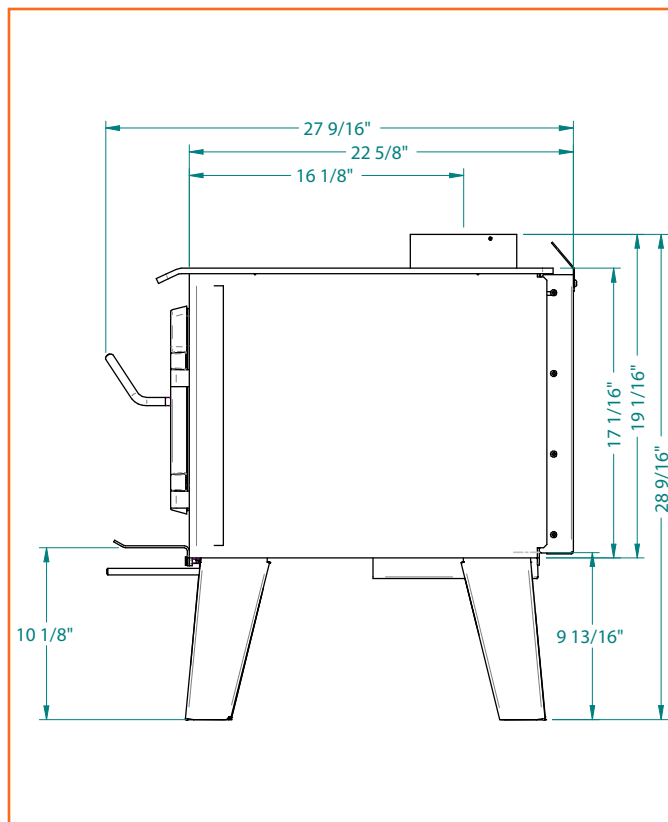


Figure 3: Vue de côté



## 2.4.2 Dimensions de la chambre à combustion

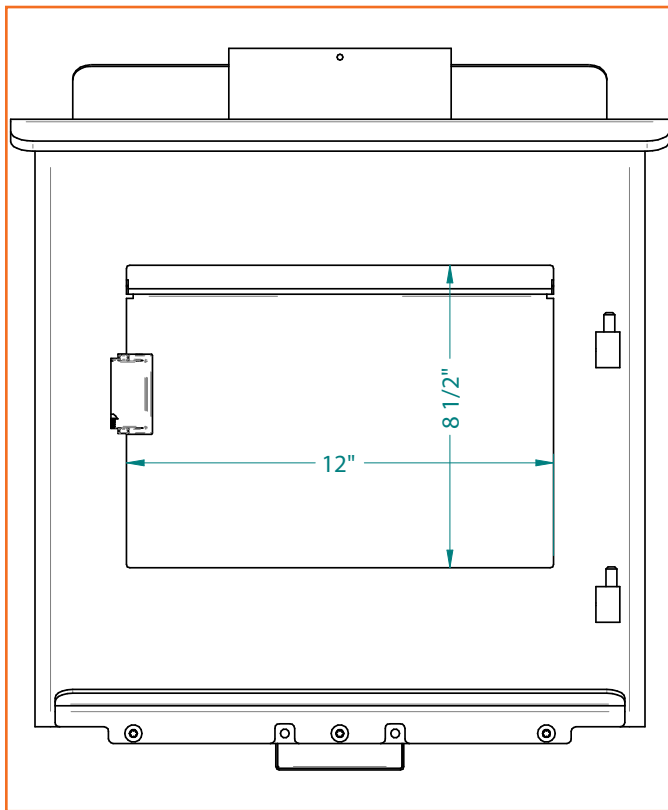


Figure 4: Ouverture de porte

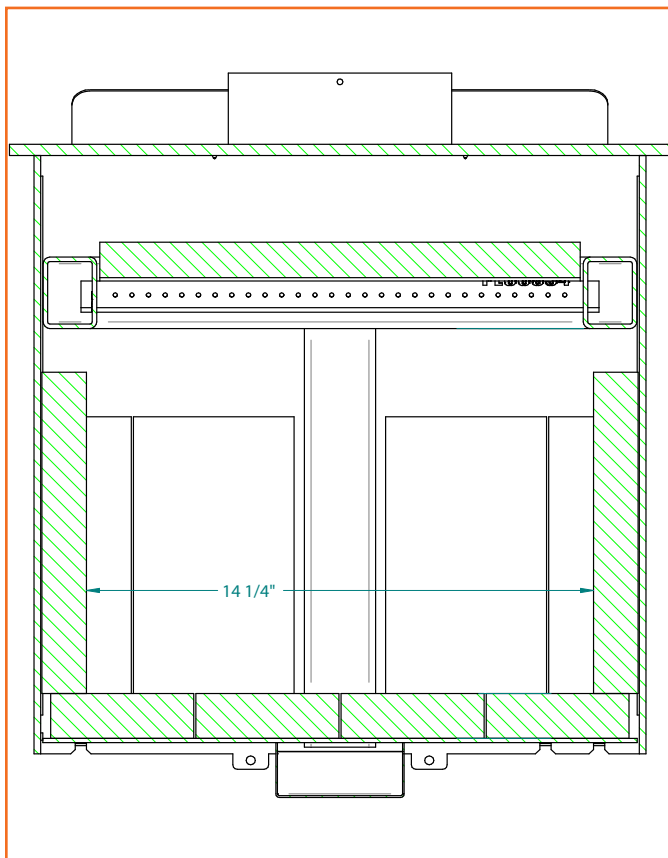


Figure 5: Vue de face - chambre à combustion

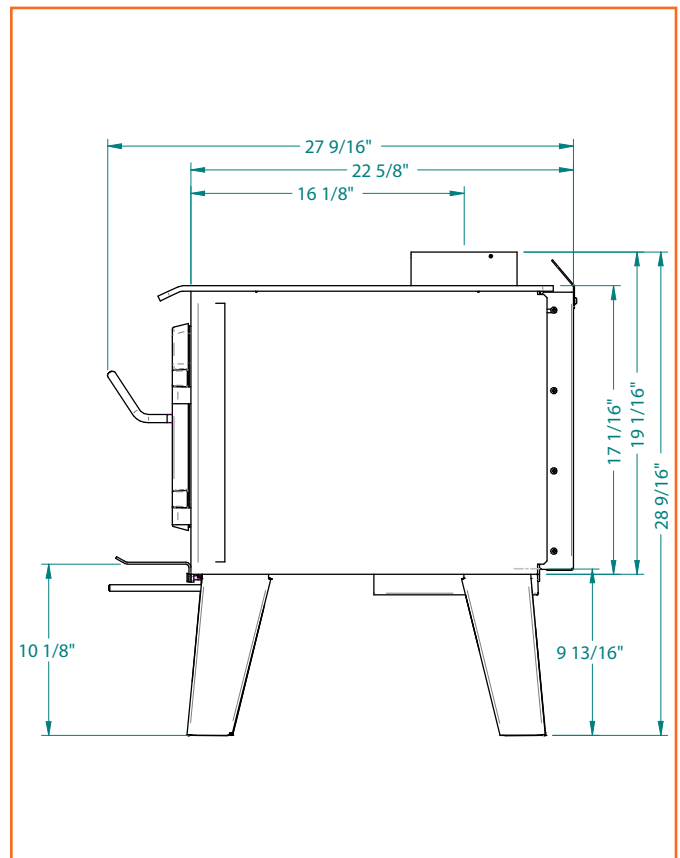


Figure 6: Vue de côté - chambre à combustion

### 3. Dégagements par rapport aux matériaux combustibles

**Aucune partie du poêle ou du conduit de fumée ne peut être placée plus près des matériaux combustibles que les dégagements minimums indiqués.**

Les dégagements par rapport aux murs inflammables peuvent être légèrement différents entre le Canada et les É.-U. et peuvent aussi varier selon l'utilisation d'un tuyau de fumée à paroi simple ou double. Le bon dégagement doit être utilisé selon l'emplacement du poêle et le type de tuyau.

Les dégagements de l'appareil et des tuyaux doivent être rencontrés de façon individuelle, c'est-à-dire que l'appareil ne peut être installé plus près des matériaux combustibles que ce que le tuyau simple ou double permet. Pour connaître la façon sécuritaire de réduire les dégagements, voir la section "Réduction sécuritaire des dégagements" dans le manuel de l'utilisateur.

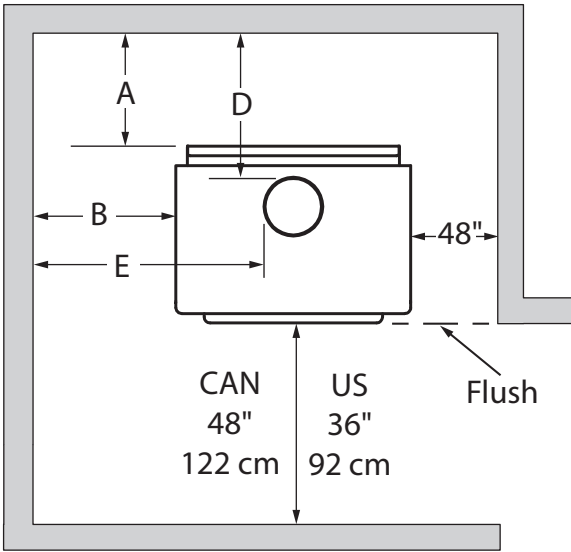


Figure 7: Dégradements - Dessus

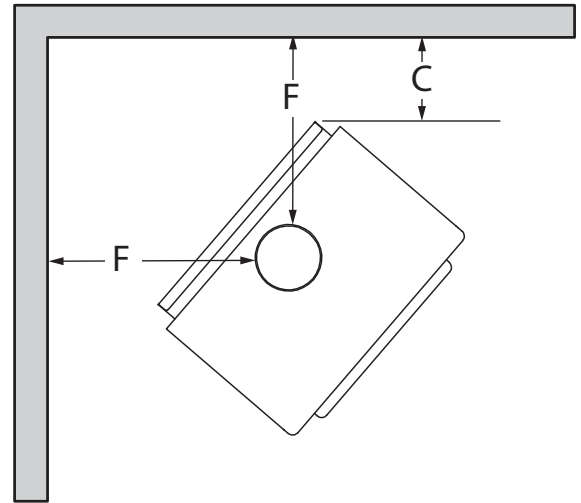


Figure 8: Dégradements - Coin

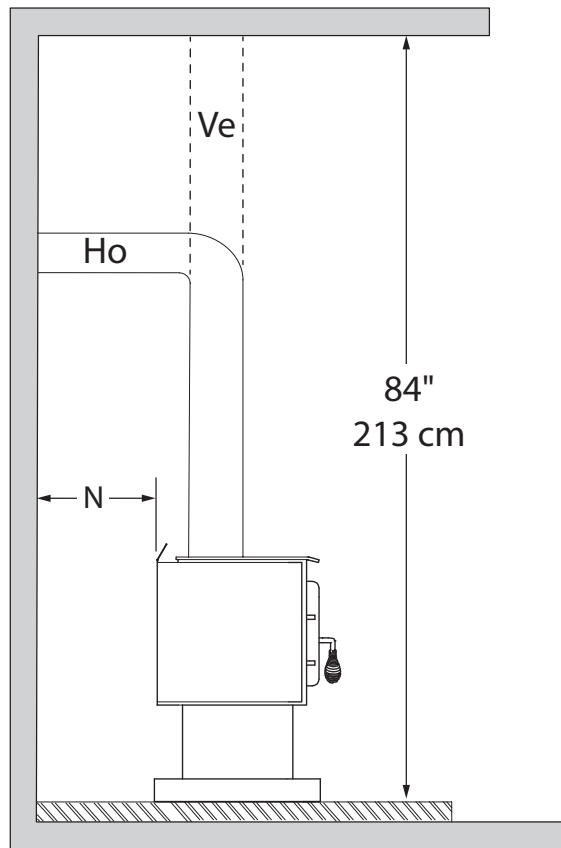


Figure 9: Dégradements - Côté

### 3.1 Dégagements

	DÉGAGEMENTS DE L'APPAREIL AVEC UN TUYAU À PAROI SIMPLE	
	Canada	USA
<b>A</b>	XX" (XXX mm)	XX" (XXX mm)
<b>B</b>	XX" (XXX mm)	XX" (XXX mm)
<b>C</b>	XX" (XXX mm)	XX" (XXX mm)

	DÉGAGEMENTS DE L'APPAREIL AVEC UN TUYAU À PAROI DOUBLE	
	Canada	USA
<b>A</b>	XX" (XXX mm)	XX" (XXX mm)
<b>B</b>	XX" (XXX mm)	XX" (XXX mm)
<b>C</b>	XX" (XXX mm)	XX" (XXX mm)

Si les dégagements ci-dessus sont rencontrés, les distances mesurées à partir de la buse seront :

	DISTANCES <sup>13</sup> DE LA BUSE AVEC TUYAU À PAROI SIMPLE	
	Canada	USA
<b>D</b>	XX" (XXX mm)	XX" (XXX mm)
<b>E</b>	XX" (XXX mm)	XX" (XXX mm)
<b>F</b>	XX" (XXX mm)	XX" (XXX mm)

	DISTANCES <sup>13</sup> DE LA BUSE AVEC TUYAU À PAROI DOUBLE	
	Canada	USA
<b>D</b>	XX" (XXX mm)	XX" (XXX mm)
<b>E</b>	XX" (XXX mm)	XX" (XXX mm)
<b>F</b>	XX" (XXX mm)	XX" (XXX mm)

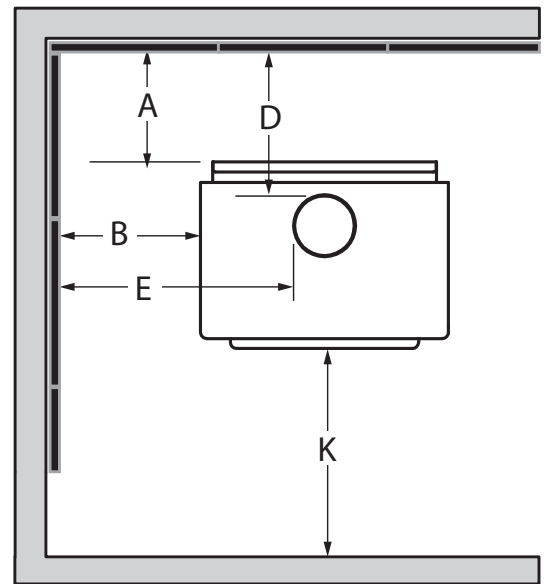
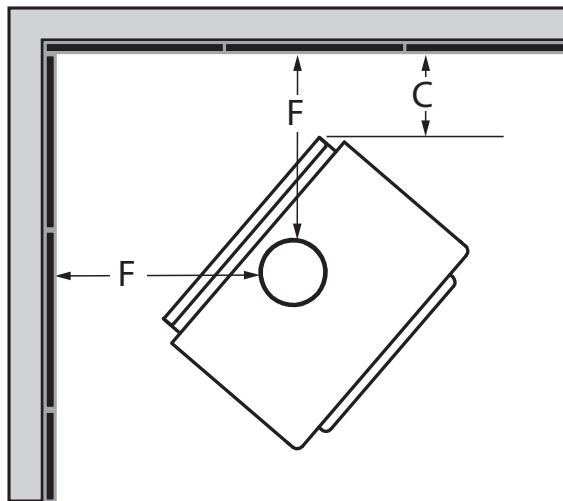
<sup>13</sup> Les distances de tuyau listées dans ce tableau se réfèrent aux distances obtenues lorsque le poêle est installé en accord avec les dégagements de l'appareil mentionnés ci-dessus.

### 3.1.1 Avec écran mural AC02710<sup>14</sup>

Pour réduire les dégagements d'un appareil utilisant un tuyau à paroi simple, l'utilisation d'un écran pare-chaaleur certifié avec le tuyau à paroi simple à 6" des matériaux combustibles doit être utilisé. Seulement dans ce cas, les mêmes dégagements qu'avec un tuyau double certifié peuvent être utilisés. Se référer au livret présent dans les options des écrans pour obtenir les dimensions à respecter.

	DÉGAGEMENTS DE L'APPAREIL AVEC UN TUYAU À PAROI DOUBLE	
	Canada	USA
<b>A</b>	XX" (XXX mm)	XX" (XXX mm)
<b>B</b>	XX" (XXX mm)	XX" (XXX mm)
<b>C</b>	XX" (XXX mm)	XX" (XXX mm)

	DISTANCES <sup>13</sup> DE LA BUSE AVEC TUYAU À PAROI DOUBLE	
	Canada	USA
<b>D</b>	XX" (XXX mm)	XX" (XXX mm)
<b>E</b>	XX" (XXX mm)	XX" (XXX mm)
<b>F</b>	XX" (XXX mm)	XX" (XXX mm)



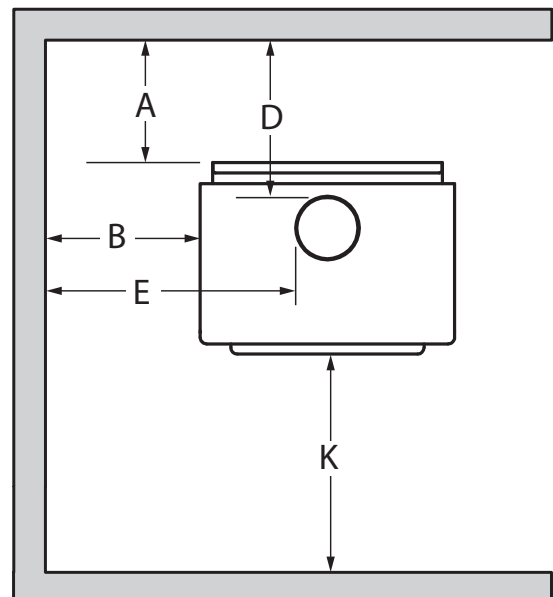
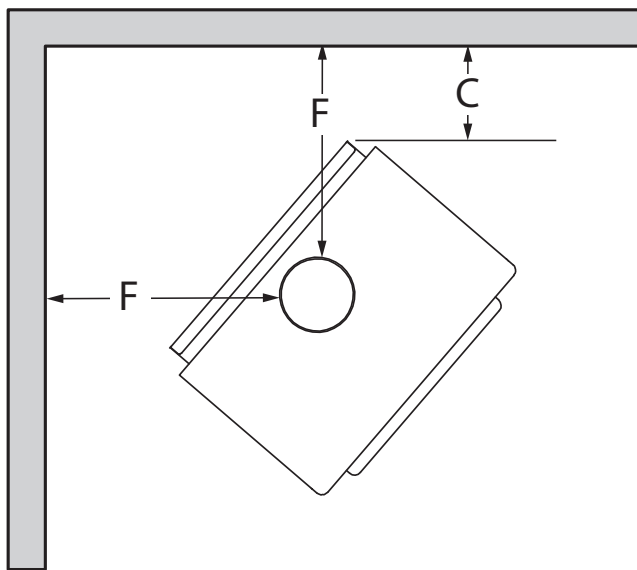
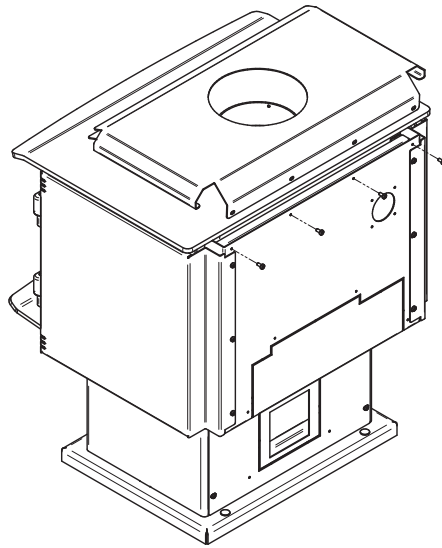
<sup>14</sup> Pour réduire les dégagements d'un appareil utilisant un tuyau à paroi simple, l'utilisation d'un écran pare-chaaleur certifié avec le tuyau à paroi simple, à 6" des matériaux combustibles, doit être utilisé. Seulement dans ce cas, les mêmes dégagements qu'avec un tuyau double certifié peuvent être utilisés.

### 3.1.2 Avec échangeur<sup>14</sup>

	DÉGAGEMENTS DE L'APPAREIL AVEC UN TUYAU À PAROI DOUBLE	
	Canada	USA
<b>A</b>	XX" (XXX mm)	XX" (XXX mm)
<b>B</b>	XX" (XXX mm)	XX" (XXX mm)
<b>C</b>	XX" (XXX mm)	XX" (XXX mm)

	DISTANCES <sup>13</sup> DE LA BUSE AVEC TUYAU À PAROI DOUBLE	
	Canada	USA
<b>D</b>	XX" (XXX mm)	XX" (XXX mm)
<b>E</b>	XX" (XXX mm)	XX" (XXX mm)
<b>F</b>	XX" (XXX mm)	XX" (XXX mm)

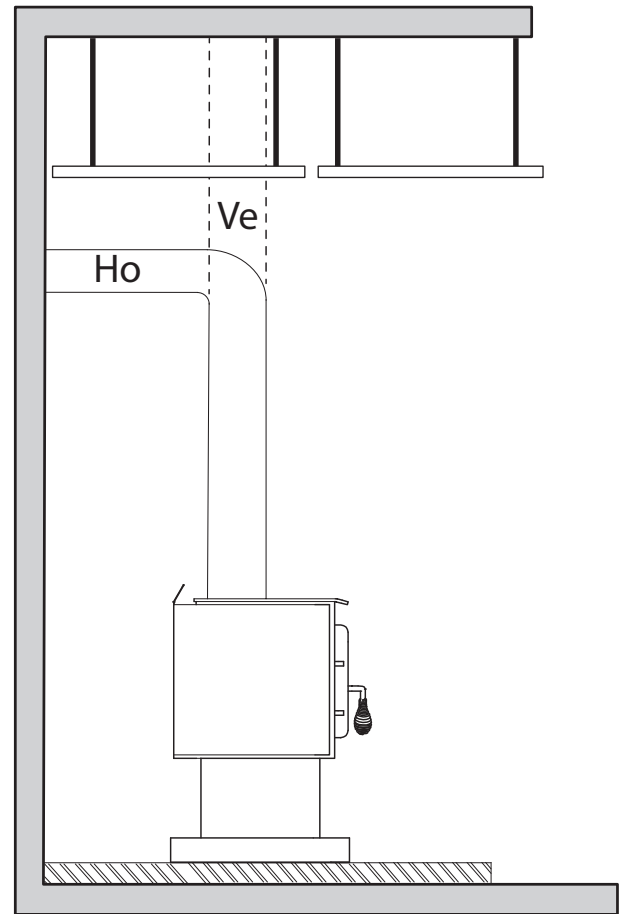
Il est possible d'installer un tuyau à paroi simple. Pour les dégagements, se référer aux dimensions du 3.1.



### 3.1.3 Avec le plafond abaissé

	DÉGAGEMENTS DE L'APPAREIL AVEC UN TUYAU À PAROI SIMPLE	
	Canada	USA
<b>A</b>	XX" (XXX mm)	XX" (XXX mm)
<b>B</b>	XX" (XXX mm)	XX" (XXX mm)
<b>C</b>	XX" (XXX mm)	XX" (XXX mm)
<b>L</b>	XX" (XXXX mm)	XX" (XXXX mm)

	DÉGAGEMENTS DE L'APPAREIL AVEC UN TUYAU À PAROI DOUBLE	
	Canada	USA
<b>A</b>	XX" (XXX mm)	XX" (XXX mm)
<b>B</b>	XX" (XXX mm)	XX" (XXX mm)
<b>C</b>	XX" (XXX mm)	XX" (XXX mm)
<b>L</b>	XX" (XXXX mm)	XX" (XXXX mm)



Si les dégagements ci-dessus sont rencontrés, alors les distances mesurées à partir de la buse seront :

	DISTANCES <sup>15</sup> DE LA BUSE AVEC TUYAU À PAROI SIMPLE	
	Canada	USA
<b>D</b>	XX" (XXX mm)	XX" (XXX mm)
<b>E</b>	XX" (XXX mm)	XX" (XXX mm)
<b>F</b>	XX" (XXX mm)	XX" (XXX mm)

	DISTANCES <sup>15</sup> DE LA BUSE AVEC TUYAU À PAROI DOUBLE	
	Canada	USA
<b>D</b>	XX" (XXX mm)	XX" (XXX mm)
<b>E</b>	XX" (XXX mm)	XX" (XXX mm)
<b>F</b>	XX" (XXX mm)	XX" (XXX mm)

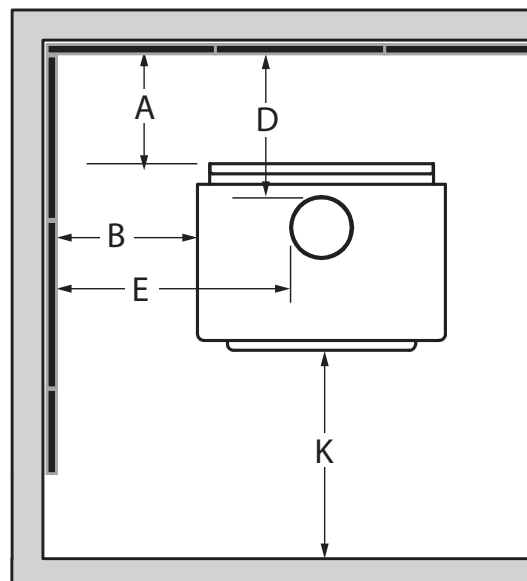
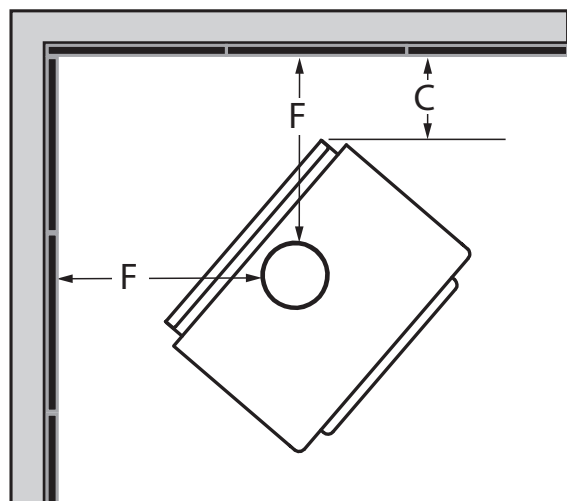
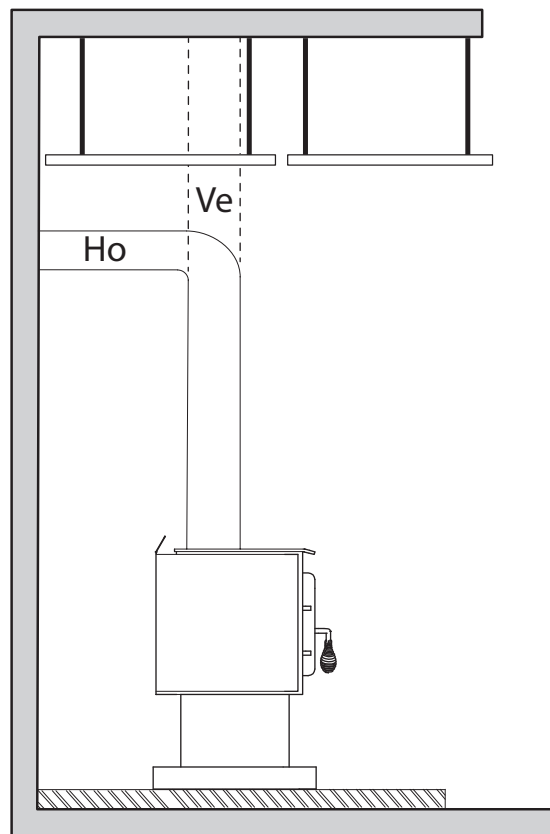
<sup>15</sup> Les distances de tuyau listées dans ce tableau se réfèrent aux distances obtenues lorsque le poêle est installé en accord avec les dégagements de l'appareil mentionnés ci-dessus.

### 3.1.4 Avec écran mural AC02710 et le plafond abaissé

Pour réduire les dégagements d'un appareil utilisant un tuyau à paroi simple, l'utilisation d'un écran pare-chaaleur certifié avec le tuyau à paroi simple à 6" des matériaux combustibles doit être utilisé. Seulement dans ce cas, les mêmes dégagements qu'avec un tuyau double certifié peuvent être utilisés. Se référer au livret présent dans les options des écrans pour obtenir les dimensions à respecter.

	DÉGAGEMENTS DE L'APPAREIL AVEC UN TUYAU À PAROI SIMPLE	
	Canada	USA
<b>A</b>	XX" (XXX mm)	XX" (XXX mm)
<b>B</b>	XX" (XXX mm)	XX" (XXX mm)
<b>C</b>	XX" (XXX mm)	XX" (XXX mm)
<b>L</b>	XX" (XXXX mm)	XX" (XXXX mm)

	DISTANCES <sup>15</sup> DE LA BUSE AVEC TUYAU À PAROI DOUBLE	
	Canada	USA
<b>D</b>	XX" (XXX mm)	XX" (XXX mm)
<b>E</b>	XX" (XXX mm)	XX" (XXX mm)
<b>F</b>	XX" (XXX mm)	XX" (XXX mm)



FRANÇAIS

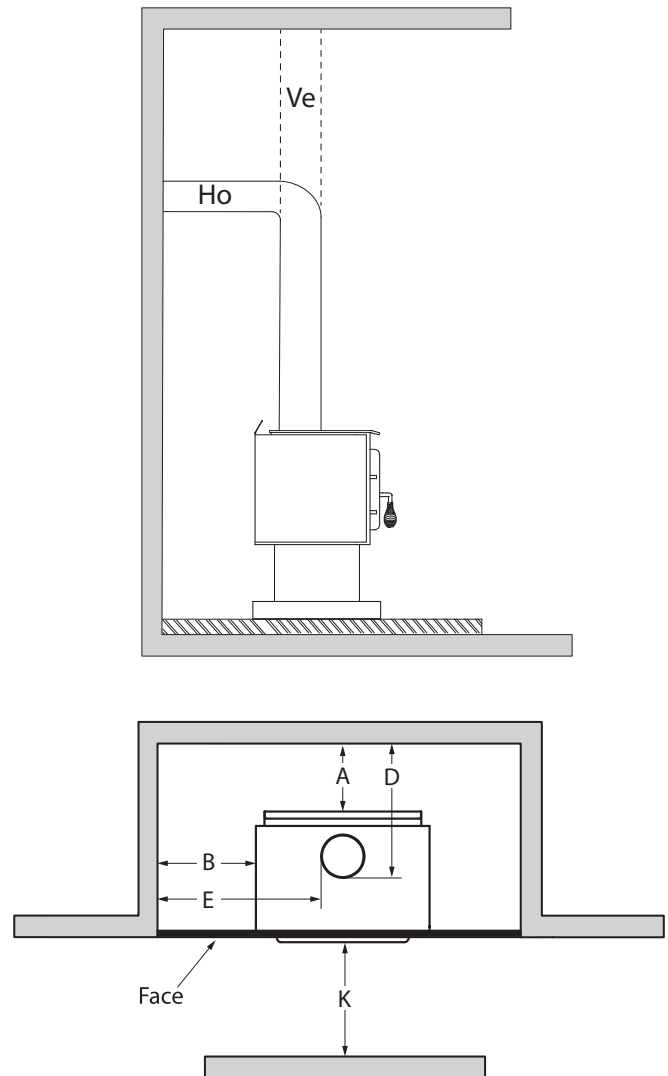


### 3.1.5 Dans une alcôve

Voir section 3.1 pour installation tuyau simple.

	DÉGAGEMENTS DE L'APPAREIL AVEC UN TUYAU À PAROI DOUBLE	
	Canada	USA
<b>A</b>	XX" (XXX mm)	XX" (XXX mm)
<b>B</b>	XX" (XXX mm)	XX" (XXX mm)
<b>K</b>	XX" (XXX mm)	XX" (XXX mm)
<b>L</b>	XX" (XXXX mm)	XX" (XXXX mm)

	DISTANCES <sup>16</sup> DE LA BUSE AVEC TUYAU À PAROI DOUBLE	
	Canada	USA
<b>D</b>	XX" (XXX mm)	XX" (XXX mm)
<b>E</b>	XX" (XXX mm)	XX" (XXX mm)



### 3.1.6 Maison mobile

Il est strictement **interdit** d'installer un appareil avec un **tuyau à simple paroi** dans une **maison mobile**.

	DÉGAGEMENTS DE L'APPAREIL AVEC UN TUYAU À PAROI DOUBLE	
	Canada	USA
<b>A</b>	XX" (XXX mm)	XX" (XXX mm)
<b>B</b>	XX" (XXX mm)	XX" (XXX mm)
<b>C</b>	XX" (XXX mm)	XX" (XXX mm)

	DISTANCES <sup>16</sup> DE LA BUSE AVEC TUYAU À PAROI DOUBLE	
	Canada	USA
<b>D</b>	XX" (XXX mm)	XX" (XXX mm)
<b>E</b>	XX" (XXX mm)	XX" (XXX mm)
<b>F</b>	XX" (XXX mm)	XX" (XXX mm)

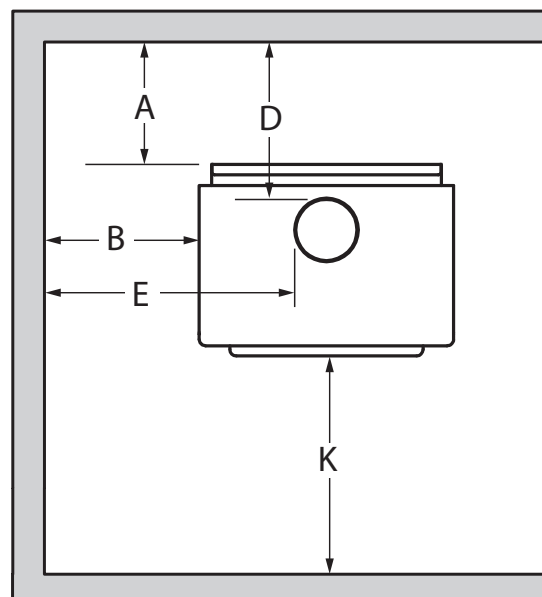
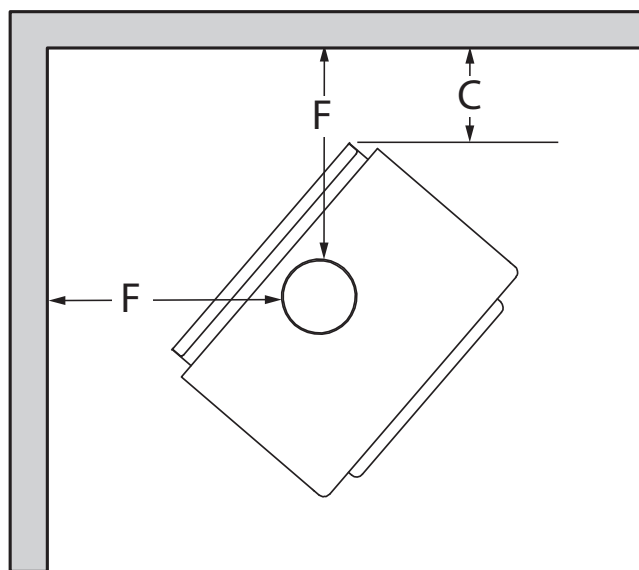
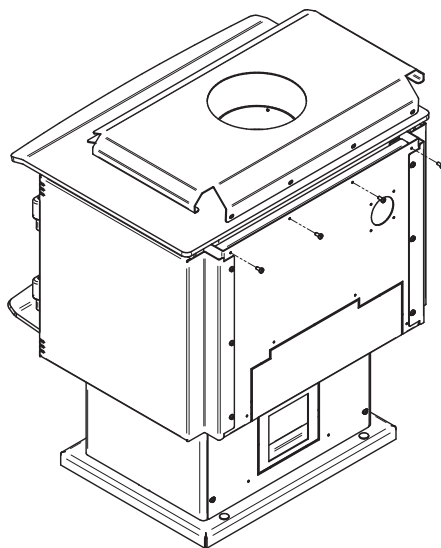
<sup>16</sup> Les distances de tuyau listées dans ce tableau se réfèrent aux distances obtenues lorsque le poêle est installé en accord avec les dégagements de l'appareil mentionnés ci-dessus.

### 3.1.7 Maison mobile avec échangeur de chaleur supérieur

Il est strictement **interdit** d'installer un appareil avec un **tuyau à simple paroi** dans une **maison mobile**.

	DÉGAGEMENTS DE L'APPAREIL AVEC UN TUYAU À PAROI DOUBLE	
	Canada	USA
<b>A</b>	XX" (XXX mm)	XX" (XXX mm)
<b>B</b>	XX" (XXX mm)	XX" (XXX mm)
<b>C</b>	XX" (XXX mm)	XX" (XXX mm)

	DISTANCES <sup>16</sup> DE LA BUSE AVEC TUYAU À PAROI DOUBLE	
	Canada	USA
<b>D</b>	XX" (XXX mm)	XX" (XXX mm)
<b>E</b>	XX" (XXX mm)	XX" (XXX mm)
<b>F</b>	XX" (XXX mm)	XX" (XXX mm)

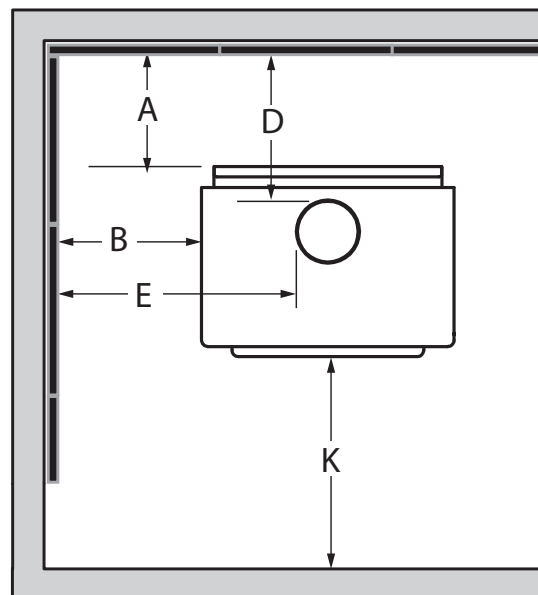
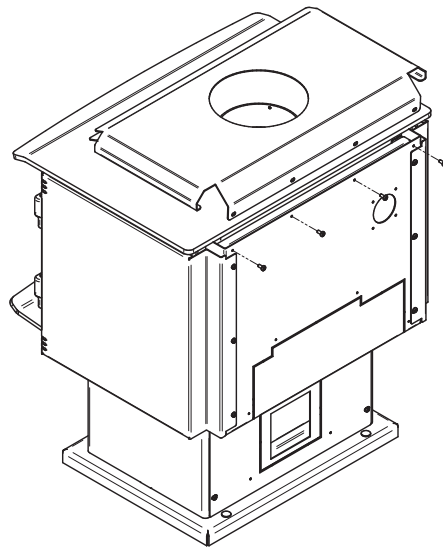


### 3.1.8 Maison mobile avec écran mural AC02710

Il est strictement **interdit** d'installer un appareil avec un **tuyau à simple paroi** dans une **maison mobile**.

	DÉGAGEMENTS DE L'APPAREIL AVEC UN TUYAU À PAROI DOUBLE	
	Canada	USA
<b>A</b>	XX" (XXX mm)	XX" (XXX mm)
<b>B</b>	XX" (XXX mm)	XX" (XXX mm)
<b>C</b>	XX" (XXX mm)	XX" (XXX mm)

	DISTANCES <sup>17</sup> DE LA BUSE AVEC TUYAU À PAROI DOUBLE	
	Canada	USA
<b>D</b>	XX" (XXX mm)	XX" (XXX mm)
<b>E</b>	XX" (XXX mm)	XX" (XXX mm)
<b>F</b>	XX" (XXX mm)	XX" (XXX mm)



<sup>17</sup> Les distances de tuyau listées dans ce tableau se réfèrent aux distances obtenues lorsque le poêle est installé en accord avec les dégagements de l'appareil mentionnés ci-dessus.

## 4. Protection du plancher

Cet appareil est conçu pour empêcher le plancher de surchauffer. Il faut toutefois le placer sur une surface ininflammable pour protéger le plancher des tisons chauds qui pourraient tomber lors du chargement.

La céramique doit être placée sur un panneau incombustible continu afin d'éviter que des tisons puissent être mis en contact avec le plancher à travers des fissures ou des manques dans le coulis de la céramique. Consulter le code local pour les alternatives approuvées. Aucune protection n'est requise si l'appareil est installé sur une surface incombustible (ex : plancher de béton).

	PROTECTION DE PLANCHER	
	Canada	USA
<b>G<sup>18</sup></b>	X" (XXX mm)	N/A
<b>H</b>	X" (203 mm)	N/A
<b>I</b>	XX" (XXX mm) à partir de l'ouverture de porte	XX" (XXX mm) à partir de l'ouverture de porte
<b>J</b>	N/A	X" (XXX mm)
<b>N<sup>19</sup></b>	N/A	voir note 19

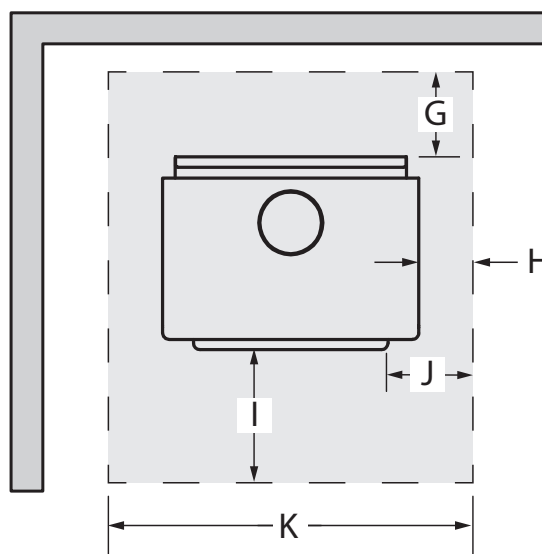
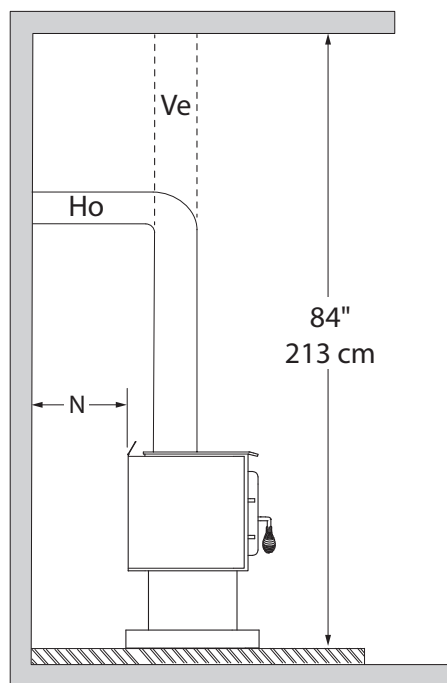
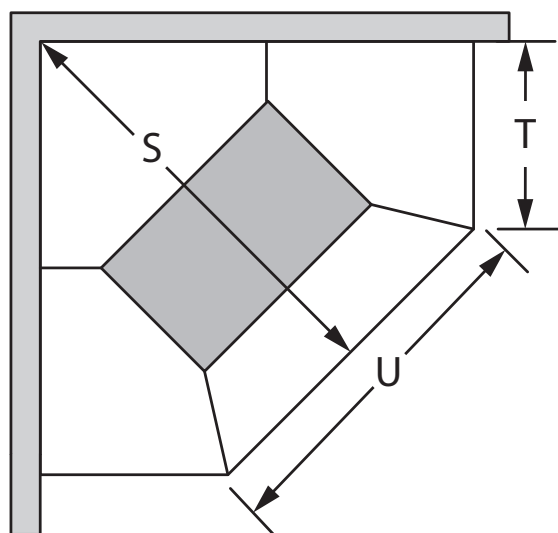


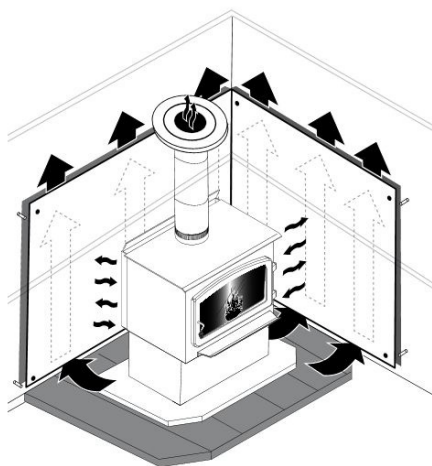
Figure 10: Protection de plancher



<sup>18</sup> La protection de plancher se limite au dégagement arrière (G) si ce dernier est inférieur à 8 pouces (203 mm).

<sup>19</sup> Seulement requis sous la section horizontale (Ho) du connecteur. Doit excéder d'au moins 2" (51 mm) de chaque côté du connecteur.

## 5. Réduction sécuritaire des dégagements



Il est souvent désiré d'occuper le moins d'espace possible lors de l'installation d'un poêle à bois. Pour ce faire, il est possible de réduire les dégagements de façon sécuritaire et rapprocher l'appareil plus près des murs en installant, de façon permanente, un écran entre le poêle et le matériau inflammable. Les règles s'appliquant aux écrans de sécurité sont parfois compliquées. Lire et appliquer les instructions soigneusement. Certaines régions peuvent avoir une réglementation différente de celle-ci. 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.

### 5.1 Règles de construction de l'écran

- Les colles utilisées dans la construction des écrans ne doivent ni s'enflammer, ni perdre leurs propriétés adhésives aux températures qui seront atteintes.
- La quincaillerie d'assemblage doit permettre une ventilation verticale complète.
- La quincaillerie d'assemblage qui pénètre dans le matériau combustible à partir de la surface de l'écran ne peut être utilisée que sur les rebords de l'écran.

A) Dégagement minimum entre le dessus de l'appareil et le plafond sans protection : XX" (XXXX mm)

B) Dépassement de l'écran plus haut que l'appareil : XX" (XXX mm)

C) Espace minimum derrière l'écran : 1" (25 mm).  
Au Canada 7/8" (21 mm)

D) Dégagement au bas de l'écran : minimum 1" (25 mm) et maximum 3" (75 mm)

E) Dégagement minimum du haut de l'écran au plafond : 3" (75 mm)

F) La quincaillerie d'assemblage ne doit pas être placée à moins de 8" (200 mm) de l'axe central de l'appareil.

G) Dégagement des rebords de l'écran aux murs de côtés et arrière pour écrans de plafond : 3" (75 mm)

H) Dépassement de l'écran au-delà des côtés de l'appareil : 18" (450 mm)

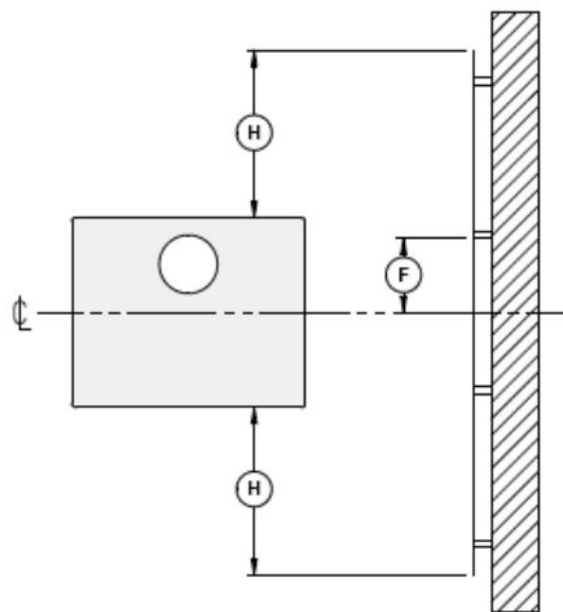


Figure 11: Dégagements pour l'écran de chaleur

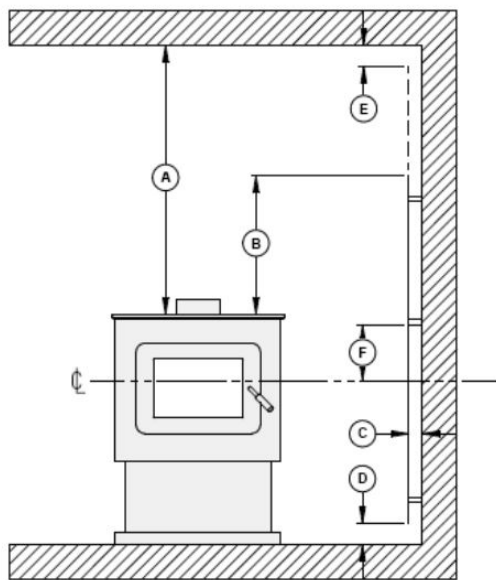


Figure 12: Dégagements pour l'écran de chaleur

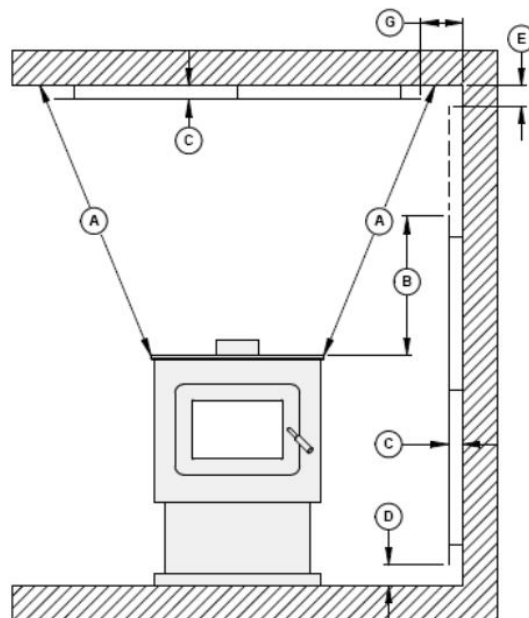


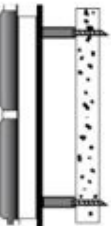
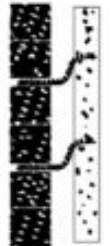



Figure 13: Dégagements pour l'écran de chaleur

TYPE D'ÉCRAN	POURCENTAGES DE RÉDUCTION DES DÉGAGEMENTS PERMIS				
	CÔTÉS ET ARRIÈRE		DESSUS (PLAFOND)		
	CAN /É-U (%)	É-U MIN.	CAN /É-U (%)	É-U MIN.	
Tôle, épaisseur 24ga au minimum (0,61 mm), espacé du mur d'au moins 1 po (25 mm)* par des cales ininflammables.	67	12" (305 mm)	50	18" (457 mm)	
Tuiles de céramique ou d'un matériau ininflammable équivalent placées sur un panneau ininflammable espacé du mur d'au moins 1 po (25 mm)* par des cales ininflammables.	50	18" (457 mm)	33	24" (610 mm)	
Tuiles de céramique ou d'un matériau ininflammable équivalent placé sur un panneau ininflammable recouvert d'une tôle d'au moins 24ga d'épaisseur (0,61 mm) espacé du mur d'au moins 1 po (25 mm)* par des cales ininflammables.	67	12" (305 mm)	50	24" (610 mm)	
Brique, espacée du mur d'au moins 1 po (25 mm)* par des cales ininflammables.	50	18" (457 mm)	N/A	N/A	
Brique, devant une tôle d'une épaisseur d'au moins 24ga (0,61 mm), espacée du mur d'au moins 1 po (25 mm)* par des cales ininflammables.	67	12" (305 mm)	N/A	N/A	

\* Au Canada, cet espace peut être de 7/8" (21 mm)

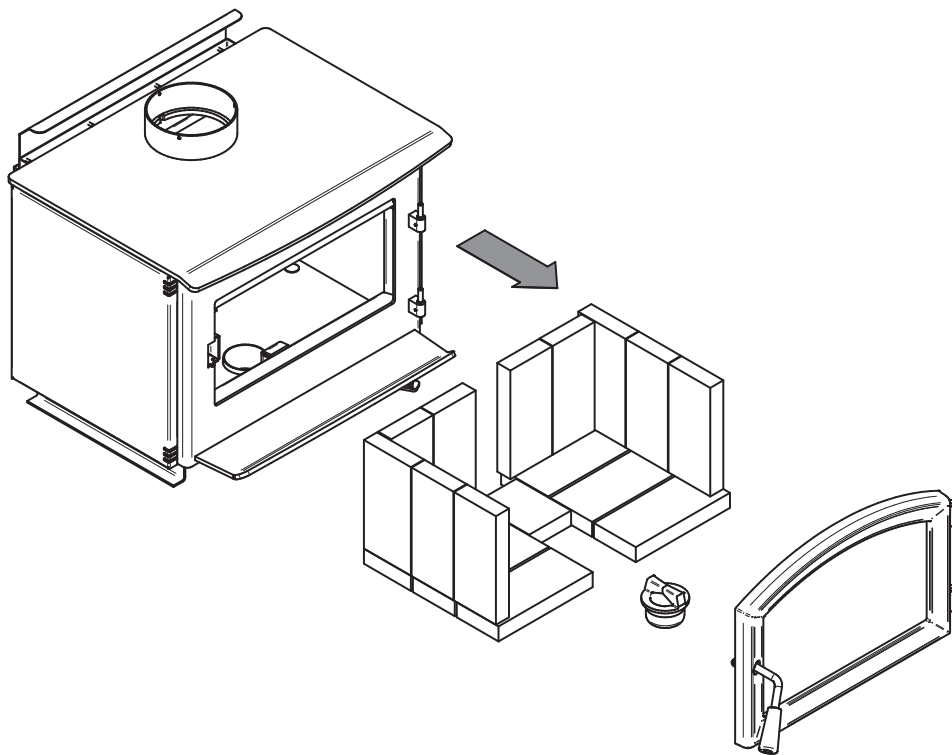
## 6. INSTALLATION DES OPTIONS SUR VOTRE PRODUIT



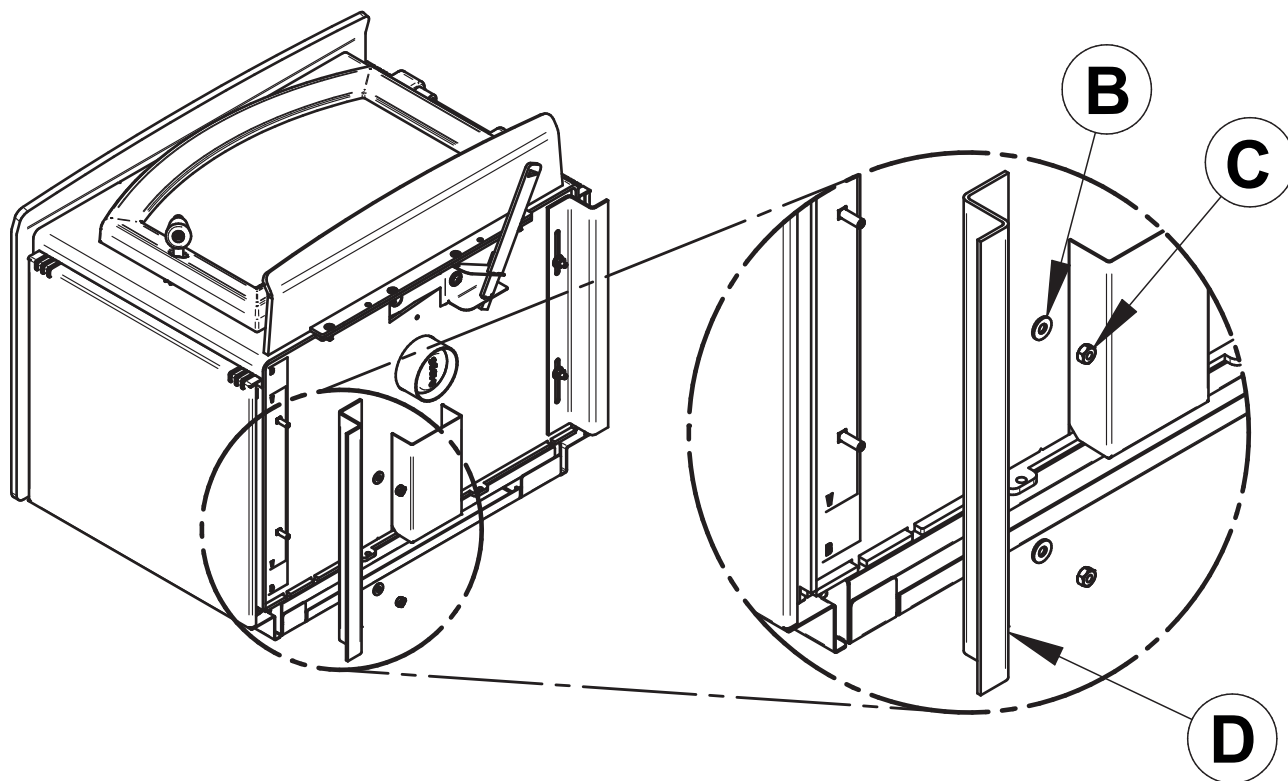
## 6.1 Installation des pattes (Si présent sur votre produit)

LES IMAGES PRÉSENTÉES SONT SEULEMENT À TITRE INDICATIF ET PEUVENT ÊTRE DIFFÉRENTES DE VOTRE PRODUIT, MAIS L'ASSEMBLAGE RESTE IDENTIQUE.

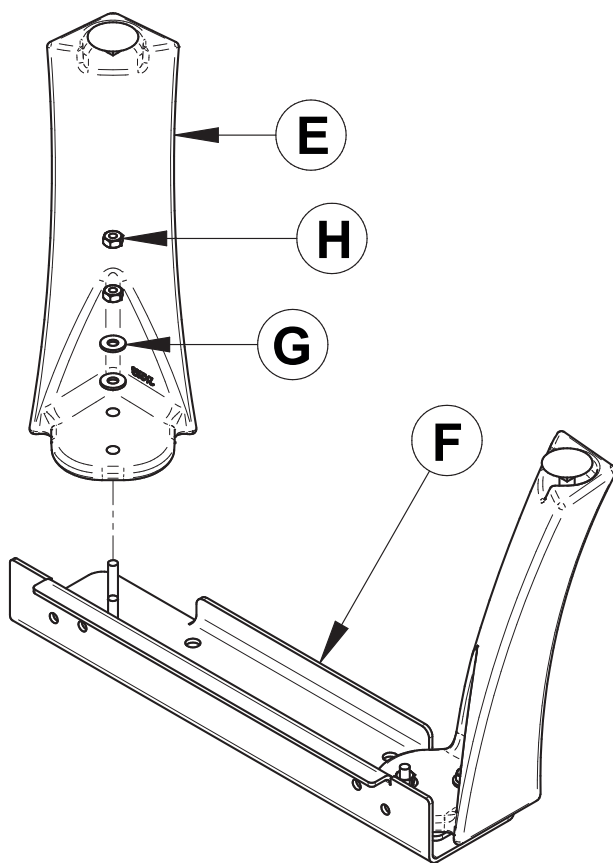
1. Retirer la porte, les briques réfractaires et le bouchon à cendres du poêle.



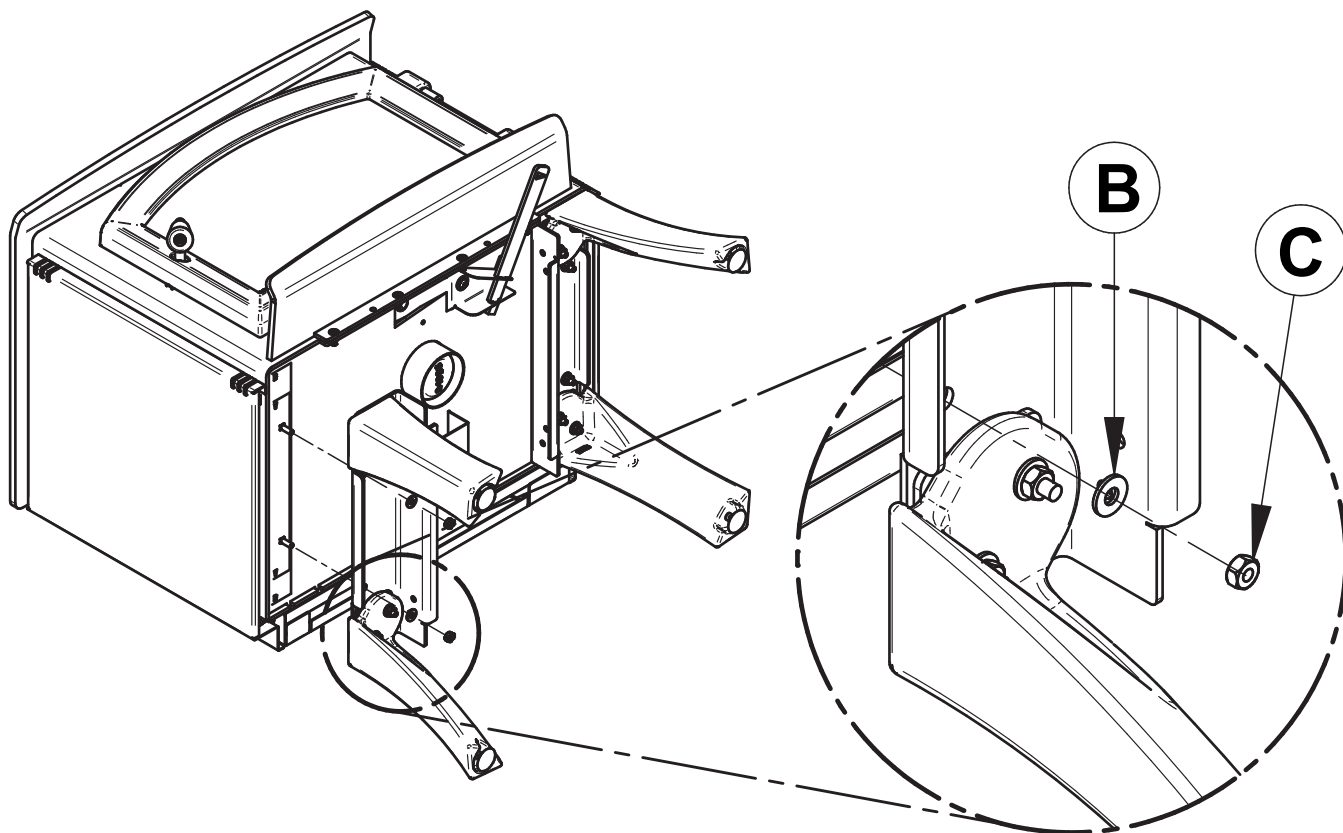
2. Déposer le poêle sur le dos. Retirer et jeter les deux supports de transport **(D)**. Conserver les écrous **(C)** et les rondelles **(B)** pour l'étape 4.



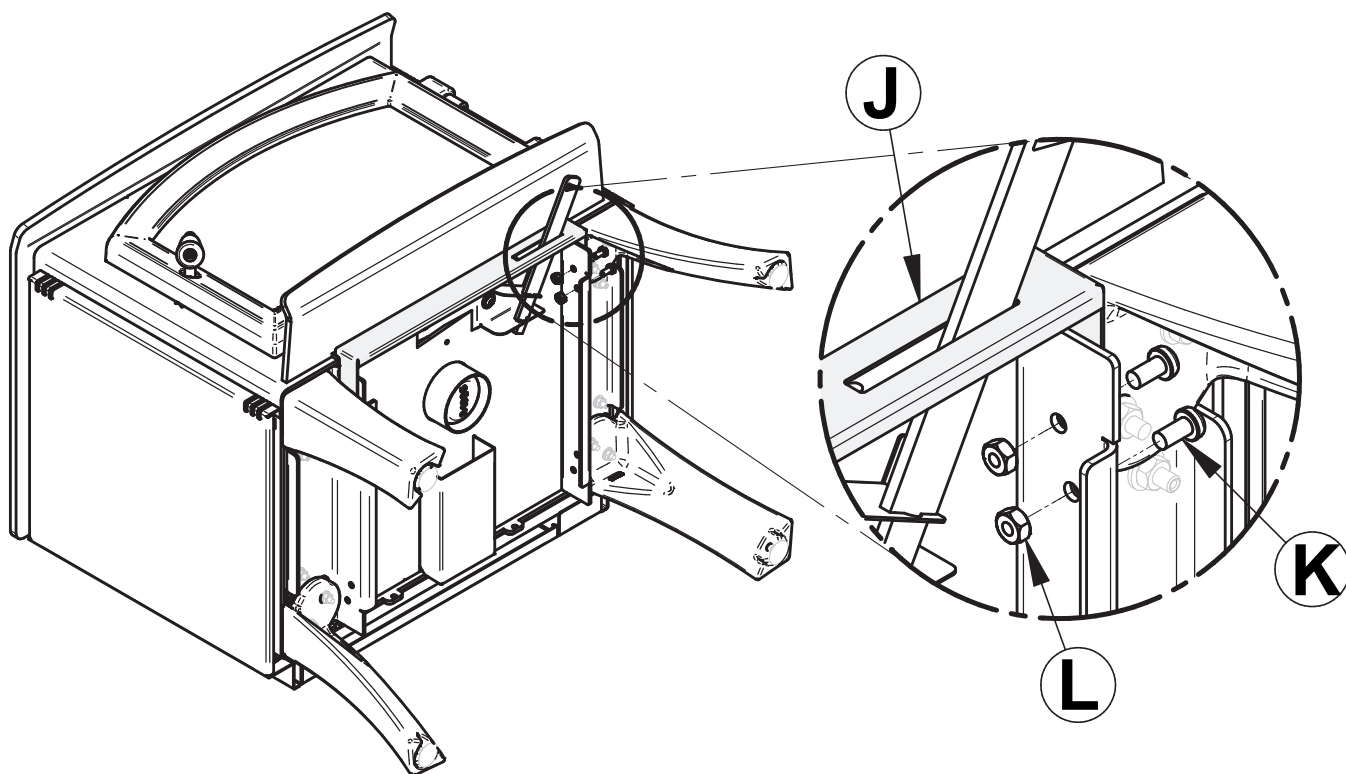
3. Installer les pattes **(E)** sur les supports de pattes **(F)**. Installer la rondelle **(G)** et visser l'écrou **(H)**.



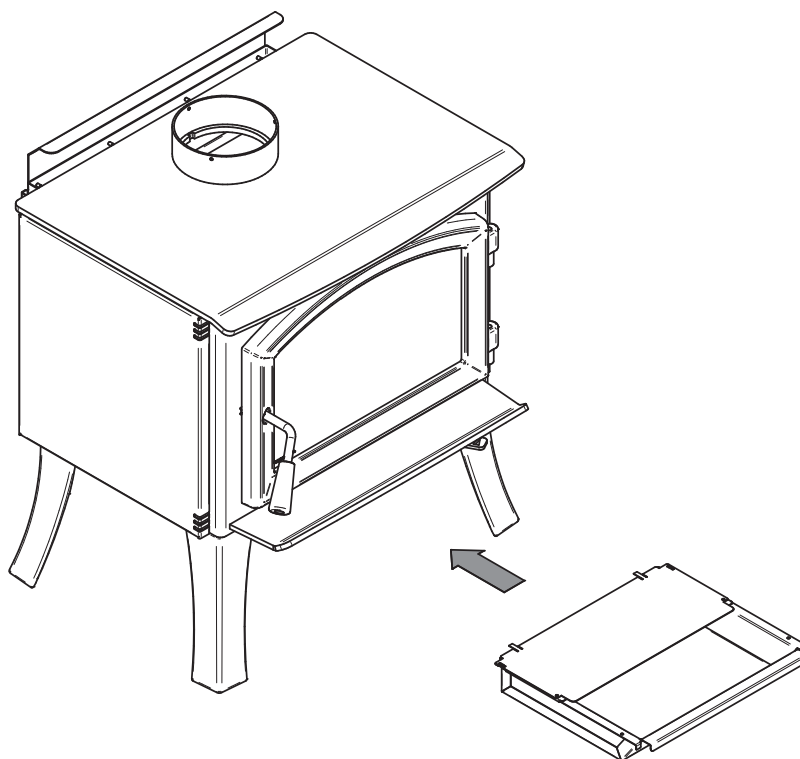
4. Installer les supports de pattes sur le poêle avec la rondelle **(B)** et visser l'écrou **(C)** provenant de l'étape 2.



5. Installer le couvercle du contrôle d'air (J) avec les vis (K) et les écrous (L). Cette étape peut ne pas être requise pour votre produit



6. Mettre le poêle sur ses pattes et installer le tiroir à cendres. Remettre les briques réfractaires, le bouchon à cendre ainsi que la porte sur le poêle. (Voir étape 1)

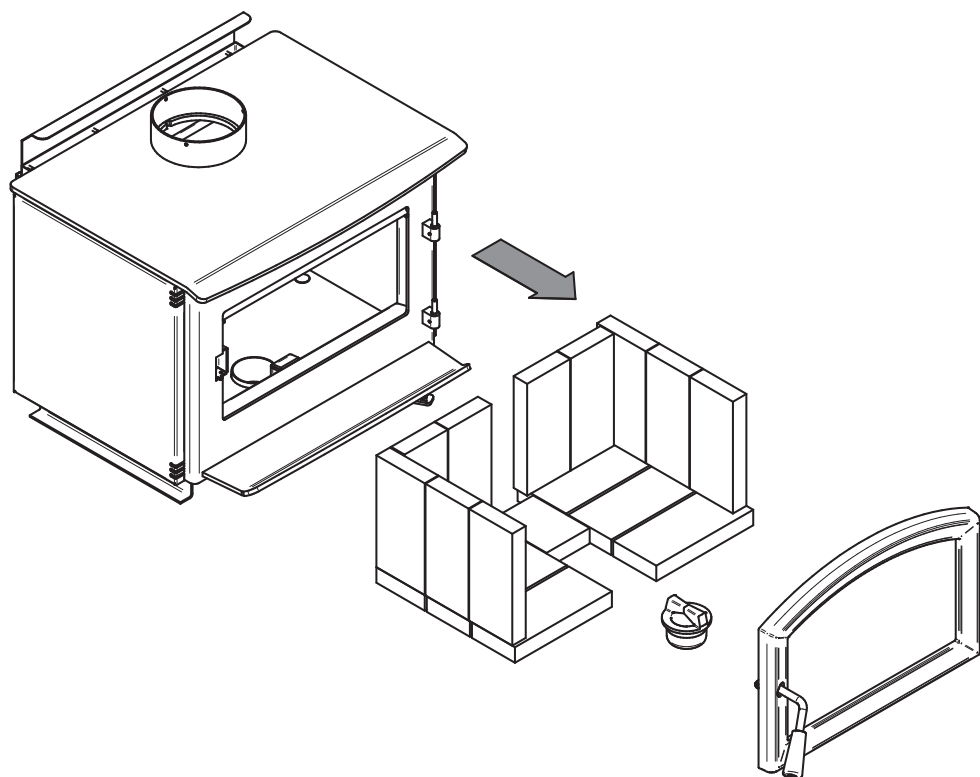


*Le coupe-feu, le bouchon à cendres si présent sur votre produit et les briques doivent être remis au bon endroit après le positionnement final de l'appareil.*

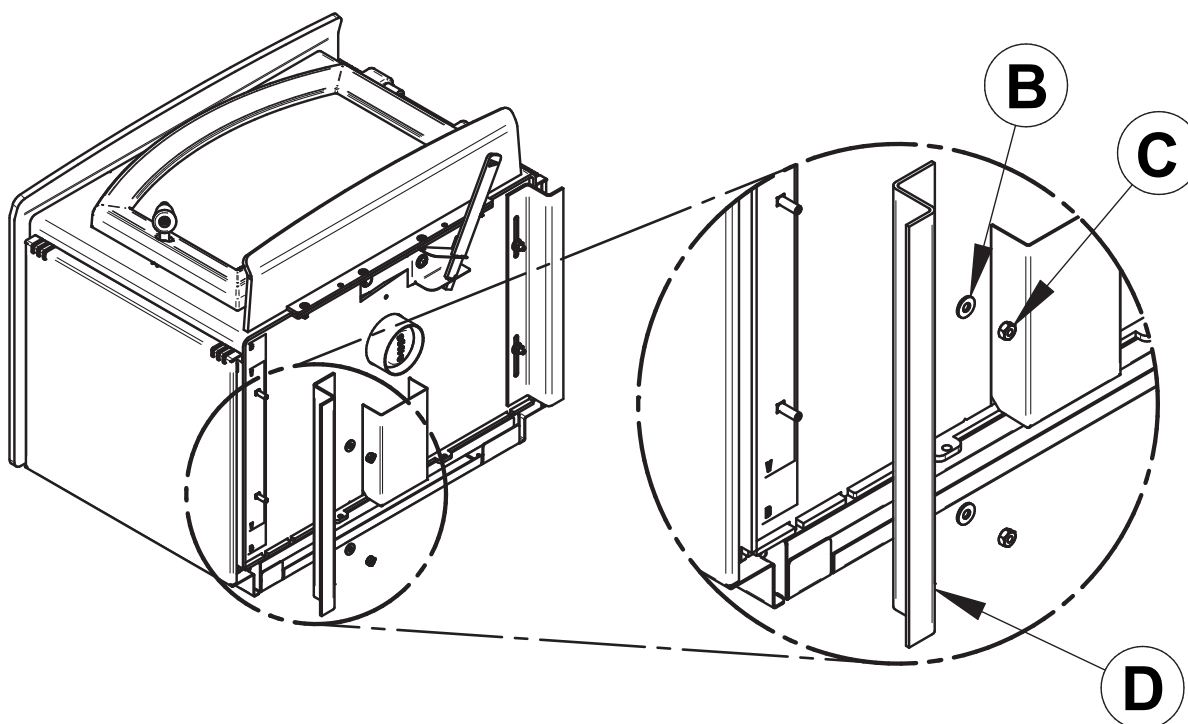
## 6.2 Installation du piédestal

LES IMAGES PRÉSENTÉES SONT SEULEMENT À TITRE INDICATIF ET PEUVENT ÊTRE DIFFÉRENTES DE VOTRE PRODUIT, MAIS L'ASSEMBLAGE RESTE IDENTIQUE.

1. Retirer la porte, les briques réfractaires et le bouchon à cendres<sup>20</sup> du poêle.

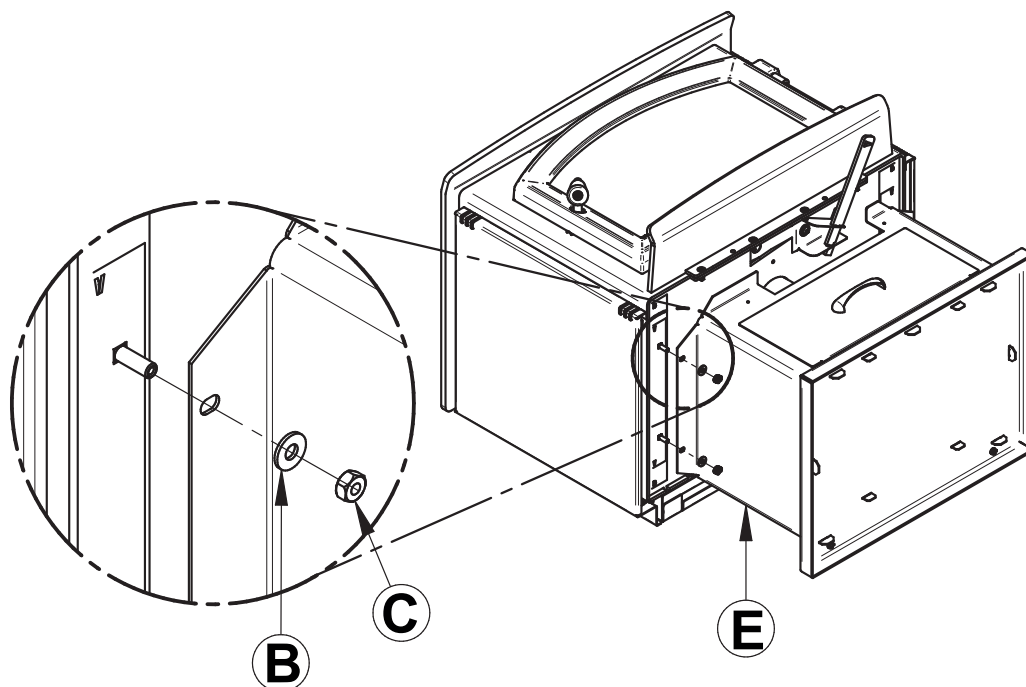


2. Déposer le poêle sur le dos. Retirer et jeter les deux supports **(D)**. Conserver les écrous **(C)** et les rondelles **(B)** pour l'étape 3.

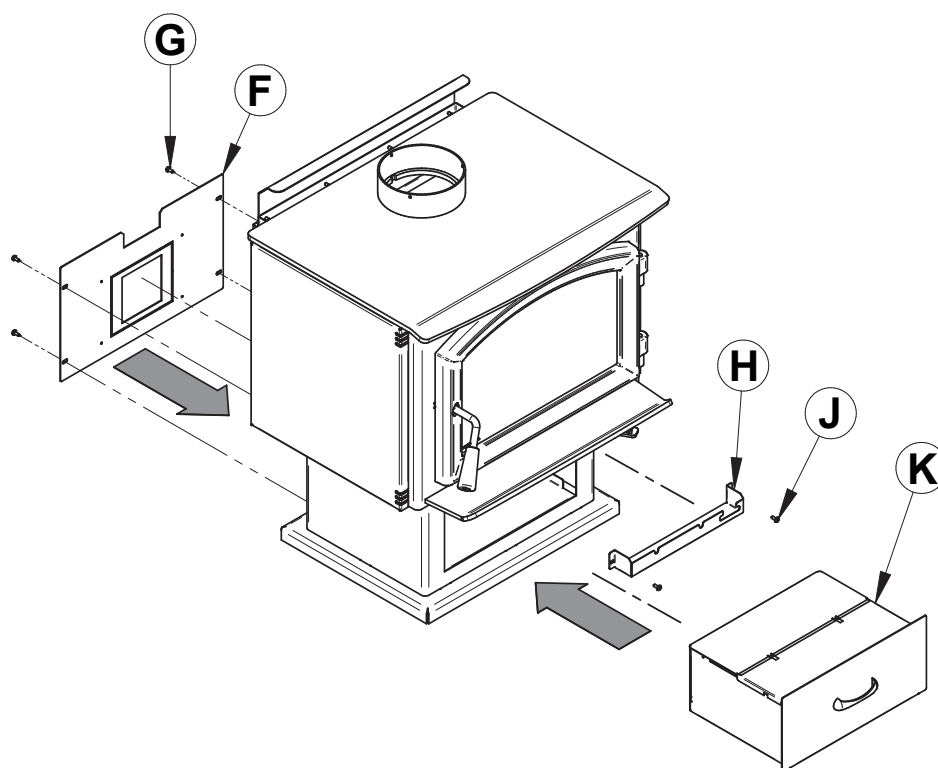


<sup>20</sup> Si présent sur votre produit

3. Installer le piedestal **(E)** sur le poêle et le fixer en place avec les rondelles **(B)** et écrous **(C)** de l'étape précédente.



4. Mettre le poêle sur son piédestal et installer le panneau d'entrée d'air frais **(F)** avec les vis **(G)**, le couvercle de contrôle d'air **(H)** avec les vis **(J)** et insérer le tiroir à cendres **(K)**. Remettre les briques réfractaires, le bouchon à cendres<sup>21</sup> ainsi que la porte sur le poêle. Voir l'étape 1.



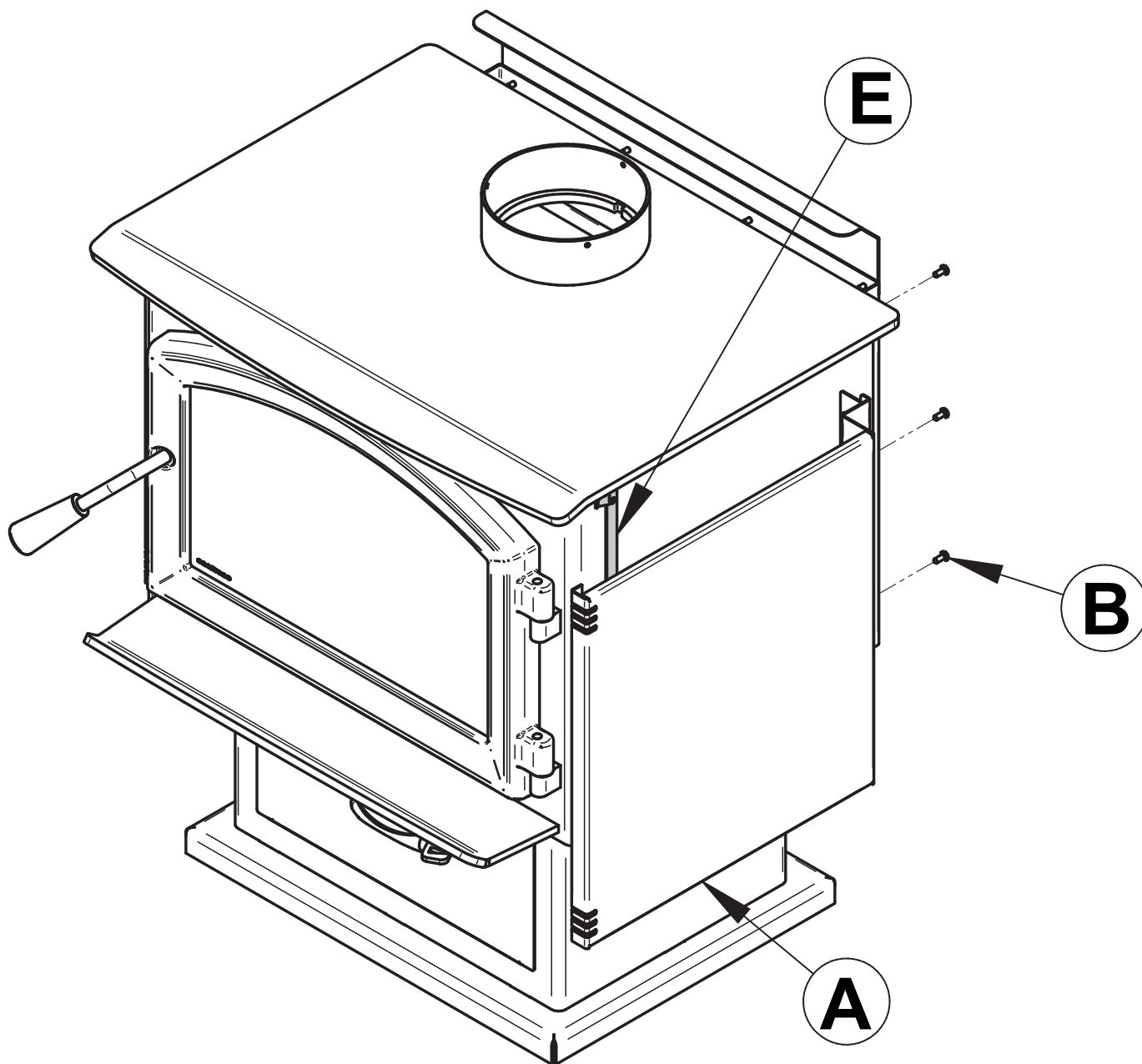
*Le coupe-feu<sup>21</sup> et les briques doivent être remis au bon endroit après le positionnement final de l'appareil*

<sup>21</sup> Si présent sur votre produit

### 6.3 Panneaux décoratifs

LES IMAGES PRÉSENTÉES SONT SEULEMENT À TITRE INDICATIF ET PEUVENT ÊTRE DIFFÉRENTES DE VOTRE PRODUIT, MAIS L'ASSEMBLAGE RESTE IDENTIQUE.

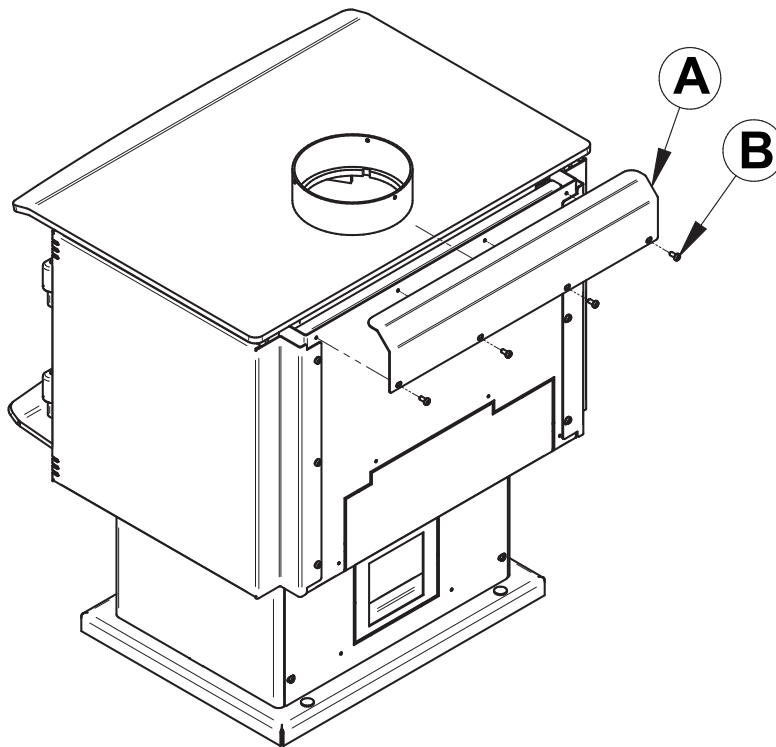
Pour retirer le panneau décoratif **(A)**, retirer les vis **(B)** et pousser sur le panneau vers l'avant pour le décrocher du support **(E)**.



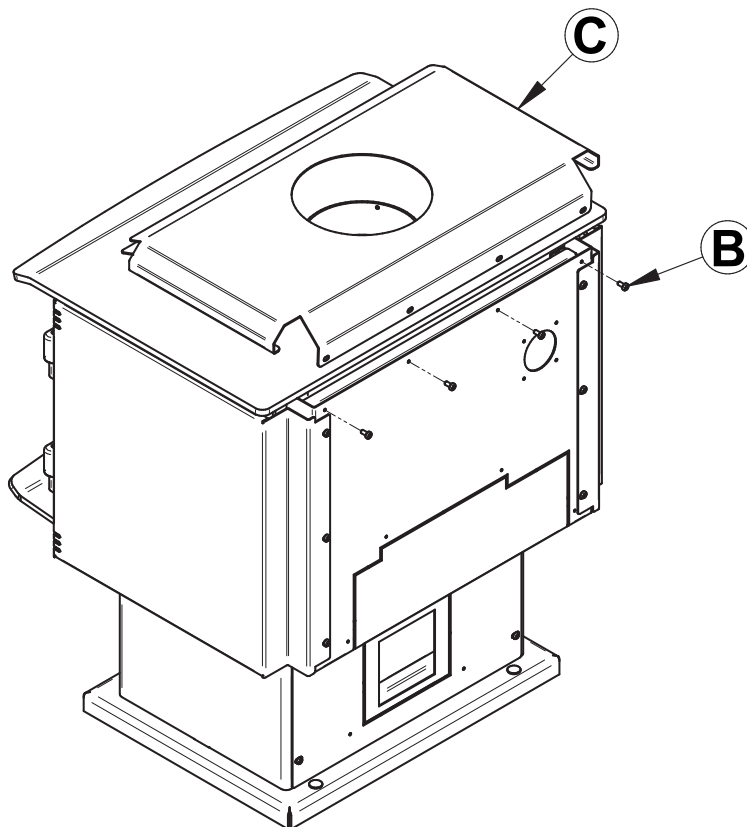
## 6.4 Installation de l'échangeur de chaleur supérieur (optionnel)

LES IMAGES PRÉSENTÉES SONT SEULEMENT À TITRE INDICATIF ET PEUVENT ÊTRE DIFFÉRENTES DE VOTRE PRODUIT, MAIS L'ASSEMBLAGE RESTE IDENTIQUE.

1. Retirer le déflecteur **(A)** et conserver les vis **(B)**.



2. Installer l'échangeur de chaleur supérieur **(C)** avec les vis conservées à l'étape précédente **(B)**.

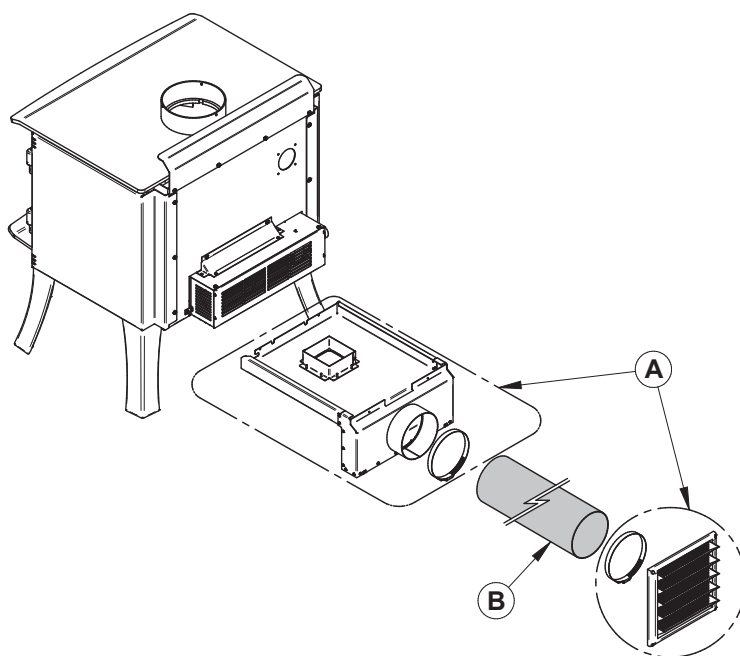


## 6.5 Installation d'un ensemble d'entrée d'air frais optionnel

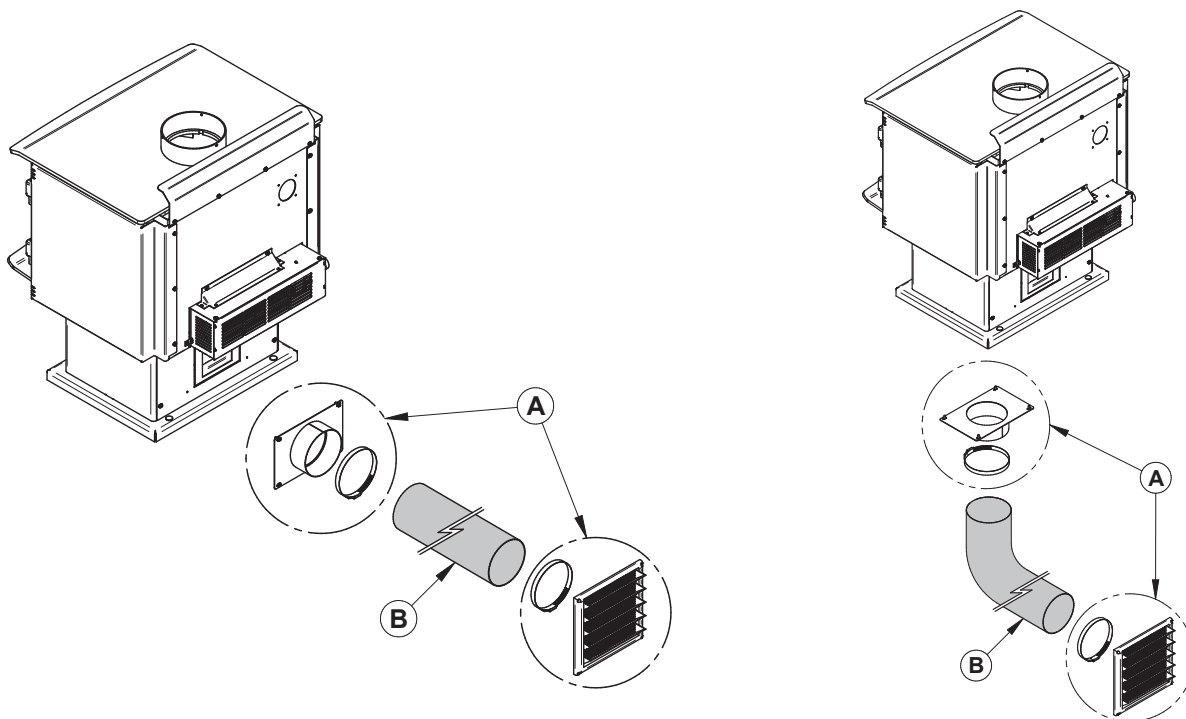
LES IMAGES PRÉSENTÉES SONT SEULEMENT À TITRE INDICATIF ET PEUVENT ÊTRE DIFFÉRENTES DE VOTRE PRODUIT, MAIS L'ASSEMBLAGE RESTE IDENTIQUE.

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.

### *Installation avec pattes*



### *Installation avec piédestal*



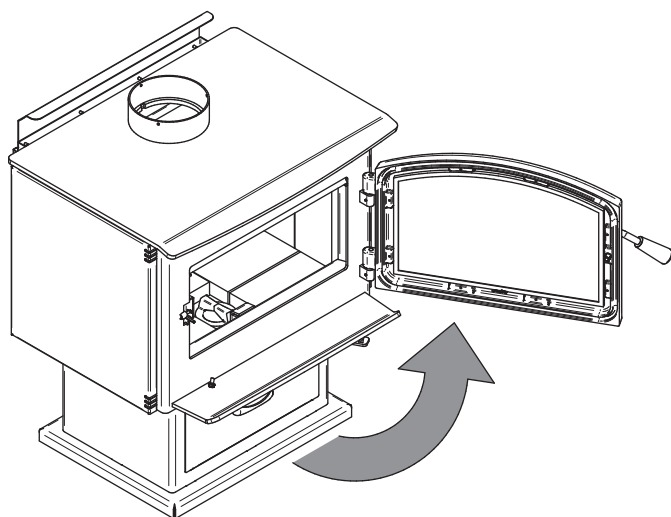


## 6.6 Installation du pare-étincelles optionnel

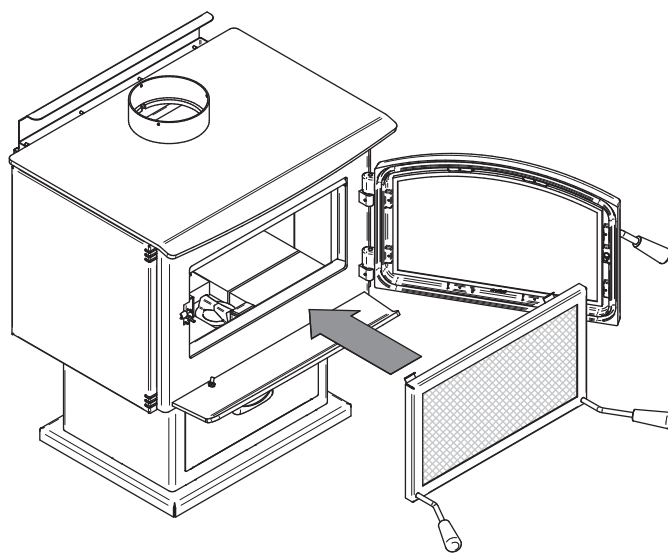
LES IMAGES PRÉSENTÉES SONT SEULEMENT À TITRE INDICATIF ET PEUVENT ÊTRE DIFFÉRENTES DE VOTRE PRODUIT, MAIS L'ASSEMBLAGE RESTE IDENTIQUE.

**Aux États-Unis ou dans les provinces régies par une limite d'émission de particules (ex. : US EPA), l'utilisation des poêles à bois porte ouverte avec un pare-étincelles est interdite.**

1. Ouvrir la porte.



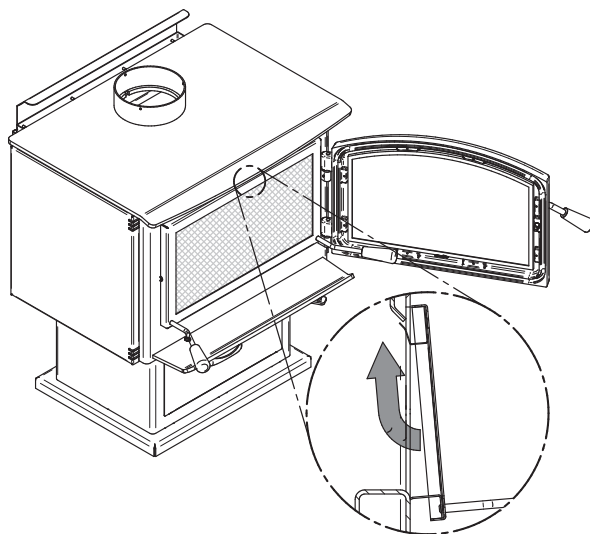
2. Tenir le pare-étincelles à l'aide des deux poignées et approchez-le de l'ouverture de porte.



3. Incliner la partie supérieure du pare-étincelles vers le haut de l'ouverture de porte. Ensuite insérer les deux crochets du haut du pare-étincelles derrière le déflecteur d'air primaire tel qu'illustré.

4. Soulever le pare-étincelles et pousser la partie inférieure vers le poêle puis laisser-le descendre jusqu'à ce que les crochets du bas soient derrière le rebord d'ouverture de porte inférieur.

**Attention: Ne jamais laisser l'appareil sans surveillance lorsque le pare-étincelles est utilisé.**

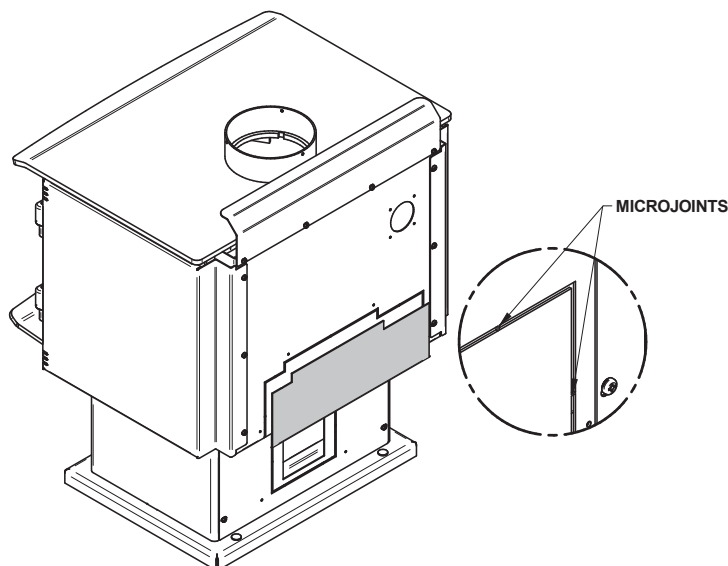


## 6.7 Installation du ventilateur et du thermodisque optionnels

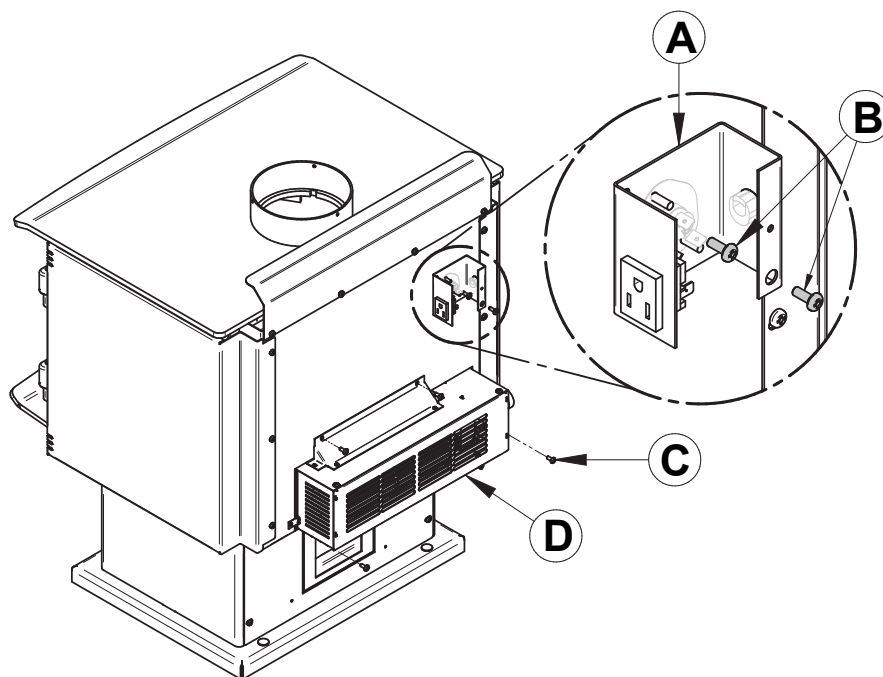
LES IMAGES PRÉSENTÉES SONT SEULEMENT À TITRE INDICATIF ET PEUVENT ÊTRE DIFFÉRENTES DE VOTRE PRODUIT, MAIS L'ASSEMBLAGE RESTE IDENTIQUE.

Un ventilateur ainsi qu'un thermodisque, vendus séparément, peuvent être installés sur le poêle. L'installation du ventilateur et du thermodisque est identique pour un poêle sur pattes ou sur piedestal. Le thermodisque permet au ventilateur de fonctionner seulement lorsque le poêle est suffisamment chaud. Voir les instructions fournies avec le thermodisque pour plus de détails.

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

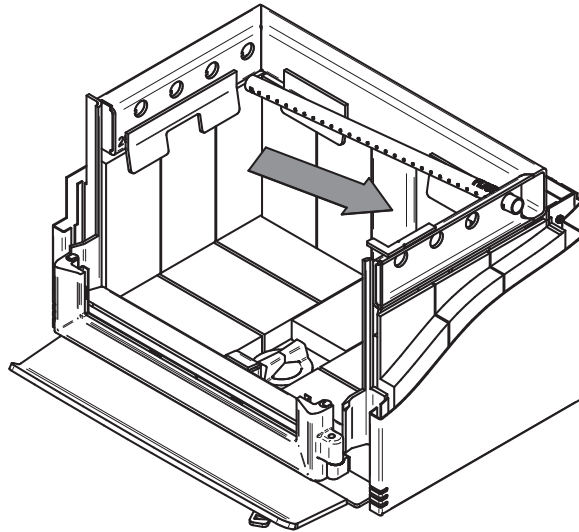


2. Visser le ventilateur **(D)** en place en utilisant les vis **(C)** incluses dans le manuel d'installation. Visser le thermodisque **(A)** avec les vis **(B)** fournies avec le thermodisque à l'arrière du poêle. **Le cordon électrique du ventilateur ne doit pas toucher à aucune surface du poêle de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

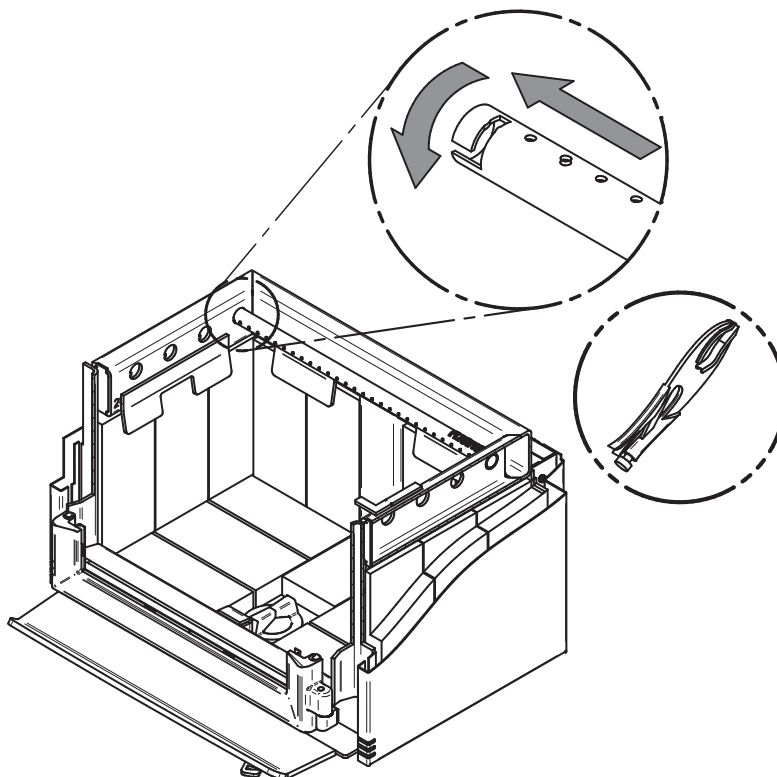


## 6.8 Installation des tubes d'air et du coupe-feu

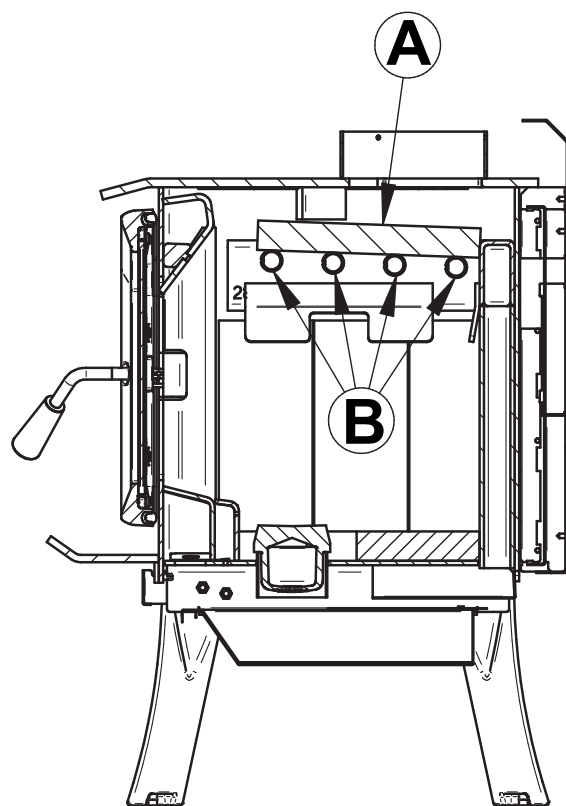
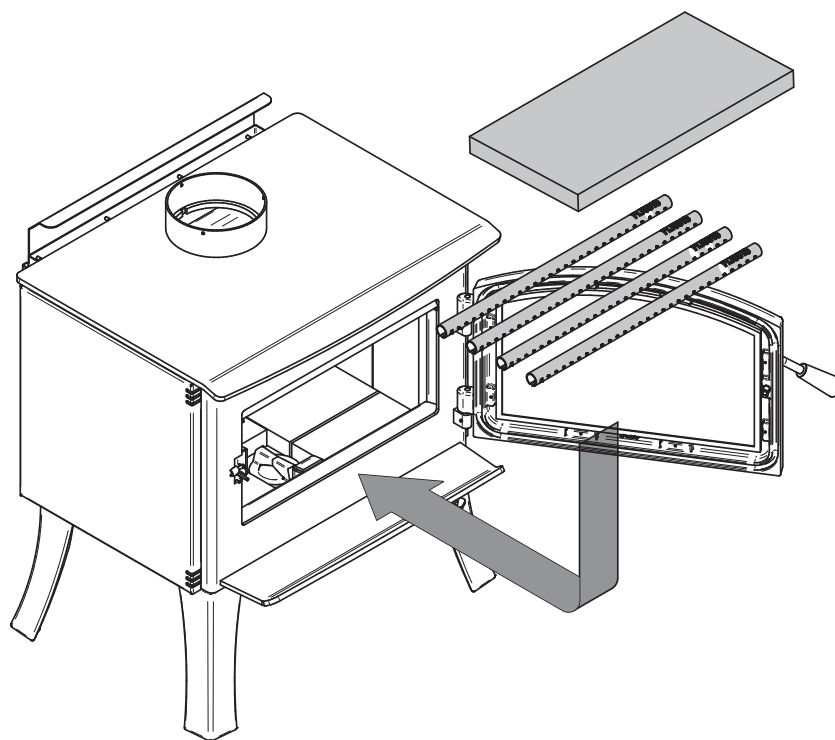
1. En commençant vers l'arrière, incliner et insérer le tube d'air secondaire arrière dans le trou du fond de la canalisation droite. Ensuite, lever et pousser le tube vers la gauche dans le trou correspondant de la canalisation de gauche.



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.



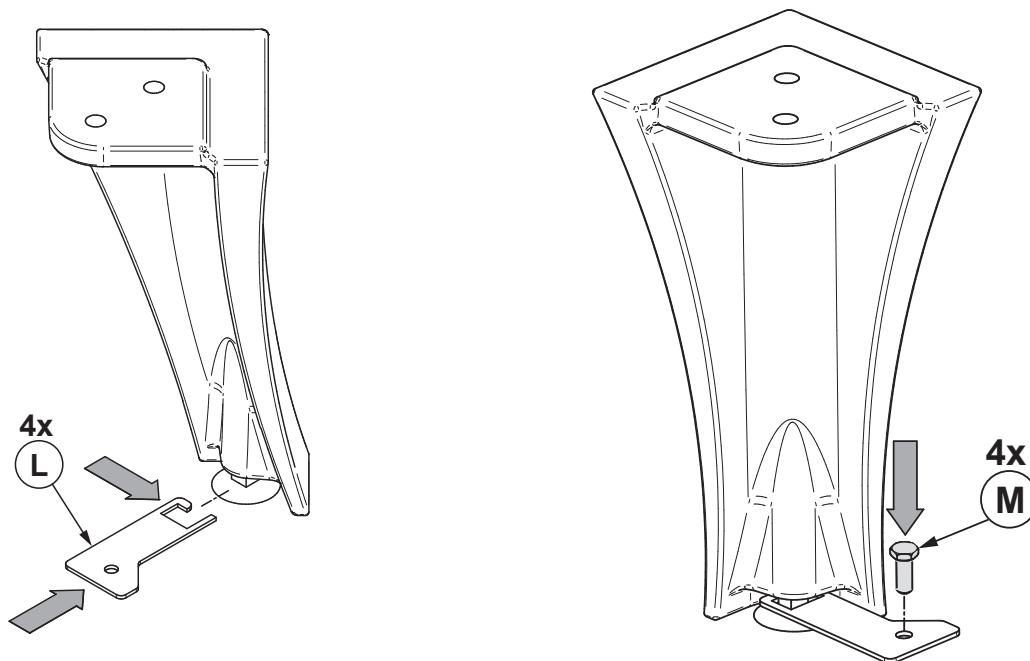
Prendre note que n'importe quel tube (B) peut être remplacé sans retirer le coupe-feu (A) et que les tubes sont tous identiques.



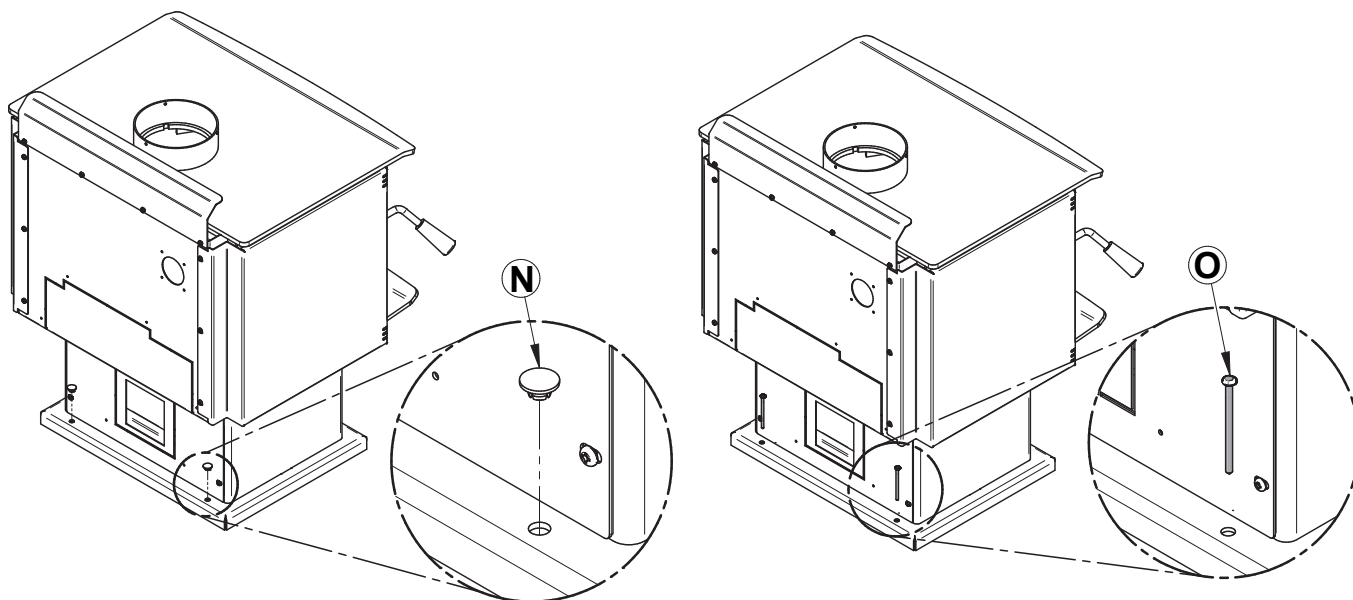
## 6.9 Installation dans une maison mobile

LES IMAGES PRÉSENTÉES SONT SEULEMENT À TITRE INDICATIF ET PEUVENT ÊTRE DIFFÉRENTES DE VOTRE PRODUIT, MAIS L'ASSEMBLAGE RESTE IDENTIQUE.

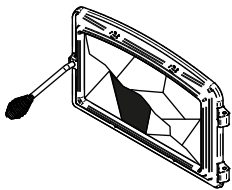
1. Pour un appareil sur pattes, installer la plaquette **(L)** sur les pattes et visser en place avec la quincaillerie appropriée **(M)**.



2. Pour un appareil sur base, retirer les bouchons **(N)** si requis et visser la base en place avec la quincaillerie appropriée **(O)**.



## 7. Entretien/Remplacement des pièces



**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.**

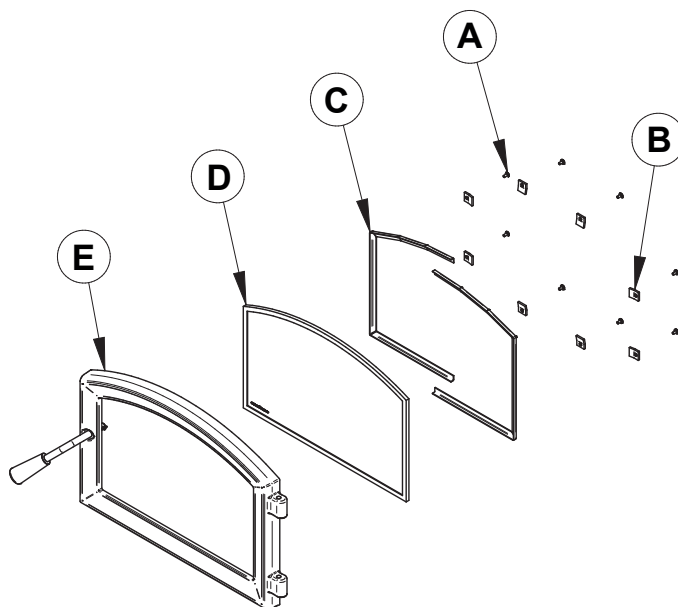
**Ne pas utiliser l'appareil si la vitre est craquée ou brisée.**

### 7.1 Remplacement de la vitre

La vitre utilisée est un verre céramique 5/32" (4 mm) d'épaisseur, 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):**

LES IMAGES PRÉSENTÉES SONT SEULEMENT À TITRE INDICATIF ET PEUVENT ÊTRE DIFFÉRENTES DE VOTRE PRODUIT, MAIS L'ASSEMBLAGE RESTE IDENTIQUE.

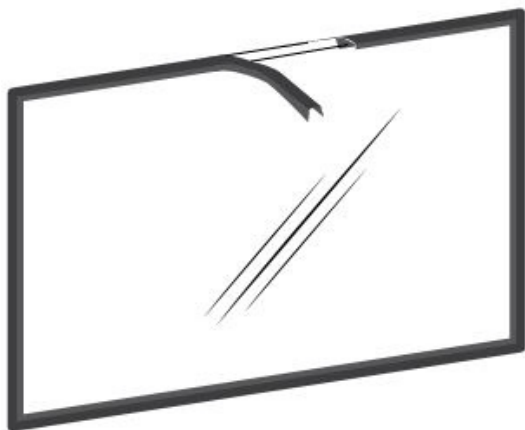


1. Soulever la porte pour la retirer de ses pentures et la déposer sur une surface douce et plane.
2. Retirer les huit vis **(A)**, les huit dispositifs de retenue de vitre **(B)**, ainsi que les cadres en métal **(C)** qui retiennent la vitre.
3. Retirer la vitre. Si elle est endommagée, installer une 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.*

## 7.2 Joint d'étanchéité de la vitre

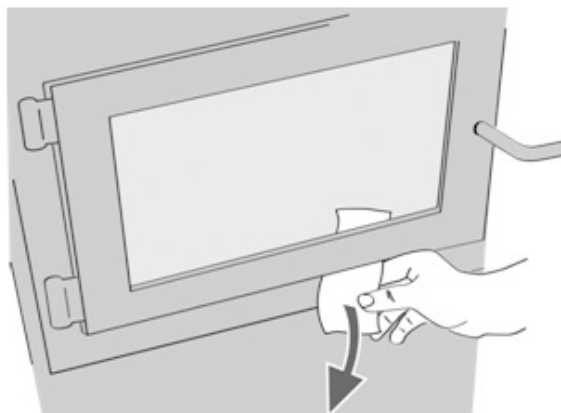
Le nouveau joint est plat, encollé et est fait de fibre de verre tressée.  
Le joint doit être centré sur la vitre.



1. Suivre les instructions précédentes pour retirer la vitre.
2. Retirer le vieux joint d'étanchéité et laver la vitre soigneusement.
3. Retirer une partie du papier qui recouvre l'adhésif et placer le joint sur une table, adhésif vers le haut.
4. 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.
5. Retirer une plus grande partie du papier et tourner la vitre. Le joint ne doit pas être étiré durant l'installation.
6. Couper le joint à la longueur nécessaire.
7. Pincer le joint sur la vitre en faisant chevaucher le rebord, sur tout le pourtour.

## 7.3 Étanchéité de la 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.



### 7.3.1 Ajustement

Afin que la combustion du poêle offre un rendement optimal, la porte doit être parfaitement étanche avec la chambre à combustion. Le joint d'étanchéité doit être inspecté périodiquement afin d'obtenir une bonne étanchéité.

L'étanchéité 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.

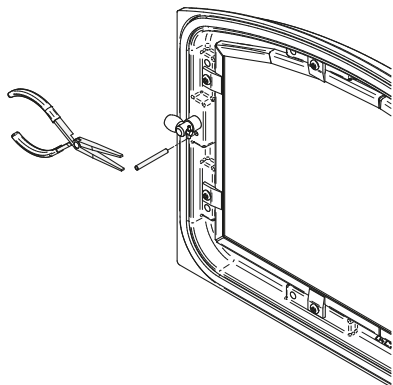


Figure 14: Retrait de la goupille de retenue

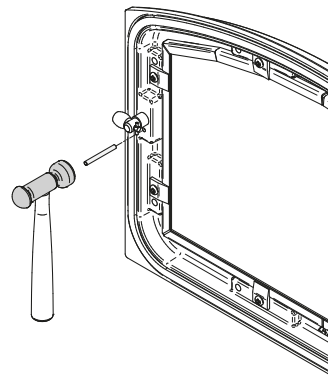
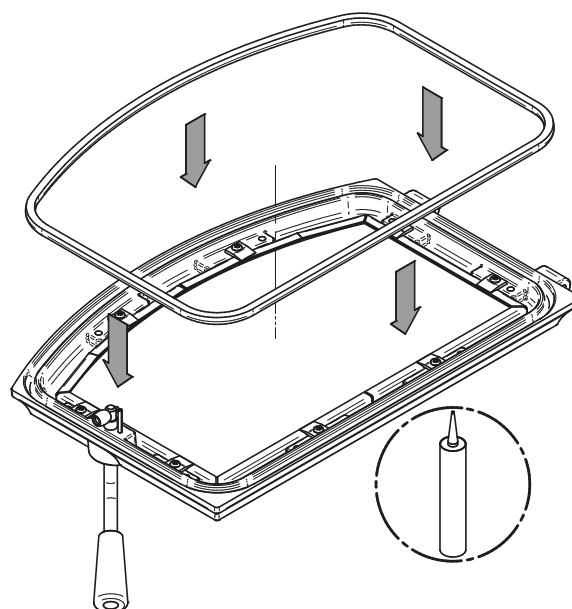


Figure 15: Installation de la goupille de retenue

### 7.3.2 Joint d'étanchéité

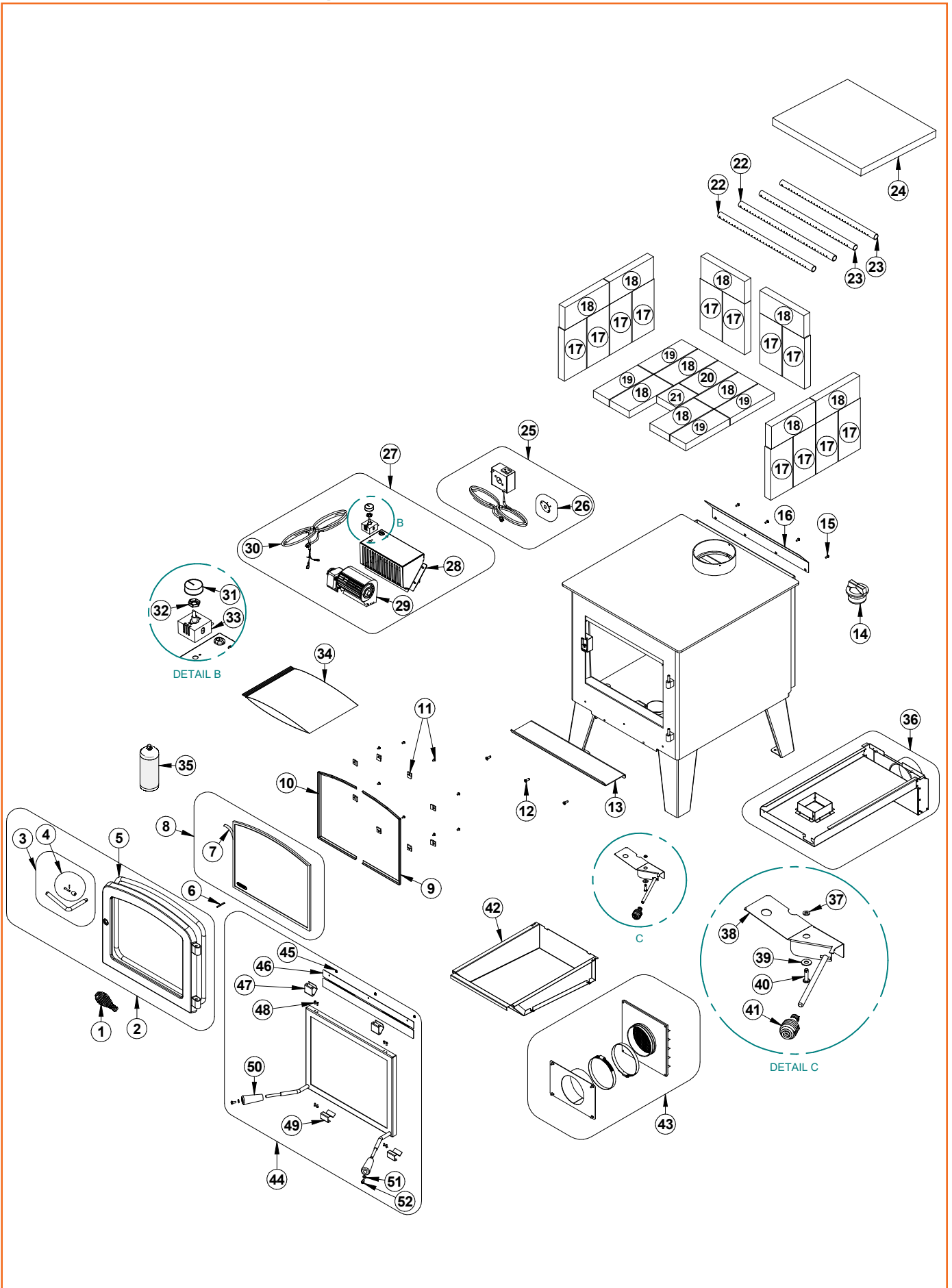
Il est important de remplacer le joint d'étanchéité avec un autre ayant le même diamètre et la même densité afin de conserver une bonne étanchéité.

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.





## 8. Vue éclatée et liste de pièces



IMPORTANT: IL S'AGIT D'INFORMATIONS ACTUALISÉES. Lors de la demande de service ou de pièces de remplacement pour votre poêle, s'il vous plaît fournir le numéro de modèle et le numéro de série. Nous nous réservons le droit de modifier les pièces en raison de mise à niveau technologique ou de disponibilité. Contacter un revendeur autorisé pour obtenir une de ces pièces. Ne jamais utiliser des matériaux de substitution. L'utilisation de pièces non approuvées peut entraîner de mauvaises performances et des risques pour votre sécurité.

#	Item	Description	Qty
1	AC07867	POIGNÉE SPIRALE 1/2" PLAQUÉE CHROME	1
2	SE24327	PORTE DROLET SÉRIE 3.3	1
3	SE70697	ENSEMBLE DE POIGNÉE DE REMPLACEMENT AVEC BARRURE	1
4	AC09185	ENSEMBLE DE BARRURE DE PORTE	1
5	AC06500	ENSEMBLE SILICONE ET CORDON NOIR 5/8" X 8' POUR CONTOUR DE PORTE	1
6	30101	GOUPILLE TENDEUSE À RESSORT 5/32"Ø X 1 1/2"L	1
7	AC06400	CORDON DE VITRE NOIR PRÉENCOLLÉ 3/4" (PLAT) X 6'	1
8	SE72531	VITRE	1
9	PL72531	CADRE DE VITRE DROIT	1
10	PL72532	CADRE DE VITRE GAUCHE	1
11	SE53585	ENSEMBLE DE (12) RETENEURS DE VITRE AVEC VIS	1
12	30507	VIS TÊTE PLATE TORX TYPE F 1/4-20 X 3/4" NOIR	3
13	PL30592	CENDRIER	1
14	24096	BOUCHON À CENDRES ROND EN FONTE	1
15	30154	VIS NOIRE #10 X 5/8" QUADREX #2 TYPE A	4
16	PL72588	DÉFLECTEUR D'AIR TÔLE DE DOS	1
17	29010	BRIQUE RÉFRACTAIRE 4 1/2" X 9" X 1 1/4"	12
18	29015	BRIQUE RÉFRACTAIRE 4" X 9" X 1 1/4"	10
19	29007	BRIQUE RÉFRACTAIRE 3 1/4" X 9" X 1 1/4"	4
20	29000	BRIQUE RÉFRACTAIRE 4" X 8" X 1 1/4"	1
21	29004	BRIQUE RÉFRACTAIRE 4" X 4 1/2" X 1 1/4"	1
22	PL72516	TUBE D'AIR SECONDAIRE AVANT	2
23	PL72515	TUBE D'AIR SECONDAIRE ARRIÈRE	2
24	21598	COUPE-FEU VERMICULITE SÉRIE 3.3	1
25	AC02055	ENSEMBLE DU THERMODISQUE À BRANCHEMENT ÉCLAIR	1
26	44028	THERMODISQUE F110-20F EN CÉRAMIQUE	1
27	AC02050	ENSEMBLE DU VENTILATEUR À VITESSE VARIABLE (JUSQU'À 100 PCM)	1
28	PL09909-02	CAGE DU VENTILATEUR	1
29	44073	VENTILATEUR TANGENTIEL 115V-60Hz-39W 100 PCM	1
30	60013	CORDON D'ALIMENTATION 96" X 18-3 Gaine SJT	1
31	44085	BOUTON DE RHÉOSTAT	1
32	44087	ÉCROU DU RHÉOSTAT	1
33	44080	RHÉOSTAT SANS ÉCROU	1

#	Item	Description	Qty
34	SE46142	KIT DU MANUEL AUSTRAL III	1
35	AC05959	PEINTURE POUR POÊLE NOIR MÉTALLIQUE - 342 g (12oz) AÉROSOL	1
36	AC01204	ENSEMBLE D'ENTRÉE D'AIR FRAIS 5" POUR POÊLE À BOIS SUR PATTES	1
37	30187	RONDELLE EN ACIER INOX 17/64" Ø INT. X 1/2" Ø EXT.	1
38	SE72530	TRAPPE DE CONTROLE D'AIR ASSEMBLÉE	1
39	30206	RONDELLE ZINC 5/16"Ø INT. X 3/4"Ø EXT.	1
40	30506	VIS TÊTE PAN TORX TYPE F 1/4-20 X 1" NOIR	1
41	30429	POIGNÉE SPIRALE 3/8" NICKEL	1
42	SE72538	TIROIR À CENDRE DROLET	1
43	AC01336	ENSEMBLE D'ENTRÉE D'AIR FRAIS 5"Ø POUR POÊLE À BOIS SUR PIÉDESTAL	1
44	AC01397	PARE-ÉTINCELLES RIGIDE	1
45	30417	ÉCROU HEX NOIR #8-32	3
46	PL72582	DÉFLECTEUR FUMÉE	1
47	PL72584	CROCHET BAS PARE-ÉTINCELLE	2
48	30021	VIS FILETAGE COUPANT 8-32 TYPE "F" X 7/16" PLATE PHILLIPS NOIRE	8
49	PL72074	CROCHET HAUT PARE-ÉTINCELLES	2
50	30898	POIGNÉE DE BOIS RONDE NOIR FINI NOIR MAT	2
51	30187	RONDELLE EN ACIER INOX 17/64" Ø INT. X 1/2" Ø EXT.	2
52	30025	VIS MÉCANIQUE 1/4-20 X 1/2" PAN QUADREX NOIR	2

## GARANTIE À VIE LIMITÉE ENERZONE

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 au détaillant ENERZONE.

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 ENERZONE. 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.

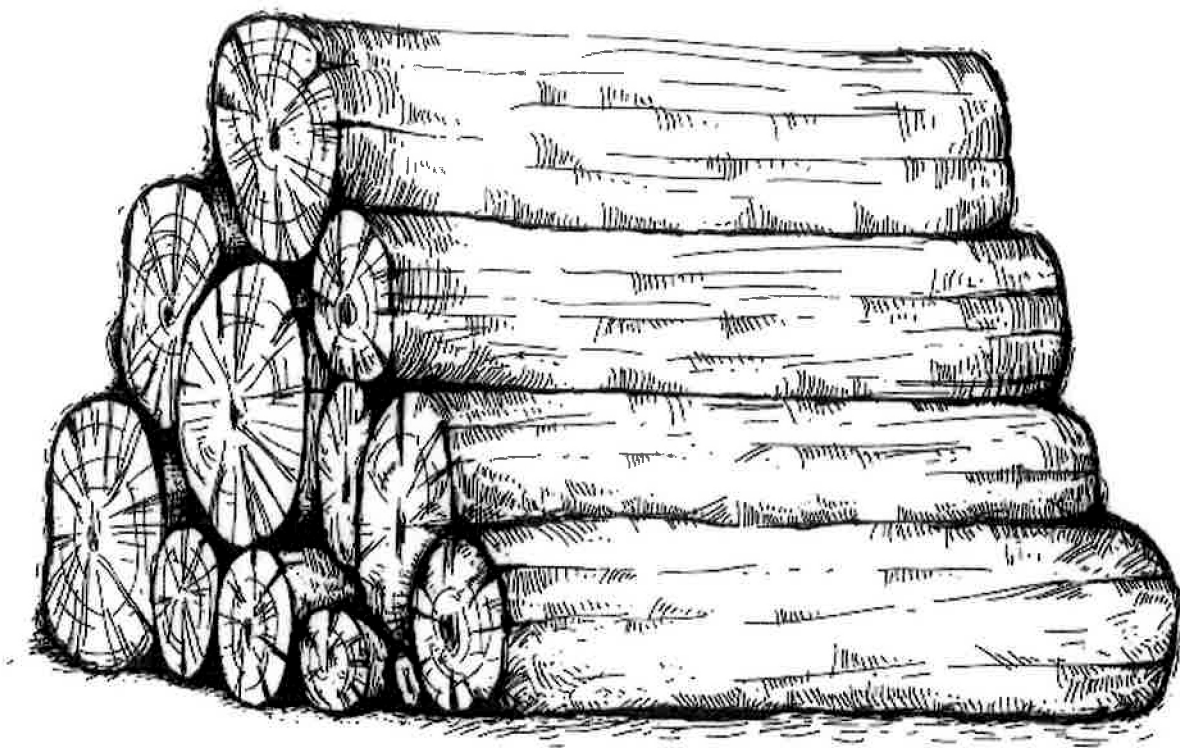
*Avant d'expédier votre appareil ou une pièce défectueuse à notre usine, vous devez obtenir un numéro d'autorisation de votre détaillant ENERZONE. Toute marchandise expédiée sans autorisation sera automatiquement refusée et retournée à l'expéditeur.*

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.



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# Operation Manual



ENGLISH

CONTACT LOCAL BUILDING OR FIRE OFFICIALS ABOUT RESTRICTIONS AND INSTALLATION INSPECTION REQUIREMENTS IN LOCAL AREA.

READ THIS ENTIRE MANUAL BEFORE INSTALLATION AND USE OF THIS WOOD STOVE. FAILURE TO FOLLOW THESE INSTRUCTIONS COULD RESULT IN PROPERTY DAMAGE, BODILY INJURY OR EVEN DEATH.

**READ AND KEEP THIS MANUAL FOR REFERENCE**

# 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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## 1. Safety Information

- This stove has been tested for use with an open door in conjunction with a fire screen, sold separately. The door may be opened, or fire screen removed only during lighting procedures or reloading. Always close the door or put back on the fire screen after ignition. Do not leave the stove unattended when the door is opened with or without the fire screen.
- **WARNING : OPERATE ONLY WITH THE DOOR FULLY CLOSED OR FULLY OPEN WITH THE FIRE SCREEN IN PLACE. IF THE DOOR IS LEFT PARTLY OPEN, GAS AND FLAME MAY BE DRAWN OUT OF THE OPENING, CREATING RISKS FROM BOTH FIRE AND SMOKE.**
- **HOT WHILE IN OPERATION, KEEP CHILDREN, CLOTHING AND FURNITURE AWAY. CONTACT MAY CAUSE SKIN BURNS. GLOVES MAY BE NEEDED FOR THE STOVE OPERATION.**
- Using a stove with cracked or broken components, such as glass, firebricks or baffle may produce an unsafe condition and may damage the stove.
- Open the air control fully before opening the loading door.
- **NEVER USE GASOLINE, LANTERN FUEL (NAPHTHA), FUEL OIL, MOTOR OIL, KEROSENE, CHARCOAL LIGHTER FLUID, OR SIMILAR LIQUIDS OR AEROSOLS TO START A FIRE IN THIS STOVE. KEEP ALL SUCH LIQUIDS OR AEROSOLS WELL AWAY FROM THE STOVE WHILE IT IS IN USE.**
- Do not store fuel within heater minimum installation clearances.
- Burn only seasoned natural firewood.
- This appliance should always be maintained and operated in accordance with these instructions.
- Do not elevate the fire by using a grate.
- Do not use makeshift materials or make any compromises when installing this appliance.
- This wood heater needs periodic inspection and repairs for the proper operation. It is against federal regulations to operate this wood heater in a manner inconsistent with operating instructions in this manual.
- A smoke detector, a carbon monoxide detector and a fire extinguisher should be installed in the house. The location of the fire extinguisher should be known by all family members.



This product can expose you to chemicals including carbon monoxide, which is known to the State of California to cause cancer, birth defects or other reproductive harm. For more information go to [www.P65warnings.ca.gov/](http://www.P65warnings.ca.gov/)

- The information given on the certification label affixed to the appliance always overrides the information published, in any other media (owner's manual, catalogues, flyers, magazines and web sites).
- Mixing of appliance components from different sources or modifying components may result in hazardous conditions. Where any such changes are planned, Stove Builder International Inc. Should be contacted in advance.
- Any modification of the appliance that has not been approved in writing by the testing authority violates CSA B365 (Canada), and ANSI NFPA 211 (USA).
- **DO NOT CONNECT TO OR USE IN CONJUNCTION WITH ANY AIR DISTRIBUTION DUCTWORK UNLESS SPECIFICALLY APPROVED FOR SUCH INSTALLATION.**
- **DO NOT CONNECT THIS UNIT TO A CHIMNEY FLUE SERVING ANOTHER APPLIANCE.**
- Connect this stove only to a listed factory-built chimney for use with solid fuel or to a lined masonry chimney conforming to national and local building codes.
- If required, a supply of combustion air shall be provided to the room.
- Certains appareils peuvent être installé dans une maison mobile. Leur installation requiert l'installation d'un ensemble d'entrée d'air frais, vendu séparément.
- 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.**

## 1.1 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.

## 1.2 Location of the Certification Label

Since the information given on the certification label affixed to the appliance always overrides the information published, in any other media (owner's manual, catalogues, flyers, magazines and web sites) it is important to refer to it in order to have a safe and compliant installation. In addition, important information about the stove can be found (model, serial number, etc.). The certification label is located on the back of the stove.

It is recommended to note the stove serial number on page 6 of this manual since it will be needed to precisely identify the version of the appliance in the event replacement parts or technical assistance is required.

## 1.3 Tree Species

The tree species the firewood is produced from is less important than its moisture content. The main difference in firewood from various tree species is the density of the wood. Hardwoods are denser than softwoods.

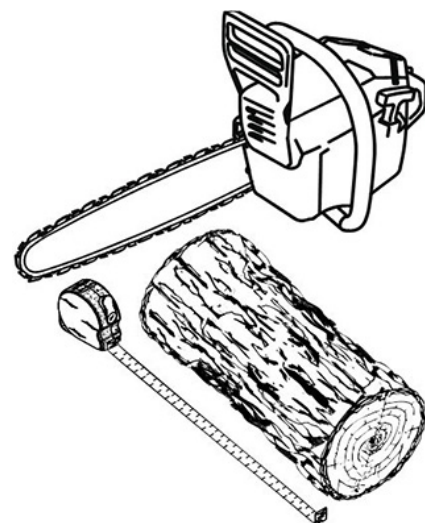
Homeowners with access to both hardwood and softwood use both types for different purposes.

Softer woods make good fuel for mild weather in spring and fall because they light quickly and produce less heat. Softwoods are not as dense as hardwoods so a given volume of wood contains less energy. Using softwoods avoids overheating the house, which can be a common problem with wood heating in moderate weather. Harder woods are best for colder winter weather when more heat and longer burn cycles are desirable.

Note that hardwood trees like oak, maple, ash and beech are slower growing and longer lived than softer woods like poplar and birch. That makes hardwood trees more valuable. The advice that only hardwoods are good to burn is outdated. Old, leaky cast iron stoves wouldn't hold a fire overnight unless they were fed large pieces of hardwood. That is no longer true.

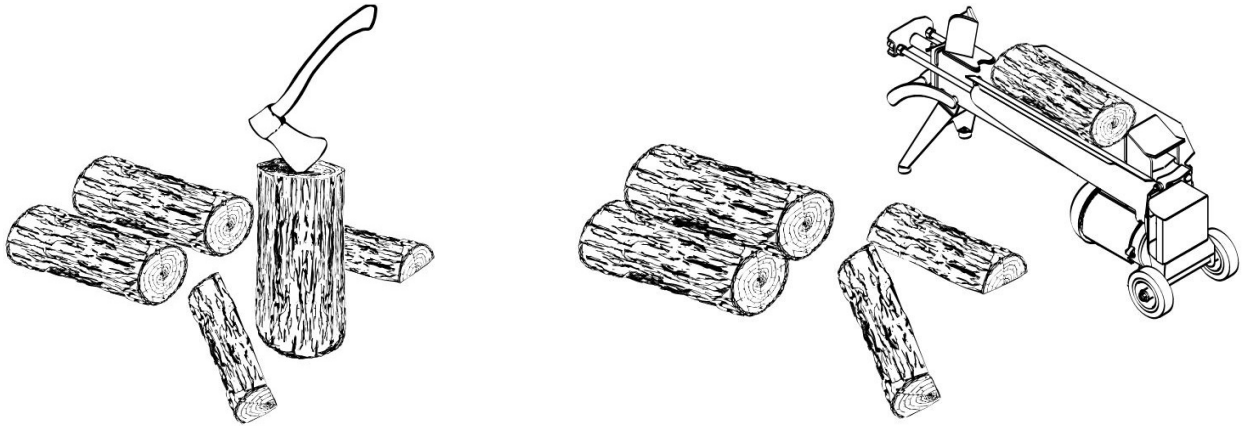
## 1.4 Log Length

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).



## 1.5 Piece Size

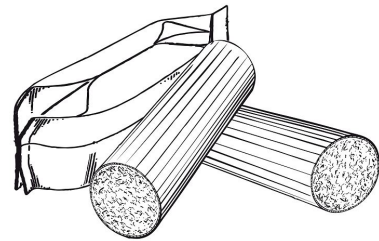
Firewood dries more quickly when it is split. Large unsplit rounds can take years to dry enough to burn. Even when dried, unsplit logs are difficult to ignite because they don't have the sharp edges where the flames first catch.



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.

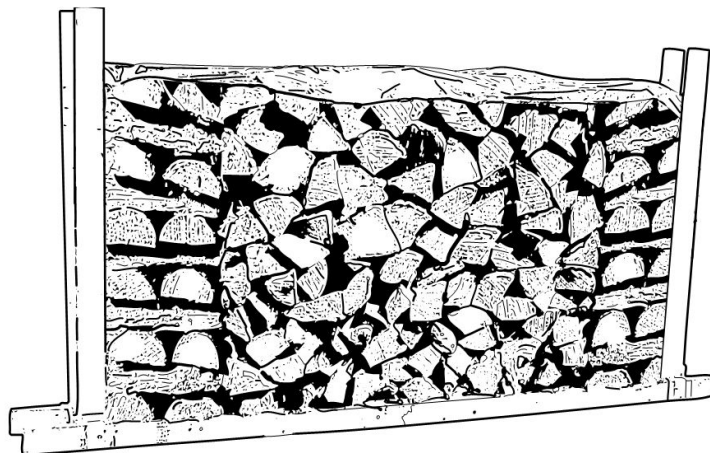
## 1.6 Compressed Wood Logs

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.



## 1.7 Drying Time

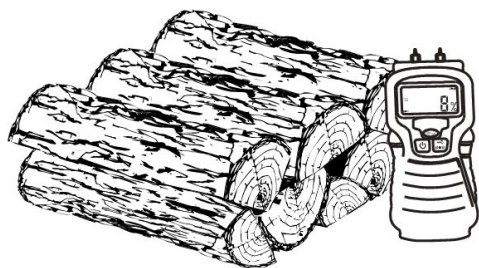
Firewood that is not dry enough to burn is the cause of most complaints about wood burning appliances. Continually burning green or unseasoned wood produces more creosote and involves lack of heat and dirty glass door. Firewood with a moisture content between 15% and 20% will allow the stove to produce its highest possible efficiency.



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

- Firewood bought from a dealer is rarely dry enough to burn, so it is advisable to buy the wood in spring and dry it yourself;
- Drying happens faster in dry weather than in a damp climate;
- Drying happens faster in warm summer weather than in winter weather;
- Small pieces dry more quickly than large pieces;
- Split pieces dry more quickly than unsplit rounds;
- Softwoods like pine, spruce, poplar, and aspen take less time to dry than hardwoods. they can be dry enough to burn after being stacked to air dry only for the summer months;
- Hardwoods like oak, maple and ash can take one, or even two years to dry fully, especially if the pieces are big;
- Firewood dries more quickly when stacked outside in a location exposed to sun and wind; it takes much longer to dry when stacked in a wood shed;

## Use these guidelines to find out if the firewood is dry enough to burn:



- Cracks form at the ends of logs as they dry;
- The wood turns from white or cream colored to grey or yellow;
- Two pieces of wood struck together sounds hollow;
- Dry wood is much lighter in weight than wet wood,
- The face of a fresh cut feels warm and dry;
- The moisture content read by a moisture meter is between 15% to 20%.

## 2. Burning Wood Efficiently

### 2.1 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.

## 2.2 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.**

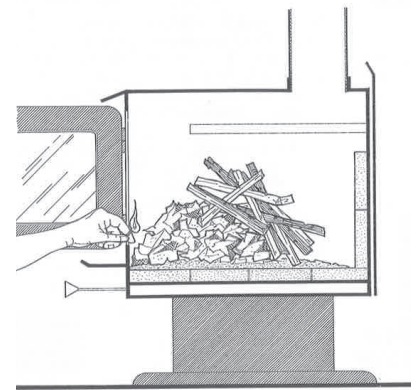
### 2.2.1 Conventional Method

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.**



### 2.2.2 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.

### 2.2.3 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.

### 2.2.4 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.

## 2.3 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.

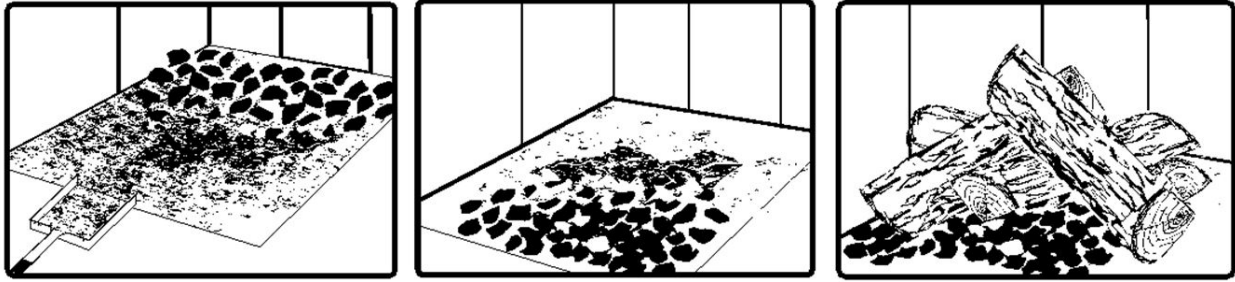
Burning in cycles means the loading door does not need to be opened while the wood is flaming. This is an advantage since it is preventing smoke leaking from the heater when the door is opened as a full fire is burning. This is especially true if the chimney is on the outside wall of the house.

**If the door must be opened while the fire is flaming, fully open air control for a few minutes then open the door slowly.**



## 2.4 Rekindling a Fire

When the temperature of the room is lower and all that remains is embers, it is time to reload. Remove excess ash from the front of the firebox and bring the ashes forward. Place a new load of wood on, and at the back of the embers. Open the air control completely and close the door.



Raking the coals is useful for two reasons. First, it brings them near where most of the combustion air enters the firebox. This will ignite the new load quickly. Secondly, the charcoal will not be smothered by the new load of wood. When the embers are simply spread inside the combustion chamber, the new load smoulder for a long time before igniting.

Close the air control only when the firebox is full of bright turbulent flames, the wood is charred, and its edges are glowing.

*The heater should not be left unattended during ignition and the fire should not burn at full intensity for more than a few minutes.*

When lighting a new load, the appliance produces a heat surge. This heat surge is pleasant when the room temperature is cool but can be unpleasant when the room is already warm. Therefore, it is best to let each load of wood burn completely so that the room cools down before putting a load of wood back on.

## 2.5 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 almost always contain live embers that can stay hot for days and which release carbon monoxide gas. Ashes should be placed in a tightly covered metal container. The container must be placed on a non-combustible floor or on the ground well away from all combustible materials.

If the ashes are disposed of by burial in soil or otherwise locally dispersed, they should be kept in a closed metal container until they are completely cooled. No other waste should be placed in this container.



**NEVER STORE ASHES INDOORS OR IN A NON-METALLIC CONTAINER OR ON A WOODEN DECK.**

## 2.6 Air Intake Control

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

As the air intake is reduced, the burn rate decreases. This has the effect of distributing the thermal energy of the fuel over a longer period of time. In addition, the flow rate of exhaust through the appliance and flue pipe slows down, which increases the duration of the energy transfer of the exhaust gases. As the air intake is reduced, the flame slows down.

If the flames diminish to the point of disappearing, the air intake has been reduced too early in the combustion cycle or the wood used is too wet. If the wood is dry and the air control is used properly, the flames should decrease, but remain bright and stable.

On the other hand, too much air can make the fire uncontrollable, creating very high temperatures in the unit as well as in the chimney and seriously damaging them. A reddish glow on the unit and on the chimney components indicates overheating. Excessive temperatures can cause a chimney fire.

## 2.7 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.

### 2.7.1 *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» to 4» in diameter. After raking the coals, lay two pieces parallel to each other diagonally in the firebox and lay two more across them in the other direction. Open the air control fully and only reduce the air after the wood is fully flaming. This kind of fire is good for mild weather and should provide enough heat for up to four hours. Small fires like this are a good time to use softer wood species and avoid overheating the house.

### 2.7.2 *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.

### 2.7.3 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.

### 2.7.4 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**

<b>FIREBOX VOLUME</b>	<b>MAXIMUM BURN CYCLE TIME</b>
<1.5 cubic feet	3 to 5 hours
1.5 c.f. to 2.0 c.f	5 to 6 hours
2.0 c.f. to 2.5 c.f.	6 to 8 hours
2.5 c.f. to 3.0 c.f.	8 to 9 hours
>3.0 c.f.	9 to 10 hours

A longer burning time is not necessarily an indication of efficient operation. It is preferable to build a smaller fire that will provide three or four hours of heating than to fully load the firebox for a much longer burn. Shorter burn cycles make it easier to match the heat output of the stove to heat demand for the space.

### 2.7.5 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. North-south loading is good for high output, long lasting fires for cold weather.

East-west loads allow a limited amount of wood since too many logs could cause them to fall on the glass. East-west loads, placed in a compact way, take a long time before breaking down. They are excellent for low-intensity, long-lasting fires in relatively mild weather.

### 2.7.6 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.

## 3. 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 ["2. Burning Wood Efficiently"](#) and also avoid letting the heater run with the air intake fully open for entire burn cycles.

### 3.1 Heater

#### 3.1.1 Cleaning and Painting

Painted and plated surfaces can be wiped down with a soft, damp cloth. If the paint is scratched or damaged, it is possible to repaint the heater with a heat-resistant paint. **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.

## 3.2 Refractory Materials and Baffle

Inspect the firebricks or the refractory panels and the baffle for damage periodically and replace anything that is broken.

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

## 3.3 Glass Door

### 3.3.1 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.

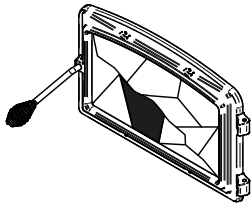
When the stove runs at a low combustion rate, light brown stains may form, especially in the lower corners of the glass. This indicates that the fire has been smoky and some of the smoke has condensed on the glass. It also indicates incomplete combustion of the wood, which also means more smoke emissions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

### 3.3.2 Replacement

In case of breakage or change of wearing parts, refer to the installation and use manual.

### 3.4 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. C-Cast or Vermiculite can withstand temperatures above 2,000 °F. It is not considered hazardous waste. Disposal at a ecocenter 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 ecocenter is recommended.

The door and glass **gaskets** are fibreglass which is spun from melted sand. Black gaskets have been dipped into a solvent-free solution. Disposal at a ecocenter is recommended.

The door **glass** is a 5/32" (4 mm) thick ceramic material that contains no toxic chemicals. It is made of natural raw materials such as sand and quartz that are combined in such a way to form a high temperature glass. Ceramic glass cannot be recycled in the same way as normal glass, so it should not be disposed of with your regular household products. Disposal at a ecocenter is recommended.

### 3.5 Zone Heating

This stove is a space heater, which means it is intended to heat the area it is installed in, as well as spaces that connect to that area, although to a lower temperature. This is called zone heating and it is an increasingly popular way to heat homes or spaces within homes.

Zone heating can be used to supplement another heating system by heating a particular space within a home, such as a basement, a family room or an addition that lacks another heat source.

Houses of moderate size and relatively new construction can be heated with a properly sized and located wood stove. Whole house zone heating works best when the stove is in the part of the house where the family spends most of its time. This is normally the main living area where the kitchen, dining and living rooms are located.

Locating the stove in this area will give the maximum benefit of the heat it produces and will achieve the highest possible heating efficiency and comfort. The space where the most time is spent will be warmest, while bedrooms and basement (if there is one) will stay cooler. In this way, less wood is burnt than with other forms of heating.

Although the stove may be able to heat the main living areas of the house to an adequate temperature, it is strongly recommended to also have a conventional oil, gas or electric heating system to provide backup heating.

The success of zone heating will depend on several factors, including the correct sizing and location of the stove, the size, layout and age of your home and your climate zone. Three-season vacation homes can usually be heated with smaller stoves than houses that are heated all winter.

### **3.6 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 for suggestions on preparing fuelwood and judging its moisture.

## 4. 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.**



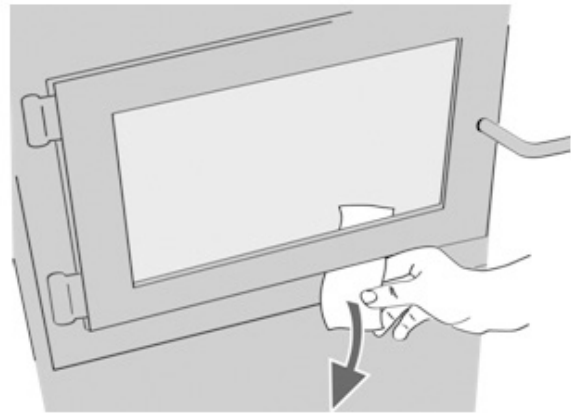
## 5. Operating the Stove

**This wood heater has a manufacturer-set minimum low burn rate that must not be altered. It is against federal regulations to alter this setting or otherwise operate this wood heater in a manner inconsistent with operating instructions in this manual.**

- Before using the stove, a pedestal base or leg kit must be installed under the product, if this is not already the case. Refer to the installation and specifications manual.
- The installation of options is optional, see the installation manual and specifications for the available options and their installation.

### 5.1 Door adjustment

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.



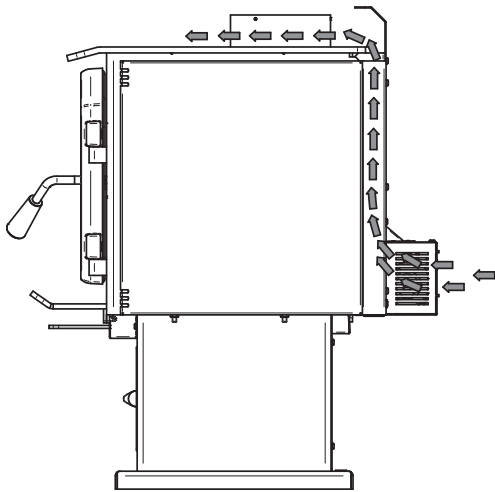
### 5.2 The Use of a Fire Screen

This stove has been tested for use with an open door in conjunction with a fire screen (*In the United States or in provinces governed by a particulate emission limit (eg US EPA), the use of open-door wood stoves with a fire screen is prohibited*), sold separately. The fire screen must be properly secured on the stove to avoid any risk of sparks damaging the flooring. When the fire screen is in use, do not leave the stove unattended to respond promptly in the event of smoke spillage into the room. Potential causes of smoke spillage are described in Section "The venting system" of this manual. See "Optional Fire Screen Installation" in the user manual for specifications about installation instructions.


**OPERATING THE STOVE WITH A FIRE SCREEN INCREASES POSSIBILITIES OF GENERATING CARBON MONOXIDE. CARBON MONOXIDE IS AN ODOURLESS GAS THAT IS HIGHLY TOXIC WHICH CAN CAUSE DEATH AT HIGH CONCENTRATION IN AIR.**

### 5.3 Blower Operation

It is possible to install a blower on this stove. The blower is optional and is sold separately. See «appendix» for genuine part number.



The blower is installed on the back of the stove to increase the airflow through the heat exchanger and improve hot air circulation in the room. When used regularly, the blower can provide a small increase in efficiency, up to 2%. However, the use of a blower should not be used as a way to gain more output from a stove that is undersized for the space it is intended to heat.



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

Figure 1: Air flow with a blower

The blower has a rheostat that can be adjusted in three different positions; either from high (HI) to low (LO) or closed (OFF).

Allow the stove to reach operating temperature (approximately one hour) before turning on the blower, since increased airflow from the blower will remove heat and affect the start up combustion efficiency.

The blower has a heat sensor. When the blower is ON, the blower will start automatically when the stove is hot enough and it will stop when the stove has cooled down. Therefore, you can leave the blower speed control at the desired setting.

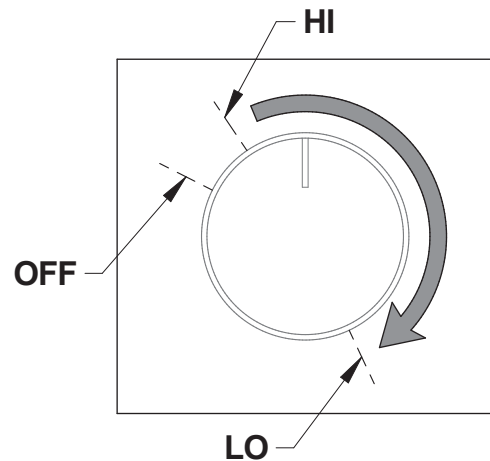


Figure 2: Blower operation

## 5.4 Exhaust System

Wood smoke can condense inside the chimney, forming a flammable 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.»*

### 5.4.1 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.

### 5.4.2 Sweeping the Chimney

Chimney sweeping can be a difficult and dangerous job. People with no chimney sweeping experience will often prefer to hire a professional chimney sweep to inspect and clean the system for the first time. After seeing the cleaning process, some will choose to do it themselves.

The chimney should be checked regularly for creosote build-up. Inspection and cleaning of the chimney can be facilitated by removing the baffle. See "Air Tubes and Baffle Installation" in the *installation and operation manual* for more details.

### 5.4.3 Chimney Fire

Regular chimney maintenance and inspection can prevent chimney fires. If you have a chimney fire, follow these steps:

1. Close the stove door and the air intake control;
2. Alert the occupants of the house of the possible danger;
3. If you require assistance, alert the fire department;
4. If possible, use a dry chemical fire extinguisher, baking soda or sand to control the fire. Do not use water as it may cause a dangerous steam explosion;

**Do not use the appliance again until the stove and its chimney have been inspected by a qualified chimney sweep or a fire department inspector.**

## 6. The Venting System

### 6.1 General

The venting system, made of the chimney and the connecting pipe between the stove and the chimney, acts as the engine that drives the wood heating system. Even the best stove will not function safely and efficiently if it is not connected to a suitable chimney.

The heat in the flue gases that pass from the stove and chimney connector into the chimney is not waste heat. This heat is what the chimney uses to make the draft that draws in combustion air, keeps smoke inside the stove and safely vents exhaust to outside. The heat in the flue gas can be seen as the fuel the chimney uses to create draft.

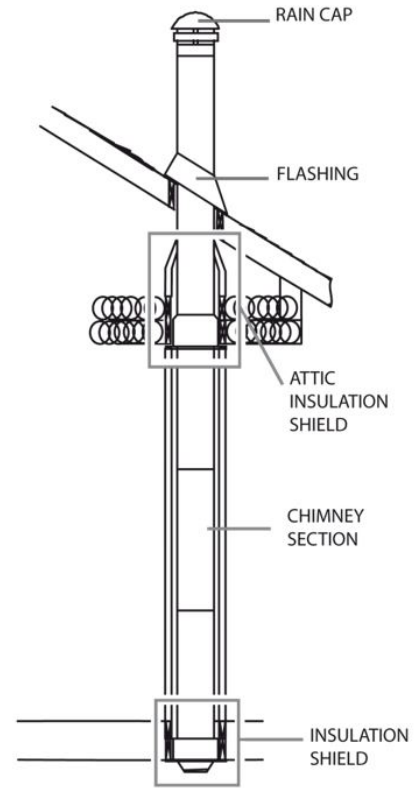
### 6.2 Suitable Chimneys

This stove will provide optimum efficiency and performance when connected to a 6" diameter chimney flue system. The connection to a chimney having a diameter of at least 5" (Canada only) or no more than 7" is permitted, if it allows the proper venting of combustion gases and that such application is verified and authorized by a qualified installer. Otherwise, the diameter of the flue should be 6".

To be suitable, a factory-built metal chimney must comply with UL 103 HT (U.S.A.) or ULC S629 (Canada).

### 6.2.1 Factory-Built Metal Chimneys

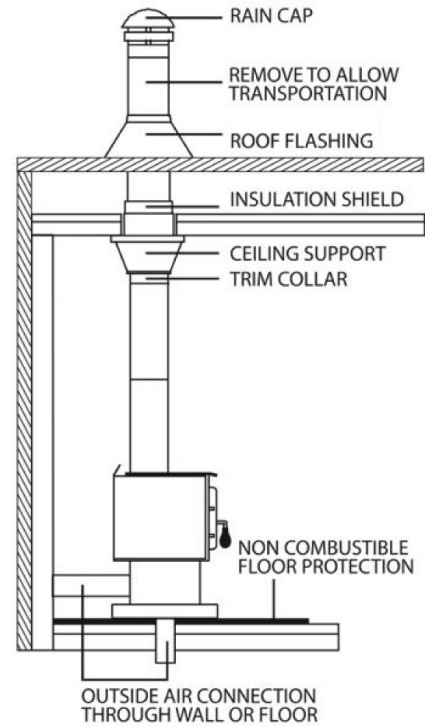
These are sometimes referred to as 'high temp' chimneys because they have the specific characteristics to withstand temperatures that can be created by wood burning stoves. Factory-built chimneys are tested as a system with all the necessary components for installation. The instructions provided with the chimney by its manufacturer are the only reliable source of installation guidelines. To be safe and effective, the chimney must be installed exactly in accordance with the manufacturer's instructions. Only components intended for the brand and model of chimney should be used. Never fabricate or substitute parts from other chimney brands. The chimney must be a type suitable for solid fuel.



### 6.2.2 Factory-Built Metal Chimneys in Mobile Homes

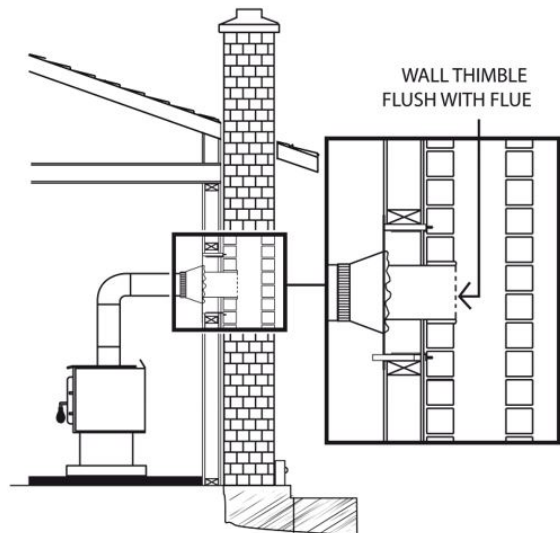
For use in a mobile home, this stove is to be connected to a 6" double wall factory built chimney pipe conforming to ULC-S629 or UL 103HT standards for 650°C Factory-built chimney. The total length of the flue system should be at least 12 feet including elbows, from the top of the stove.

To maintain an effective vapour barrier, insulation and waterproof at the chimney and outside flue pipe, a roof flashing must be installed and sealed with silicone adhesive.



### 6.2.3 Masonry Chimneys

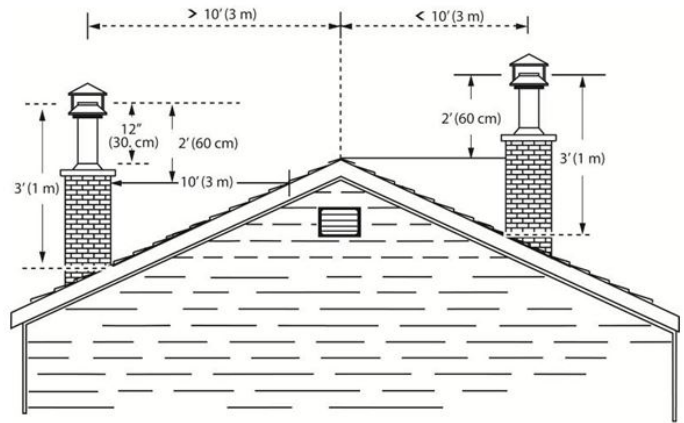
The stove may also be connected to a masonry chimney, provided the chimney complies with the construction rules found in the building code enforced locally. The chimney must have either a clay liner or a suitably listed stainless steel liner. If the masonry chimney has a square or rectangular liner that is larger in cross-sectional area than a round 6" flue, it should be relined with a suitably listed 6" stainless steel liner. Do not downsize the flue to less than 6" unless the venting system is straight and exceeds 25 feet in height. When passing through a combustible wall, the use of an insulated listed thimble is required.



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### 6.3 Minimum Chimney Height

The top of the chimney should be tall enough to be above the air turbulence caused when wind blows against the house and its roof. The chimney must extend at least 3 ft. (1 m) above the highest point of contact with the roof, and at least 2 ft. (60 cm) higher than any roof line or obstacle within a horizontal distance of 10 ft. (3 m).



### 6.4 Chimney Location

Because the venting system is the engine that drives the wood heating system, it must have the right characteristics. The signs of bad system design are cold back drafting when there is no fire in the stove, slow kindling of new fires, and smoke roll-out when the door is opened for loading. There are two guidelines to follow. First, the chimney should be installed up through the heated space of the house, not out and up an outside wall. Second, the chimney should penetrate to the top of the building at or near the highest heated space.

Venting systems that rise straight up from the stove flue collar provide the best performance. Chimneys that rise inside the warm space of the house tend to provide a small amount of draft even when there is no fire burning. This means that when a fire is lit, the smoke goes up the chimney and strong draft build quickly as the chimney flue warms up. Although they are common in North America, chimneys that exit a house wall and run up outside can cause problems.

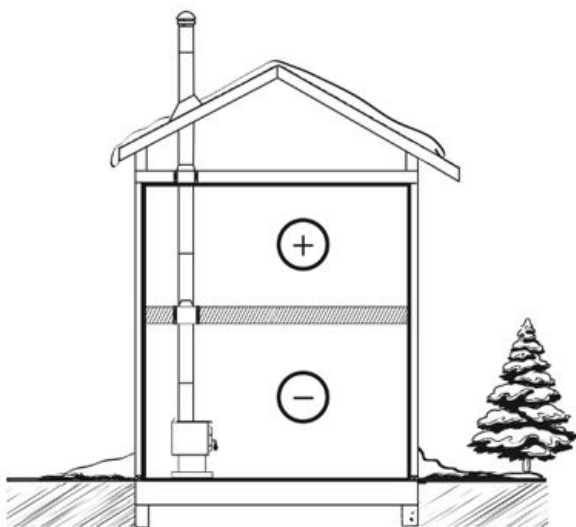


Figure 3: Good System Design

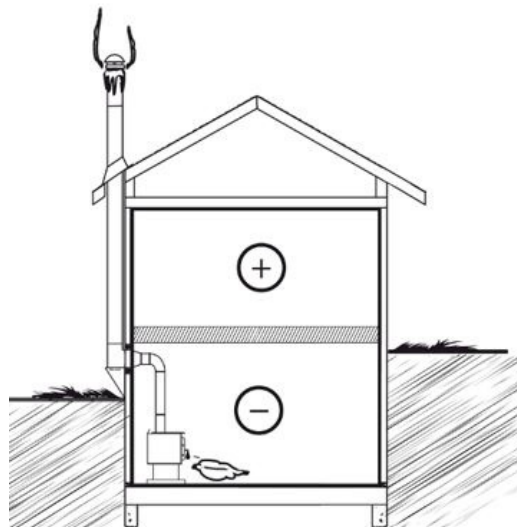


Figure 4: Inferior System Design

When it is cold outside, the warm air in the house is buoyant so it tends to rise. This creates a slight pressure difference in the house. Called 'stack effect', it produces a slightly negative pressure in the lower part of the house (compared to the outside) and a slightly positive pressure zone in the high part of the house. If there is no fire burning in a heater connected to a chimney that is shorter than the warm space inside the house, the slight negative pressure in the lower part of the house will compete against the desired upward flow in the chimney. This occurs for the two following reasons:

First, the chimney runs up the outside of the house, so the air in it is colder and denser than the warm air in the house. And second, the chimney is shorter than the heated space of the house, meaning the negative pressure in the lower part of the house will draw cold air down the chimney, through the stove and into the room. Even the finest stove will not work well when connected to this chimney.



## 6.5 Supply of Combustion Air

In Canada, wood stoves are not required to have a combustion air supply from outside, except for mobile homes. Research has shown that outside air supply do not compensate for the depressurization of the house and may not be sufficient to provide a supply of combustion air in windy weather. However, to reduce the risks against smoke spillage due to house depressurization, a carbon monoxide (CO) detector is required in the room where the stove is installed. The CO detector will provide warning if for any reason the wood stove fails to function correctly.

### 6.5.1 Mobile Home

This stove is 'mobile home approved'. 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.

Where a mobile home has been converted to a standard house by mounting it on a permanent basement foundation, the supply of outdoor air is not required.



## 6.5.2 Conventional House

The safest and most reliable supply of combustion air for a wood stove is from the room in which it is installed. Room air is already preheated so it will not chill the fire, and its availability is not affected by wind pressures on the house. Contrary to commonly expressed concerns, almost all tightly sealed new houses have enough natural leakage to provide the small amount of air needed by the stove. The only case in which the wood stove may not have adequate access to combustion air is if the operation of a powerful exhaust device (such as a kitchen range exhaust) causes the pressure in the house to become negative relative to outdoors.

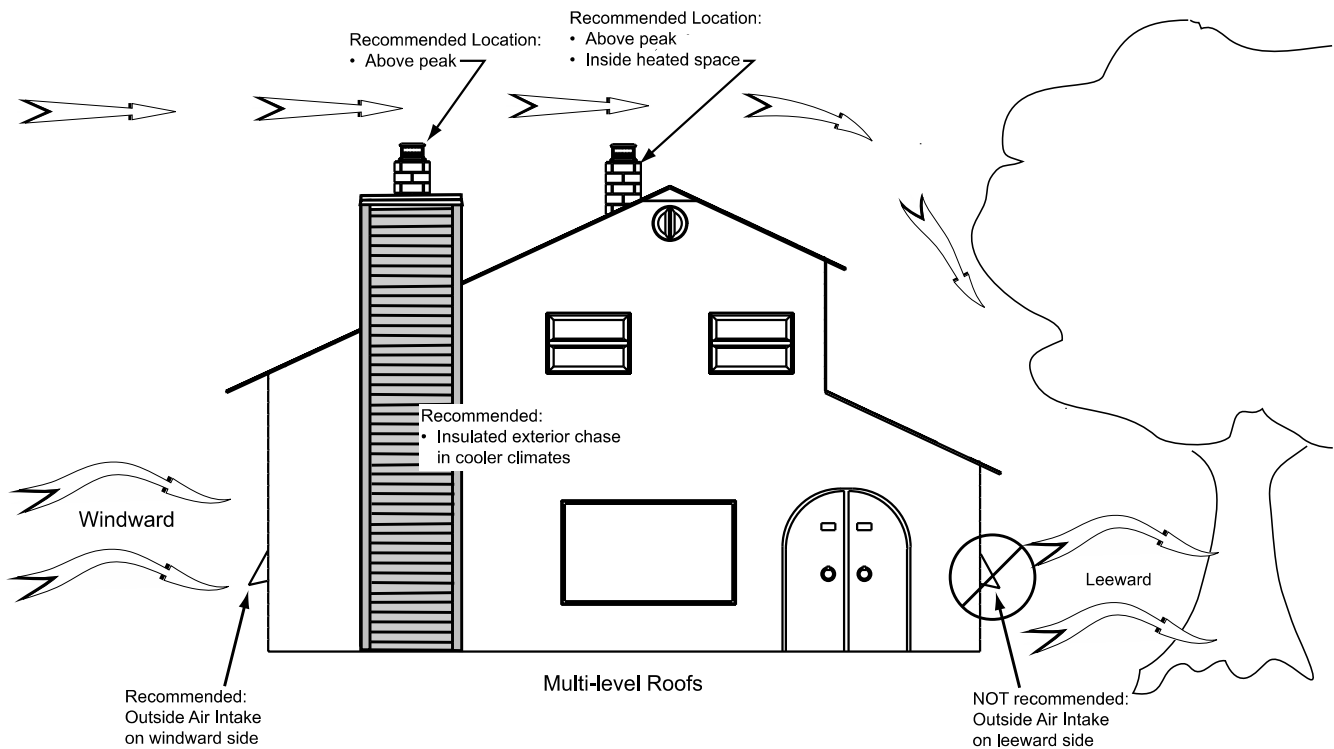


Figure 5: Air supply in conventional houses

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

## 6.6 Installing the Chimney Connector

The chimney connector is the single or double wall pipe installed between the stove flue collar and the chimney breech. Single wall pipe components are available from most hardware and building supply stores. These components are not usually tested to a particular standard and certified as compliant. Therefore, a list of rules found in solid fuel installation codes apply to the installation of a single wall pipe.

Double wall chimney connectors are tested and certified. The rules for double wall pipe are found in the manufacturer's installation instructions. These rules will be very different than those for single wall.

### 6.6.1 Installation of Single Wall Chimney Connector

The chimney connector assembly has been called 'the weak link' in the safety of wood heating systems because failure to install the connector properly (which has been common in the past) can result in house fires.

The best flue pipe assembly is one that rises straight up from the stove to the base of the chimney with no elbows. Straight assemblies are less likely to cause problems like smoke roll-out when the door is opened for loading. They are also more stable and easier to maintain than assemblies with elbows. Horizontal runs of flue pipe should be avoided where possible because they reduce chimney draft.

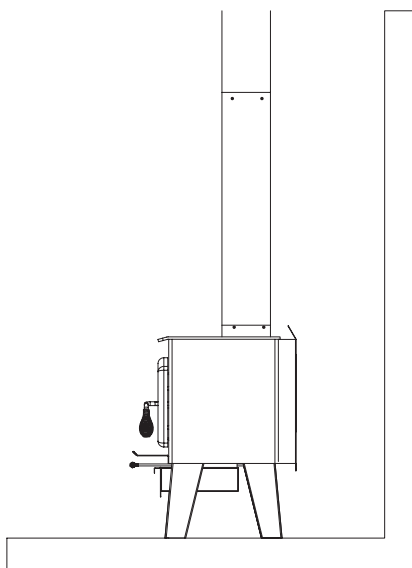


Figure 6: Best

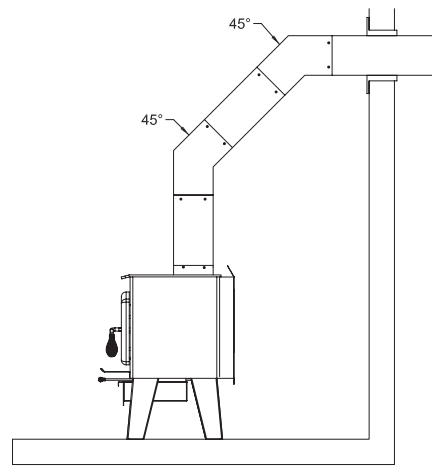


Figure 7: Acceptable

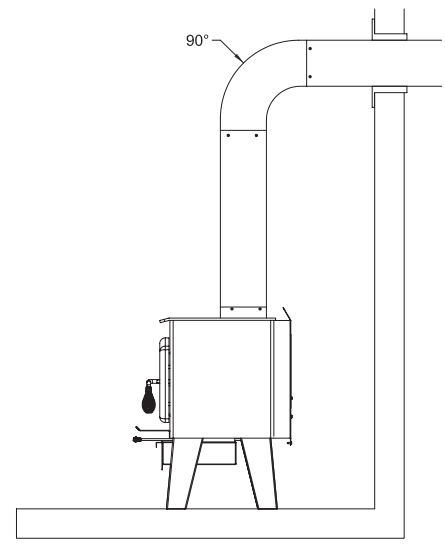


Figure 8: Avoid

The rules below are based on those found in the CSA B365 installation code. Please carefully follow these installation instruction rules, or those enforced by the local code.

- Maximum overall length of horizontal pipe: 10 ft. (3 m) including elbows.
- Minimum clearance from combustible material: 18" (450 mm). The minimum clearance may be reduced by 50 percent to 9" (225 mm) if suitable shielding is installed either on the pipe or on the combustible surface.
- The assembly should be as short and direct as possible between the stove and chimney. The use of two 45 degree elbows is often preferable to a single 90 degree elbow because less turbulence is created in the exhaust flow and they result in less horizontal run.

- The minimum overall height of the chimney system, measured from the stove top to the exterior termination cap of the chimney should be at least 12 ft. (3.66 m). A chimney which is too short may lack the “tunnel effect” required to obtain a proper draft.
- Maximum number of 90-degree elbows: 2.
- Maximum unsupported horizontal length: 3 ft. (1 m).
- Galvanized flue pipes must not be used because the coatings vaporize at high temperatures and release dangerous gases. Use black painted flue pipes.
- Flue pipes must be at least 24 gauge in thickness.
- Flue pipe joints should overlap 1 ¼" (30 mm).
- Each joint in the assembly must be fastened with at least three screws.
- The assembly must make allowance for expansion: elbows in assemblies allow for expansion; straight assemblies should include an inspection wrap with one end unfastened, or a telescopic section.
- Minimum upward slope towards the chimney: ¼ in/ft. (20 mm/m).
- **One end of the assembly must be securely fastened to the flue collar** with 3 sheet metal screws and the other end securely fastened to the chimney.
- There must be provision for cleaning of the pipes, either through a clean out or by removal of the pipe assembly. Removal of the assembly should not require that the stove be moved.
- The male ends of the sections must be oriented towards the appliance so that falling dust and condensation stay inside the pipe.
- A flue pipe must never pass through a combustible floor or ceiling or through an attic, roof space, closet or concealed space. Where passage through a wall or partition of combustible construction is desired, the installation shall conform to CAN/CSA-B365, Installation Code for Solid-Fuel-Burning Appliances and Equipment.
- A straight up connector assembly needs either a telescopic length or an inspection wrap (pipe coupler) to allow it to be assembled and disassembled without moving the stove.
- A straight flue pipe assembly offers the least restriction to gas flow and results in a stronger draft. Straight assemblies also need less maintenance because there are no corners to collect creosote.
- The chimney connector must be clean and in good condition.

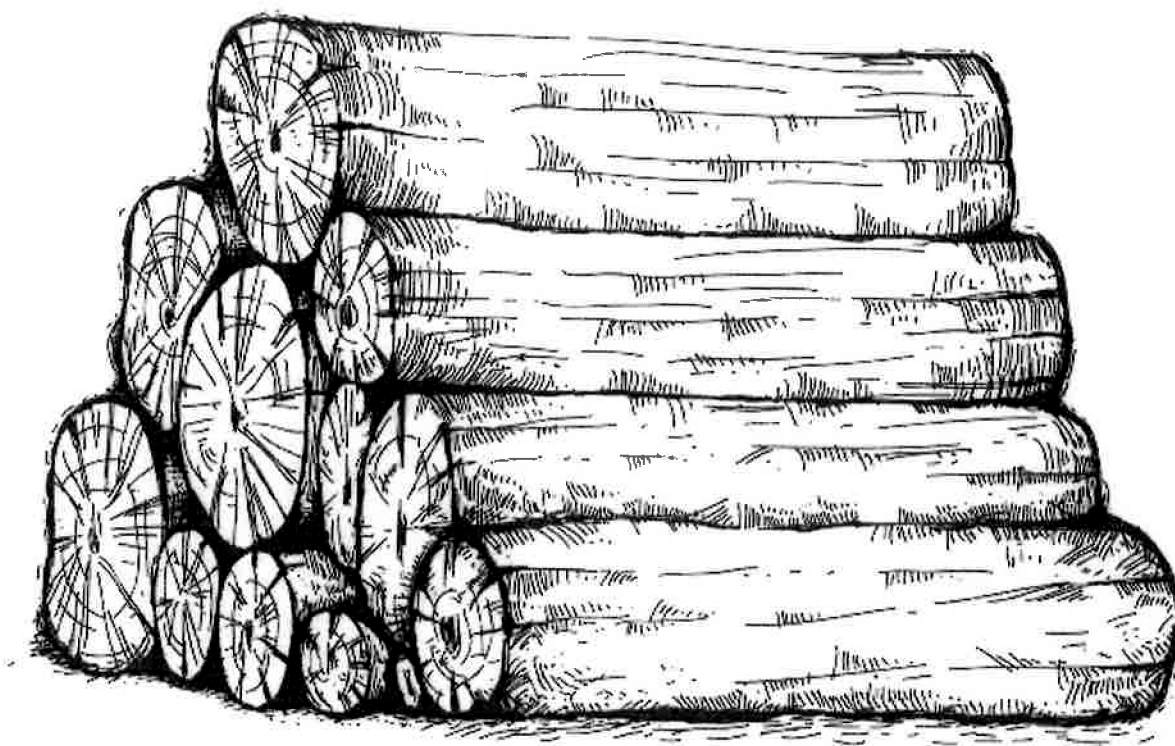


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# Manuel de l'utilisateur



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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## 1. Sécurité

- Certains produits ont été mis à l'essai pour être utilisés, là où cela est permis, la porte ouverte avec un pare-étincelles, vendu séparément (Voir dans le manuel d'installation et spécifications si votre produit peut avoir cette option). Il faut ouvrir la porte ou retirer le pare-étincelles seulement pour allumer et recharger le poêle. Toujours fermer la porte ou remettre le pare-étincelles après l'allumage. Ne pas laisser le poêle sans surveillance lorsque la porte est ouverte, avec ou sans pare-étincelles.
- **AVERTISSEMENT: UTILISER CET APPAREIL EN MAINTENANT LA PORTE SOIT COMPLÈTEMENT FERMÉE OU COMPLÈTEMENT OUVERTE AVEC LE PARE-ÉTINCELLES EN PLACE. LORSQUE LA PORTE EST PARTIELLEMENT OUVERTE, DES FLAMMES OU DES GAZ PEUVENT S'ÉCHAPPER CRÉANT DES RISQUES ASSOCIÉS À LA FOIS À LA FUMÉE ET AU FEU.**
- **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 peuvent être dangereux et peuvent l'endommager.
- 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 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/)

- 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 manufacturier 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.
- Certains appareils peuvent être installés dans une maison mobile. Leur installation requiert l'installation d'un ensemble d'entrée d'air frais, vendu séparément.
- **AVERTISSEMENT : NE PAS INSTALLER DANS UNE CHAMBRE À COUCHER.**
- **SI L'INSTALLATION DU PRODUIT EST PERMISE DANS UNE MAISON MOBILE, IL DOIT ÊTRE FIXÉ À LA STRUCTURE.**
- **ATTENTION : QUAND L'INSTALLATION EN MAISON MOBILE EST ACCEPTÉE, L'INTÉGRITÉ STRUCTURALE DU PLANCHER, DES MURS, DU PLAFOND ET DU TOIT DE LA MAISON MOBILE DOIT ÊTRE MAINTENU.**

## 1.1 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 autonome 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.

## 1.2 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 à la page 2 du *manuel d'installation et d'utilisation*, car il sera nécessaire pour identifier précisément la version de l'appareil, dans le cas où des pièces de rechange ou une assistance technique serait nécessaire.

## 1.3 Essences d'arbres

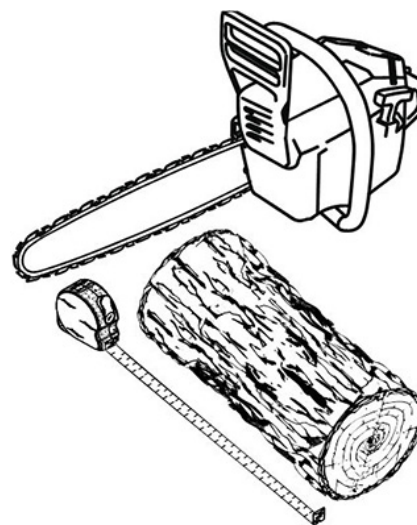
Les essences d'arbres d'où provient le bois de chauffage sont moins importantes que sa teneur en humidité. La principale différence entre les différentes essences d'arbres est la densité du bois. Le bois franc est plus dense que le bois mou.

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. Cela n'est plus le cas.

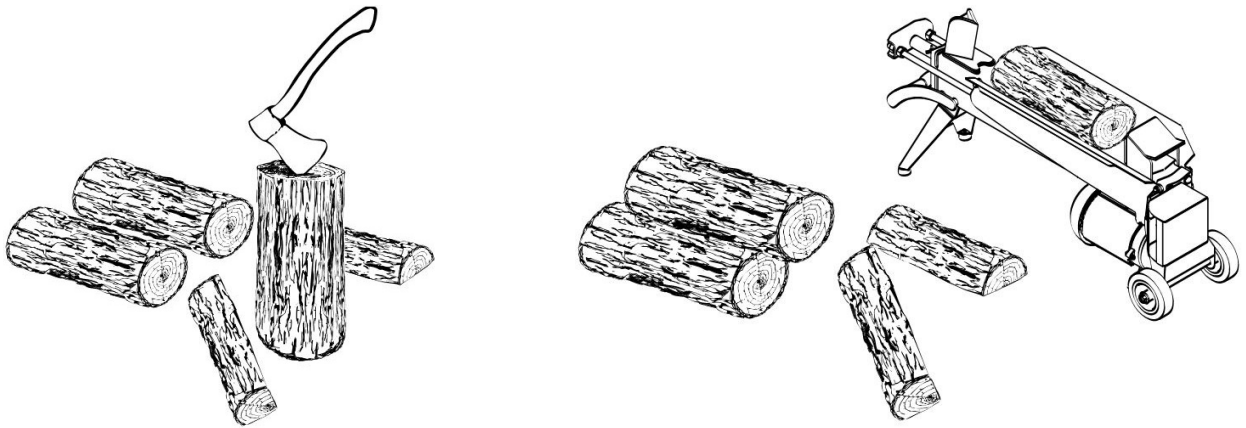
## 1.4 Longueur des bûches

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).



## 1.5 Grosseur des bûches

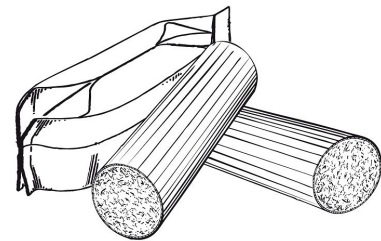
Le bois de chauffage sèche plus rapidement lorsqu'il est fendu. Les gros rondins qui ne sont pas fendus peuvent mettre des années à sécher suffisamment pour qu'on puisse les brûler. Même lorsqu'elles sont sèches, les bûches non fendues sont difficiles à allumer parce qu'elles n'ont pas d'arêtes vives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

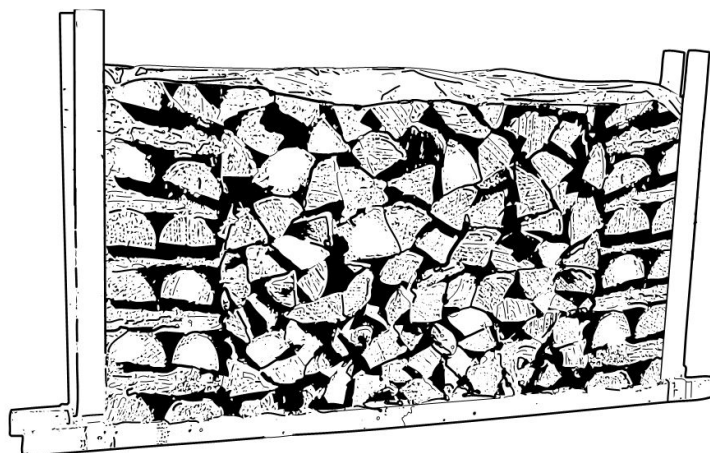
## 1.6 Bûches densifiées

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.



## 1.7 Séchage du bois

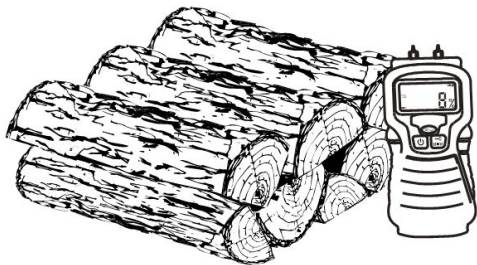
Le bois de chauffage qui n'est pas suffisamment sec est la cause de la plupart des plaintes concernant les appareils de chauffage au bois. Brûler constamment du bois vert produit plus de créosote et implique généralement un manque de chaleur et des vitres de porte sales. Du bois de chauffage avec une 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 petites bûches sèchent plus rapidement que les grosses;
- 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;
- Du bois de chauffage prêt à brûler avec une teneur en humidité de 15% à 20 % permettra au poêle d'atteindre son rendement le plus élevé.

## 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 crémeuse 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%.

## 2. Combustion efficace du bois

### 2.1 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.

## 2.2 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 créosote 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.**

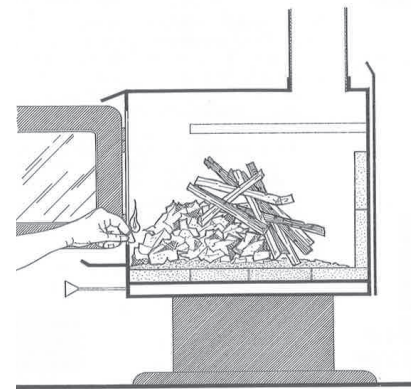
**Voici trois façons répandues et efficaces pour faire un feu de bois.**

### 2.2.1 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.**

### 2.2.2 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.

### 2.2.3 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.

### 2.2.4 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.

## 2.3 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.

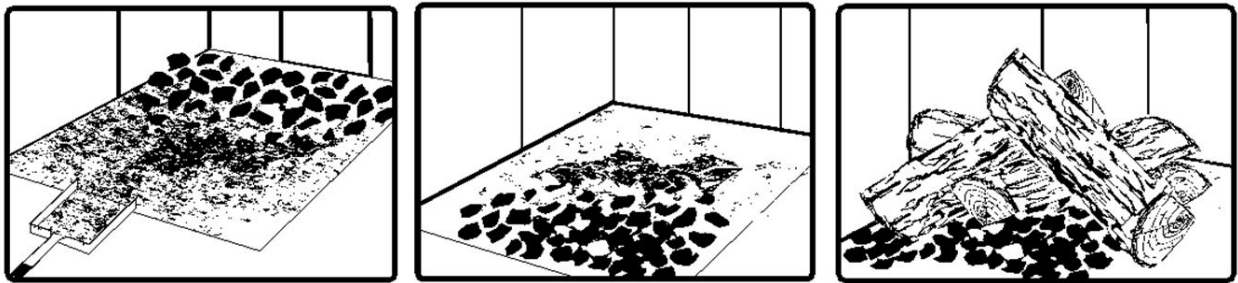
En alimentant le feu par cycles, la porte est ouverte moins souvent durant la combustion du bois. Ceci est un avantage puisqu'il évite que de la fumée s'échappe de l'appareil lors de l'ouverture de la porte durant un cycle de combustion. Ceci est particulièrement vrai si la cheminée est fixée au mur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



## 2.4 Raviver un feu

Lorsque la température de la pièce est plus basse, il est temps de recharger le feu. Enlevez les cendres, puis déplacez les braises vers l'avant de la chambre à combustion avant de remettre du bois. La plupart des braises restantes seront situées au fond de la chambre à combustion, à l'opposé de la porte. Il faut donc déplacer ces braises vers la porte à l'aide d'une pelle, avant de remettre du bois.



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 peuvent enflammer 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.

## 2.5 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 couverc 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. 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.**

## 2.6 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.

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 indiquent une surchauffe. Des températures excessives peuvent provoquer un feu de cheminée.

## 2.7 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.

### 2.7.1 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" ou 4" 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.

### 2.7.2 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.

### 2.7.3 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.

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

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

**Table 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.

## 2.7.5 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. Les charges placées droites sont utiles pour des feux à haut rendement qui durent longtemps par temps froid.

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

## 2.7.6 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.

## 3. 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 ["2. Combustion efficace du bois"](#) et éviter de faire fonctionner l'appareil avec le contrôle d'air complètement ouvert durant des cycles de combustion complets.

### 3.1 Appareil

#### 3.1.1 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.

## 3.2 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.*

## 3.3 Vitre

### 3.3.1 Nettoyage

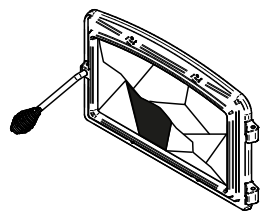
Dans des conditions normales, la vitre devrait rester relativement propre. Si le bois de chauffage est suffisamment sec et que les instructions d'utilisation de ce manuel sont suivies, il se formera un dépôt blanchâtre et poussiéreux sur la surface intérieure de la vitre après environ une semaine d'utilisation. 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 créosote 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.**

### 3.3.2 Remplacement

En cas de bris ou de changement de pièces d'usures, se référer au *manuel d'installation et d'utilisation*.

### 3.4 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** peut-être soit en C-cast ou Vermiculite qui forment une planche rigide. Ces isolants peuvent résister à des températures de plus de 2000 °F. Ils ne sont pas considérés comme des déchets dangereux. Il est recommandé de les envoyer au 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 au écocentre.

**La brique réfractaire grise** est composée de ciment et de pierre ponce. La pierre ponce est faite de roche volcanique. Il est recommandé de l'envoyer à l'écocentre.

**La brique réfractaire jaune** 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 **joints 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 au 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 au écocentre.

### 3.5 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, vous devez aussi avoir un système de chauffage conventionnel au mazout, au gaz ou à l'électricité comme source de chauffage principale.

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.

### **3.6 Émissions et rendement**

Les faibles émissions de particules qui résultent de la technologie utilisée dans ce poêle signifient que la maisonnera 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.

## 4. 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 DILUANTS 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 AUTRE MATÉRIAUX SATURÉS A 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.**



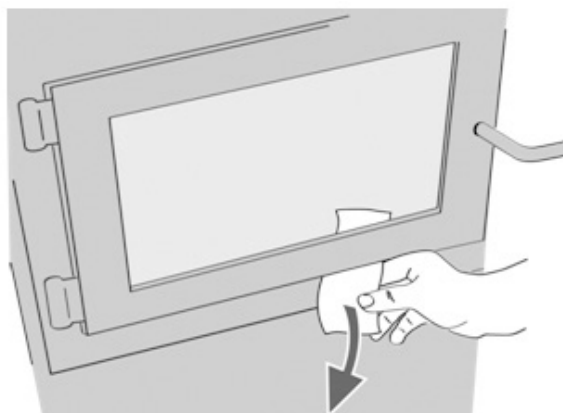
## 5. Utilisation du poêle

**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.**

- Avant d'utiliser le poêle il faut impérativement qu'une base piédestal ou kit de pattes soit installée sous le produit, si ce n'est pas déjà le cas. Vous référer au manuel d'installation et spécifications.
- L'installation des options est facultative, voir sur le manuel d'installation et spécifications pour les options disponibles et leur installation.

### 5.1 Étanchéité de la 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.



### 5.2 Utilisation d'un pare-étincelles

Certains poêles ont été mis à l'essai pour être utilisés la porte ouverte avec un pare-étincelles (**Aux États-Unis ou dans les provinces régies par une limite d'émission de particules (ex. : US EPA), l'utilisation des poêles à bois porte ouverte avec un pare-étincelles est interdite**), vendu séparément. Assurez-vous que le pare-étincelles soit bien fixé à l'appareil pour éviter que des étincelles endommagent le revêtement de sol. Lorsque le pare-étincelles est utilisé, il est important de ne pas laisser le poêle sans surveillance afin de pouvoir réagir promptement dans l'éventualité d'un retour de fumée dans la pièce. Les causes potentielles de retour de fumée sont décrites à la section " Le système d'évacuation" de ce manuel. Voir " Installation du pare-étincelles optionnel" dans le manuel de l'utilisateur et des spécifications les instructions d'installation.

**L'UTILISATION DU PARE-ÉTINCELLES AUGMENTE LES CHANCES DE GÉNÉRER DU MONOXYDE DE CARBONE. LE MONOXYDE DE CARBONE EST UN GAZ INODORE QUI EST HAUTEMENT TOXIQUE ET QUI PEUT ENTRAÎNER LA MORT LORSQU'IL EST EN FORTE CONCENTRATION DANS L'AIR.**

## 5.3 Fonctionnement du ventilateur

Il est possible sur les poêles à bois d'installer un ventilateur (en fonction de votre produit, il pourrait être inclus ou vendu séparément). Voir la Vue éclatée et liste de pièces ce trouvant dans le manuel d'utilisateur et spécifications pour obtenir le numéro de pièce original.

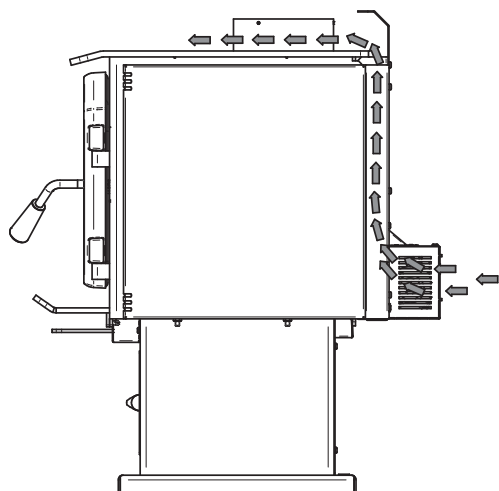


Figure 1: Circulation de l'air

Le ventilateur est installé derrière le poêle pour accroître la circulation d'air dans l'échangeur de chaleur et améliorer la circulation d'air chaud dans la pièce. 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 rhéostat 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.

Lorsque celui-ci est actionné, il mettra le ventilateur en fonction automatiquement lorsque le poêle sera chaud et s'arrêtera lorsque le poêle aura refroidi. Par conséquent, le contrôle de vitesse variable peut être laissé à la vitesse désirée.

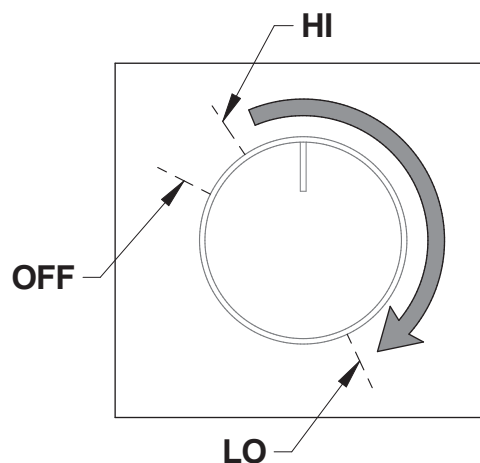


Figure 2: Rhéostat du ventilateur

## 5.4 Système d'évacuation

La fumée de bois se condense à l'intérieur de la cheminée, formant un dépôt inflammable appelé créosote. Lorsque la créosote 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 créosote. Lors d'une bonne combustion, les gaz sortant de la cheminée sont presque transparents, donc la créosote se forme plus lentement.

*«Créosote - 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 créosote. Ces vapeurs se condensent dans un conduit de cheminée relativement froid d'un appareil qui brûle lentement. Par conséquent, les résidus de créosote s'accumulent dans le conduit. Lorsqu'elle prend feu, la créosote 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 créosote s'est produite. Si la créosote s'est accumulée ( $\frac{1}{8}$ " [3mm] ou plus), il faut l'enlever pour réduire le risque de feu de cheminée »*

### 5.4.1 Fréquence

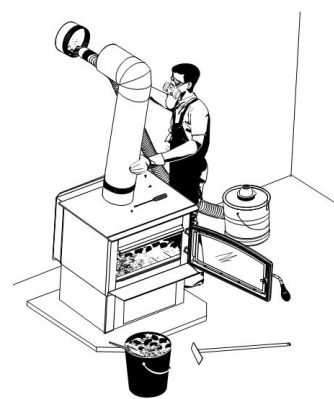
Il n'est pas possible de prédire en combien de temps ou combien de créosote se formera dans la cheminée. Il est important, par conséquent, de vérifier mensuellement s'il y a des dépôts dans la cheminée, jusqu'à ce que le taux de formation de la créosote soit connu. Même si la créosote se forme lentement 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 créosote jusqu'à ce que l'expérience montre à quelle fréquence le nettoyage doit être fait. Plus le feu est chaud, moins de créosote 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.

### 5.4.2 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 créosote.

L'inspection et le nettoyage de la cheminée peuvent être facilités en retirant le coupe-feu. Voir « Installation des tubes d'air et du coupe-feu » dans le *manuel d'utilisateur et spécifications* pour plus de détails.



### 5.4.3 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.**

## 6. Le système d'évacuation

### 6.1 Conseils généraux

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 vu comme le combustible dont se sert la cheminée pour créer le tirage.

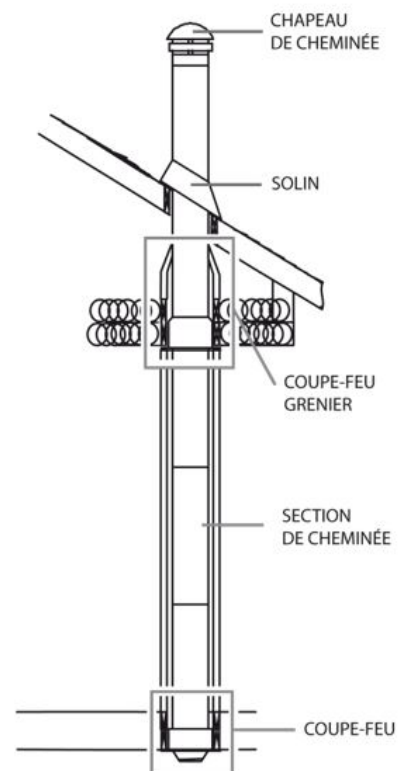
### 6.2 Des cheminées appropriées

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" de diamètre. Le raccordement à une cheminée ayant un diamètre au minimum de 5" (Canada seulement) ou d'au plus 7" 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".

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

### 6.2.1 Cheminées de métal préfabriquées

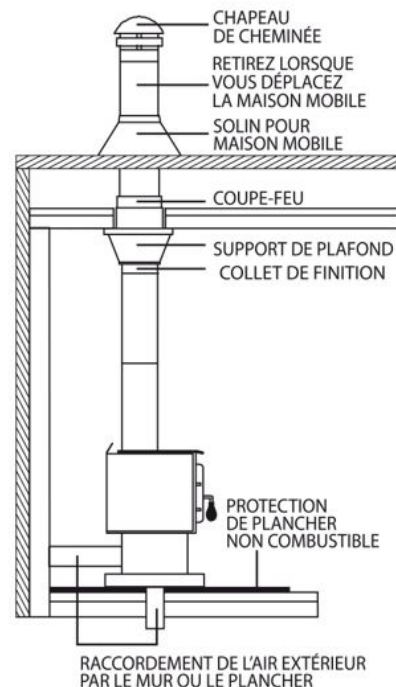
Ces cheminées sont souvent appelées cheminées «à haute température», parce qu'elles possèdent des caractéristiques spéciales pour supporter les températures qui peuvent être générées par les poêles à bois. Les cheminées préfabriquées subissent des essais en tant que système comportant tous les éléments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



## 6.2.2 Cheminées de métal préfabriquées pour les maisons mobiles

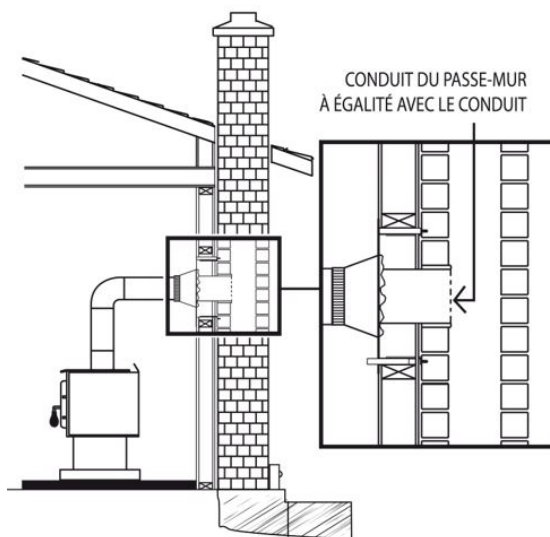
Pour une utilisation dans une maison mobile (si autorisé), ce poêle doit être raccordé à un tuyau préfabriqué à double paroi de 6" de diamètre conforme à la norme ULC S629 ou UL 103HT, pour les cheminées préfabriquées pour des températures n'excédant pas 650°C. La longueur totale du système de cheminée, incluant les coudes, doit être au moins 12 pieds à partir du dessus du 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 extérieure, un solin de toit pour maison mobile doit être installé et scellé avec un adhésif à base de silicone.



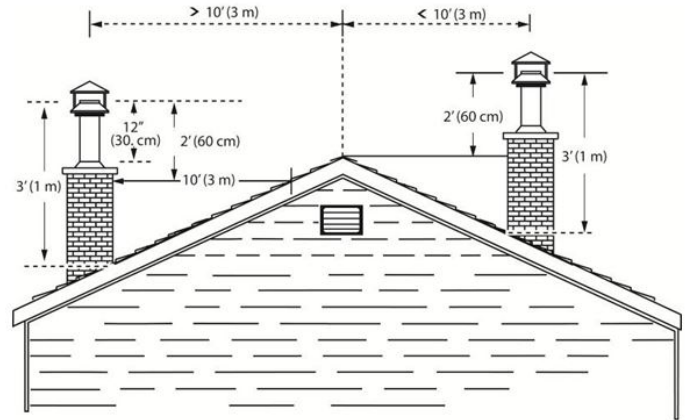
## 6.2.3 Cheminées de maçonnerie

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", il faut y insérer une chemise d'acier inoxydable (gaine) de 6" homologuée appropriée. Le conduit de fumée ne doit pas être réduit à moins de 6" à moins que le système d'évacuation ne soit droit et excède 25 pieds de hauteur. Si un mur combustible doit être traversé, un manchon isolé homologué est obligatoire.



### 6.3 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 pi. (1 mètre) au-dessus de son point de sortie du toit le plus haut et d'au moins 2 pi. (60 cm) toute portion du toit ou d'un obstacle situé à une distance horizontale de moins de 10 pi. (3 m).



### 6.4 Emplacement de la cheminée

Parce que le système d'évacuation est le moteur qui entraîne le système de chauffage au bois, il doit posséder les bonnes caractéristiques. Les signes d'un mauvais système sont les courants d'air froids descendants lorsque le poêle n'est pas allumé, l'allumage lent d'un nouveau feu et le retour de fumée lorsque la porte est ouverte pour recharger le poêle. Pour éviter ceci, il y a deux règles de base à suivre. Premièrement, installer la cheminée verticalement dans la partie chauffée de la maison, pas dehors le long d'un mur extérieur. Deuxièmement, la cheminée devrait traverser la partie supérieure du bâtiment, dans la partie chaude la plus élevée ou tout près.

Les systèmes d'évacuation qui sont installés verticalement, directement à partir de la buse du poêle donnent le meilleur rendement. Les cheminées qui sont installées dans la partie chauffée de la maison ont tendance à produire un léger tirage, même lorsqu'il n'y a pas de feu. Ceci signifie que lorsqu'un feu est allumé, la fumée d'allumage s'envole par la cheminée et un tirage fort se développe rapidement au fur et à mesure que le conduit de fumée de la cheminée se réchauffe. Bien qu'elles soient répandues en Amérique du Nord, les cheminées qui traversent un mur et sont installées le long d'un mur extérieur peuvent causer des problèmes.

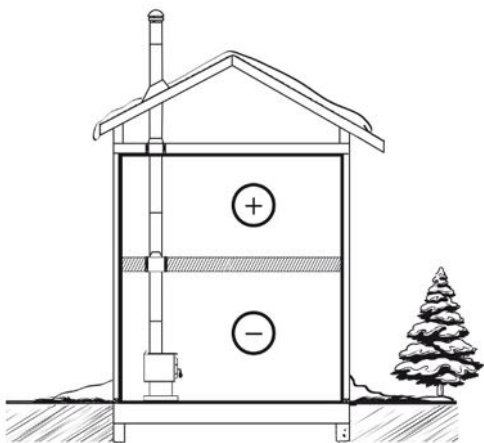


Figure 3: Bonne conception du système

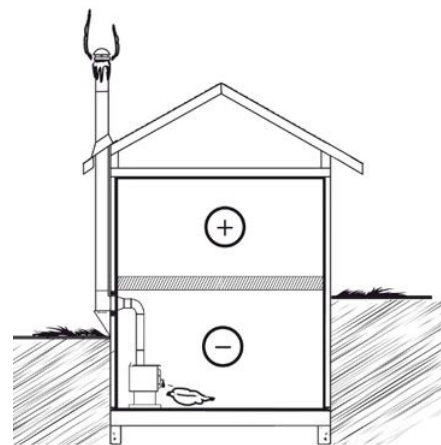
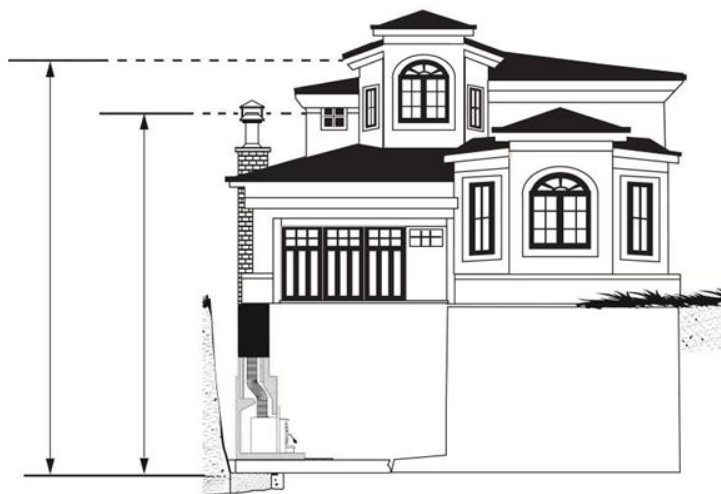


Figure 4: Conception de système acceptable

Lorsqu'il fait froid dehors, l'air chaud de la maison, qui est plus léger, tend à s'élever. Ceci crée une légère différence de pression dans la maison. Appelé «effet de cheminée», il se produit une légère pression négative dans la partie basse de la maison (par rapport à l'extérieur) et une zone de légère haute pression dans la partie élevée de la maison. Lorsqu'il n'y a pas de feu qui brûle dans un appareil raccordé à une cheminée moins élevée que l'espace chaud à l'intérieur de la maison, la légère pression négative dans la partie basse de la maison s'opposera au tirage vers le haut souhaité dans la cheminée. Cette situation se présente pour les deux raisons suivantes:

Tout d'abord, la cheminée est située à l'extérieur, le long du mur de la maison, de sorte que l'air qui s'y trouve est plus froid et plus dense que l'air chaud de la maison. Deuxièmement, la cheminée est moins haute que la partie chaude de la maison, ce qui signifie que la pression négative dans la partie basse de la maison aspirera de l'air froid descendant par la cheminée, le poêle et dans la pièce. Même le meilleur poêle ne fonctionnera pas bien s'il est raccordé à cette cheminée.



## 6.5 Apport d'air de combustion

Au Canada, les poêles à bois n'ont pas à être munis d'un apport d'air de combustion de l'extérieur (sauf pour les maisons mobiles). Les recherches ont démontré que ces apports ne compensent pas la dépressurisation de la maison et peuvent ne pas suffire à fournir un apport d'air de combustion par temps venteux. Cependant, pour diminuer les risques associés à un retour de fumée suivant la dépressurisation de la maison, un détecteur de monoxyde de carbone (CO) doit être installé dans la pièce où se trouve le poêle. Le détecteur de CO retentira si, pour quelque raison que ce soit, le poêle à bois ne fonctionne pas correctement.

### 6.5.1 Maison mobile

Si votre poêle est homologué et «approuvé pour maison mobile». Il doit donc avoir un conduit d'apport d'air de combustion 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 nécessaire.



## 6.5.2 Maison 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. Contrairement aux croyances populaires, presque toutes les nouvelles maisons, scellées hermétiquement, 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.

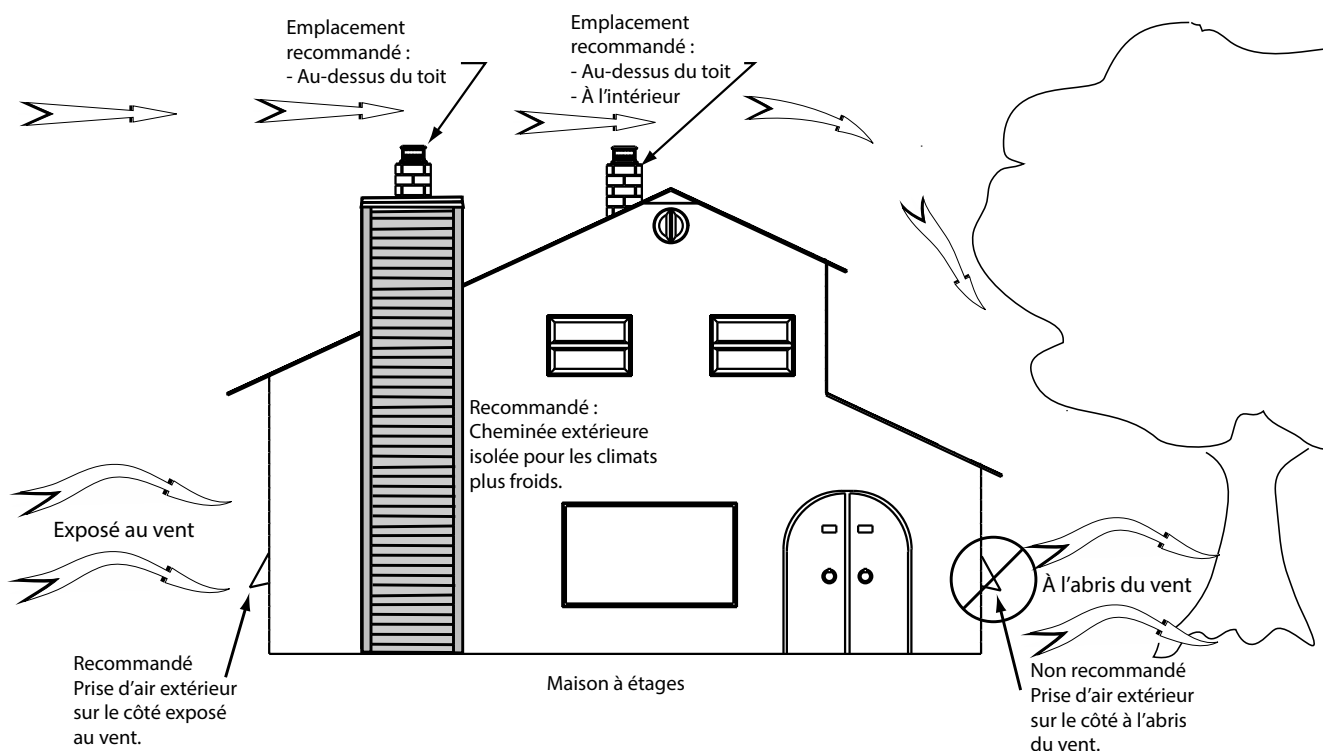


Figure 5: Apport d'air dans les maisons conventionnelles

Si une entrée d'air est installée dans le mur de la maison, sa pression peut varier par temps venteux. Si des changements dans le rendement du poêle à bois par temps venteux, et en particulier si des bouffées de fumée sortent du poêle, le conduit d'apport d'air devrait être débranché du poêle afin de vérifier si ce dernier constitue la cause du problème. Dans certaines conditions venteuses, de la pression négative près du capuchon contre les intempéries à l'extérieur de la maison 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.

## 6.6 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 éléments de tuyau à paroi simple se vendent dans la plupart des quincailleries et magasins de matériaux de construction. Ces sections n'ont généralement pas subi d'essais selon une norme précise, ni été homologuées. 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.

Les raccords de cheminée à paroi double ont subi des essais et sont homologués. Les règles concernant les tuyaux à paroi double se trouvent dans les instructions d'installation du fabricant. Ces règles sont très différentes de celles concernant les tuyaux à paroi simple. Vous référer au *manuel d'installation, section des options* pour savoir si une configuration spéciale est requise sur votre produit.

### 6.6.1 Installation d'un raccord de cheminée à paroi simple

L'ensemble du raccord de cheminée a été appelé «le maillon faible» dans la sécurité des systèmes de chauffage au bois, parce que si le raccord est mal installé (ce qui est arrivé souvent auparavant), cela peut provoquer un incendie.

La meilleure installation de tuyau de fumée est celle qui monte directement du poêle jusqu'à la base de la cheminée sans aucun coude. Les installations droites causeront probablement moins de problèmes, comme les retours de fumée, lorsqu'on ouvre la porte 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.

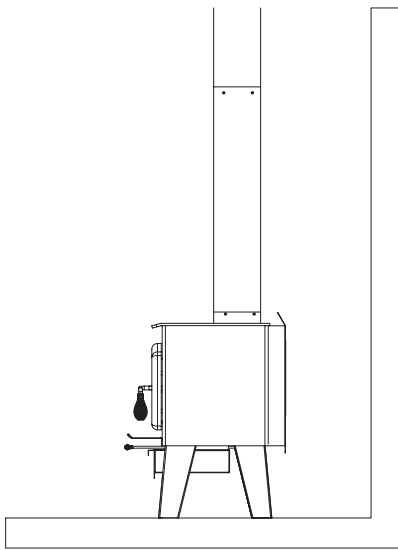


Figure 6: Meilleure

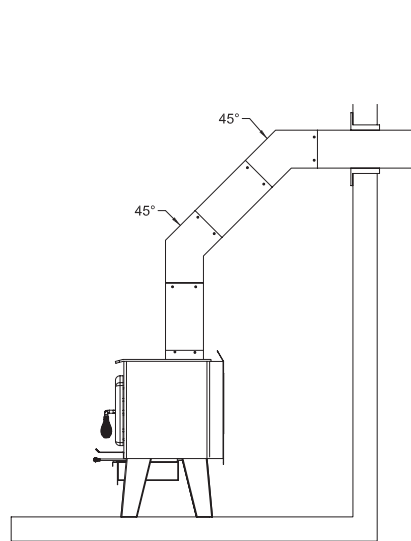


Figure 7: Acceptable

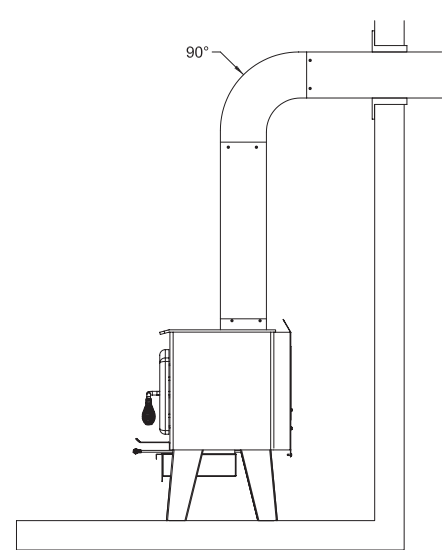


Figure 8: Éviter

Les règles ci-dessous sont basées sur celles que l'on retrouve dans le code d'installation CSA B365. Prière de suivre soigneusement ces instructions d'installation ou celles qui sont en vigueur dans la région.

- Longueur maximum de tuyau horizontal : 10 pi. (3 m) incluant les coudes.
- Dégagement minimum par rapport aux matériaux inflammable : 18 po. (450 mm) Le dégagement minimum peut être réduit de 50 pour cent à 9 po. (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 souvent préférable d'utiliser deux coudes à 45 degrés plutôt qu'un seul coude à 90 degrés, parce que cela crée moins de turbulence dans la fumée et que cela raccourcit la section horizontale.

- 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 pi (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 degrés : 2.
- Longueur horizontale maximum sans support : 3 pi. (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. Utilisez 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 po. (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 po. /pi. (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 combustible est souhaité, l'installation doit être conforme à la norme CSA B365, code d'installation des appareils à combustibles solides et du matériel connexe.
- Une installation de tuyau idéale est celle qui monte tout droit à partir de la buse du poêle directement dans la cheminée, sans coudes. Une installation qui monte tout droit exige soit une section télescopique ou un tuyau d'accouplement pour qu'on puisse la monter et la démonter sans déplacer le poêle.
- Une installation de tuyau droit offre le minimum de restriction à l'échappement de la fumée et donne un meilleur tirage. Les installations droites ont aussi besoin de moins d'entretien parce qu'il n'y a pas d'angles où la créosote puisse se déposer.
- Le raccord de cheminée doit être propre et en bon état.



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[tech@sbi-international.com](mailto:tech@sbi-international.com)



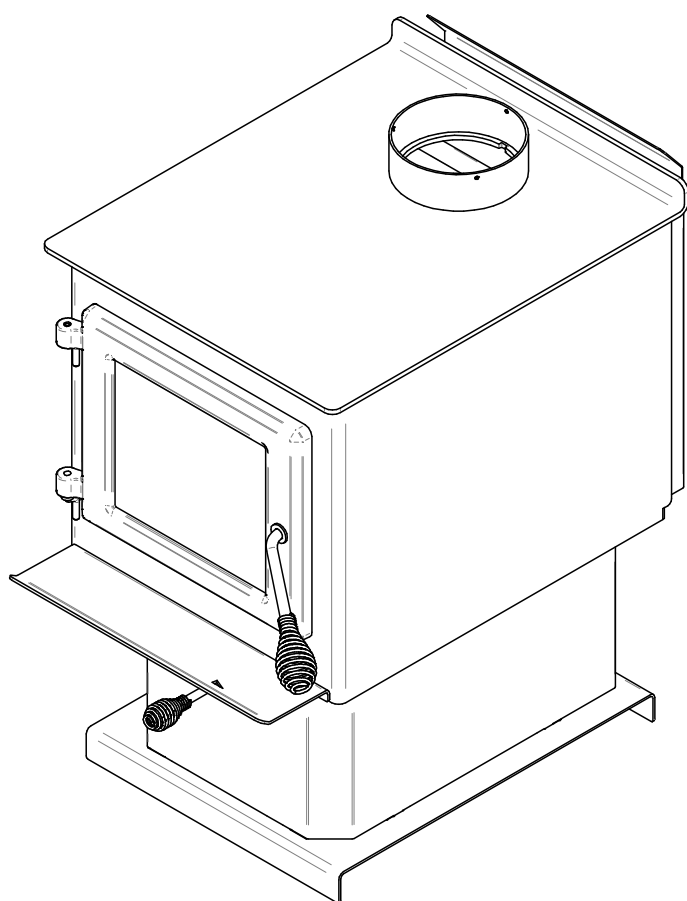
# Wood Stove Owner's Manual

## Part 2 of 2

### BLUE RIDGE 100

(ESW0001 model)

### INSTALLATION AND OPERATION REQUIREMENTS



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



ENGLISH

CONTACT LOCAL BUILDING OR FIRE OFFICIALS ABOUT RESTRICTIONS AND INSTALLATION INSPECTION REQUIREMENTS IN LOCAL AREA.

READ THIS ENTIRE MANUAL BEFORE INSTALLATION AND USE OF THIS WOOD STOVE. FAILURE TO FOLLOW THESE INSTRUCTIONS COULD RESULT IN PROPERTY DAMAGE, BODILY INJURY OR EVEN DEATH.

**READ AND KEEP THIS MANUAL FOR REFERENCE**

Dealer: \_\_\_\_\_

Installer: \_\_\_\_\_

Phone Number: \_\_\_\_\_

**Serial Number:** \_\_\_\_\_

### ONLINE WARRANTY REGISTRATION

If the unit requires repairs during the warranty period, proof of purchase must be provided. The purchase invoice must be kept. The date indicated on it establishes the warranty period. If it can not be provided, the warranty period will be determined by the date of manufacture of the product. It is also highly recommended to register the warranty online at

<https://heatredefined.com/pages/warranty-registration>

Registering the warranty will help to quickly find the information needed on the unit.



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# 1. CERTIFICATION PLATE



**Intertek**  
 April/Avril 2022  
 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 ULC S627  
 Certified to/Certifié selon UL 1482  
 Certified to/Certifié selon UL 737  
 Certified to/Certifié selon CSA B415.1-10  
 Certified to/Certifié selon ASTM E3053-17  
 Certified to/Certifié selon ASTM E2515-11 (R2017)

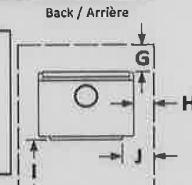
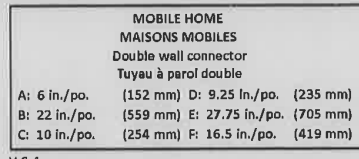
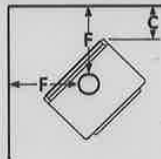
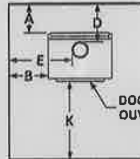
**LISTED SOLID FUEL BURNING APPLIANCE**

**POÊLE À COMBUSTIBLE SOLIDE HOMOLOGUÉ**

**MODEL / MODÈLE :  
 BLUE RIDGE 100**

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: 14 in./po. (356 mm)	A: 6 in./po. (152 mm)	A: 12 in./po. (305 mm)	A: 6 in./po. (152 mm)	G: 8 in./po. (203 mm)	I: 16 in./po. (406 mm)		
B: 18 in./po. (457 mm)	B: 18 in./po. (457 mm)	B: 18 in./po. (457 mm)	B: 18 in./po. (457 mm)	H: 8 in./po. (203 mm)	J: 8 in./po. (203 mm)		
C: 11 in./po. (279 mm)	C: 7 in./po. (178 mm)	C: 11 in./po. (279 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: 9.25 in./po. (235 mm)	D: 16 in./po. (406 mm)	D: 9.25 in./po. (235 mm)	K: 48 in./po. (1219 mm)			
E: 24.5 in./po. (622 mm)	E: 23.75 in./po. (603 mm)	E: 24.5 in./po. (622 mm)	E: 23.75 in./po. (603 mm)				
F: 18.25 in./po. (464 mm)	F: 13.5 in./po. (343 mm)	F: 18.25 in./po. (464 mm)	F: 13.5 in./po. (343 mm)				

\* See owner's manual for other clearances with lowered ceiling / voir manuel d'installation pour autres dégagements avec plafond abaissé

**PREVENT HOUSE FIRES**

- Install and use only in accordance with the manufacturer's Installation and operating Instructions.
- Contact local building or fire officials about restrictions and Installation Insp...ion 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.
- For use with solid fuel 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 grata 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.
- 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.
- Contactez 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.
- Pour l'usage avec du combustible solide 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.
- 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 de bois.

Weighted average emission rate / Moyenne pondérée des émissions: 1.8 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  
 11/04/2022 (# test)



Fabriqué à St-Augustin-de-Desmaures (Qc), Canada  
 11/04/2022 (# test)

27902

ENGLISH



## 2. General Information

### 2.1 Performances

Values are as measured per test method, except for the recommended heating area, firebox volume, maximum burn time and maximum heat output.

Model	Blue Ridge 100 (ESW0001)	
Combustion type	Non-catalytic	
Fuel Type	Dry Cordwood	
Recommended heating area (sq. ft.) <sup>1</sup>	250 to 1,200 ft <sup>2</sup> (23 to 111 m <sup>2</sup> )	
Total firebox volume	1.7 ft <sup>3</sup> (0.0481 m <sup>3</sup> )	
EPA loading volume	1.55 ft <sup>3</sup> (0.0439 m <sup>3</sup> )	
Maximum burn time <sup>1</sup>	5 hours	
Maximum heat output (dry cordwood) <sup>2</sup>	45,000 BTU/h (13.2 kW)	
Overall heat output rate (min. to max.) <sup>2 3</sup>	12,124 BTU/h to 26,700 BTU/h (3.55 kW to 7.83 kW)	
Average overall efficiency <sup>3</sup> (Dry cordwood)	74 % (HHV) <sup>4</sup>	79 % (LVH) <sup>5</sup>
Optimum efficiency <sup>6</sup>	80 %	
Optimum heat transfer efficiency <sup>7</sup>	79 %	
Average particulate emissions rate <sup>8</sup>	1.8 g/h (EPA / CSA B415.1-10) <sup>9</sup>	
Average CO <sup>10</sup>	74 g/h	

<sup>1</sup> Recommended heating area and maximum burn time may vary subject to location in home, chimney draft, heat loss factors, climate, fuel type and other variables. The recommended heated area for a given appliance is defined by the manufacturer as its capacity to maintain a minimum acceptable temperature in the designated area in case of a power failure.

<sup>2</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> and reloading intervals ranging from 60 to 120 minutes. Other performances are based on a fuel load prescribed by the standard without any reloading between start and finish. 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>3</sup> As measured per CSA B415.1-10 stack loss method.

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

<sup>5</sup> Lower Heating Value of the fuel.

<sup>6</sup> Optimum overall efficiency at a specific burn rate (LHV).

<sup>7</sup> The optimum heat transfer efficiency is for the low burn rate and represents the appliance's ability to convert the energy contained in the wood logs into energy transferred to the room in the form of heat and does not take into account the chemical losses during combustion.

<sup>8</sup> This appliance is officially tested and certified by an independent agency.

<sup>9</sup> Tested and certified in compliance with CFR 40 part 60, subpart AAA, section 60.534(a)(1)(ii) and ASTM E3053-17 based on the ALT-125 sent by EPA on February 28<sup>th</sup>, 2018.

<sup>10</sup> Carbon monoxide.

## 2.2 Specifications

Maximum log length <sup>11</sup>	17 in (432 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)
Minimum chimney height	12 feet
Baffle material	Vermiculite
Approved for alcove installation	Yes
Approved for mobile home installation <sup>12</sup>	Yes
Type of door	Simple, glazed or not, with cast iron frame
Type of glass	Ceramic glass
Blower	Optional (up to 100 CFM)
Particulate emission standard <sup>13</sup>	EPA / CSA B415.1-10

<sup>11</sup> North-south: ends of the logs visible, East-west: sides of the logs visible.

<sup>12</sup> Mobile homes (Canada) or manufactured homes (USA): The US Department of Housing and Urban Development describes “manufactured homes” better known as “mobile homes” as follows; buildings built on fixed wheels and those transported on temporary wheels/axles and set on a permanent foundation. In Canada, a mobile home is a dwelling for which the manufacture and assembly of each component is completed or substantially completed prior to being moved to a site for installation on a foundation and connection to service facilities and which conforms to the CAN/CSA-Z240 MH standard.

<sup>13</sup> Tested and certified in compliance with CFR 40 part 60, subpart AAA, section 60.534(a)(1)(ii) and ASTM E3053-17 based on the ALT-125 sent by EPA on February 28<sup>th</sup>, 2018.

## 2.3 Dimensions

### 2.3.1 Stove Dimensions

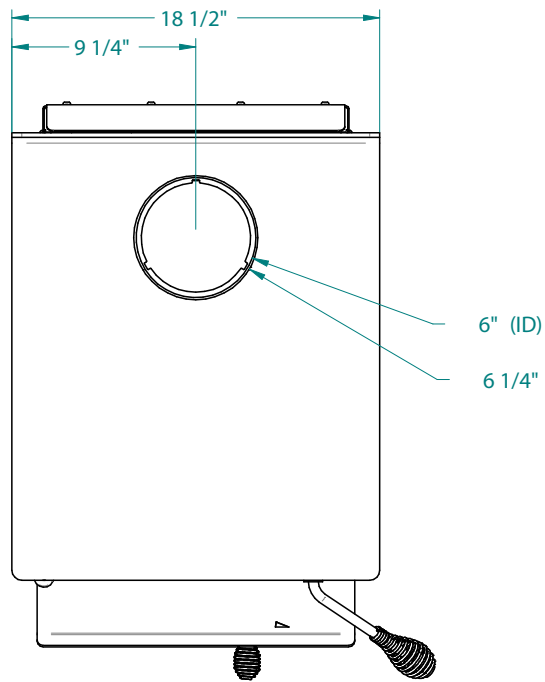


Figure 1: Top View

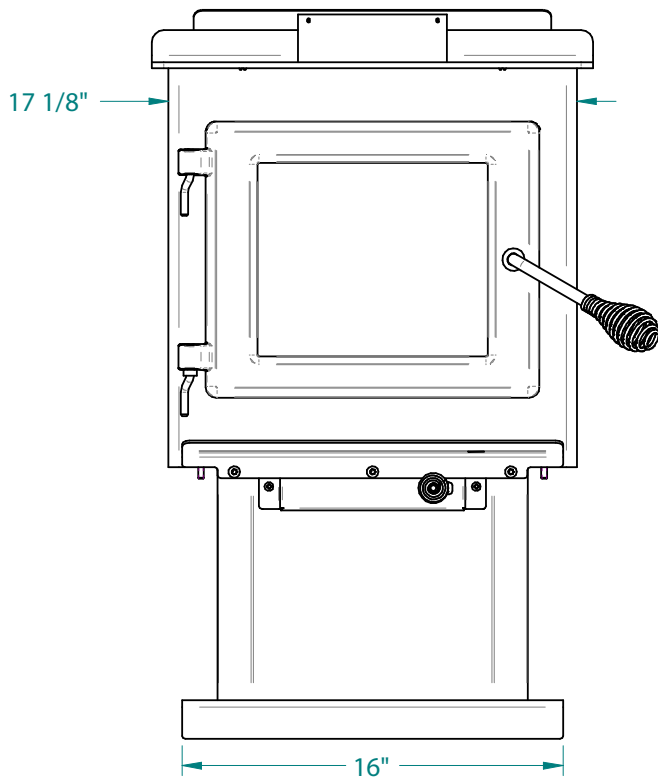


Figure 2: Front View

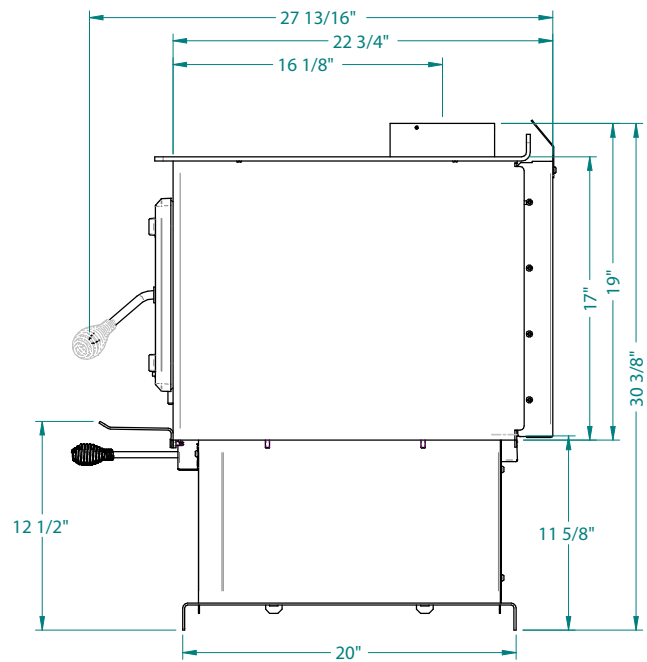


Figure 3: Side View

### 2.3.2 Combustion Chamber Dimensions

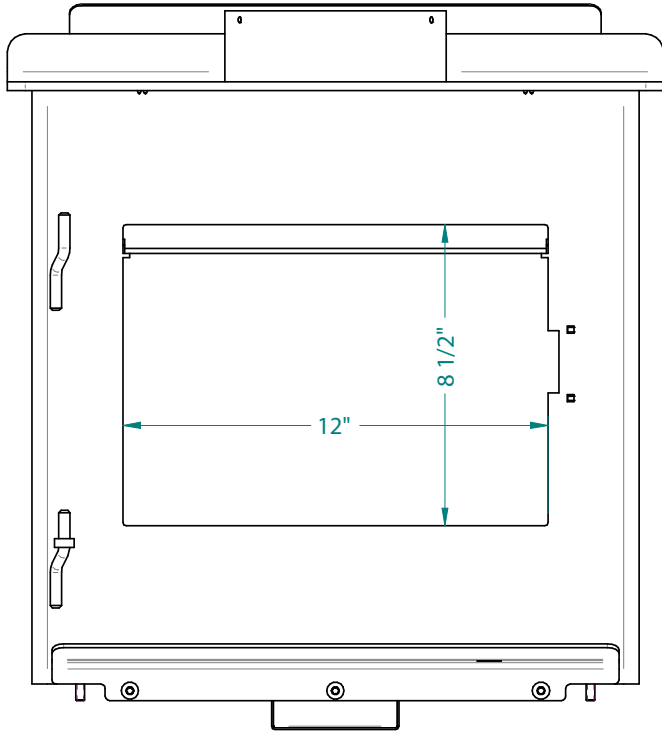


Figure 4: Door Opening

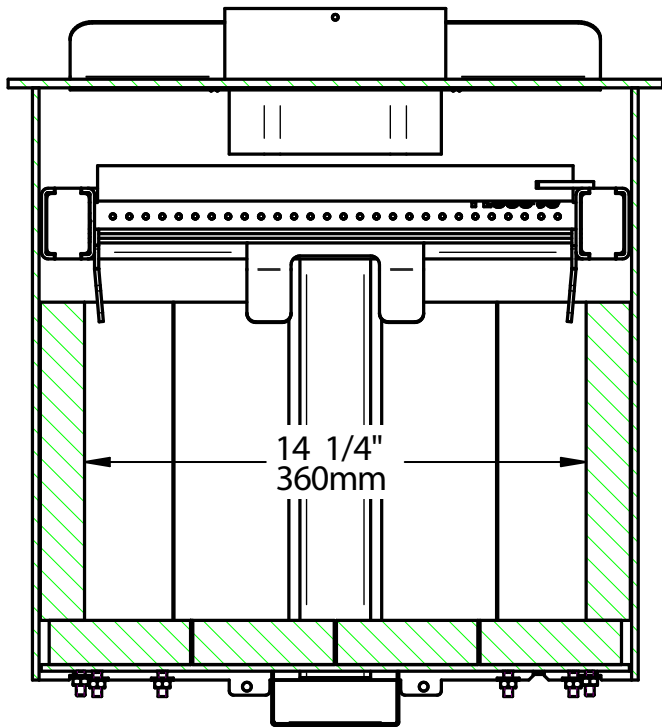


Figure 5: Front View - Combustion Chamber

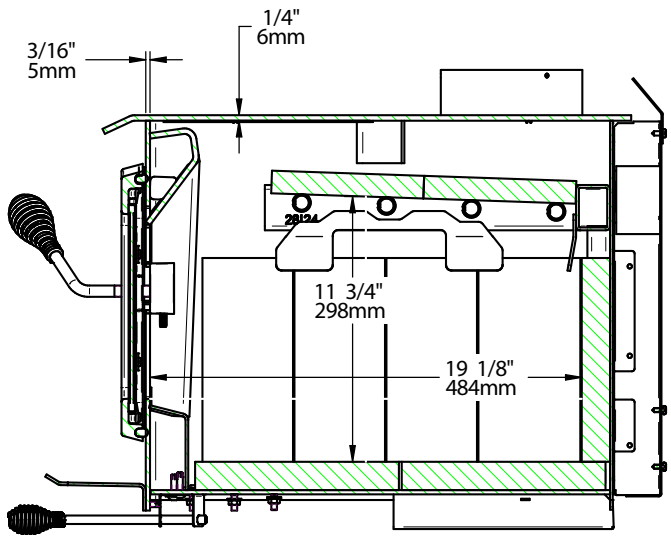


Figure 6: Side View - Combustion Chamber

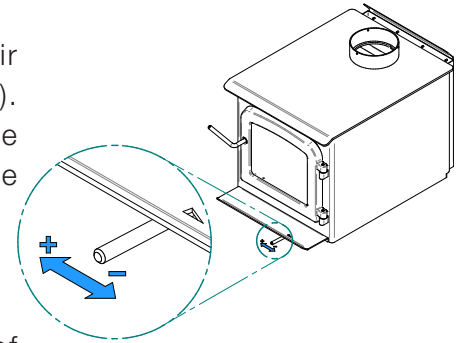
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## 2.4 EPA loading

The charging methods shown below are those that were used during emissions certification.

### 2.4.1 Air control

The air control is located underneath the ash shelf. To open the air control, push the air control handle completely to the left (High). This will increase the burn rate. To close the air control, push the air control handle completely to the right (Low). This will decrease the burn rate.



### 2.4.2 High burn rate (primary air control open)

Open the air control completely. Place six small pieces (2"x2") of wood in the firebox crossing them at the greatest possible angle.

Criss cross fifteen kindling wood pieces on the small pieces of wood in three layers at the greatest possible angle. Tie knot with five sheets of paper and place them on top of the kindling wood. Light up the paper and let the door ajar at 90° until all the kindling wood is on fire and the first row of small pieces of wood is on fire too. Close the door.

When there is no more fire in the front of the firebox and there are only faint flames on the wood in the back of the firebox, break ashes, level the coal bed and put four logs in the firebox. Place the biggest log (about 5"x5") and a medium log (about 4"x4") on the coal bed with a north-south orientation. Place two other medium logs on the first two with the greatest possible angle. Their should be air space between each logs and between the logs and the bricks. Let the door ajar at 90° for approximately two minutes and then close the door.

### 2.4.3 Medium and low burn rate

On a 2" coal bed that is still slightly red, place five logs of approximately 4"x4" or 3"x3" with a north-south orientation. Place three logs on the coal bed and the other two on top with the greatest possible angle. Their should be air space between each logs and between the logs and the bricks. Let the door ajar at 90° for approximately 5 min. Then, close the door with the primary air control open. Leave to burn with the primary air control open for approximately 10 minutes and then close the primary air control completely for the low burn rate and halfway for the medium burn rate.

### 3. Clearances to Combustible Material

The clearances shown in this section have been determined by tests according to procedures set out in safety standards . When the stove is installed so that its surfaces are at or beyond the minimum clearances specified, combustible surfaces will not overheat under normal and even abnormal operating conditions.

**No part of the stove or flue pipe may be located closer to combustibles than the minimum clearance figures given.**

The clearances to combustible walls may be slightly different in Canada and the U.S.A. and may also differ depending on whether single or double wall flue pipe is used. Make sure to choose the correct clearance for the stove location and type of flue pipe.

The clearances of the appliance and the flue pipes must be met individually, meaning the appliance cannot be installed closer to the combustible materials than the single or double wall pipe allows. For a safe way to reduce clearances refer to section "5. Reducing Wall and Ceiling Clearances Safely"

#### 3.1 Clearances

	APPLIANCE CLEARANCES WITH SINGLE WALL PIPE CONNECTOR	
	Canada	USA
<b>A</b>		
<b>B</b>		
<b>C</b>		

	APPLIANCE CLEARANCES WITH DOUBLE WALL PIPE CONNECTOR	
	Canada	USA
<b>A</b>		
<b>B</b>		
<b>C</b>		

If the above clearances are met, then the distances measured from the flue outlet will be:

	DISTANCES <sup>14</sup> FROM PIPE CONNECTOR WITH SINGLE WALL PIPE CONNECTOR	
	Canada	USA
<b>D</b>		
<b>E</b>		
<b>F</b>		

	DISTANCES <sup>14</sup> FROM PIPE CONNECTOR WITH DOUBLE WALL PIPE CONNECTORE	
	Canada	USA
<b>D</b>		
<b>E</b>		
<b>F</b>		

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<sup>14</sup> The pipe distances listed in this table refer to the distances obtained when the stove is installed in accordance with the appliance clearances above mentioned.



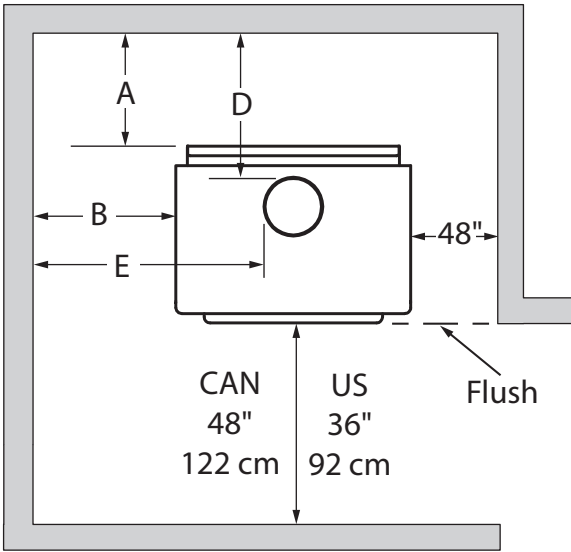


Figure 7: Clearances - Top

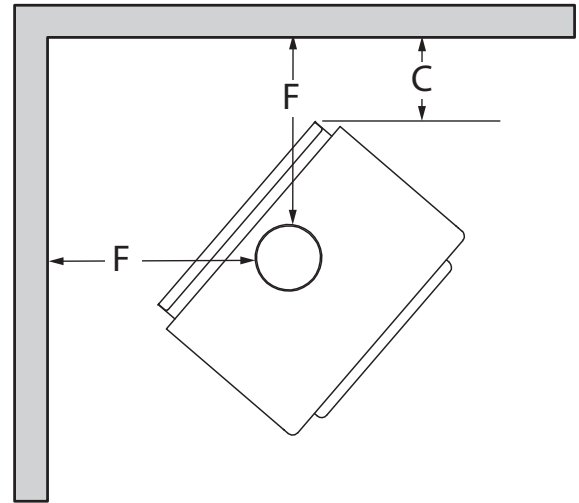


Figure 8: Clearances - Corner

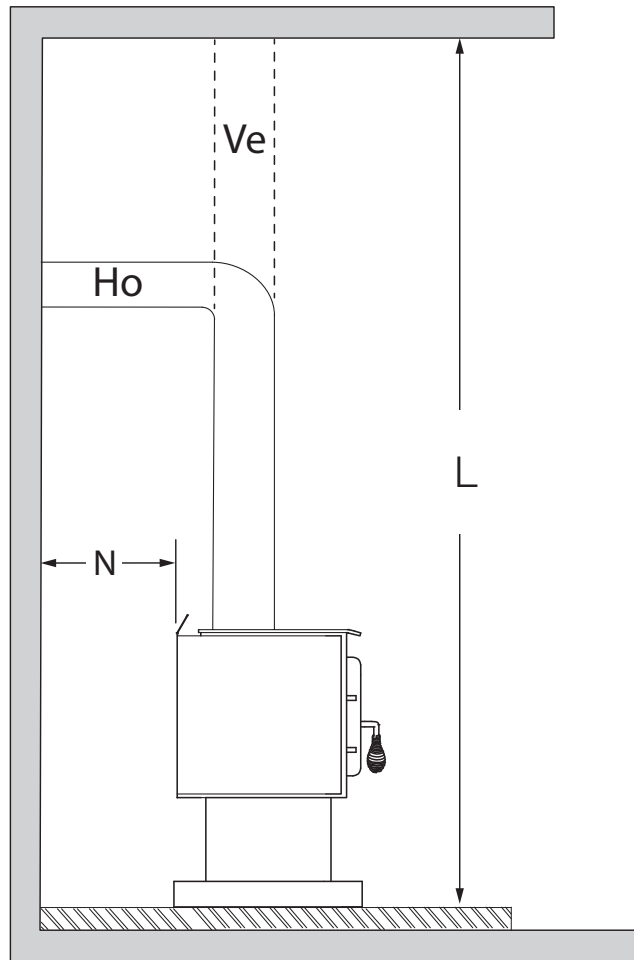


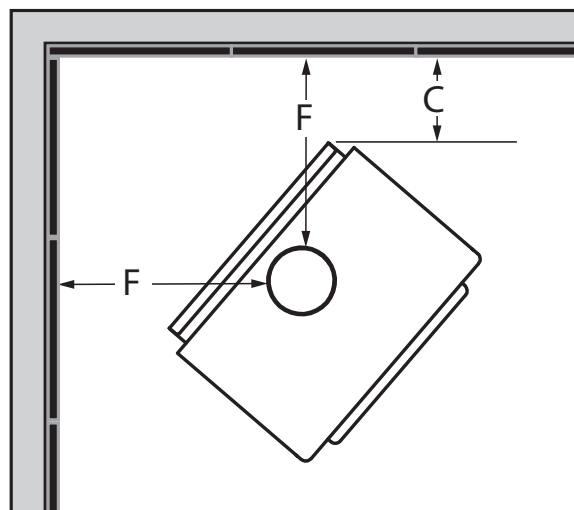
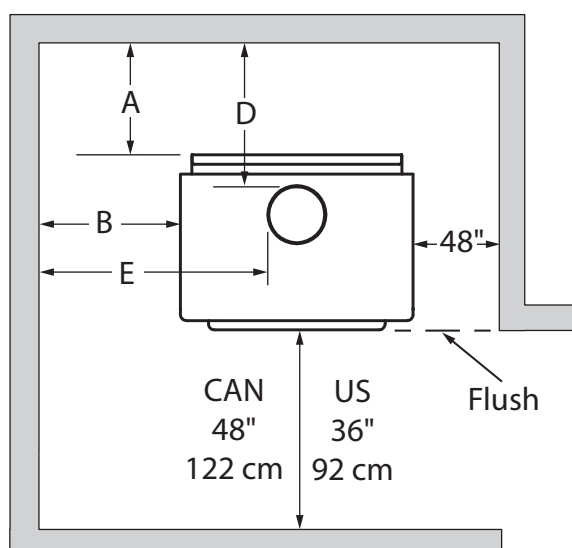
Figure 9: Clearances - Side

### 3.1.1 With Heat Shield AC02762<sup>15</sup>

To reduce the clearances of an appliance using a single wall pipe connector, the use of a heat shield certified with the single wall pipe connector to be used as close as 6" from combustible materials must be used. Only in this case, the same clearances as a certified double wall pipe connector can be used. Refer to the booklet present in the screen options to obtain the dimensions to be respected.

	APPLIANCE CLEARANCES WITH DOUBLE WALL PIPE CONNECTOR	
	Canada	USA
<b>A</b>		
<b>B</b>		
<b>C</b>		

	DISTANCES <sup>16</sup> FROM DOUBLE WALL PIPE CONNECTOR	
	Canada	USA
<b>D</b>		
<b>E</b>		
<b>F</b>		



If the clearance reduction is on the same side as the door handle, position the stove at a minimum of 6 inches from the side wall (clearance B), otherwise it may be located at the clearance shown in the table above.

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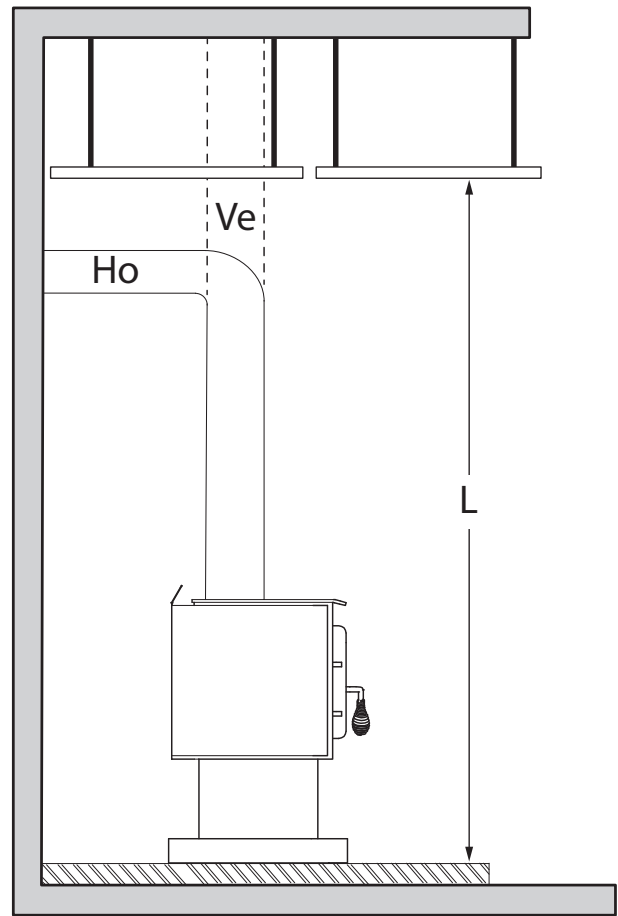
<sup>15</sup> Note that to reduce the clearances of an appliance using a single wall pipe connector, the use of a heat shield certified with the single wall pipe connector to be used as close as 6" from combustible materials must be used. Only in this case, the same clearances as a certified double wall pipe connector can be used.

<sup>16</sup> The pipe distances listed in this table refer to the distances obtained when the stove is installed in accordance with the appliance clearances above mentioned.

### 3.1.2 With Lowered Ceiling

	APPLIANCE CLEARANCES WITH SINGLE WALL PIPE CONNECTOR	
	Canada	USA
<b>A</b>		
<b>B</b>		
<b>C</b>		
<b>L</b>		

	APPLIANCE CLEARANCES WITH DOUBLE WALL PIPE CONNECTOR	
	Canada	USA
<b>A</b>		
<b>B</b>		
<b>C</b>		
<b>L</b>		



If the above clearances are met, then the distances measured from the flue outlet will be:

	DISTANCES <sup>17</sup> FROM PIPE CONNECTOR WITH SINGLE WALL PIPE CONNECTOR	
	Canada	USA
<b>D</b>		
<b>E</b>		
<b>F</b>		

	DISTANCES <sup>17</sup> FROM PIPE CONNECTOR WITH DOUBLE WALL PIPE CONNECTOR	
	Canada	USA
<b>D</b>		
<b>E</b>		
<b>F</b>		

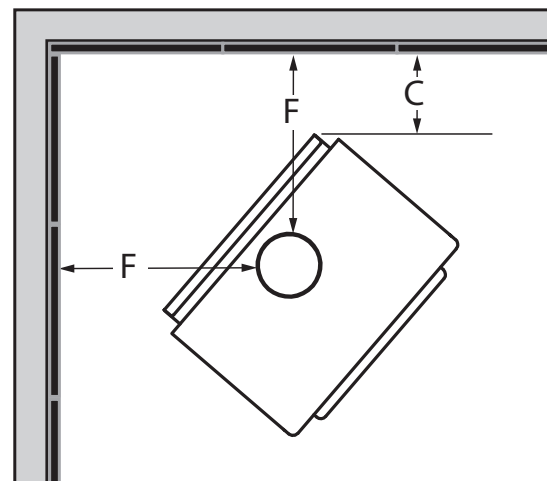
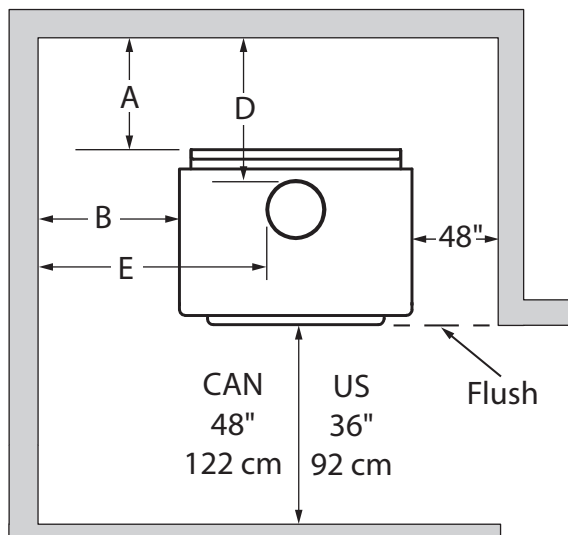
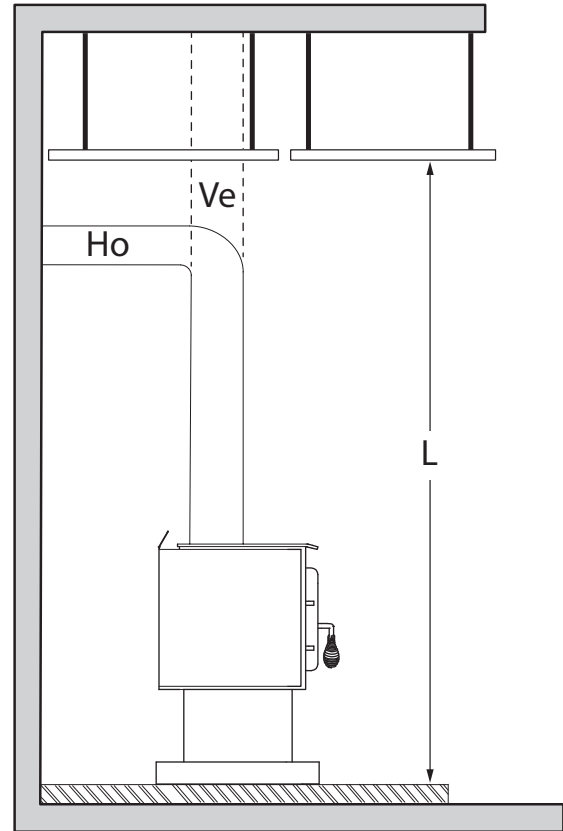
<sup>17</sup> The pipe distances listed in this table refer to the distances obtained when the stove is installed in accordance with the appliance clearances above mentioned.

### 3.1.3 With Heat Shield AC02762 and Lowered Ceiling

To reduce the clearances of an appliance using a single wall pipe connector, the use of a heat shield certified with the single wall pipe connector to be used as close as 6" from combustible materials must be used. Only in this case, the same clearances as a certified double wall pipe connector can be used. Refer to the booklet present in the screen options to obtain the dimensions to be respected.

	APPLIANCE CLEARANCES WITH DOUBLE WALL PIPE CONNECTOR	
	Canada	USA
<b>A</b>		
<b>B</b>		
<b>C</b>		
<b>L</b>		

	DISTANCES <sup>18</sup> FROM PIPE CONNECTOR WITH DOUBLE WALL PIPE CONNECTOR	
	Canada	USA
<b>D</b>		
<b>E</b>		
<b>F</b>		



**If the clearance reduction is on the same side as the door handle, position the stove at a minimum of 6 inches from the side wall (clearance B), otherwise it may be located at the clearance shown in the table above.**

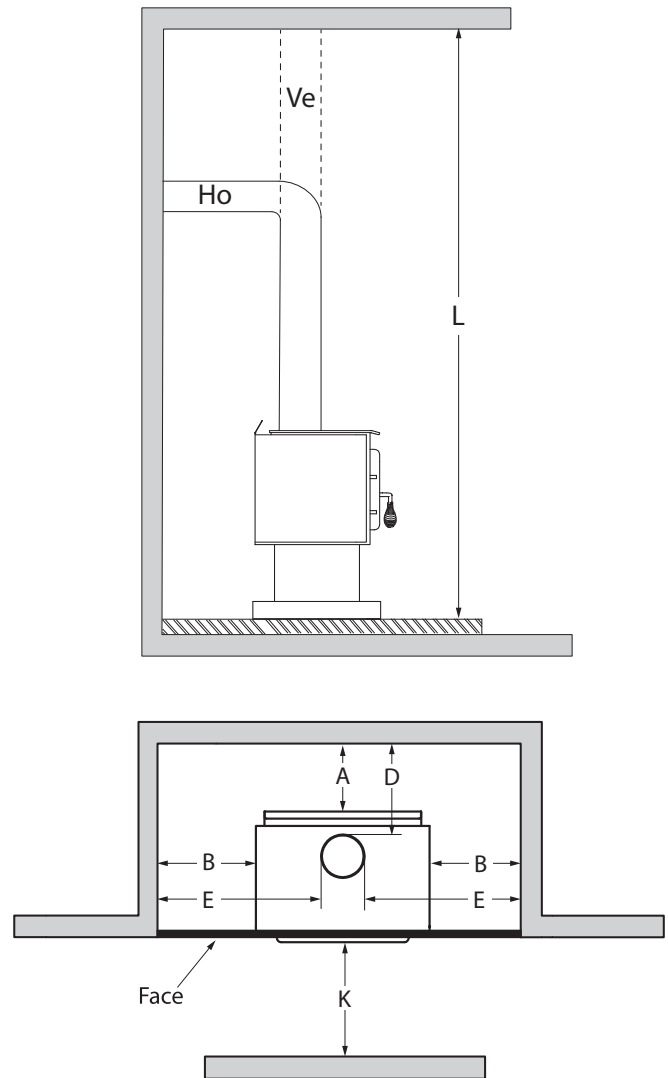
<sup>18</sup> The pipe distances listed in this table refer to the distances obtained when the stove is installed in accordance with the appliance clearances above mentioned.

### 3.1.4 Inside a Combustible Alcove

See section 3.1 for single wall pipe installation.

	APPLIANCE CLEARANCES WITH DOUBLE WALL PIPE CONNECTOR	
	Canada	USA
<b>A</b>		
<b>B</b>		
<b>K</b>		
<b>L</b>		

	DISTANCES <sup>19</sup> FROM PIPE CONNECTOR WITH DOUBLE WALL PIPE CONNECTOR	
	Canada	USA
<b>D</b>		
<b>E</b>		



### 3.1.5 Mobile Home

It is strictly **forbidden** to install a unit with a **single wall pipe** in a **mobile home**.

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	APPLIANCE CLEARANCES WITH DOUBLE WALL PIPE CONNECTOR	
	Canada	USA
<b>A</b>		
<b>B</b>		
<b>C</b>		

	DISTANCES <sup>19</sup> FROM PIPE CONNECTOR WITH DOUBLE WALL PIPE CONNECTOR	
	Canada	USA
<b>D</b>		
<b>E</b>		
<b>F</b>		

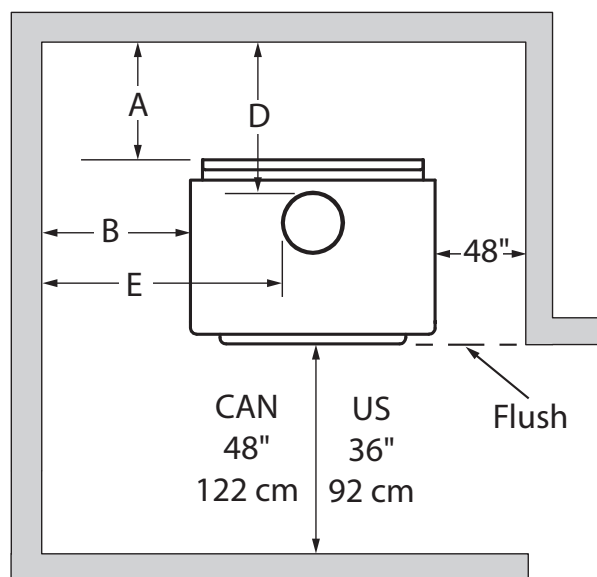
<sup>19</sup> The pipe distances listed in this table refer to the distances obtained when the stove is installed in accordance with the appliance clearances above mentioned.

### 3.1.6 Mobile Home With Heat Shield AC02762

It is strictly **forbidden** to install a unit with a **single wall pipe** in a **mobile home**.

	APPLIANCE CLEARANCES WITH DOUBLE WALL PIPE CONNECTOR	
	Canada	USA
A		
B		
C		

	DISTANCES <sup>20</sup> FROM PIPE CONNECTOR WITH DOUBLE WALL PIPE CONNECTOR	
	Canada	USA
D		
E		
F		



If the clearance reduction is on the same side as the door handle, position the stove at a minimum of 6 inches from the side wall (clearance B), otherwise it may be located at the clearance shown in the table above.

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<sup>20</sup> Les distances de tuyau listées dans ce tableau se réfèrent aux distances obtenues lorsque le poêle est installé en accord avec les dégagements de l'appareil mentionnés ci-dessus.

## 4. Floor Protection

This stove is designed to prevent the floor from overheating. However, it must be placed on a non-flammable surface to protect the floor from hot embers that may fall during loading.

The floor protection must be a continuous, non combustible material, such as steel with a minimum thickness of 0.015" (0.38 mm) or ceramic tiles sealed together with grout. Cement board, brick, or any other approved or listed material suited for floor protection. No R factor required.

Any type of tile will require a continuous non combustible sheet beneath to prevent the possibility of embers falling through to the combustible floor if cracks or separation should occur in the finished surface. Check local codes for approved alternatives.

No protection is required if the unit is installed on a non-combustible floor (ex: concrete).

	FLOOR PROTECTION	
	Canada	USA
<b>G<sup>21</sup></b>	8" (203 mm)	N/A
<b>H</b>	8" (203 mm)	N/A
<b>I</b>	18" (457 mm) From door opening	16" (203 mm) From door opening
<b>J</b>	N/A	8" (203 mm)
<b>K</b>	34 ½" (876 mm)	31 ¼" (794 mm)
<b>N<sup>22</sup></b>	N/A	See note 22
<b>S</b>	48 ¾" (1238 mm)	38 ¾" (984 mm)
<b>T</b>	34 ½" (876 mm)	27 ½" (698 mm)
<b>U</b>	34 ½" (876 mm)	31 ¼" (794 mm)
<b>V</b>	66" (1676 mm)	54 3/8" (1381 mm)

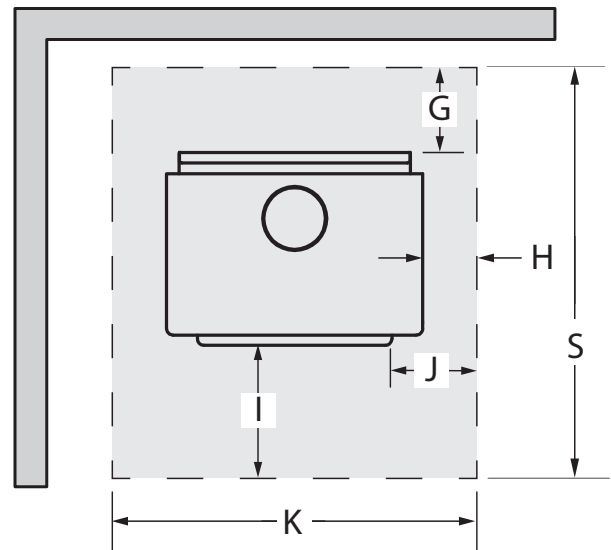
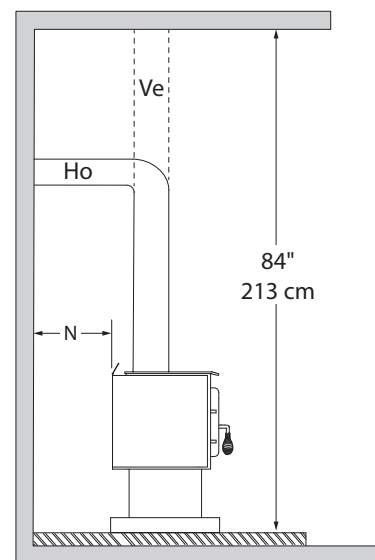
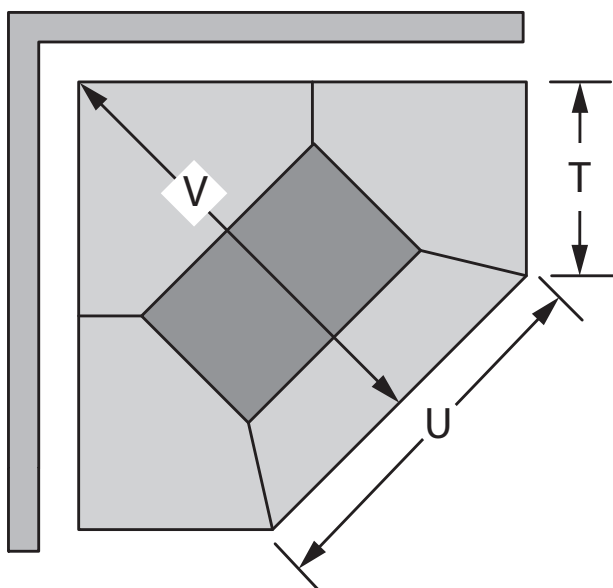


Figure 10: Floor Protection



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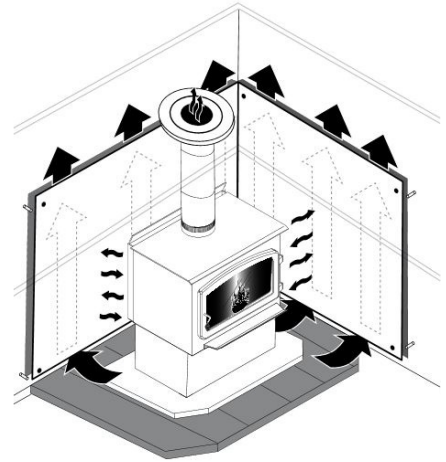
<sup>21</sup> The floor protection at the back of the stove is limited to the stove's required clearance if such clearance is smaller than 8 inches (203 mm).

<sup>22</sup> Only required under the horizontal section (Ho) of the connector. Must exceed each side of the connector by at least 2 inches (51 mm).

## 5. Reducing Wall and Ceiling Clearances Safely

It is often desired to use as little space as possible when installing a wood stove. To do this, it is possible to reduce the clearances safely and install the stove closer to the walls by permanently installing a heat shield between the stove and the flammable material.

The rules for heat shields are sometimes complicated. Read and apply the instructions carefully. Some regions may have different regulations. Consult the local building code or contact the fire department for restrictions, inspection and installation requirements in the area.



### 5.1 Shield Construction Rules

- Adhesives used in shield construction must not ignite or lose adhesive qualities at temperatures likely to be encountered.
  - Mounting hardware which extends from the shield surface into combustibles may be used only at the edges of the shield.
  - Mounting hardware must allow full vertical ventilation.
- A) Minimum clearance between the appliance top and an unshielded combustible ceiling (for a ceiling 72" from the floor):  
43 5/8" (1108 mm)
- B) Shield extension above the appliance: 20" (500 mm)
- C) Minimum space behind the shield: 1" (25 mm). In Canada 7/8" (21 mm)
- D) Clearance along the bottom of the shield: minimum 1" (25 mm) and maximum 3" (75 mm)
- E) Minimum clearance along the top of the shield: 3" (75 mm)
- F) Mounting hardware must not be located closer than 8" (200 mm) from the vertical centre line of the appliance.
- G) Edge clearance for ceiling shields to side and back walls: 3" (75 mm)
- H) Shield extension beyond each side of the appliance: 18" (450 mm).

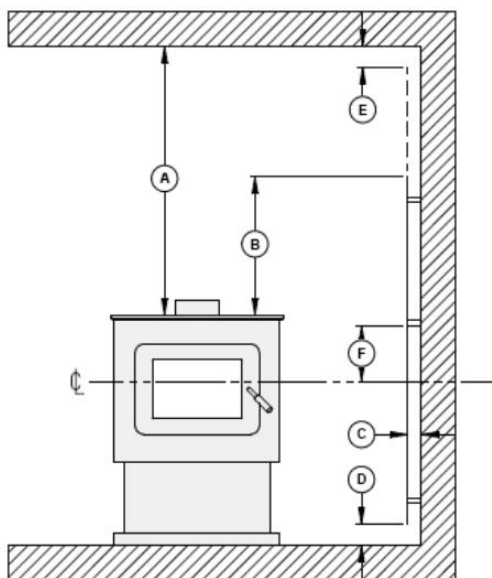


Figure 11: Heat shield clearances

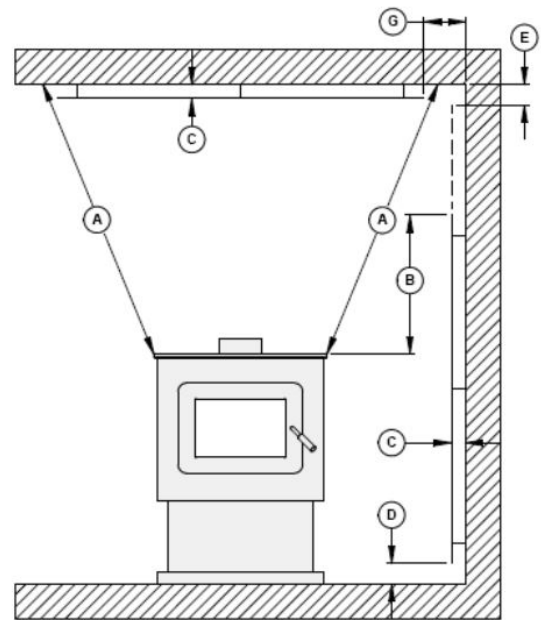


Figure 12: Heat shield clearances



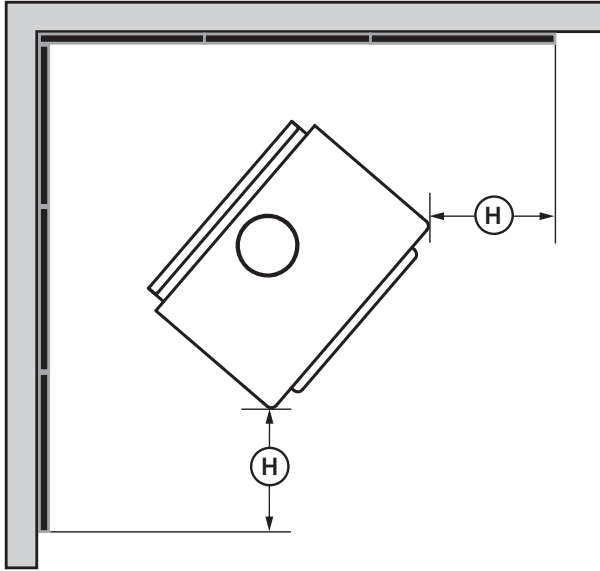


Figure 13: Heat shield clearances

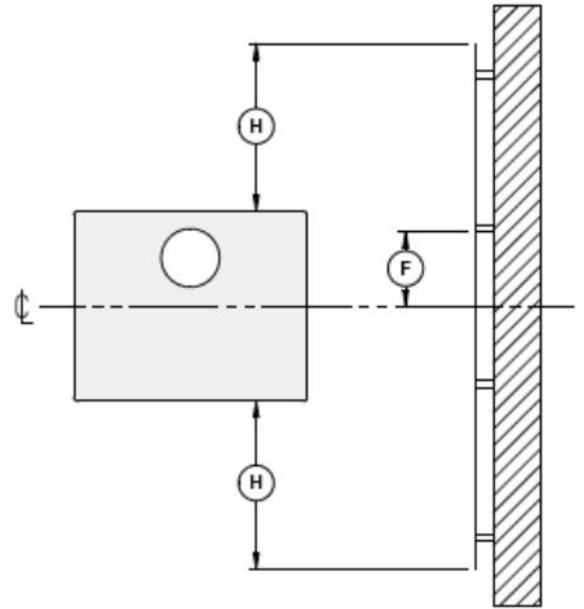
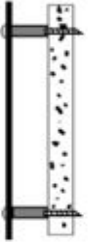
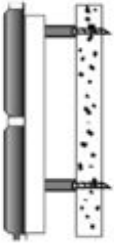
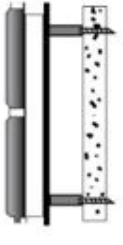
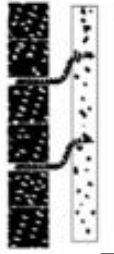
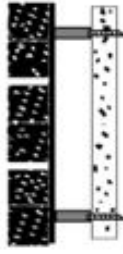


Figure 14: Heat shield clearances

TYPE OF SHIELD	CLEARANCES MAY BE REDUCED BY THESE PERCENTAGES				
	SIDES AND REAR		TOP (CEILING)		
	CAN / USA (%)	USA MIN.	CAN / USA (%)	USA MIN.	
Sheet metal, a minimum of 24 gauge (0.61 mm) in thickness , spaced out at least 1" (25 mm)* by non-combustible spacers	67	12" (305 mm)	50	18" (457 mm)	
Ceramic tiles, or equivalent non-combustible material, on non-combustible board spaced out at least 1" (25 mm)* by non-combustible spacers	50	18" (457 mm)	33	24" (610 mm)	
Ceramic tiles, or equivalent non-combustible material, on non-combustible board, with a minimum of 24 gauge (0.61 mm) sheet metal backing spaced out at least 1" (25 mm)* by non-combustible spacers	67	12" (305 mm)	50	24" (610 mm)	
Brick, spaced out at least 1" (25 mm)* by non-combustible spacers	50	18" (457 mm)	N/A	N/A	
Brick, with a minimum of 24 gauge (0.61 mm) sheet metal backing, spaced out at least 1" (25 mm)* by non-combustible spacers	67	12" (305 mm)	N/A	N/A	

\* In Canada this space can be 7/8" (21 mm)

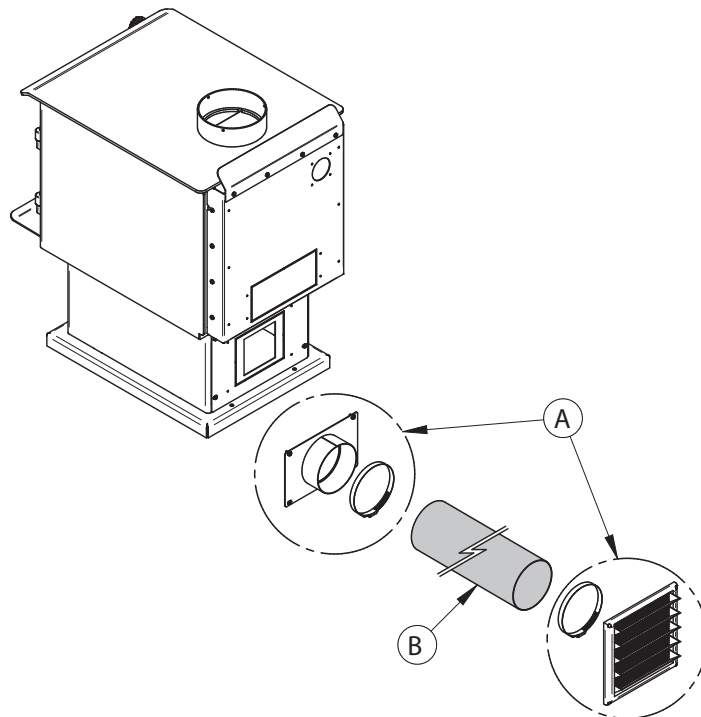
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## 6. OPTIONS INSTALLATION ON YOUR PRODUCT

## 6.1 Optional Fresh Air Intake Kit Installation

THE IMAGES SHOWN ARE INDICATIVE ONLY AND MAY DIFFER OF YOUR PRODUCT, BUT THE ASSEMBLY REMAINS THE SAME.

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



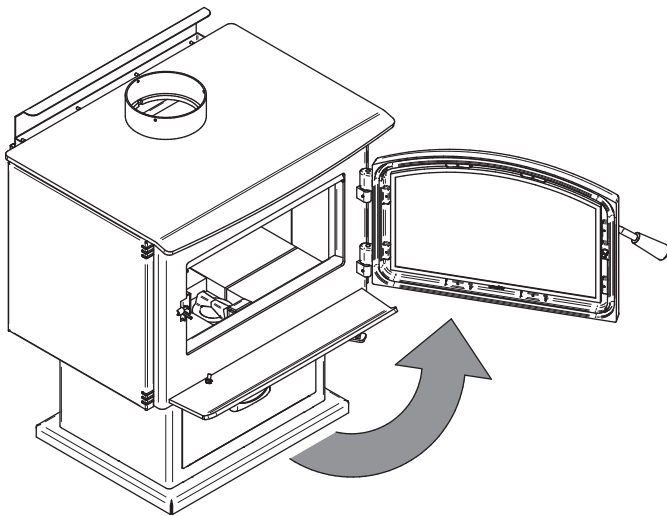
## 6.2 Optional Fire Screen Installation

THE IMAGES SHOWN ARE INDICATIVE ONLY AND MAY DIFFER OF YOUR PRODUCT, BUT THE ASSEMBLY REMAINS THE SAME.

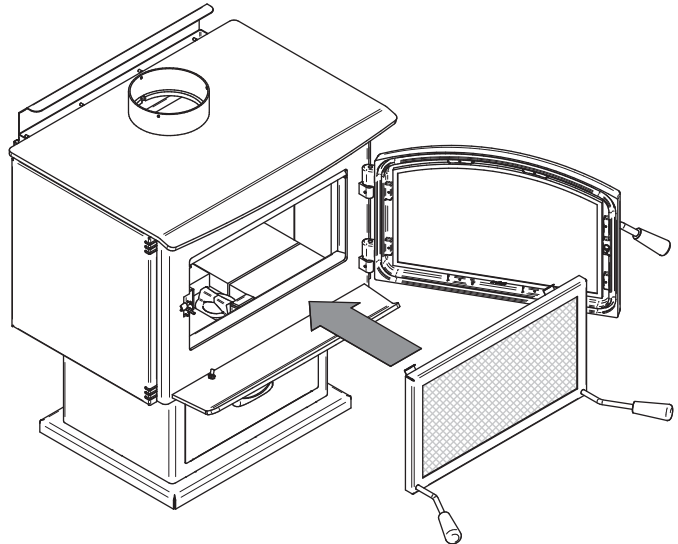
In the United States or in provinces with a particulate emission limit (eg US EPA), the use of wood stoves with open door with and fire screen is prohibited.

It is prohibited to use this wood stove with a fire screen in a mobile home.

1. Open the door.



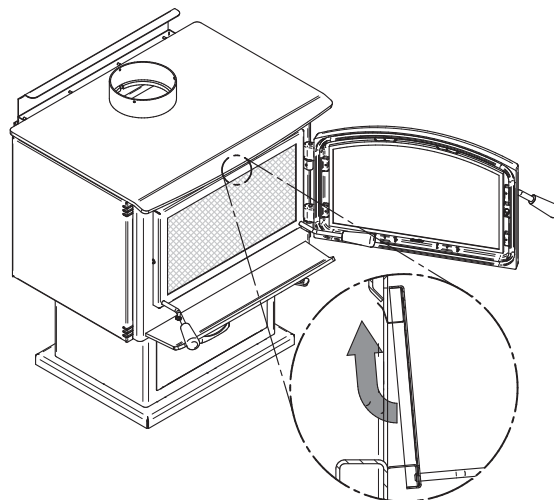
2. Hold the fire screen by the two handles and bring it close to the door opening.



3. Lean the upper part of the fire screen against the top door opening making sure to position the top fire screen brackets behind the primary air deflector.

4. Lift the fire screen upwards and push the bottom part towards the stove then let the fire screen rest on the bottom of the door opening.

**Warning: Never leave the stove unattended while in use with the fire screen.**

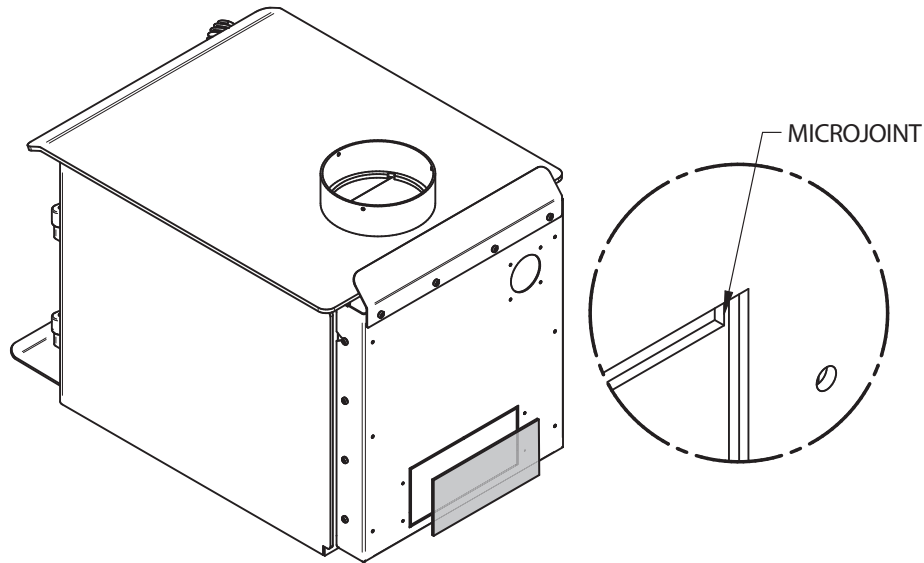


## 6.3 Optional Blower And Thermodisc Installation

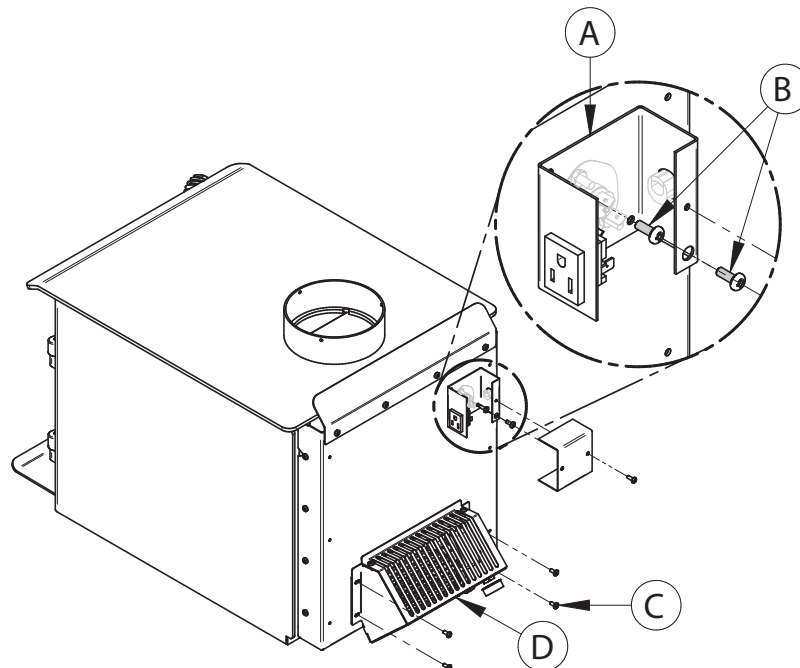
THE IMAGES SHOWN ARE INDICATIVE ONLY AND MAY DIFFER OF YOUR PRODUCT, BUT THE ASSEMBLY REMAINS THE SAME.

A blower and a thermodisc, sold separately, can be installed on the stove. The installation of the blower is identical for a stove on legs or pedestal. Thermodisc allows the blower to operate only when the stove is hot enough. See the instructions provided with the thermodisc for more details.

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

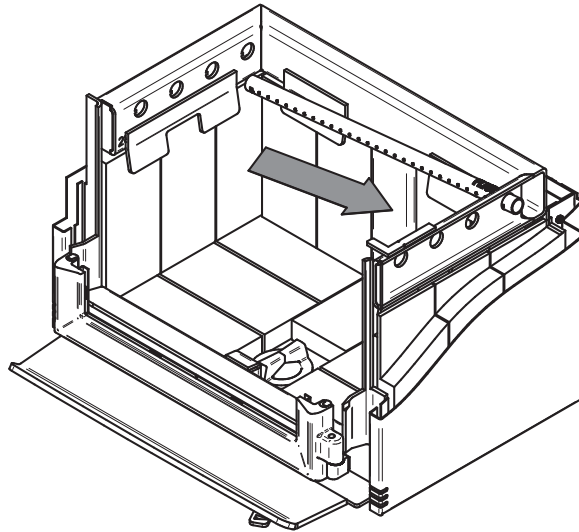


2. Screw the blower **(D)** in place using the screws **(C)** included in the installation manual. Screw the thermodisc **(A)** with the screws **(B)** supplied with the thermodisc on the back of the stove. **Ensure that the blower's power cord is not in contact with any surface of the stove to prevent electrical shock or fire damage. Do not run the power cord beneath the stove.**

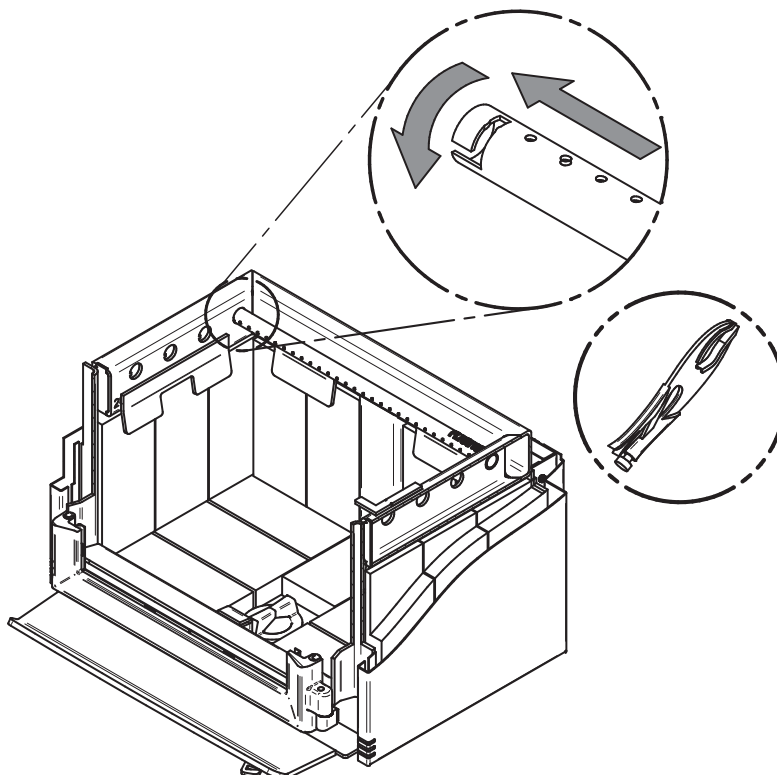


## 6.4 Air Tubes And Baffle Installation

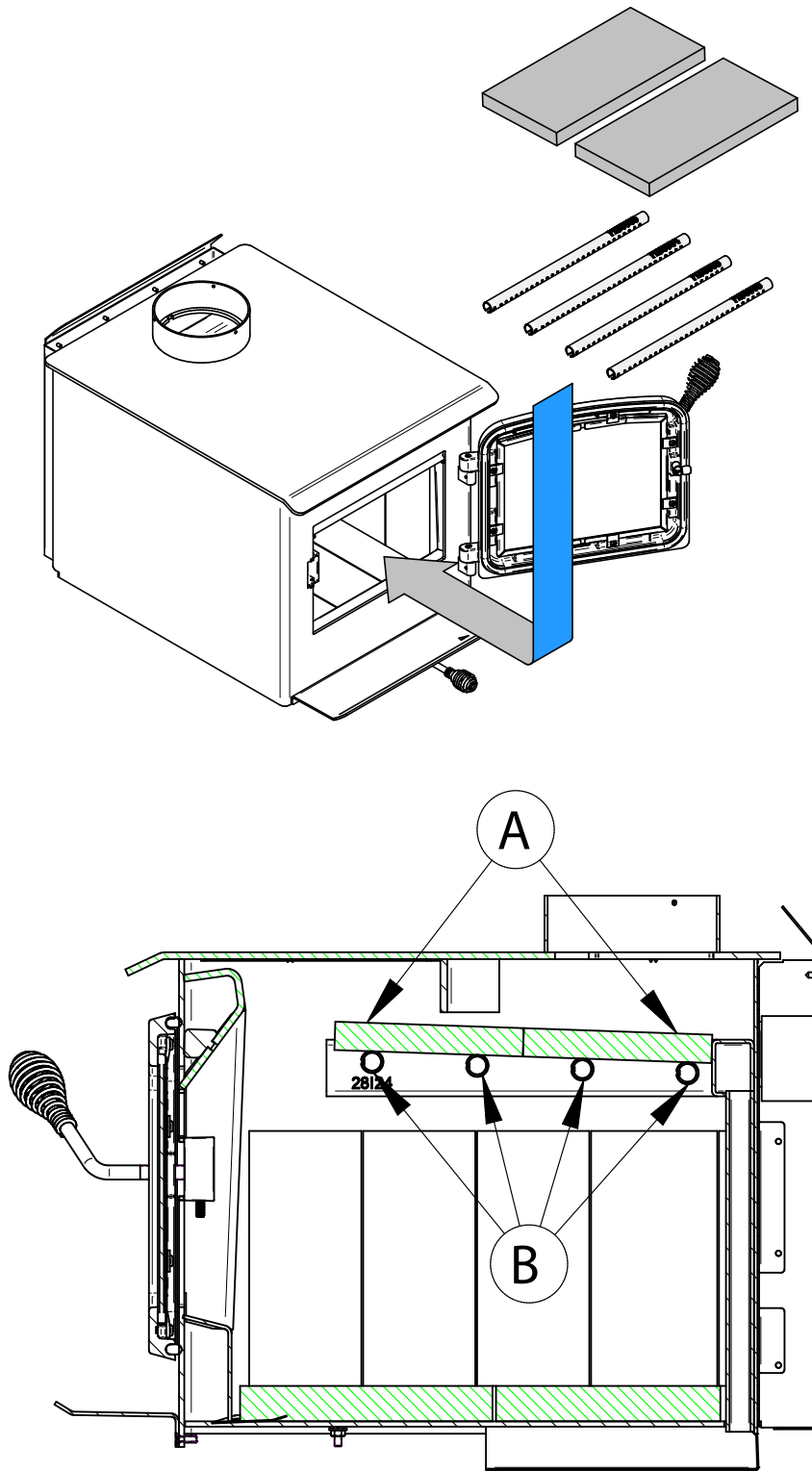
1. Starting with the rear tube, lean and insert the right end of the secondary air tube into the rear right channel hole. Then lift and insert the left end of the tube into the rear left channel.



2. Align the notch in the left end of the tube with the key of the left air channel hole. Using a Vise 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 (B) can be replaced without removing the baffle board (A) and that all tube are not necessarily identical (look at the part number on the tube).



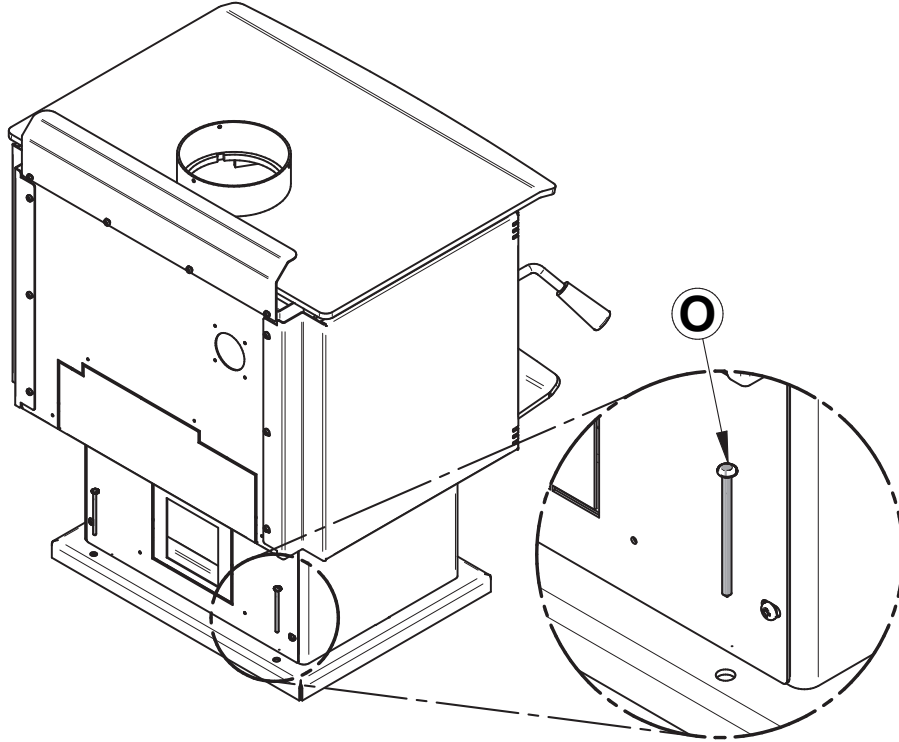
ENGLISH



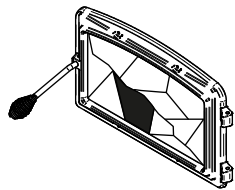
## 6.5 Mobile Home Installation

THE IMAGES SHOWN ARE INDICATIVE ONLY AND MAY DIFFER OF YOUR PRODUCT, BUT THE ASSEMBLY REMAINS THE SAME.

Screw the base on the floor with the proper hardware **(O)**.



## 7. Maintenance/Parts Replacement



**Do not clean the glass when the stove is hot.**

**Do not abuse the glass door by striking or slamming shut.**

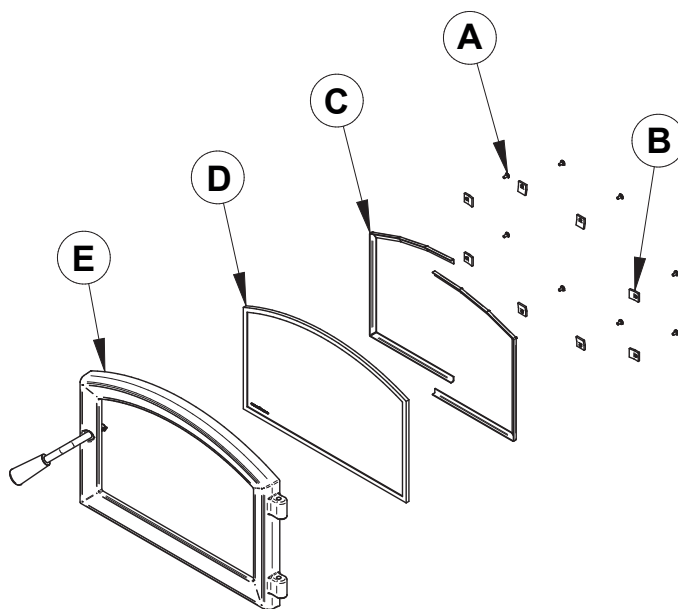
**Do not use the stove if the glass is broken.**

### 7.1 Replacement

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

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

THE IMAGES SHOWN ARE INDICATIVE ONLY AND MAY DIFFER OF YOUR PRODUCT, BUT THE ASSEMBLY REMAINS THE SAME.



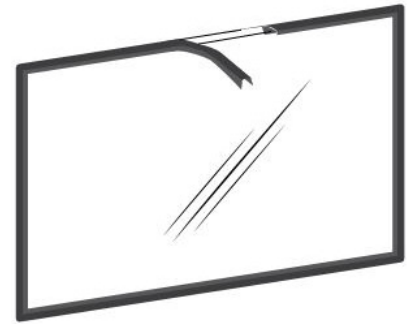
1. Remove the door **(E)** from its hinges and lay it on a soft, flat surface.
2. Remove the eight screws **(A)**, the eight glass retainers **(B)**, and the metal frames **(C)**.
3. Remove the glass **(D)**. If it is damaged install a new one in place. The replacement glass must have a gasket all around (see procedure below).
4. Reinstall the glass, being careful to centre the glass in the door and not to over-tightening the retaining screw.

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

## 7.2 Gasket

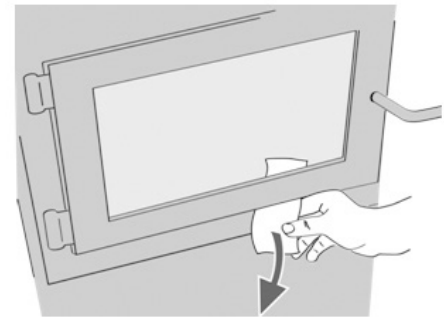
The glass gasket is flat, adhesive-backed, woven fibreglass. The gasket must be centred on the edge of the glass.

1. Follow the steps of the previous section to remove the glass.
2. Remove the old gasket and clean the glass thoroughly.
3. Peel back a section of the paper covering the adhesive and place the gasket on a table with the adhesive side up.
4. Stick the end of the gasket to the middle of one edge, then press the edge of the glass down onto the gasket, taking care that it is perfectly centred on the gasket.
5. Peel off more of the backing and rotate the glass. The gasket must not be stretched during installation.
6. Cut the gasket to the required length.
7. Pinch the gasket onto the glass in a U shape, all around the glass.



## 7.3 Door

In order for the stove to burn at its best efficiency, the door must provide a perfect seal with the firebox. The tightness of the door seal can be verified by closing and latching the door on a strip of paper. The test must be performed all around the door. If the paper slips out easily anywhere, either adjust the door or replace the gasket.



### 7.3.1 Adjustment

In order for the stove to burn at its best efficiency, the door must provide a perfect seal with the firebox. Therefore, the gasket should be inspected periodically to check for a good seal. The gasket seal may be improved with a simple latch mechanism adjustment:

1. Remove the split pin by pulling and turning it using pliers.
2. Turn the handle one counterclockwise turn to increase pressure.
3. Reinstall the split pin with a small hammer.

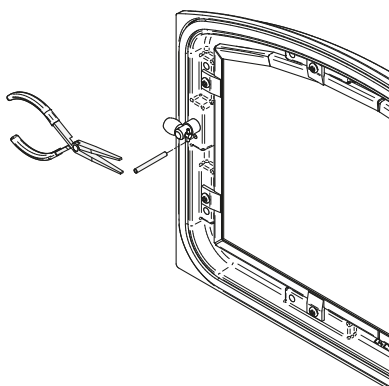


Figure 15: Removing the split pin

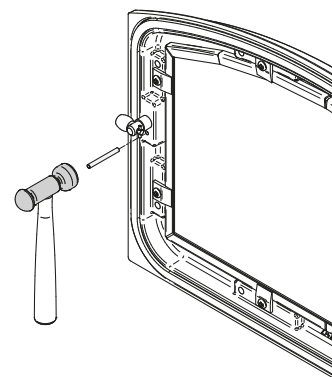
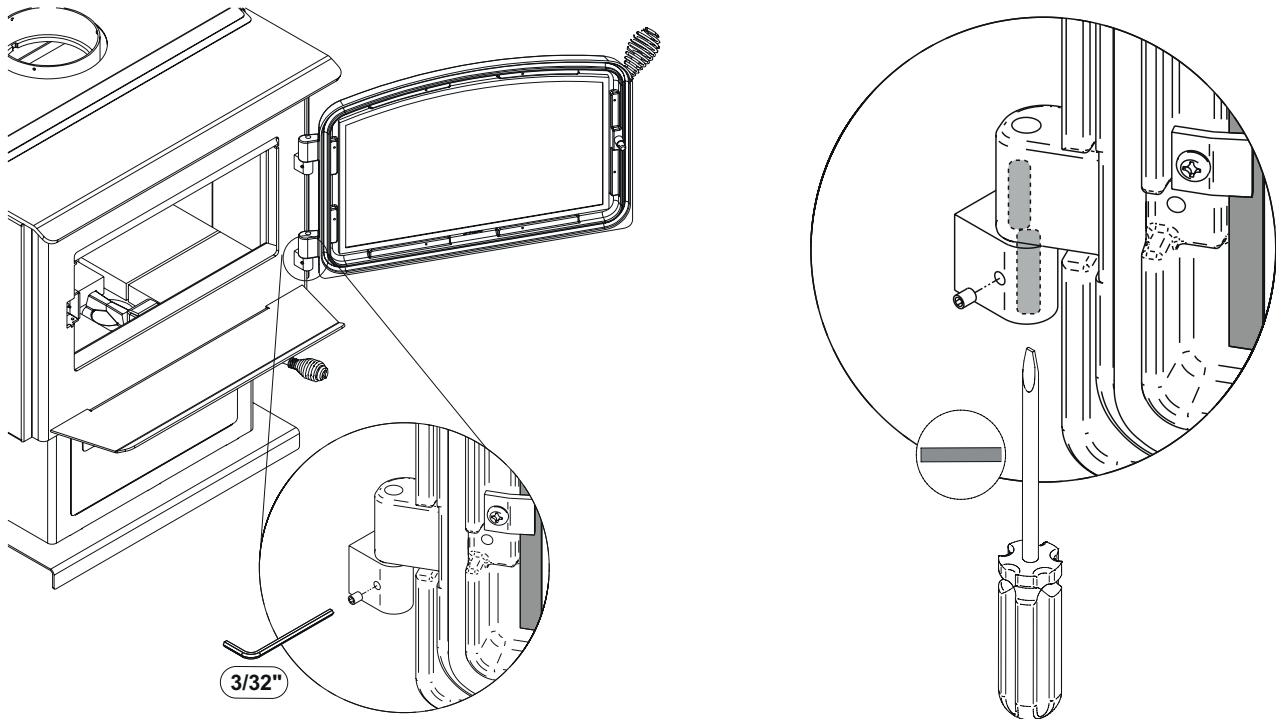


Figure 16: Installing the split pin

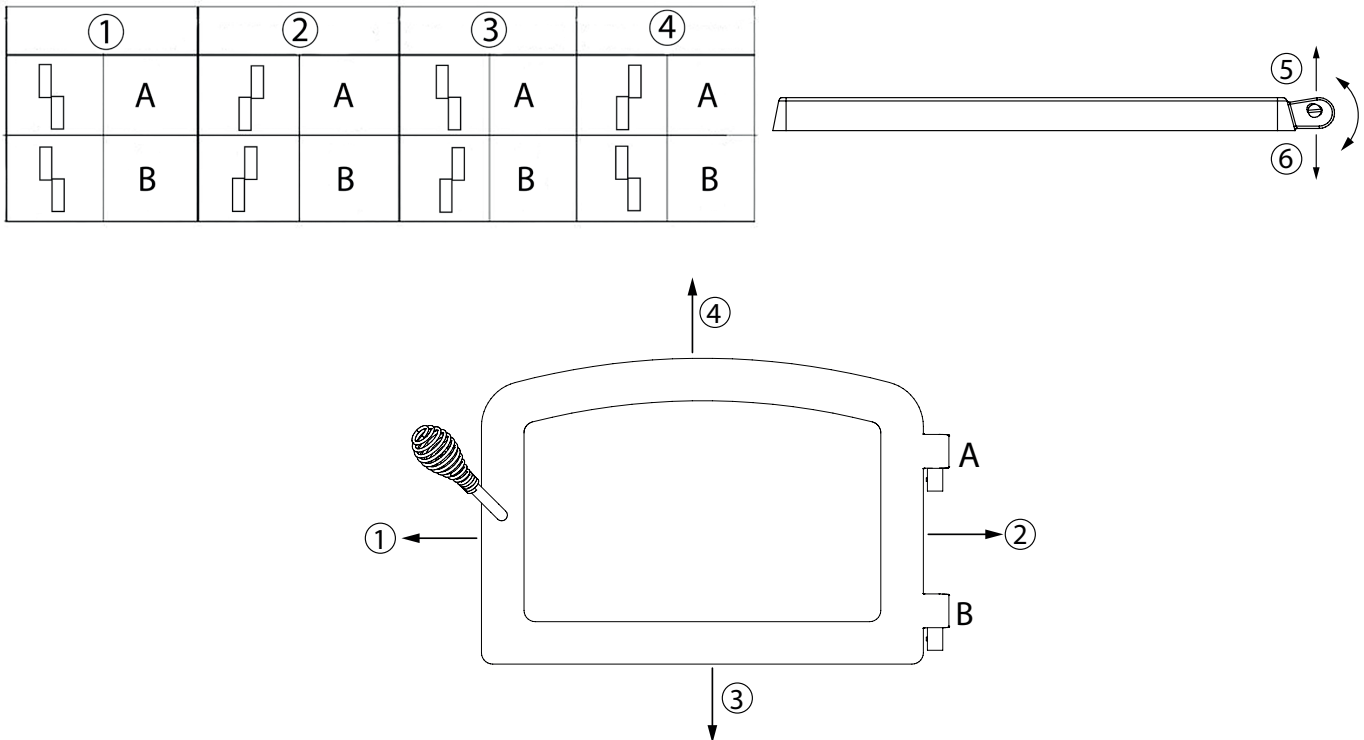
### 7.3.2 Door Alignment

**Door alignment should be checked before lighting the wood stove for the first time, as it may not be properly aligned.**

To align, open the door and loosen the pressure screws located on the lower and upper hinges of the door using a 3/32" Allen key to free the adjustable hinge rods.



Using a flat screwdriver, turn the adjustable hinge rods in the direction shown to adjust the doors. Tighten all door hinge pressure screws when they are at the desired positions. Configurations 1-2-3-4-5-6, show in which direction these act on the adjustment of the door.

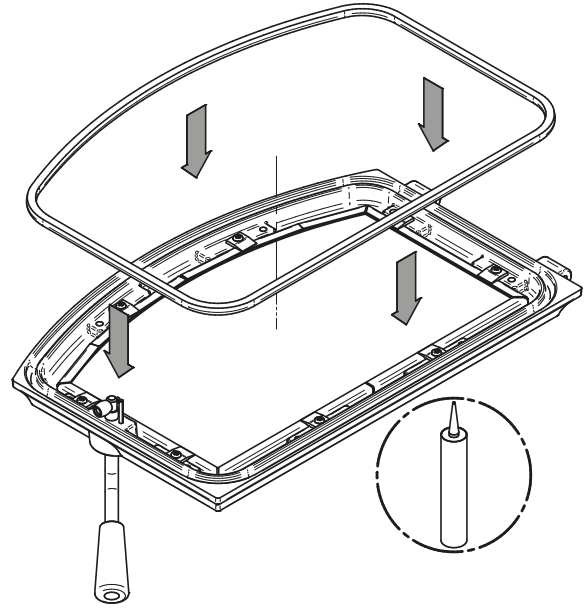


ENGLISH

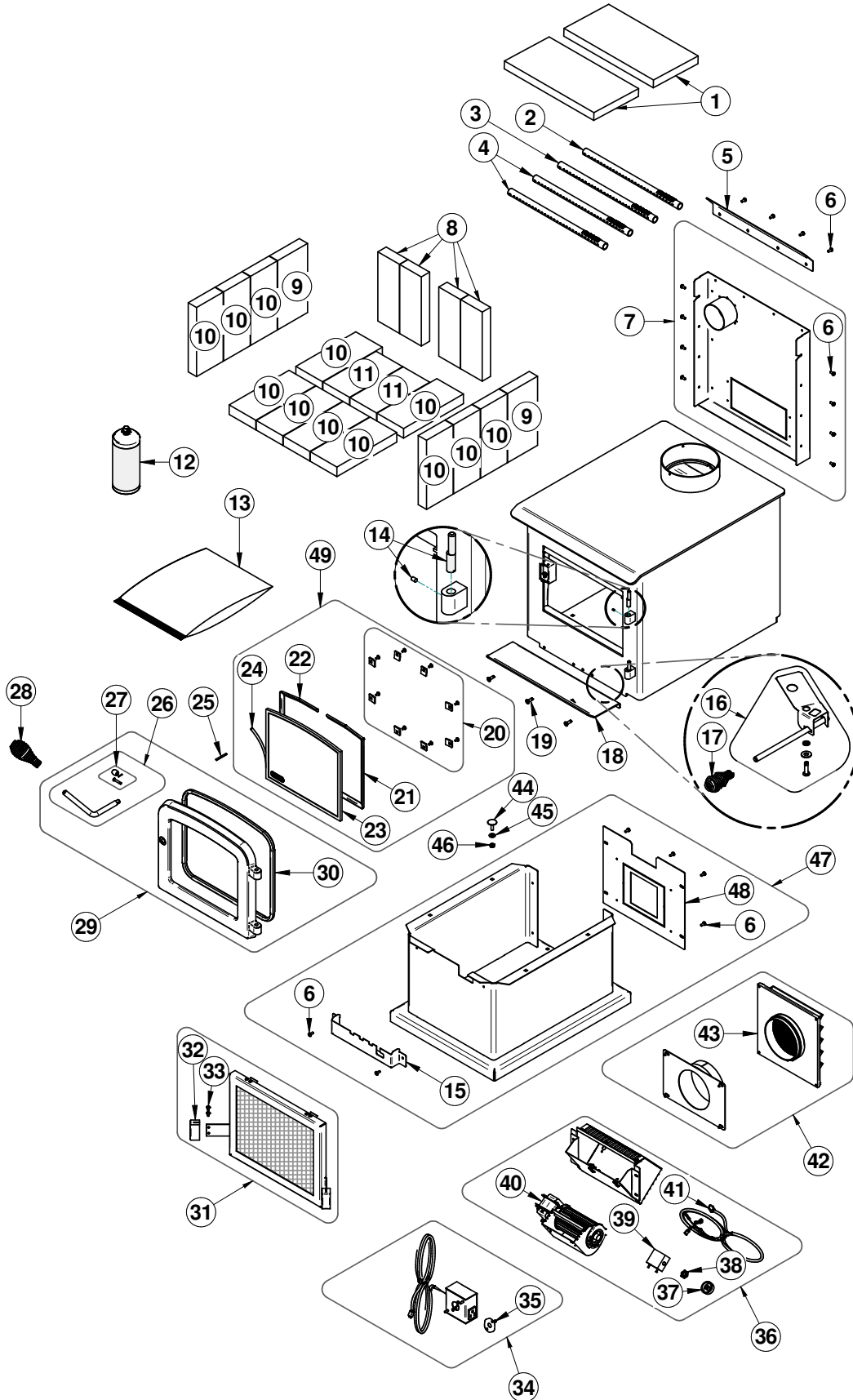
### 7.3.3 Gasket

It is important to replace the gasket with another having the same diameter and density to maintain a good seal.

1. Remove the door and place it face-down on something soft like a cushion of rags or a piece of carpet.
2. Remove the old gasket from the door. Use a screwdriver to scrape the old gasket adhesive from the door gasket groove.
3. Apply a bead of approximately 3/16" (5 mm) of high temperature silicone in the door gasket groove. Starting from the middle, hinges side, press the gasket into the groove. The gasket must not be stretched during installation.
4. Leave about 1/2" 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.



# 8. Exploded Diagram and Parts List



ENGLISH

IMPORTANT: THIS IS DATED INFORMATION. When requesting service or replacement parts for your stove, please provide the model number and serial number. We reserve the right to change parts due to technology upgrade or availability. Contact an authorized dealer to obtain one of these parts. Never use substitute materials. The use of unapproved parts can cause poor performance and risk to your safety.

#	Item	Description	Qty
1	21622	13 7/16" X 6 3/4" X 1" VERMICULITE BAFFLE	2
2	PL66833	REAR SECONDARY AIR TUBE	1
3	PL66834	REAR CENTER SECONDARY AIR TUBE	1
4	PL66835	FRONT AND CENTER SECONDARY AIR TUBE	2
5	PL74264	AIR DEFLECTOR	1
6	30154	BLACK SCREW #10 X 5/8" QUADREX #2 TYPE A	20
7	SE74262	BACK HEAT SHIELD ASSEMBLY	1
8	29007	3 1/4" X 9" X 1 1/4" REFRACTORY BRICK	4
9	29010	4 1/2" X 9" X 1 1/4" REFRACTORY BRICK	2
10	29015	4" X 9" X 1 1/4" REFRACTORY BRICK	12
11	29000	4" X 8" X 1 1/4" REFRACTORY BRICK	2
12	AC05959	METALLIC BLACK STOVE PAINT - 342 g (12oz) AEROSOL	1
13	SE46242	BLUE RIDGE 100 MANUAL KIT	1
14	SE74167	DOOR HINGE REPLACEMENT KIT	1
15	PL74327	DECORATIVE DASH	1
16	SE74355	ASSEMBLY AIR CONTROL HATCH KIT	1
17	30429	3/8" NICKEL COIL HANDLE	1
18	PL74265	ASH TRAY	1
19	30507	BLACK TORX SCREW WITH FLAT HEAD TYPE F 1/4-20 X 3/4"	3
20	SE53585	GLASS RETAINER KIT WITH SCREWS (12 PER KIT)	1
21	PL74317	RIGHT GLASS FRAME	1
22	PL74318	LEFT GLASS FRAME	1
23	SE74251	GLASS WITH GASKET 11 3/8" L X 9 1/2" H	1
24	AC06400	3/4" X 6' FLAT BLACK SELF-ADHESIVE GLASS GASKET	1
25	30101	SPRING TENSION PIN 5/32"Ø X 1 1/2"L	1
26	SE70697	REPLACEMENT HANDLE WITH LATCH KIT	1
27	AC09185	DOOR LATCH KIT	1
28	AC07867	1/2" CHROME PLATED COIL HANDLE	1
29	SE24349	BLUE RIDGE 100 CAST IRON DOOR ASSEMBLY	1
30	AC06500	SILICONE AND 5/8" X 8' BLACK DOOR GASKET KIT	1
31	AC01420	RIGID FIRESCREEN	1
32	PL06728	PAINTED AIR CONTROL HANDLE	2
33	30129	METAL SCREW #10 X 1/2" PAN QUADREX ZINC "A" TYPE	4

#	Item	Description	Qty
34	AC02055	QUICK CONNECT THERMODISC	1
35	44028	CERAMIC THERMODISC F110-20F	1
36	AC02050	BLOWER ASSEMBLY WITH VARIABLE SPEED CONTROL (UP TO 100 CFM)	1
37	44085	RHEOSTAT KNOB	1
38	44087	RHEOSTAT NUT	1
39	44080	RHEOSTAT WITHOUT NUT (MODEL KBMS-13BV)	1
40	44073	CROSSFLOW BLOWER 115V-60Hz-39W 100 CFM	1
41	60013	POWER CORD 96" X 18-3 type SJT (50 pcs per carton)	1
42	AC01336	5"Ø FRESH AIR INTAKE KIT FOR WOOD STOVE ON PEDESTAL	1
43	49028	5" WHITE AIR INTAKE TERMINATION	1
44	30536	LEVELING BOLT 1/4 - 20 X 1"	4
45	30185	17/64" AA TYPE WASHER BLACK	4
46	30100	BLACK HEX NUT 1/4 - 20	4
47	SE74266	BLUE RIDGE 100 PEDESTAL ASSEMBLY	1
48	PL74268	BACK OF THE BASE	1
49	SE74362	BLUE RIDGE 100 GLASS AND MOLDING KIT	1



# ENGLANDER LIMITED LIFETIME WARRANTY

The warranty of the manufacturer extends only to the original retail purchaser and is not transferable. This warranty covers brand new products only, which have not been altered, modified nor repaired since shipment from factory.

**This warranty applies to normal residential use only. Damages caused by misuse, abuse, improper installation, lack of maintenance, over firing, negligence or accident during transportation, power failures, downdrafts, venting problems or under-estimated heating area are not covered by this warranty. The recommended heated area for a given appliance is defined by the manufacturer as its capacity to maintain a minimum acceptable temperature in the designated area in case of a power failure.**

This warranty does not cover any scratch, corrosion, distortion, or discoloration. Any defect or damage caused by the use of unauthorized or other than original parts voids this warranty. An authorized qualified technician must perform the installation in accordance with the instructions supplied with this product and all local and national building codes. Any reclamation 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. All parts 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 July 1st, 2020.

DESCRIPTION	WARRANTY APPLICATION*
	PARTS
Combustion chamber (welds only) and cast iron door frame.	5 years
Surrounds, heat shields, ash drawer, steel legs, pedestal and convector air-mate.	2 years
Removable stainless steel combustion chamber components, secondary air tubes**, deflectors and supports.	2 years
Glass retainers, handle assembly, and air control mechanism.	2 years
Carbon steel combustion chamber components, vermiculite baffle**and ceramic glass.	1 year
Blower, heat sensors, switches, rheostat, wiring, and other controls.	1 year
Firebricks, paint and gaskets.	-
Any parts replaced under the warranty (Except firebricks, paint and gaskets)	90 days

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

Shall your unit or a components be defective, contact immediately your CENTURY. To accelerate processing of your warranty claim, make sure to have on hand the following information when calling:

- Your name, address and telephone number;
- Installation configuration;
- Nature of the defect and any relevant information.
- Serial number and model name as indicated on the nameplate fixed to the back of your unit;

**Before shipping your unit or defective component to our plant, you must obtain an Authorization Number from your CENTURY. Any merchandise shipped to our plant without authorization will be refused automatically and returned to sender.**



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The logo for Englander, featuring the word "Englander" in a stylized, italicized, red font with a black outline and a registered trademark symbol (®) to the right.

Stove Builder International inc.  
250, rue de Copenhague,  
St-Augustin-de-Desmaures (Québec) Canada  
G3A 2H3  
418-908-8002  
[https://heatredefined.com/  
service@englanderstoves.com](https://heatredefined.com/service@englanderstoves.com)

**CERTIFICAT D'ÉTALONNAGE # 11410**

Date d'étalonnage : 2019-10-25

Date d'émission du certificat : 2019-10-25

**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, ANSI/NCSL Z540-1-1994, ISO-10012-1, MIL-STD 45662A.

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


**APTITUDE EN MATIÈRE DE MESURE ET D'ÉTALONNAGE - CMC**

Les 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
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

  
Métrologiste

  
Responsable du laboratoire

## Certificat d'étalonnage # 11410

Numéro de série:	07J264834	Station de mesure:	3
Date d'étalonnage:	2019-10-25	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	1500261087	2020-05-21
DHI molbox1	Molbox1	755	1500261095	2020-05-22
RTD Mist	M22	2208102	2019002616	2020-04-15
Module 44.5 PSI avec Baro 163671	Module 30	160659	2019002630	2020-04-24

### Spécifications finales de l'appareil

### Condition d'étalonnage

Spécifications finales de l'appareil		Condition d'étalonnage	
Gaz	Air	Gaz	Air
Température d'opération		Température ambiante	22 °C
Pression à l'entrée		Pression ambiante	1022.14 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				
4.9706	0.8360	14.8299	22.21	0.8318	0.8274	0.0086	0.6658	>4
10.5016	1.7580	14.8281	22.21	1.7600	1.7508	0.0072	0.6669	>4
15.5352	2.6020	14.8270	22.16	2.5980	2.5843	0.0177	0.6654	>4
25.5129	4.2820	14.8273	22.15	4.2690	4.2461	0.0359	0.6657	>4
39.9610	6.7290	14.8341	22.11	6.6915	6.6518	0.0772	0.6658	>4

Bernard Poirier  
Métrologue

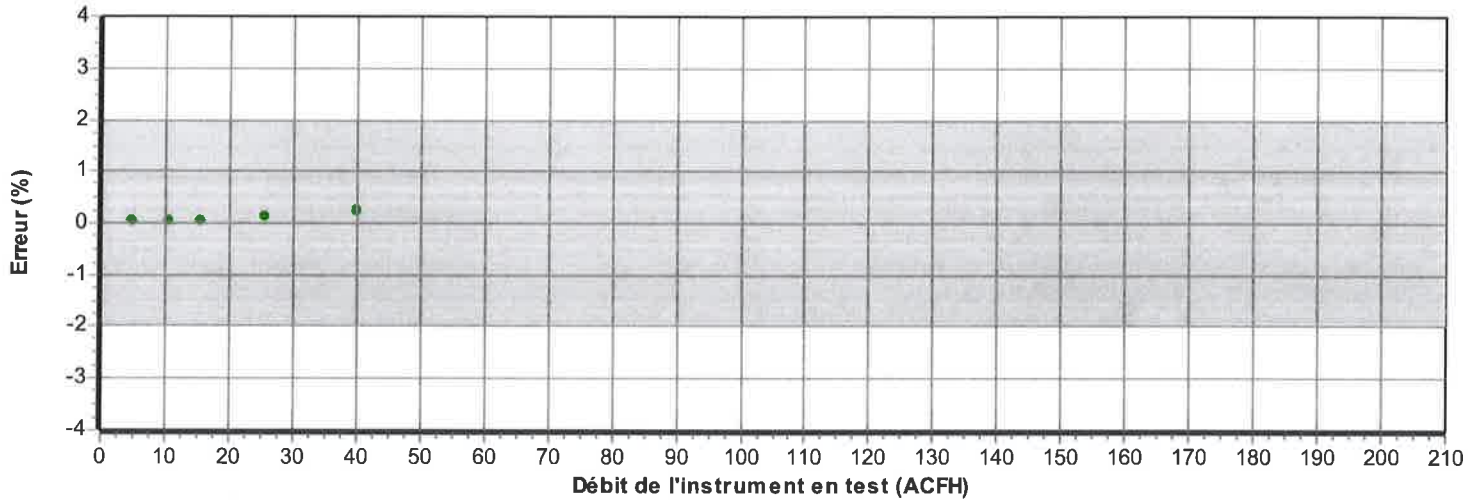


Signature

## Certificat d'étalonnage # 11410


Numéro de série:	07J264834	Station de mesure:	3
Date d'étalonnage:	2019-10-25	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

**CERTIFICAT D'ÉTALONNAGE # 13027**

Date d'étalonnage : 2020-10-13

Date d'émission du certificat : 2020-10-13

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

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

**CONFORMITÉ AU PROGRAMME DE QUALITÉ**

Tous les étalonnages sont effectués conformément au manuel d'assurance qualité de Polycontrols qui est conforme à la norme ISO/IEC 17025 – 2017, à la norme ISO 9001 – 2015 ainsi qu'à tout autre exigences de qualité définies dans la description d'achat des clients.

**TRAÇABILITÉ**

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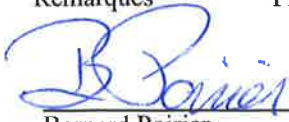
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**APTITUDE EN MATIÈRE DE MESURE ET D'ÉTALONNAGE - CMC**

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**SOMMAIRE DES CONDITIONS DE L'INSTRUMENT EN TEST**

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

  
Bernard Poirier  
Métrologiste

  
Responsable du laboratoire

## Certificat d'étalonnage # 13027

Numéro de série:	07J264834	Station de mesure:	3
Date d'étalonnage:	2020-10-13	Procédure:	POS-CAL-005
Identification de l'instrument:	SBI-103	Règle de décision:	Méthode #2

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

Description	Modèle	# Série	Traçabilité	Date dû
DHI molbloc (30 slpm)	3E4-VCR-V-Q	2359	1500279712	2021-03-04
DHI molbox1	Molbox1	755	1500285062	2021-06-09
RTD Mist	Mist	L00295	2019008203	2020-12-13
Module 44.5 PSI avec Baro 163671	Module 30	160659	2020003156	2021-04-28

### Spécifications finales de l'appareil

### Condition d'étalonnage

Gaz	Air	Gaz	Air
Température d'opération		Température ambiante	22 °C
Pression à l'entrée		Pression ambiante	1017.71 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

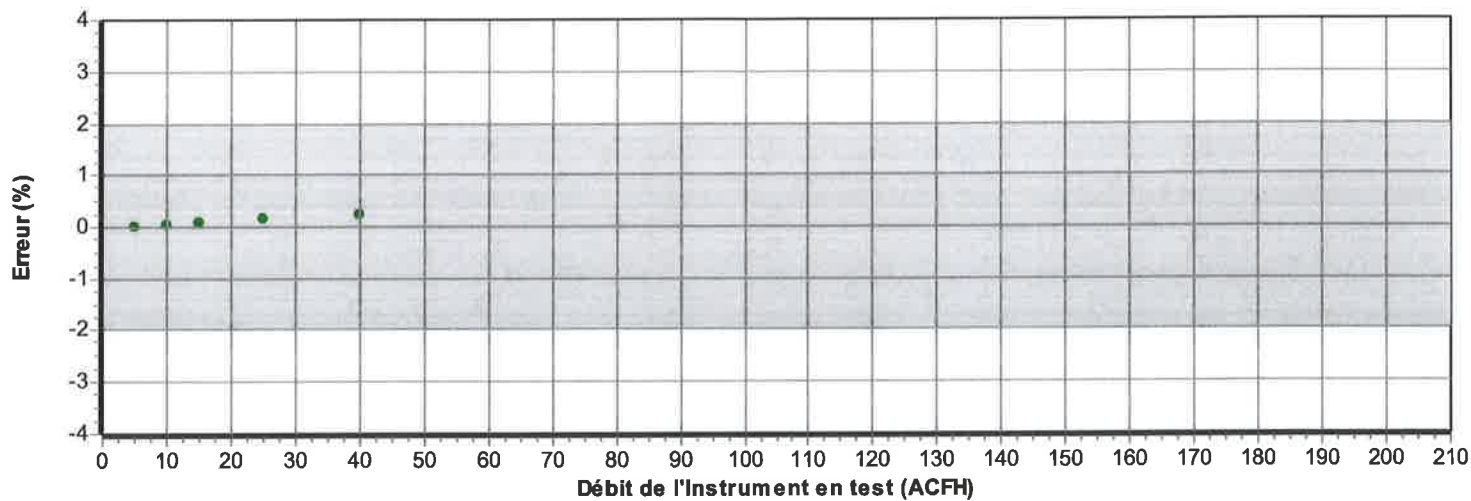
Débit du test ACFH	Instrument en test ft <sup>3</sup>	Valeurs mesurées			Référence calculée ft <sup>3</sup>	Erreur calculée ft <sup>3</sup>	Tolérance acceptable ft <sup>3</sup>	Incertitude k = 2 ft <sup>3</sup>	TUR
		Pression PSIA	Température °C	Référence ft <sup>3</sup>					
5.0012	0.8350	14.7006	22.19	0.8297	0.8325	0.0025	0.6658	0.0034	>4
10.0479	1.6910	14.6978	22.14	1.6681	1.6737	0.0173	0.6663	0.0056	>4
15.0460	2.5350	14.6960	22.09	2.4977	2.5060	0.0290	0.6662	0.0083	>4
25.0808	4.2250	14.6987	22.01	4.1601	4.1720	0.0530	0.6654	0.0139	>4
40.1053	6.7640	14.7066	21.93	6.6675	6.6813	0.0827	0.6664	0.0222	>4



**Certificat d'étalonnage # 13027**

Numéro de série:	07J264834	Station de mesure:	3
Date d'étalonnage:	2020-10-13	Procédure:	POS-CAL-005
Identification de l'instrument:	SBI-103	Règle de décision:	Méthode #2

**Résultats finaux**




Voir l'annexe pour la règle de décision

# 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>1.011</b>

Calibration Date: 2020-10-01  
 Calibrated by: Gabrielle Santerre  
 Calibration Frequency: 6-month  
 Next Calibration Due: 2021-04-01  
 Instrument Range: 1.000 cfm  
 Standard Temp.: 66 oF  
 Standard Press.: 29.92 "Hg  
 Barometric Press.: 29.7 "Hg  
 Signature/Date:  2020-10-01

### Previous Calibration Comparison

Date	2020.04-16	Acceptable	
		Deviation (5%)	Deviation
y Factor	1.008	0.0504	0.003
Acceptance	<b>Acceptable</b>		

### Current Calibration

Acceptable y Deviation	0.050
Maximum y Deviation	0.003
Acceptance	<b>Acceptable</b>

### Reference Standard \*

Standard	Model	Standard Test Meter
Calibrator	S/N	07J264834
	Calib. Date	25-oct-19
	Calib. Value	0.996 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	399.9	408.4	416.804
Final Reference Meter	407.918	416.616	424.931
Initial DGM	704.269	712.693	720.985
Final DGM	712.196	720.784	728.971
Temp. Ref. Meter (°F), Tr	76.2	77.8	77.6
Temperature DGM (°F), Td	76.3	77.4	77.5
Time (Minutes)	92.0	65.0	49.0
Net Volume Ref. Meter, Vr	8.018	8.216	8.127
Net Volume DGM, Vd	7.927	8.091	7.986
<b>Gas Meter y Factor =</b>	<b>1.008</b>	<b>1.011</b>	<b>1.013</b>
<b>Gas Meter y Factor Deviation (from avg.)</b>	0.003	0.000	0.003
<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:  $0.086163043$

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**  
**1.010**

Calibration Date: 2020-10-06  
 Calibrated by: Gabrielle Santerre  
 Calibration Frequency: 6-month  
 Next Calibration Due: 2021-04-06  
 Instrument Range: 1.000 cfm  
 Standard Temp.: 65.7 °F  
 Standard Press.: 29.92 "Hg  
 Barometric Press.: 30 "Hg  
 Signature/Date: *Gabrielle Santerre* 2020-10-06

### Previous Calibration Comparison

Date	2020-04-16	Acceptable	
		Deviation (5%)	Deviation
y Factor	1.008	0.0504	0.002
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	25-oct-19
	Calib. Value	0.996 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	454.9	467	475.7
Final Reference Meter	466.768	474.965	480.93
Initial DGM	125.025	137	145.6
Final DGM	136.765	144.864	150.737
Temp. Ref. Meter (°F), Tr	75.4	76.0	76.6
Temperature DGM (°F), Td	74.6	76.2	76.7
Time (Minutes)	127.0	67.0	32.0
Net Volume Ref. Meter, Vr	11.868	7.965	5.230
Net Volume DGM, Vd	11.74	7.864	5.137
<b>Gas Meter y Factor =</b>	<b>1.005</b>	<b>1.009</b>	<b>1.014</b>
<b>Gas Meter y Factor Deviation (from avg.)</b>	0.004	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: 0.092440945

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-290 (88N515612)

**Average Gas  
Meter y Factor**  
**0.993**

Calibration Date: 2020-10-05  
 Calibrated by: Gabrielle Santerre  
 Calibration Frequency: 6-month  
 Next Calibration Due: 2021-04-05  
 Instrument Range: 1.000 cfm  
 Standard Temp.: 66 oF  
 Standard Press.: 29.92 "Hg  
 Barometric Press.: 30.2 "Hg  
 Signature/Date: *Gabrielle Santerre* 2020-10-05

### Previous Calibration Comparison

Date	2017-04-24	Acceptable	
		Deviation (5%)	Deviation
y Factor	1.000	0.05	0.007
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	25-oct-19
	Calib. Value	0.996 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	428.6	438.1	445.3
Final Reference Meter	437.45	445.09	454.405
Initial DGM	3.63	13.16	20.364
Final DGM	12.501	20.171	29.506
Temp. Ref. Meter (°F), Tr	73.2	73.6	76.0
Temperature DGM (°F), Td	73.0	73.6	75.8
Time (Minutes)	52.0	45.0	79.0
Net Volume Ref. Meter, Vr	8.850	6.990	9.105
Net Volume DGM, Vd	8.871	7.011	9.142
<b>Gas Meter y Factor =</b>	<b>0.993</b>	<b>0.993</b>	<b>0.992</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:

0.170596154

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**  
**0.997**

Calibration Date: 2020-11-24  
 Calibrated by: Gabrielle Santerre  
 Calibration Frequency: 6-month  
 Next Calibration Due: 2021-05-25  
 Instrument Range: 1.000 cfm  
 Standard Temp.: 66 oF  
 Standard Press.: 29.92 "Hg  
 Barometric Press.: 29.8 "Hg  
 Signature/Date: *Gabrielle Santerre* 2020-11-24

### Previous Calibration Comparison

Date	2020-10-01	Acceptable	
		Deviation (5%)	Deviation
y Factor	1.011	0.05055	0.014
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	13-oct-20
	Calib. Value	0.990 y factor (ref)

Calibration Parameters	Run 1	Run 2	Run 3
Vacuum ("Hg)	0.00	0.00	0.00
dH ("H2O)	0.00	0.00	0.00
Initial Reference Meter	571.1	579.9	585.5
Final Reference Meter	579.591	585.102	590.597
Initial DGM	153.075	161.786	167.345
Final DGM	161.482	166.95	172.403
Temp. Ref. Meter (°F), Tr	67.2	67.4	67.4
Temperature DGM (°F), Td	66.4	66.4	66.4
Time (Minutes)	70.0	43.0	42.0
Net Volume Ref. Meter, Vr	8.491	5.202	5.097
Net Volume DGM, Vd	8.407	5.164	5.058
<b>Gas Meter y Factor =</b>	<b>0.998</b>	<b>0.995</b>	<b>0.996</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:  $0.1201$

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**  
**0.996**

Calibration Date: 2020-11-24  
 Calibrated by: Gabrielle Santerre  
 Calibration Frequency: 6-month  
 Next Calibration Due: 2021-05-25  
 Instrument Range: 1.000 cfm  
 Standard Temp.: 65.7 °F  
 Standard Press.: 29.92 "Hg  
 Barometric Press.: 29.8 "Hg  
 Signature/Date:  2020-11-24

### Previous Calibration Comparison

Date	2020-04-16	Acceptable	
		Deviation (5%)	Deviation
y Factor	1.01	0.0505	0.014
Acceptance	Acceptable		

### Current Calibration

Acceptable y Deviation	0.050
Maximum y Deviation	0.000
Acceptance	Acceptable

### Reference Standard \*

Standard	Model	Standard Test Meter
Calibrator	S/N	07J264834
	Calib. Date	13-oct-20
	Calib. Value	0.990 y factor (ref)

Calibration Parameters	Run 1	Run 2	Run 3
Vacuum ("Hg)	0.00	0.00	0.00
dH ("H2O)	0.00	0.00	0.00
Initial Reference Meter	539.1	546.6	560.7
Final Reference Meter	546.352	560.054	570.238
Initial DGM	432.907	440.347	454.334
Final DGM	440.1	453.7	463.8
Temp. Ref. Meter (°F), Tr	66.8	67.4	67.4
Temperature DGM (°F), Td	66.0	66.5	66.6
Time (Minutes)	59.0	110.0	78.0
Net Volume Ref. Meter, Vr	7.252	13.454	9.538
Net Volume DGM, Vd	7.193	13.353	9.466
<b>Gas Meter y Factor =</b>	<b>0.997</b>	<b>0.996</b>	<b>0.996</b>
<b>Gas Meter y Factor Deviation (from avg.)</b>	0.000	0.000	0.000
<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: 0.121915254

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: American Meter Company  
 Model: DTM-200A  
 Serial Number: SBI-290 (88N515612)

<b>Average Gas Meter y Factor</b>
<b>0.982</b>

Calibration Date: 2020-11-23  
 Calibrated by: Gabrielle Santerre  
 Calibration Frequency: 6-month  
 Next Calibration Due: 2021-05-24  
 Instrument Range: 1.000 cfm  
 Standard Temp.: 65.7 °F  
 Standard Press.: 29.92 "Hg  
 Barometric Press.: 29.4 "Hg  
 Signature/Date: *Gabrielle Santerre* 2020-11-23

### Previous Calibration Comparison

Date	2020-10-05	Acceptable	
		Deviation (5%)	Deviation
y Factor	0.993	0.04965	0.011
Acceptance	Acceptable		

### Current Calibration

Acceptable y Deviation	0.050
Maximum y Deviation	0.002
Acceptance	Acceptable

### Reference Standard \*

	Standard	Standard Test Meter
Calibrator	Model	07J264834
	S/N	07J264834
	Calib. Date	13-oct-20
	Calib. Value	0.990 y factor (ref)

Calibration Parameters	Run 1	Run 2	Run 3
Vacuum ("Hg)	0.00	0.00	0.00
dH ("H2O)	0.00	0.00	0.00
Initial Reference Meter	511	516.7	532.6
Final Reference Meter	516.195	527.593	538.156
Initial DGM	59.076	64.824	80.865
Final DGM	64.303	75.811	86.453
Temp. Ref. Meter (°F), Tr	67.0	66.0	66.4
Temperature DGM (°F), Td	65.0	66.0	66.4
Time (Minutes)	48.0	83.0	46.0
Net Volume Ref. Meter, Vr	5.195	10.893	5.556
Net Volume DGM, Vd	5.227	10.987	5.588
<b>Gas Meter y Factor =</b>	<b>0.980</b>	<b>0.982</b>	<b>0.984</b>
Gas Meter y Factor Deviation (from avg.)	0.002	0.000	0.002
<b>Orifice dH@</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
Orifice dH@ Deviation (from avg.)	0.000	0.000	0.000

where:  $0.108895833$

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

## Unit break-in period

<b>Total conditioning time (h)</b>	<b>53.05</b>
------------------------------------	--------------

**Model tested:** 1.4 Series

**Identification number:** QC20200826SERIE1.4

Date	Burn cycle	Test run	Duration	Load type	Fuel added	Moisture
		(#)	(min)	(-)	(lbs)	(% db)
2020-11-02	Preload		49	Kindling & SUF	8.09	16
	Condition	NA	103	High fire	16.22	20.5
	Load		410	Medium fire	19.52	20.7
2020-11-03	Preload		67	Kindling & SUF	8.12	14.5
	Condition	NA	102	High fire	16.27	20.3
	Load		430	Medium fire	19.50	19.8
2020-11-04	Preload		54	Kindling & SUF	8.12	17.1
	Condition	NA	108	High fire	16.24	20.1
	Load		370	Medium fire	19.47	21.3
2020-11-05	Preload		147	Kindling & SUF	8.11	16.2
	Condition	NA	24	High fire	16.25	20.6
	Load		72	Medium fire	19.53	19.8
2020-11-09	Preload		108	Kindling & SUF	8.12	14.7
	Condition	NA	67	High fire	16.29	21.5
	Load		380	Medium fire	19.52	20.4
2020-11-12	Preload		85	Kindling & SUF	8.13	17.3
	Condition	NA	97	High fire	16.26	20.5
	Load		510	Medium fire	19.51	19.1



## Unit break-in period

<b>Total conditioning time (h)</b>	<b>53.05</b>
------------------------------------	--------------

**Model tested:** 1.4 Series

**Identification number:** QC20200826SERIE1.4

Date	Burn cycle	Test run	Duration	Load type	Fuel added	Moisture
		(#)	(min)	(-)	(lbs)	(% db)
2020-11-02	Preload		49	Kindling & SUF	8.09	16
	Condition	NA	103	High fire	16.22	20.5
	Load		410	Medium fire	19.52	20.7
2020-11-03	Preload		67	Kindling & SUF	8.12	14.5
	Condition	NA	102	High fire	16.27	20.3
	Load		430	Medium fire	19.50	19.8
2020-11-04	Preload		54	Kindling & SUF	8.12	17.1
	Condition	NA	108	High fire	16.24	20.1
	Load		370	Medium fire	19.47	21.3
2020-11-05	Preload		147	Kindling & SUF	8.11	16.2
	Condition	NA	24	High fire	16.25	20.6
	Load		72	Medium fire	19.53	19.8
2020-11-09	Preload		108	Kindling & SUF	8.12	14.7
	Condition	NA	67	High fire	16.29	21.5
	Load		380	Medium fire	19.52	20.4
2020-11-12	Preload		85	Kindling & SUF	8.13	17.3
	Condition	NA	97	High fire	16.26	20.5
	Load		510	Medium fire	19.51	19.1









68.8977	157	74.55212729	240.803451	151.2882018	261.1404339	241.790475	262.4730255	69.5313289	69.113749425	4184.194216	69.532379	69.28270165	4184.194216	4184.194216	4184.194216	-0.001448056	0.08492307	0.25979852	0.726178817	0.830126569	0.238495655	3.46508717	3.459460596	3.92514	2020-11-02 20:10
68.7382	157	74.64481897	248.949721	151.1388428	262.8512138	241.218181	262.7880266	69.5143093	69.16613887	4184.145718	69.5168097	69.28181947	4184.145718	4184.145718	4184.145718	-0.003778683	0.08719379	0.268297616	0.707816205	0.827794184	0.207488851	3.47602132	3.448489339	3.5211	2020-11-02 20:11
68.7601	156	74.61660169	248.690261	151.0502317	260.4778268	240.86327	262.1232012	69.5377922	69.15433864	4184.154311	69.5157062	69.29233223	4184.154311	4184.154311	4184.154311	-0.001693077	0.074729458	0.258846255	0.728852505	0.820573177	3.4681338	3.45771715	3.92137	2020-11-02 20:12	
68.720	156	74.65668501	248.371701	151.0803376	260.2189799	240.933823	261.7438820	69.5143239	69.16320254	4184.118834	69.5131801	69.29359469	4184.118834	4184.118834	4184.118834	-0.001039442	0.056406556	0.237684512	0.705407344	0.820048925	3.45141813	3.444882525	3.91756	2020-11-02 20:13	
68.7361	156	74.51288266	248.155406	151.1659908	259.9848614	240.02070	261.677451	69.5362824	69.1451281	4184.130832	69.5165061	69.29540661	4184.130832	4184.130832	4184.130832	-0.001396507	0.08949479	0.268948186	0.728834779	0.828859298	3.47766256	3.45125293	3.93081	2020-11-02 20:14	
68.8025	156	74.51477611	247.80734	151.1731765	259.588274	239.718999	261.5642648	69.5210204	69.11383449	4184.130308	69.5158401	69.2895254	4184.130308	4184.130308	4184.130308	-0.001274206	0.074620705	0.262358080	0.721144686	0.826262062	0.424443211	3.45145814	3.4509497	3.89874	2020-11-02 20:15
68.771	156	74.51702747	247.80734	151.0558181	259.1846149	239.08641	261.564948	69.5151211	69.11880381	4184.145192	69.5160841	69.2951111	4184.145192	4184.145192	4184.145192	-0.001168477	0.085821803	0.259059161	0.729212937	0.826279143	0.18662981	3.4673197	3.44983182	3.89018	2020-11-02 20:16
68.774	155	74.46424247	246.31228	150.8752961	259.6102763	238.4463953	260.7121913	69.5204447	69.14142126	4184.08718	69.5160865	69.2764971	4184.08718	4184.08718	4184.08718	-0.001291783	0.08060233	0.2528608	0.739902719	0.827902719	0.222029712	3.46530813	3.44763886	3.89024	2020-11-02 20:17
68.7985	155	74.65444686	246.469848	150.8253804	258.660821	238.44606	260.2428265	69.5173797	69.14813184	4184.095383	69.5164997	69.2807181	4184.095383	4184.095383	4184.095383	-0.001364113	0.08330503	0.257394407	0.725984407	0.828851123	0.254497521	3.46790811	3.45445812	3.87418	2020-11-02 20:18
68.7545	155	74.3927211	246.07782	150.424886	258.0206339	238.07542	260.0148919	69.5146209	69.1482852	4184.099128	69.5138781	69.2899841	4184.099128	4184.099128	4184.099128	-0.001041557	0.08679526	0.262327919	0.729354784	0.827654922	0.243880351	3.45646939	3.45424883	3.8743	2020-11-02 20:19
68.7961	154	74.48472942	245.658564	150.2164913	257.729659	237.20996	259.7942097	69.5132008	69.1481501	4184.083345	69.5081977	69.2911521	4184.083345	4184.083345	4184.083345	-0.001449569	0.084934515	0.261469532	0.731568613	0.828979028	0.238979028	3.47161564	3.44641037	3.8561	2020-11-02 20:20
68.6418	154	74.41505818	246.056115	149.7126957	257.1133661	237.21681	259.4705211	69.4952922	69.12479661	4184.056115	69.4948627	69.26335858	4184.056115	4184.056115	4184.056115	-0.000898107	0.084186564	0.261465137	0.72161305	0.82101093	0.20023474	3.4732218	3.44646264	3.86276	2020-11-02 20:21
68.7111	154	74.31776161	244.51479	148.830717	256.7176911	236.719986	259.1656462	69.512625	69.1293717	4184.059184	69.5112744	69.2820482	4184.059184	4184.059184	4184.059184	-0.001240775	0.081888701	0.26102223	0.717262995	0.82062223	0.24131885	3.47138369	3.45111603	3.84917	2020-11-02 20:22
68.792	153	74.2041156	241.90171	149.3121209	256.211818	236.11081	258.892114	69.507766	69.1447951	4184.05412	69.5162844	69.2797976	4184.05412	4184.05412	4184.05412	-0.000947625	0.081466109	0.261465137	0.728610291	0.819798484	0.26102223	3.47138369	3.44606151	3.8411	2020-11-02 20:23
68.773	153	74.51848385	242.517201	148.8191888	255.6967871	235.883025	258.031127	69.4994981	69.1286073	4184.024607	69.4998748	69.26274586	4184.024607	4184.024607	4184.024607	-0.00104138	0.08569481	0.26181417	0.730214863	0.82054817	0.25974021	3.4627943	3.46043041	3.83286	2020-11-02 20:24
68.6661	153	74.1978403	242.162323	148.808879	255.125118	235.460764	258.333752	69.5038476	69.1317963	4184.067966	69.5169191	69.29232462	4184.067966	4184.067966	4184.067966	-0.001131725	0.083393608	0.261878171	0.729362167	0.820786444	0.25445889	3.46502097	3.45175355	3.83211	2020-11-02 20:25
68.7528	153	74.23786545	241.690312	148.581381	254.6626306	235.04211	257.913114	69.5005847	69.11755008	4184.032118	69.5163941	69.2784341	4184.032118	4184.032118	4184.032118	-0.001202766	0.079188117	0.26428634	0.729038475	0.820078708	0.20078708	3.45619818	3.46028049	3.82317	2020-11-02 20:26
68.714	152	74.3008167	241.18899	148.198777	254.264025	234.49712	257.210431	69.509197	69.10318117	4184.030303	69.5110247	69.2757013	4184.030303	4184.030303	4184.030303	-0.001094766	0.081131007	0.27107978	0.728050582	0.814740934	0.20202919	3.467111	3.45242769	3.81181	2020-11-02 20:27
68.6797	152	74.51616225	240.158651	147.9212687	253.6169285	234.139007	256.842204	69.5112389	69.1212567	4184.027964	69.5121274	69.2646676	4184.027964	4184.027964	4184.027964	-0.001321684	0.08211708	0.261165177	0.721365099	0.816473974	0.21975705	3.4671115	3.44184808	3.8095	2020-11-02 20:28

Main data table with columns for various vehicle specifications and model numbers.





68.9423	163	75.1270968	248.95281	141.130253	263.8019665	247.754935	255.8062021	69.7299967	69.13282096	4184.623425	69.7391631	4184.623425	4184.623425	4184.623425	4184.623425	0.007007899	0.659956226	0.76134451	0.826693245	0.905129756	1.0637456	1.0429993	4.12226	2020-11-03 19:54
68.9604	163	75.1644867	247.840791	144.778113	263.4329065	247.723641	255.8189712	69.8023991	69.11819915	4184.518717	69.6953216	4184.4967396	4184.1871	4184.1871	4184.1871	0.007007899	0.659956226	0.76134451	0.826693245	0.905129756	1.0637456	1.0429993	4.12226	2020-11-03 19:55
68.9448	163	75.1490871	246.75021	142.752807	263.752807	247.227674	255.8468771	69.8719456	69.1344398	4184.576176	69.7210477	4184.5512053	4184.576176	4184.576176	4184.576176	0.007007899	0.659956226	0.76134451	0.826693245	0.905129756	1.0637456	1.0429993	4.12226	2020-11-03 19:56
68.8795	162	74.9952369	246.057783	144.244254	262.464254	247.544083	255.8395269	69.8829794	69.10852116	4184.512694	69.8800771	4184.512694	4184.512694	4184.512694	4184.512694	0.007007899	0.659956226	0.76134451	0.826693245	0.905129756	1.0637456	1.0429993	4.12226	2020-11-03 19:57
68.9407	162	74.9813011	246.75021	144.032613	261.942784	246.80043	255.868151	69.898086	69.2088427	4184.553867	69.8887788	4184.553867	4184.553867	4184.553867	4184.553867	0.007007899	0.659956226	0.76134451	0.826693245	0.905129756	1.0637456	1.0429993	4.12226	2020-11-03 19:58
68.8796	162	75.0132676	246.34391	143.641319	261.19105	246.40917	254.757678	69.8628879	69.2098862	4184.561837	69.8682036	4184.561837	4184.561837	4184.561837	4184.561837	0.007007899	0.659956226	0.76134451	0.826693245	0.905129756	1.0637456	1.0429993	4.12226	2020-11-03 19:59
68.8796	161	74.99719613	244.783315	143.192187	261.195651	246.39357	254.722666	69.8881336	69.13045291	4184.568138	69.6917961	4184.568138	4184.568138	4184.568138	4184.568138	0.007007899	0.659956226	0.76134451	0.826693245	0.905129756	1.0637456	1.0429993	4.12226	2020-11-03 20:00
68.778	161	74.7999054	244.732511	143.156242	260.655453	245.634098	254.529752	69.8902029	69.2790281	4184.530074	69.8723267	4184.530074	4184.530074	4184.530074	4184.530074	0.007007899	0.659956226	0.76134451	0.826693245	0.905129756	1.0637456	1.0429993	4.12226	2020-11-03 20:01
68.8776	161	74.8026204	242.732523	142.852413	260.236704	245.523509	254.6397788	69.8540071	69.1389615	4184.617801	69.8759151	4184.617801	4184.617801	4184.617801	4184.617801	0.007007899	0.659956226	0.76134451	0.826693245	0.905129756	1.0637456	1.0429993	4.12226	2020-11-03 20:02
68.6669	161	74.8800246	242.642813	142.742175	259.889233	245.237706	253.4880806	69.8621258	69.3042606	4184.515864	69.8700956	4184.515864	4184.515864	4184.515864	4184.515864	0.007007899	0.659956226	0.76134451	0.826693245	0.905129756	1.0637456	1.0429993	4.12226	2020-11-03 20:03
68.8277	160	74.7884861	241.097845	142.407617	259.430863	245.07362	253.5366566	69.8732074	69.2964689	4184.522342	69.8612027	4184.522342	4184.522342	4184.522342	4184.522342	0.007007899	0.659956226	0.76134451	0.826693245	0.905129756	1.0637456	1.0429993	4.12226	2020-11-03 20:04
68.7502	160	74.8428782	241.245055	142.254782	258.900643	244.81822	253.2048011	69.8651245	69.31330114	4184.510964	69.8481261	4184.510964	4184.510964	4184.510964	4184.510964	0.007007899	0.659956226	0.76134451	0.826693245	0.905129756	1.0637456	1.0429993	4.12226	2020-11-03 20:05
68.7176	160	74.8100191	241.328911	141.912146	258.493316	244.42673	252.7601619	69.8712268	69.2933836	4184.482413	69.8517248	4184.482413	4184.482413	4184.482413	4184.482413	0.007007899	0.659956226	0.76134451	0.826693245	0.905129756	1.0637456	1.0429993	4.12226	2020-11-03 20:06
68.787	160	74.71320174	240.388441	141.670799	257.855128	244.22485	252.7602165	69.8300706	69.31884268	4184.468149	69.8701398	4184.468149	4184.468149	4184.468149	4184.468149	0.007007899	0.659956226	0.76134451	0.826693245	0.905129756	1.0637456	1.0429993	4.12226	2020-11-03 20:07
68.660	159	74.5621805	241.407072	141.589324	257.146472	243.07375	252.5366419	69.8554138	69.31390213	4184.480276	69.8747811	4184.480276	4184.480276	4184.480276	4184.480276	0.007007899	0.659956226	0.76134451	0.826693245	0.905129756	1.0637456	1.0429993	4.12226	2020-11-03 20:08
68.7513	159	74.7020501	240.736671	141.211593	257.1588173	243.648354	252.8830611	69.8755055	69.2962297	4184.483151	69.8683844	4184.483151	4184.483151	4184.483151	4184.483151	0.007007899	0.659956226	0.76134451	0.826693245	0.905129756	1.0637456	1.0429993	4.12226	2020-11-03 20:09
68.7239	159	74.71702138	239.87712	140.940408	256.610013	243.35114	252.141651	69.8609598	69.2981332	4184.424132	69.8644842	4184.424132	4184.424132	4184.424132	4184.424132	0.007007899	0.659956226	0.76134451	0.826693245	0.905129756	1.0637456	1.0429993	4.12226	2020-11-03 20:10
68.7628	159	74.7101217	238.780791	140.889808	256.154784	243.04848	251.9682368	69.854545	69.279469	4184.389196	69.864846	4184.389196	4184.389196	4184.389196	4184.389196	0.007007899	0.659956226	0.76134451	0.826693245	0.905129756	1.0637456	1.0429993	4.12226	2020-11-03 20:11
68.7896	159	74.544644	238.749319	140.312515	255.091125	242.63317	251.546646	69.8123889	69.2870946	4184.369173	69.8367357	4184.369173	4184.369173	4184.369173	4184.369173	0.007007899	0.659956226	0.76134451	0.826693245	0.905129756	1.0637456	1.0429993	4.12226	2020-11-03 20:12
68.5564	158	74.5999209	237.503481	140.309001	255.406309	242.53910	251.7577719	69.8602014	69.3026666	4184.385399	69.8607444	4184.385399	4184.385399	4184.385399	4184.385399	0.007007899	0.659956226	0.76134451	0.826693245	0.905129756	1.0637456	1.0429993	4.12226	2020-11-03 20:13
68.5753	158	74.6400261	236.842451	140.046968	254.902651	241.73379	251.688126	69.8122097	69.3090906	4184.346153	69.8606285	4184.346153	4184.346153	4184.346153	4184.346153	0.007007899	0.659956226	0.76134451	0.826693245	0.905129756	1.0637456	1.0429993	4.12226	2020-11-03 20:14
68.5447	158	74.5108558	236.05101	139.888073	254.496207	241.84284	250.571187	69.8389065	69.2548135	4184.297498	69.8688871	4184.297498	4184.297498	4184.297498	4184.297498	0.007007899	0.659956226	0.76134451	0.826693245	0.905129756	1.0637456	1.0429993	4.12226	2020-11-03 20:15
68.571	158	74.5712157	235.59451	139.548393	254.157795	241.612591	249.9838811	69.8374719	69.2597017	4184.312529	69.8398078	4184.312529	4184.312529	4184.312529	4184.312529	0.007007899	0.659956226	0.76134451	0.826693245	0.905129756	1.0637456	1.0429993	4.12226	2020-11-03 20:16
68.5515	157	74.4474212	234.97502	139.57132	253.686067	241.38804	249.7980871	69.8993736	69.2740218	4184.297341	69.8610404	4184.297341	4184.297341	4184.297341	4184.297341	0.007007899	0.659956226	0.76134451	0.826693245	0.905129756	1.0637456	1.0429993	4.12226	2020-11-03 20:17
68.5471	157	74.4612132	234.20191	139.346011	249.318941	240.91147	249.947862	69.8520764	69.219388	4184.2268	69.8602833	4184.2268	4184.2268	4184.2268	4184.2268	0.007007899	0.659956226	0.76134451	0.826693245	0.905129756	1.0637456	1.0429993	4.12226	2020-11-03 20:18
68.5307	157	74.4545482	233.332026	139.130372	252.86101	240.87947	249.111628	69.8991864	69.1304777	4184.24706	69.8520252	4184.24706	4184.24706	4184.24706	4184.24706	0.007007899	0.659956226	0.76134451	0.826693245	0.905129756	1.0637456	1.0429993	4.12226	2020-11-03 20:19
68.5169	157	74.4821737	232.92216	138.924499	252.470311	240.84069	249.077281	69.8668847	69.2664218	4184.202599	69.8767497	4184.202599	4184.202599	4184.202599	4184.202599	0.007007899	0.659956226	0.76134451	0.826693245	0.905129756	1.0637456	1.0429993	4.12226	2020-11-03 20:20
68.4951	157	74.4483184	232.689915	138.806451	252.111549	240.36129	248.9466263	69.8602099	69.2488948	4184.210314	69.8686121	4184.210314	4184.210314	4184.210314	4184.210314	0.007007899	0.659956226	0.76134451	0.826693245	0.905129756	1.0637456	1.0429993	4.12226	2020-11-03 20:21
68.5081	156	74.4456649	232.598281	138.688776	251.805084	240.03626	248.775271	69.8717008	69.2382215	4184.151183	69.8487055	4184.151183	4184.151183	4184.151183	4184.151183	0.007007899	0.659956226	0.76134451	0.826693245	0.905129756	1.0637456	1.0429993	4.12226	2020-11-03 20:22
68.5111	156	74.5741688	231.618918	138.334966	251.542487	239.88969	248.5605505	69.8736709	69.2491756	4184.126511	69.860921	4184.126511	4184.126511	4184.126511	4184.126511	0.007007899	0.659956226	0.76134451	0.826693245	0.905129756	1.0637456	1.0429993	4.12226	2020-11-03 20:23
68.5084	156	74.5888841	231.690667	138.188164	250.991764	239.53557	247.846765	69.846038	69.2630803	4184.078626	69.8586511	4184.078626	4184.078626	4184.078626	4184.078626	0.007007899	0.659956226	0.76134451	0.826693245	0.905129756	1.0637456	1.0429993	4.12226	2020-11-03 20:24
68.4824	156	74.6031888	231.403818	138.032171	250.658936	239.28224	247.6187764	69.853019	69.2328824	4184.063616	69.863019	4184.063616	4184.063616	4184.063616	4184.063616	0.007007899	0.659956226	0.76134451	0.826693245	0.905129756	1.0637456	1.0429993	4.12226	2020-11-03 20:25
68.4904	156	74.5967685	231.177118	138.042117																				











Ambank	Flow	Dilution Tunnel	Fluxbox Top	Fluxbox Back	Fluxbox Right	Fluxbox Left	Fluxbox Bottom	DOG inlet 1	DOG Outlet 1	Probe Temp 1	DOG inlet 2	DOG Outlet 2	Probe Temp 2	Probe Temp 3	DOG inlet 3	Manomètre Draft	Manomètre Tunnel	Transmetteur Vacuum 1	Transmetteur pression système 1	Transmetteur pression système 2	Transmetteur Vacuum 2	Manoflow 1	Manoflow 2	Balance Data	Date	
64.874	65	67.222284	65.621161	65.242917	65.800964	65.748899	65.645131	65.172059	65.147037	4155.530026	65.11249	4155.187820	4155.530026	4155.530026	0.00166699	0.00221305	0.00154972	0.00154972	0.00154972	0.00154972	0.00154972	0.00154972	0.00154972	0.00154972	0.00154972	2009-11-04 11:10
64.884	100	68.1758609	67.7440217	67.1852238	67.6373845	67.5018446	65.2320251	65.2738548	4155.96141	4155.197871	65.1854197	4155.96141	4155.96141	4155.96141	0.00163092	0.00163092	0.00163092	0.00163092	0.00163092	0.00163092	0.00163092	0.00163092	0.00163092	0.00163092	0.00163092	2009-11-04 11:11
64.892	140	69.2825654	68.4925205	68.792794	67.7807880	69.7042127	65.2320251	65.2443996	4155.96141	4155.197871	65.2085220	4155.96141	4155.96141	4155.96141	0.00179630	0.00179630	0.00179630	0.00179630	0.00179630	0.00179630	0.00179630	0.00179630	0.00179630	0.00179630	0.00179630	2009-11-04 11:12
64.896	175	70.9678285	71.1702029	71.033954	70.3597871	71.7479171	65.2320251	65.2388925	4155.96141	4155.197871	65.2388925	4155.96141	4155.96141	4155.96141	0.00187142	0.00187142	0.00187142	0.00187142	0.00187142	0.00187142	0.00187142	0.00187142	0.00187142	0.00187142	0.00187142	2009-11-04 11:13
64.925	180	73.5300895	74.1470507	70.1700803	65.6682717	71.5436272	65.7476263	65.357777	4155.148812	65.220044	65.2200507	4155.148812	4155.148812	4155.148812	0.00194619	0.00194619	0.00194619	0.00194619	0.00194619	0.00194619	0.00194619	0.00194619	0.00194619	0.00194619	0.00194619	2009-11-04 11:14
64.941	120	74.5399887	75.136231	67.1338033	65.1188317	67.4662809	65.7494422	65.1341102	4155.184087	65.249287	65.249287	4155.184087	4155.184087	4155.184087	0.00202784	0.00202784	0.00202784	0.00202784	0.00202784	0.00202784	0.00202784	0.00202784	0.00202784	0.00202784	0.00202784	2009-11-04 11:15
64.951	214	75.6682805	76.1614961	69.4892783	65.7473747	71.3382895	65.8136145	65.358281	4155.178041	4155.139258	4155.139258	4155.178041	4155.178041	4155.178041	0.00210974	0.00210974	0.00210974	0.00210974	0.00210974	0.00210974	0.00210974	0.00210974	0.00210974	0.00210974	0.00210974	2009-11-04 11:16
64.956	238	76.6505797	77.0374184	70.7027824	65.4966706	71.6400774	65.8232506	65.3628122	4155.417647	4155.139258	4155.139258	4155.417647	4155.417647	4155.417647	0.00219266	0.00219266	0.00219266	0.00219266	0.00219266	0.00219266	0.00219266	0.00219266	0.00219266	0.00219266	0.00219266	2009-11-04 11:17
65.054	255	77.1708168	77.5319831	69.7599243	65.6282809	71.9377953	65.8370873	65.3744799	4155.132208	4155.288541	4155.132208	4155.132208	4155.132208	4155.132208	0.00227558	0.00227558	0.00227558	0.00227558	0.00227558	0.00227558	0.00227558	0.00227558	0.00227558	0.00227558	0.00227558	2009-11-04 11:18
65.057	261	77.2388089	77.5851715	71.5225115	65.4165881	70.5474704	65.8420716	65.3837171	4155.4442128	4155.238581	4155.238581	4155.4442128	4155.4442128	4155.4442128	0.00235850	0.00235850	0.00235850	0.00235850	0.00235850	0.00235850	0.00235850	0.00235850	0.00235850	0.00235850	0.00235850	2009-11-04 11:19
65.071	269	77.3109627	77.6388118	71.6380033	65.4165881	70.5474704	65.8420716	65.3837171	4155.4442128	4155.238581	4155.238581	4155.4442128	4155.4442128	4155.4442128	0.00244142	0.00244142	0.00244142	0.00244142	0.00244142	0.00244142	0.00244142	0.00244142	0.00244142	0.00244142	0.00244142	2009-11-04 11:20
65.074	281	78.0459201	78.7410121	72.5470562	65.1130717	71.4388224	65.7833032	65.3912125	4155.644675	4155.312912	4155.312912	4155.644675	4155.644675	4155.644675	0.00252434	0.00252434	0.00252434	0.00252434	0.00252434	0.00252434	0.00252434	0.00252434	0.00252434	0.00252434	0.00252434	2009-11-04 11:21
65.081	289	78.0649039	78.1111121	72.0522068	65.4488949	71.374664	65.8278822	65.4032922	4155.4488949	4155.4488949	4155.4488949	4155.4488949	4155.4488949	4155.4488949	0.00260726	0.00260726	0.00260726	0.00260726	0.00260726	0.00260726	0.00260726	0.00260726	0.00260726	0.00260726	0.00260726	2009-11-04 11:22
65.077	296	79.1873762	79.4409177	71.987208	64.814383	71.939223	68.1929288	65.4238462	4155.4889479	4155.56297	4155.4889479	4155.4889479	4155.4889479	4155.4889479	0.00269018	0.00269018	0.00269018	0.00269018	0.00269018	0.00269018	0.00269018	0.00269018	0.00269018	0.00269018	0.00269018	2009-11-04 11:23
65.143	309	81.6381193	81.680021	71.8477093	65.736541	74.4645029	69.7047148	65.4782599	4155.015053	4155.4782599	4155.015053	4155.015053	4155.015053	4155.015053	0.00277310	0.00277310	0.00277310	0.00277310	0.00277310	0.00277310	0.00277310	0.00277310	0.00277310	0.00277310	0.00277310	2009-11-04 11:24
65.043	32	82.091201	83.974311	74.2524117	65.2438122	74.530788	70.8228384	65.4106161	4155.4799027	4155.424387	4155.424387	4155.4799027	4155.4799027	4155.4799027	0.00285602	0.00285602	0.00285602	0.00285602	0.00285602	0.00285602	0.00285602	0.00285602	0.00285602	0.00285602	0.00285602	2009-11-04 11:25
65.094	381	85.1677038	85.3991203	71.4948084	65.1049025	74.1741212	71.7591749	65.404011	4155.4788384	4155.4157901	4155.4157901	4155.4788384	4155.4788384	4155.4788384	0.00293894	0.00293894	0.00293894	0.00293894	0.00293894	0.00293894	0.00293894	0.00293894	0.00293894	0.00293894	0.00293894	2009-11-04 11:26
65.201	382	87.1612611	86.5388717	71.484868	65.708551	71.433211	73.7578964	65.415241	4155.4796713	4155.378851	4155.378851	4155.4796713	4155.4796713	4155.4796713	0.00302186	0.00302186	0.00302186	0.00302186	0.00302186	0.00302186	0.00302186	0.00302186	0.00302186	0.00302186	0.00302186	2009-11-04 11:27
65.289	404	88.1619663	89.0523847	75.1479338	65.1993913	70.32863	75.2107488	65.4102029	4155.4667273	4155.482627	4155.482627	4155.4667273	4155.4667273	4155.4667273	0.00310478	0.00310478	0.00310478	0.00310478	0.00310478	0.00310478	0.00310478	0.00310478	0.00310478	0.00310478	0.00310478	2009-11-04 11:28
65.325	414	89.0268474	89.1839971	75.1456487	65.4191516	70.8900261	71.4882076	65.4102964	4155.4666611	4155.482627	4155.482627	4155.4666611	4155.4666611	4155.4666611	0.00318770	0.00318770	0.00318770	0.00318770	0.00318770	0.00318770	0.00318770	0.00318770	0.00318770	0.00318770	0.00318770	2009-11-04 11:29
65.243	418	89.6111007	90.1520992	76.8548287	65.8528866	70.869321	79.3932609	65.4248448	4155.482627	4155.482627	4155.482627	4155.482627	4155.482627	4155.482627	0.00327062	0.00327062	0.00327062	0.00327062	0.00327062	0.00327062	0.00327062	0.00327062	0.00327062	0.00327062	0.00327062	2009-11-04 11:30
65.440	423	89.9380958	90.8202129	77.4558288	65.2058282	71.6558282	79.9502185	65.4248448	4155.482627	4155.482627	4155.482627	4155.482627	4155.482627	4155.482627	0.00335354	0.00335354	0.00335354	0.00335354	0.00335354	0.00335354	0.00335354	0.00335354	0.00335354	0.00335354	0.00335354	2009-11-04 11:31
65.489	423	90.2195013	90.549784	78.084788	65.4102062	71.63884	84.8888204	65.4248448	4155.482627	4155.482627	4155.482627	4155.482627	4155.482627	4155.482627	0.00343646	0.00343646	0.00343646	0.00343646	0.00343646	0.00343646	0.00343646	0.00343646	0.00343646	0.00343646	0.00343646	2009-11-04 11:32
65.591	429	91.1682074	90.8820826	80.1971735	65.2127221	71.138884	88.2026166	65.4102062	4155.482627	4155.482627	4155.482627	4155.482627	4155.482627	4155.482627	0.00351938	0.00351938	0.00351938	0.00351938	0.00351938	0.00351938	0.00351938	0.00351938	0.00351938	0.00351938	0.00351938	2009-11-04 11:33
65.597	430	91.0782764	92.332061	81.1211664	65.2287889	72.849504	89.1974128	65.4102062	4155.482627	4155.482627	4155.482627	4155.482627	4155.482627	4155.482627	0.00360230	0.00360230	0.00360230	0.00360230	0.00360230	0.00360230	0.00360230	0.00360230	0.00360230	0.00360230	0.00360230	2009-11-04 11:34
65.671	445	92.2229204	93.0723251	82.1997422	65.2493828	74.919851	91.1999968	65.4307073	4155.4778826	4155.4778826	4155.4778826	4155.4778826	4155.4778826	4155.4778826	0.00368522	0.00368522	0.00368522	0.00368522	0.00368522	0.00368522	0.00368522	0.00368522	0.00368522	0.00368522	0.00368522	2009-11-04 11:35
65.790	450	93.1188027	94.070994	83.6038136	65.2452189	74.70994	100.829161	65.4143783	4155.4805627	4155.479423	4155.479423	4155.4805627	4155.4805627	4155.4805627	0.00376814	0.00376814	0.00376814	0.00376814	0.00376814	0.00376814	0.00376814	0.00376814	0.00376814	0.00376814	0.00376814	2009-11-04 11:36
65.836	457	94.0818127	94.464294	80.0088846	65.2484814																					

Table with columns: Ambient, Flow, Dilution Tunnel, Flow, Friction, Friction Right, Friction Left, Friction Bottom, DGM Inlet 1, DGM Outlet 1, Probe Tunnel 1, DGM Inlet 2, DGM Outlet 2, Probe Tunnel 2, Probe Tunnel 3, DGM Inlet 3, Manometer Draft, Manometer Tunnel, Transmitter Vacuum 1, Transmitter pressure system 1, Transmitter pressure system 2, Transmitter Vacuum 2, Manifold A, Manifold B, Balance Data Drive. The table contains a dense grid of numerical data points for each parameter across various test runs.



Ambient	Flue	Dilution Tunnel	Fluebox Top	Fluebox Back	Fluebox Right	Fluebox Left	Fluebox Bottom	OGM Inlet 1	OGM Outlet 1	Probe Temp 1	OGM Inlet 2	OGM Outlet 2	Probe Temp 2	Probe Temp 3	OGM Inlet 3	Manometer Draft	Manometer Tunnel	Transmitter Vacuum 1	Transmitter pressure system 1	Transmitter pressure system 2	Transmitter Vacuum 2	Manuflow 1	Manuflow 2	Balance	Date	Hour
77.923	338	97.02424866	500.880961	244.3050251	441.888987	418.884247	331.8786238	70.4597363	70.50222406	4182.918702	70.5029728	70.61551537	4182.918702	4182.9187	-0.002302864	0.028026159	-0.28880254	-0.96533007	-0.96533007	-0.96533007	-0.28880254	-0.28880254	-0.28880254	-0.28880254	2020-11-05	11:49
77.361	333	95.65213	494.125849	338.7702471	438.8132177	414.764272	331.7767572	70.462618	70.51280833	4182.941396	70.4897361	70.61552304	4182.941396	4182.941396	-0.0012097246	0.0790558	-0.386884275	-0.96533007	-0.96533007	-0.96533007	-0.386884275	-0.386884275	-0.386884275	-0.386884275	2020-11-05	11:50
77.8269	339	95.12388493	485.020237	328.983309	426.0737302	412.658975	332.3484255	70.4724542	70.55669545	4182.993548	70.4868999	70.62008339	4182.993548	4182.993548	-0.001348192	0.055096558	-0.350596558	-0.96533007	-0.96533007	-0.96533007	-0.350596558	-0.350596558	-0.350596558	-0.350596558	2020-11-05	11:51
77.824	334	95.78402495	478.952478	326.393866	433.2440026	407.201544	333.207982	70.4880218	70.54432903	4183.013152	70.5332666	70.64886159	4183.013152	4183.013152	-0.00194239	0.049349846	-0.352337271	-0.96533007	-0.96533007	-0.96533007	-0.352337271	-0.352337271	-0.352337271	-0.352337271	2020-11-05	11:52
77.457	338	95.7617255	470.948245	334.470992	429.939863	409.17708	332.287261	70.5082025	70.55340743	4183.000794	70.5524074	70.6788372	4183.000794	4183.000794	-0.001332088	0.045320079	-0.353320079	-0.96533007	-0.96533007	-0.96533007	-0.353320079	-0.353320079	-0.353320079	-0.353320079	2020-11-05	11:53
77.827	332	94.7687222	463.951542	330.604283	426.792585	399.895544	332.4889688	70.5184238	70.57023754	4183.000633	70.57023754	70.70060002	4183.000633	4183.000633	-0.00226218	0.041302841	-0.351302841	-0.96533007	-0.96533007	-0.96533007	-0.351302841	-0.351302841	-0.351302841	-0.351302841	2020-11-05	11:54
77.723	307	94.95657872	464.031861	327.5870258	422.5292888	396.530997	332.4646178	70.549835	70.58620293	4183.11166	70.5710432	70.6979382	4183.11166	4183.11166	-0.0020139383	0.048422611	-0.352082094	-0.96533007	-0.96533007	-0.96533007	-0.352082094	-0.352082094	-0.352082094	-0.352082094	2020-11-05	11:55
77.5449	303	93.9706267	446.437671	329.478711	418.644632	392.51528	333.2220184	70.5497985	70.63866983	4183.105336	70.57520671	70.70578228	4183.105336	4183.105336	-0.002262021	0.044232942	-0.35668308	-0.96533007	-0.96533007	-0.96533007	-0.35668308	-0.35668308	-0.35668308	-0.35668308	2020-11-05	11:56
77.4139	299	93.61423774	438.54723	323.1883936	414.6297373	389.601907	332.4825263	70.5524449	70.60202641	4183.205291	70.5824298	70.69818697	4183.205291	4183.205291	-0.001095681	0.044987187	-0.351874062	-0.96533007	-0.96533007	-0.96533007	-0.351874062	-0.351874062	-0.351874062	-0.351874062	2020-11-05	11:57
77.3469	295	93.2993776	431.115584	323.065814	412.699998	385.494179	332.4678638	70.5599004	70.61055551	4183.20906	70.5858454	70.6999357	4183.20906	4183.20906	-0.002287741	0.04444433	-0.35192397	-0.96533007	-0.96533007	-0.96533007	-0.35192397	-0.35192397	-0.35192397	-0.35192397	2020-11-05	11:58
77.772	292	92.8118642	424.53027	323.197749	406.7586959	382.02046	332.9222706	70.5778566	70.62720941	4183.289142	70.6125955	70.72029741	4183.289142	4183.289142	-0.001252594	0.04893977	-0.352705939	-0.96533007	-0.96533007	-0.96533007	-0.352705939	-0.352705939	-0.352705939	-0.352705939	2020-11-05	11:59
77.533	289	92.64883338	418.217908	321.811237	402.460004	379.90807	332.791128	70.620589	70.6450562	4183.327872	70.6209909	70.7896478	4183.327872	4183.327872	-0.001148555	0.043594979	-0.352002753	-0.96533007	-0.96533007	-0.96533007	-0.352002753	-0.352002753	-0.352002753	-0.352002753	2020-11-05	12:00
77.396	285	92.4484021	412.108517	318.431083	398.355085	375.738144	332.70177	70.6208113	70.6347305	4183.360178	70.619031	70.7629478	4183.360178	4183.360178	-0.001201935	0.040331905	-0.351795921	-0.96533007	-0.96533007	-0.96533007	-0.351795921	-0.351795921	-0.351795921	-0.351795921	2020-11-05	12:01
77.192	282	93.70484211	406.638951	314.228043	394.1487971	372.466513	332.1291614	70.6251058	70.66888278	4183.403139	70.63683128	70.75426134	4183.403139	4183.403139	-0.001900209	0.042047909	-0.352176164	-0.96533007	-0.96533007	-0.96533007	-0.352176164	-0.352176164	-0.352176164	-0.352176164	2020-11-05	12:02
77.5262	280	91.7907469	401.430564	314.028087	395.570558	369.709813	331.5389152	70.6137978	70.63338099	4183.431214	70.6332025	70.76283334	4183.431214	4183.431214	-0.001364395	0.040451803	-0.350933635	-0.96533007	-0.96533007	-0.96533007	-0.350933635	-0.350933635	-0.350933635	-0.350933635	2020-11-05	12:03
77.601	277	91.56162313	396.154663	312.980282	387.289145	366.867709	332.464119	70.6451693	70.67862267	4183.459136	70.629759	70.76220096	4183.459136	4183.459136	-0.001290045	0.043939446	-0.352691818	-0.96533007	-0.96533007	-0.96533007	-0.352691818	-0.352691818	-0.352691818	-0.352691818	2020-11-05	12:04
77.546	275	91.1747185	391.477521	311.978693	385.762811	364.071815	332.8995304	70.688226	70.6880281	4183.507718	70.6688044	70.7611348	4183.507718	4183.507718	-0.001309875	0.04128438	-0.352886857	-0.96533007	-0.96533007	-0.96533007	-0.352886857	-0.352886857	-0.352886857	-0.352886857	2020-11-05	12:05
77.508	272	91.1010107	386.53157	310.927654	380.62528	361.528205	332.760778	70.6282005	70.694475	4183.561676	70.685421	77.715944	4183.561676	4183.561676	-0.001251578	0.044648732	-0.352551	-0.96533007	-0.96533007	-0.96533007	-0.352551	-0.352551	-0.352551	-0.352551	2020-11-05	12:06
77.887	270	91.55182761	382.133046	309.826093	377.402244	359.533983	332.86793	70.6754647	70.71487984	4183.601039	70.6698155	70.7935093	4183.601039	4183.601039	-0.001299539	0.04512884	-0.351992407	-0.96533007	-0.96533007	-0.96533007	-0.351992407	-0.351992407	-0.351992407	-0.351992407	2020-11-05	12:07
77.4749	268	90.9512176	378.624574	308.838801	374.617613	356.648484	333.811211	70.6718771	70.70796847	4183.6072	70.6759951	70.79517961	4183.6072	4183.6072	-0.000987941	0.04421002	-0.351554796	-0.96533007	-0.96533007	-0.96533007	-0.351554796	-0.351554796	-0.351554796	-0.351554796	2020-11-05	12:08
77.865	265	90.55186883	374.670795	307.5726882	370.7278941	353.621077	333.0410425	70.671879	70.7374679	4183.639034	70.6959978	70.79051741	4183.639034	4183.639034	-0.001328241	0.043883518	-0.351881511	-0.96533007	-0.96533007	-0.96533007	-0.351881511	-0.351881511	-0.351881511	-0.351881511	2020-11-05	12:09
77.4189	263	90.12176549	370.77005	306.7984623	367.860099	351.740295	333.8426547	70.6823292	70.7498463	4183.646836	70.6837078	70.8115507	4183.646836	4183.646836	-0.001263808	0.044023002	-0.351986357	-0.96533007	-0.96533007	-0.96533007	-0.351986357	-0.351986357	-0.351986357	-0.351986357	2020-11-05	12:10
77.8502	262	100.816202	365.48757	328.556616	364.731246	349.83065	333.010636	70.6802004	70.7864285	4183.704682	70.691948	70.8059728	4183.704682	4183.704682	-0.001362319	0.041445048	-0.352515772	-0.96533007	-0.96533007	-0.96533007	-0.352515772	-0.352515772	-0.352515772	-0.352515772	2020-11-05	12:11
77.5346	269	95.06660912	361.853751	326.628715	362.3610245	347.944452	335.065655	70.711889	70.75750118	4183.757821	70.7283482	70.84912335	4183.757821	4183.757821	-0.001257528	0.046747216	-0.352929447	-0.96533007	-0.96533007	-0.96533007	-0.352929447	-0.352929447	-0.352929447	-0.352929447	2020-11-05	12:12







Table with columns: Ambient, Flow, Dilution Tunnel, Flowback Top, Flowback Back, Flowback Right, Flowback Left, Flowback Bottom, DGM Inlet 1, DGM Outlet 1, Probe Temp 1, DGM Inlet 2, DGM Outlet 2, Probe Temp 2, Probe Temp 3, DGM Inlet 3, Manomètre Draft, Manomètre Tunnel, Transmetteur Vacuum 1, Transmetteur pression système 1, Transmetteur pression système 2, Transmetteur Vacuum 2, Maniflow 1, Maniflow 2, Balance Data Flow. The table contains a dense grid of numerical data points for each parameter across various flow and measurement points.









75.1621	150	80.740701	248.58844	188.534915	272.803807	252.343998	250.733662	14.460542	7.14026077	419.884913	73.920364	7.19133606	419.884913	73.920364	419.884913	0.00000263	0.04908888	0.07767075	0.58805483	0.44262929	-0.01017388	3.5042902	4.3077674	4.59883	2020-11-12 0:04
75.2624	150	80.701778	248.49894	188.499178	251.854177	252.343998	250.733662	14.460542	7.14026077	419.884913	73.920364	7.19133606	419.884913	73.920364	419.884913	0.00000263	0.04908888	0.07767075	0.58805483	0.44262929	-0.01017388	3.5042902	4.3077674	4.59883	2020-11-12 0:04
75.2665	150	80.645562	247.78811	188.304812	272.014662	251.854177	250.733662	14.460542	7.14026077	419.884913	73.920364	7.19133606	419.884913	73.920364	419.884913	0.00000263	0.04908888	0.07767075	0.58805483	0.44262929	-0.01017388	3.5042902	4.3077674	4.59883	2020-11-12 0:04
75.2902	150	80.551659	247.10391	188.120728	271.813209	251.854177	250.733662	14.460542	7.14026077	419.884913	73.920364	7.19133606	419.884913	73.920364	419.884913	0.00000263	0.04908888	0.07767075	0.58805483	0.44262929	-0.01017388	3.5042902	4.3077674	4.59883	2020-11-12 0:04
75.2914	150	80.527816	247.06441	188.051174	271.940404	251.854177	250.733662	14.460542	7.14026077	419.884913	73.920364	7.19133606	419.884913	73.920364	419.884913	0.00000263	0.04908888	0.07767075	0.58805483	0.44262929	-0.01017388	3.5042902	4.3077674	4.59883	2020-11-12 0:04
75.2531	149	80.647413	247.68891	187.505471	270.928202	250.733662	249.624978	14.460542	7.14026077	419.884913	73.920364	7.19133606	419.884913	73.920364	419.884913	0.00000263	0.04908888	0.07767075	0.58805483	0.44262929	-0.01017388	3.5042902	4.3077674	4.59883	2020-11-12 0:04
75.2661	149	80.532165	247.00981	187.330618	270.624999	250.733662	249.624978	14.460542	7.14026077	419.884913	73.920364	7.19133606	419.884913	73.920364	419.884913	0.00000263	0.04908888	0.07767075	0.58805483	0.44262929	-0.01017388	3.5042902	4.3077674	4.59883	2020-11-12 0:04
75.2119	149	80.511173	246.56881	187.088042	270.240065	250.733662	249.624978	14.460542	7.14026077	419.884913	73.920364	7.19133606	419.884913	73.920364	419.884913	0.00000263	0.04908888	0.07767075	0.58805483	0.44262929	-0.01017388	3.5042902	4.3077674	4.59883	2020-11-12 0:04
75.2777	149	80.331625	245.26681	186.206811	269.880724	250.733662	249.624978	14.460542	7.14026077	419.884913	73.920364	7.19133606	419.884913	73.920364	419.884913	0.00000263	0.04908888	0.07767075	0.58805483	0.44262929	-0.01017388	3.5042902	4.3077674	4.59883	2020-11-12 0:04
75.2167	148	80.467068	244.70791	186.093842	268.538418	249.624978	248.516207	14.460542	7.14026077	419.884913	73.920364	7.19133606	419.884913	73.920364	419.884913	0.00000263	0.04908888	0.07767075	0.58805483	0.44262929	-0.01017388	3.5042902	4.3077674	4.59883	2020-11-12 0:04
75.1281	148	80.402738	243.93801	185.300668	268.044345	249.624978	248.516207	14.460542	7.14026077	419.884913	73.920364	7.19133606	419.884913	73.920364	419.884913	0.00000263	0.04908888	0.07767075	0.58805483	0.44262929	-0.01017388	3.5042902	4.3077674	4.59883	2020-11-12 0:04
74.9975	148	80.406134	243.70001	185.23928	268.487011	249.624978	248.516207	14.460542	7.14026077	419.884913	73.920364	7.19133606	419.884913	73.920364	419.884913	0.00000263	0.04908888	0.07767075	0.58805483	0.44262929	-0.01017388	3.5042902	4.3077674	4.59883	2020-11-12 0:04
75.0088	148	80.393309	243.49721	185.106419	268.200073	248.64713	248.64713	14.460542	7.14026077	419.884913	73.920364	7.19133606	419.884913	73.920364	419.884913	0.00000263	0.04908888	0.07767075	0.58805483	0.44262929	-0.01017388	3.5042902	4.3077674	4.59883	2020-11-12 0:04
75.0181	148	80.362989	243.26291	185.012037	267.929187	248.538882	248.538882	14.460542	7.14026077	419.884913	73.920364	7.19133606	419.884913	73.920364	419.884913	0.00000263	0.04908888	0.07767075	0.58805483	0.44262929	-0.01017388	3.5042902	4.3077674	4.59883	2020-11-12 0:04
75.3155	148	80.241252	243.24801	184.917143	267.320211	247.7763	247.7763	14.460542	7.14026077	419.884913	73.920364	7.19133606	419.884913	73.920364	419.884913	0.00000263	0.04908888	0.07767075	0.58805483	0.44262929	-0.01017388	3.5042902	4.3077674	4.59883	2020-11-12 0:04
75.0277	147	80.326474	242.95811	184.826493	267.030067	248.800724	248.800724	14.460542	7.14026077	419.884913	73.920364	7.19133606	419.884913	73.920364	419.884913	0.00000263	0.04908888	0.07767075	0.58805483	0.44262929	-0.01017388	3.5042902	4.3077674	4.59883	2020-11-12 0:04
75.0517	147	80.296749	242.84481	184.740659	266.745844	247.69879	247.69879	14.460542	7.14026077	419.884913	73.920364	7.19133606	419.884913	73.920364	419.884913	0.00000263	0.04908888	0.07767075	0.58805483	0.44262929	-0.01017388	3.5042902	4.3077674	4.59883	2020-11-12 0:04
75.1401	147	80.276729	241.68891	184.611303	266.487872	246.7802	246.7802	14.460542	7.14026077	419.884913	73.920364	7.19133606	419.884913	73.920364	419.884913	0.00000263	0.04908888	0.07767075	0.58805483	0.44262929	-0.01017388	3.5042902	4.3077674	4.59883	2020-11-12 0:04
75.0181	146	80.259661	241.12161	184.527447	266.133564	245.8698	245.8698	14.460542	7.14026077	419.884913	73.920364	7.19133606	419.884913	73.920364	419.884913	0.00000263	0.04908888	0.07767075	0.58805483	0.44262929	-0.01017388	3.5042902	4.3077674	4.59883	2020-11-12 0:04
75.0071	146	80.248308	240.65781	184.455684	265.811905	245.0926	245.0926	14.460542	7.14026077	419.884913	73.920364	7.19133606	419.884913	73.920364	419.884913	0.00000263	0.04908888	0.07767075	0.58805483	0.44262929	-0.01017388	3.5042902	4.3077674	4.59883	2020-11-12 0:04
75.1621	146	80.216489	240.33801	184.380068	265.448377	244.319968	244.319968	14.460542	7.14026077	419.884913	73.920364	7.19133606	419.884913	73.920364	419.884913	0.00000263	0.04908888	0.07767075	0.58805483	0.44262929	-0.01017388	3.5042902	4.3077674	4.59883	2020-11-12 0:04
75.1383	146	80.185701	239.87811	184.307529	265.091878	244.49204	244.49204	14.460542	7.14026077	419.884913	73.920364	7.19133606	419.884913	73.920364	419.884913	0.00000263	0.04908888	0.07767075	0.58805483	0.44262929	-0.01017388	3.5042902	4.3077674	4.59883	2020-11-12 0:04
75.0281	146	80.157206	239.58451	184.225207	264.749889	244.32748	244.32748	14.460542	7.14026077	419.884913	73.920364	7.19133606	419.884913	73.920364	419.884913	0.00000263	0.04908888	0.07767075	0.58805483	0.44262929	-0.01017388	3.5042902	4.3077674	4.59883	2020-11-12 0:04
75.1494	146	80.159678	239.32811	184.204823	264.505205	244.15178	244.15178	14.460542	7.14026077	419.884913	73.920364	7.19133606	419.884913	73.920364	419.884913	0.00000263	0.04908888	0.07767075	0.58805483	0.44262929	-0.01017388	3.5042902	4.3077674	4.59883	2020-11-12 0:04
75.1745	146	80.113964	237.11211	183.999819	264.21478	244.2148	244.2148	14.460542	7.14026077	419.884913	73.920364	7.19133606	419.884913	73.920364	419.884913	0.00000263	0.04908888	0.07767075	0.58805483	0.44262929	-0.01017388	3.5042902	4.3077674	4.59883	2020-11-12 0:04
75.0441	145	80.159122	236.62971	183.717738	263.982021	244.28275	244.28275	14.460542	7.14026077	419.884913	73.920364	7.19133606	419.884913	73.920364	419.884913	0.00000263	0.04908888	0.07767075	0.58805483	0.44262929	-0.01017388	3.5042902	4.3077674	4.59883	2020-11-12 0:04
75.2407	145	80.021207	236.15811	183.589084	263.523807	244.42824	244.42824	14.460542	7.14026077	419.884913	73.920364	7.19133606	419.884913	73.920364	419.884913	0.00000263	0.04908888	0.07767075	0.58805483	0.44262929	-0.01017388	3.5042902	4.3077674	4.59883	2020-11-12 0:04
75.0665	145	80.024263	235.76661	183.510378	263.187086	244.139968	244.139968	14.460542	7.14026077	419.884913	73.920364	7.19133606	419.884913	73.920364	419.884913	0.00000263	0.04908888	0.07767075	0.58805483	0.44262929	-0.01017388	3.5042902	4.3077674	4.59883	2020-11-12 0:04
74.8399	145	79.996561	235.24941	183.438842	262.846139	244.29204	244.29204	14.460542	7.14026077	419.884913	73.920364	7.19133606	419.884913	73.920364	419.884913	0.00000263	0.04908888	0.07767075	0.58805483	0.44262929	-0.01017388	3.5042902	4.3077674	4.59883	2020-11-12 0:04
75.0518	145	79.954432	234.86611	183.361344	262.509186	244.21827	244.21827	14.460542	7.14026077	419.884913	73.920364	7.19133606	419.884913	73.920364	419.884913	0.00000263	0.04908888	0.07767075	0.58805483	0.44262929	-0.01017388	3.5042902	4.3077674	4.59883	2020-11-12 0:04
75.0518																									





VERSION: 2.4  
 2010-04-15  
 Manufacturer: SBI  
 Model: 1.4 series  
 Date: 2020-11-17  
 Run: 1  
 Control #: G104473478  
 Test Duration: 398  
 Output Category: Low

Appliance Type: Non-Cat (Cat, Non-Cat, Pellet)

Temp. Units F (F or C)  
 Weight Units lb (kg or lb)

Default Fuel Values  
 D. Fir 19,810  
 Oak 19,887  
 HHV (kJ/kg) 48.73  
 %C 48.73  
 %H 6.87  
 %O 43.9  
 %Ash 0.5

Wood Moisture (% wet): 16.80  
 Load Weight (lb wet): 19.50  
 Burn Rate (dry kg/h): 1.11  
 Total Particulate Emissions: 14.643 g

Fuel Data  
 Beech  
 HHV 18,800 kJ/kg  
 %C 48.7  
 %H 5.8  
 %O 44.9  
 %Ash 0.6

Note 1: For other fuels, use the heating value and fuel composition determined by analysis of fuel sample in accordance with Clause 9.2.

Averages 0.45 6.55 14.04 239.45 73.79

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%)			Flue Gas Temp (°F)	Room Temp
		CO	CO <sub>2</sub>	O <sub>2</sub>		
0	19.50	0.35	3.37	17.18	271.7	80.5
1	19.47	0.31	1.94	18.73	261.6	81.6
2	19.45	0.14	1.16	19.81	252.4	83.1
3	19.19	0.14	1.60	19.32	280.5	83.2
4	18.84	0.40	2.72	18.13	351.5	84.2
5	18.56	0.80	7.86	12.97	354.9	81.0
6	18.39	0.85	8.63	12.21	361.1	78.5
7	18.19	0.47	11.41	9.42	407.1	78.5
8	17.99	0.67	13.53	7.55	432.2	78.2
9	17.84	0.41	11.53	9.60	426.0	78.1
10	17.67	0.32	10.65	10.42	425.3	77.6
11	17.50	0.30	10.88	10.23	431.8	77.7
12	17.34	0.29	11.49	9.56	441.6	78.2
13	17.16	0.28	12.03	9.12	451.8	78.6
14	16.95	0.29	13.08	8.05	470.0	78.0
15	16.79	0.38	14.38	6.85	473.4	77.9
16	16.62	0.48	13.27	7.82	451.9	78.1
17	16.48	0.46	12.45	8.85	428.5	77.7
18	16.35	0.40	11.82	9.29	413.3	78.0
19	16.23	0.25	10.85	10.23	399.2	77.6
20	16.11	0.19	9.56	11.44	386.4	77.7
21	16.02	0.30	8.59	12.40	373.2	79.1
22	15.91	0.46	7.83	13.13	362.1	79.2
23	15.81	0.56	7.02	13.73	351.5	79.6
24	15.70	0.61	7.20	13.56	346.2	81.0
25	15.57	0.54	7.98	12.88	345.6	82.0
26	15.45	0.49	8.38	12.55	345.4	82.9
27	15.33	0.45	8.27	12.60	344.3	83.2
28	15.20	0.44	8.13	12.82	342.7	83.8
29	15.10	0.44	7.90	13.06	340.3	83.9
30	15.00	0.45	7.43	13.48	336.2	84.3
31	14.91	0.48	7.03	13.91	330.2	84.6
32	14.81	0.52	6.62	14.23	324.3	85.1
33	14.73	0.54	6.40	14.47	319.4	83.4
34	14.67	0.55	6.07	14.78	313.8	82.2
35	14.57	0.56	6.01	14.84	309.3	82.0
36	14.51	0.56	5.94	14.88	305.6	81.4
37	14.45	0.56	5.92	14.87	302.4	81.3
38	14.37	0.56	5.89	14.90	299.5	80.6
39	14.30	0.55	5.93	14.86	296.7	82.2
40	14.21	0.57	5.96	14.85	294.0	83.4
41	14.10	0.56	6.04	14.76	292.4	84.2
42	14.01	0.56	6.06	14.77	291.0	84.4
43	13.94	0.54	6.08	14.70	289.9	84.8
44	13.84	0.53	6.04	14.76	288.9	85.0
45	13.75	0.52	5.94	14.86	288.3	83.0
46	13.68	0.51	5.83	14.96	287.8	81.4
47	13.64	0.51	5.91	14.91	286.5	80.1
48	13.59	0.51	6.00	14.77	285.2	79.7
49	13.50	0.5113	6.13	14.65	285.52	80.2721
50	13.44	0.5074	6.43	14.39	286.463	82.0548
51	13.34	0.4781	6.64	14.13	287.922	82.9189
52	13.23	0.4693	6.92	13.92	290.071	83.7298
53	13.15	0.4374	7.01	13.87	292.752	80.9576
54	13.08	0.4485	6.95	13.95	295.311	79.1851
55	13.02	0.4199	7.11	13.77	297.755	78.7003
56	12.95	0.397	7.21	13.67	299.747	79.1241
57	12.86	0.39	7.37	13.6	301.296	79.419
58	12.79	0.3796	7.48	13.53	302.78	79.5548
59	12.71	0.3969	7.54	13.48	304.498	79.7711
60	12.64	0.3956	7.68	13.36	306.571	78.8433
61	12.56	0.3896	7.87	13.21	308.033	79.0451
62	12.47	0.3943	8.23	12.9	310.975	79.6728
63	12.36	0.3637	8.55	12.62	313.591	79.514
64	12.25	0.3263	9.2	12.07	319.93	79.8033
65	12.16	0.3304	10.16	11.22	328.665	79.8028
66	12.02	0.4296	10.92	10.39	336.797	78.3834
67	11.89	0.5196	11.37	10	344.554	79.0602
68	11.77	0.4425	11.49	10.03	349.307	78.5549
69	11.63	0.3065	11.64	10.03	352.367	78.1873
70	11.49	0.2269	11.99	9.68	356.537	78.5089
71	11.35	0.2713	12.34	9.34	363.403	77.8841
72	11.19	0.464	13.36	8.4	371.903	78.1496
73	11.01	0.7538	14.23	7.53	382.521	78.0908
74	10.84	1.0999	14.8	6.92	392.655	78.9735
75	10.63	1.2761	15.09	6.55	400.318	76.3127
76	10.45	1.3507	15.18	6.39	406.226	76.4878
77	10.24	1.3423	15.12	6.45	410.107	75.7745
78	10.06	1.2858	15.02	6.48	411.079	75.4669
79	9.87	1.2362	14.94	6.57	413.039	75.7505
80	9.71	1.178	14.82	6.6	414.922	75.6143
81	9.52	1.1163	14.77	6.73	414.36	75.5814
82	9.34	1.0458	14.59	6.9	414.066	74.1924
83	9.18	1.0037	14.63	6.97	413.747	74.9787
84	9.00	0.9483	14.57	7.03	414.09	74.5586
85	8.85	0.9062	14.31	7.16	413.156	74.8803
86	8.65	0.8569	14.37	7.19	411.728	74.7163
87	8.51	0.8419	14.19	7.35	410.323	74.5916

Note 2: In cases where the "Fuel Weight Remaining" is the same for three or more readings in a row, a "divide by zero error" will occur in the calculation sheet. In such cases, adjust the weight values by interpolation between the first occurrence and the next reading showing a decrease in weight.

88	8.35	0.8328	14.13	7.43	408.353	74.8566
89	8.19	0.8413	13.98	7.49	407.688	74.2841
90	8.03	0.8301	13.92	7.55	406.521	74.8452
91	7.90	0.8235	13.89	7.56	405.594	75.1296
92	7.73	0.8157	13.82	7.64	404.248	75.0171
93	7.58	0.8237	13.83	7.63	403.002	75.1994
94	7.43	0.8529	13.83	7.61	403.071	75.2701
95	7.29	0.8463	13.77	7.55	402.835	75.193
96	7.13	0.8858	13.8	7.5	403.521	74.7578
97	7.01	0.9139	13.81	7.46	403.111	75.1895
98	6.84	0.9354	13.85	7.4	402.788	75.2232
99	6.71	0.9349	13.86	7.38	401.459	74.8027
100	6.56	0.8754	13.61	7.54	399.681	74.8813
101	6.46	0.7934	13.42	7.54	397.554	75.1594
102	6.32	0.6232	13.51	7.45	395.963	75.4595
103	6.18	0.4237	13.45	7.62	394.312	75.1641
104	6.07	0.3824	13.55	7.63	393.661	75.5376
105	5.95	0.3886	13.61	7.52	393.511	74.8004
106	5.85	0.4266	13.48	7.51	392.723	74.9668
107	5.72	0.4918	13.4	7.58	391.264	75.3275
108	5.61	0.5294	13.17	7.8	388.252	75.4454
109	5.47	0.5234	12.91	8.03	385.914	75.799
110	5.38	0.5082	12.69	8.26	382.373	74.8562
111	5.27	0.5633	12.37	8.44	378.845	74.3075
112	5.16	0.6032	12.18	8.63	375.871	73.7426
113	5.05	0.6515	12.11	8.66	373.512	73.8068
114	4.95	0.6778	12.1	8.58	370.858	73.7057
115	4.87	0.6205	11.71	8.88	366.243	74.3681
116	4.78	0.3484	10.98	9.55	360.373	74.5163
117	4.70	0.1779	10.45	10.01	353.645	74.9565
118	4.65	0.1016	9.67	10.72	345.457	74.2081
119	4.58	0.0941	8.83	11.53	336.655	74.1005
120	4.54	0.0951	8.4	11.99	329.094	73.1036
121	4.47	0.1241	8.07	12.36	321.7	73.3693
122	4.40	0.1596	7.75	12.68	315.254	74.1534
123	4.38	0.1962	7.45	12.95	308.585	73.8452
124	4.33	0.2299	7.32	13.1	302.971	73.718
125	4.27	0.2576	7.18	13.2	297.855	74.085
126	4.23	0.3001	7.19	13.22	293.043	74.4671
127	4.20	0.3271	7.07	13.23	288.955	74.933
128	4.14	0.355	7.06	13.23	285.41	74.4656
129	4.10	0.3626	7.15	13.16	282.34	74.2543
130	4.04	0.3695	7.12	13.17	279.466	74.7011
131	4.00	0.3696	7.1	13.16	276.528	74.3555
132	3.96	0.3612	7.16	13.1	274.166	74.493
133	3.91	0.3587	7.13	13.11	271.461	74.3434
134	3.88	0.3646	7.12	13.13	268.957	74.201
135	3.82	0.3707	7.04	13.14	266.95	73.961
136	3.79	0.364	7.09	13.17	264.526	74.5036
137	3.75	0.3477	7.07	13.15	263.24	73.9392
138	3.71	0.3308	7.05	13.13	261.263	73.9928
139	3.67	0.337	7.18	13.1	259.71	74.3173
140	3.63	0.3253	7.1	13.09	258.115	74.0983
141	3.60	0.3033	7.22	13.05	256.495	73.8364
142	3.55	0.2827	7.14	13.1	255.209	73.9185
143	3.53	0.2717	7.18	13.1	254.043	73.7304
144	3.49	0.2557	7.34	12.97	253.362	74.0426
145	3.47	0.2431	7.36	12.91	252.199	73.6877
146	3.44	0.2529	6.95	13.33	249.573	73.7685
147	3.40	0.2965	6.32	13.93	246.26	74.1053
148	3.38	0.309	6.03	14.22	242.947	73.7072
149	3.37	0.3044	5.93	14.36	239.878	73.5353
150	3.35	0.3091	5.84	14.44	237.291	74.0949
151	3.33	0.3247	5.78	14.52	234.919	73.8889
152	3.31	0.3476	5.78	14.57	232.877	73.9672
153	3.29	0.369	5.71	14.67	230.629	73.7802
154	3.27	0.4165	5.59	14.79	228.257	73.8474
155	3.24	0.4553	5.54	14.82	226.04	73.5417
156	3.24	0.4603	5.51	14.9	223.623	73.4538
157	3.22	0.4691	5.46	14.93	221.455	73.1294
158	3.20	0.4675	5.5	14.96	219.182	73.4666
159	3.18	0.4761	5.48	14.97	217.35	73.4271
160	3.17	0.4796	5.47	14.95	215.986	73.5888
161	3.15	0.4791	5.47	14.97	214.208	73.5327
162	3.12	0.4896	5.49	14.99	213.142	73.5197
163	3.10	0.5033	5.45	15.03	211.397	73.6425
164	3.10	0.5152	5.49	15.07	210.069	73.381
165	3.08	0.5184	5.43	15.08	208.612	73.4611
166	3.07	0.5179	5.46	15.06	207.432	73.6877
167	3.05	0.5129	5.47	15.09	206.128	73.3004
168	3.03	0.5046	5.46	15.12	205.114	73.5759
169	3.02	0.5051	5.44	15.1	204.559	73.3078
170	2.99	0.5077	5.48	15.08	203.63	73.202
171	2.99	0.5018	5.49	15.1	202.727	72.9954
172	2.96	0.4995	5.56	15.1	202.159	73.1859
173	2.94	0.4935	5.49	15.12	201.097	73.1777
174	2.93	0.4916	5.49	15.13	200.529	72.9864
175	2.92	0.4878	5.49	15.13	199.712	73.2229
176	2.90	0.4863	5.52	15.15	199.146	73.1966
177	2.88	0.4848	5.54	15.15	198.525	73.1531
178	2.87	0.4873	5.53	15.15	197.453	73.027
179	2.85	0.4834	5.5	15.2	197.221	73.155
180	2.83	0.4854	5.53	15.16	196.534	72.8784
181	2.81	0.4827	5.53	15.19	195.738	73.1874
182	2.79	0.4813	5.52	15.19	195.176	73.1585
183	2.77	0.4801	5.52	15.17	194.637	72.9777
184	2.75	0.48	5.57	15.19	193.954	73.1708
185	2.73	0.476	5.53	15.21	193.391	72.9164
186	2.73	0.474	5.57	15.22	193.057	72.9242
187	2.71	0.4772	5.56	15.23	192.549	73.0094
188	2.69	0.4702	5.54	15.25	192.11	72.9748
189	2.67	0.4549	5.54	15.27	191.638	72.904
190	2.65	0.4492	5.49	15.31	191.071	72.9567
191	2.65	0.4507	5.57	15.27	190.591	72.9582
192	2.61	0.4472	5.54	15.29	190.512	72.7874
193	2.59	0.4436	5.53	15.29	190.063	72.9222
194	2.59	0.4528	5.52	15.26	189.723	72.9919
195	2.58	0.4415	5.5	15.31	189.157	72.2234

196	2.55	0.4458	5.56	15.27	188.931	72.4279
197	2.54	0.4405	5.49	15.32	188.716	72.7887
198	2.51	0.437	5.52	15.32	188.75	72.8952
199	2.51	0.4397	5.57	15.3	188.278	72.9473
200	2.49	0.4401	5.55	15.3	188.217	72.6193
201	2.47	0.441	5.54	15.31	187.643	72.7222
202	2.47	0.4415	5.57	15.3	187.519	72.6358
203	2.43	0.4358	5.64	15.23	187.272	72.7511
204	2.42	0.4335	5.63	15.21	187.511	72.5951
205	2.41	0.4345	5.64	15.25	187.249	72.6524
206	2.40	0.4323	5.63	15.21	187.351	72.7865
207	2.38	0.4333	5.66	15.21	187.458	72.5731
208	2.37	0.4299	5.66	15.23	187.276	72.5419
209	2.35	0.4279	5.7	15.21	187.195	72.6043
210	2.32	0.4196	5.6	15.27	187.043	72.42
211	2.30	0.4193	5.63	15.26	186.702	72.5944
212	2.30	0.4277	5.65	15.27	186.858	72.3918
213	2.29	0.4073	5.65	15.26	186.988	72.601
214	2.26	0.4156	5.63	15.29	187.131	72.5556
215	2.24	0.412	5.63	15.28	186.962	72.468
216	2.22	0.4089	5.61	15.32	186.857	72.4086
217	2.20	0.4096	5.57	15.35	186.635	72.3961
218	2.20	0.4067	5.58	15.37	186.885	72.3955
219	2.18	0.4056	5.56	15.4	186.669	72.3906
220	2.17	0.4063	5.61	15.36	186.315	72.188
221	2.14	0.4091	5.62	15.34	186.161	72.6176
222	2.13	0.407	5.58	15.39	185.982	72.256
223	2.11	0.4062	5.6	15.39	186.145	72.1692
224	2.10	0.4058	5.6	15.38	186.1	72.1558
225	2.08	0.4039	5.62	15.39	186.034	72.3161
226	2.06	0.4009	5.6	15.4	186.038	72.1301
227	2.03	0.4024	5.53	15.43	185.775	71.8514
228	2.04	0.4035	5.54	15.46	185.883	72.0732
229	2.01	0.4062	5.49	15.46	185.709	72.2701
230	1.99	0.4041	5.54	15.45	185.59	71.924
231	1.97	0.4021	5.52	15.5	185.453	72.1031
232	1.96	0.4011	5.53	15.47	185.219	71.6696
233	1.95	0.3984	5.55	15.49	185.12	72.2143
234	1.92	0.4011	5.5	15.47	185.141	72.1564
235	1.91	0.3897	5.59	15.39	185.742	71.9648
236	1.88	0.4998	5.51	15.36	185.879	72.1698
237	1.87	0.5414	5.44	15.4	185.555	72.135
238	1.85	0.5288	5.41	15.45	185.277	72.0196
239	1.85	0.5207	5.33	15.52	184.937	72.0953
240	1.83	0.4797	4.89	15.3	184.319	72.0398
241	1.81	0.4781	4.87	15.31	184.142	71.9429
242	1.80	0.4719	4.89	15.3	183.437	72.1151
243	1.79	0.4718	4.89	15.32	182.959	71.8313
244	1.78	0.4725	4.87	15.32	182.331	72.0204
245	1.75	0.4739	4.9	15.3	181.711	71.7431
246	1.73	0.4725	4.83	15.33	181.061	72.097
247	1.72	0.472	4.82	15.37	180.502	71.9425
248	1.70	0.472	4.76	15.41	180.417	71.7323
249	1.69	0.4699	4.75	15.43	180.009	71.8909
250	1.67	0.4704	4.75	15.44	179.659	71.9538
251	1.67	0.4671	4.76	15.45	179.244	72.0568
252	1.66	0.4639	4.7	15.46	178.734	71.812
253	1.64	0.4622	4.67	15.5	178.24	71.7733
254	1.62	0.4591	4.63	15.57	177.706	71.8131
255	1.62	0.4534	4.61	15.62	177.316	71.4613
256	1.59	0.4489	4.56	15.63	176.819	71.817
257	1.57	0.4508	4.61	15.59	176.84	71.5254
258	1.58	0.4505	4.57	15.63	176.326	71.738
259	1.56	0.4508	4.59	15.62	175.869	71.6112
260	1.55	0.4508	4.57	15.62	175.58	71.5494
261	1.54	0.4504	4.6	15.61	175.284	71.4275
262	1.52	0.4491	4.57	15.61	174.702	71.5872
263	1.51	0.4508	4.56	15.61	174.478	71.4386
264	1.50	0.4512	4.59	15.59	174.001	71.8101
265	1.49	0.4527	4.62	15.59	173.664	71.5361
266	1.47	0.4521	4.56	15.62	173.415	71.5555
267	1.45	0.4528	4.58	15.61	173.077	71.6675
268	1.42	0.4507	4.55	15.64	172.822	71.3108
269	1.42	0.4496	4.47	15.71	172.503	71.2735
270	1.41	0.4504	4.44	15.75	172.238	71.4243
271	1.39	0.4531	4.36	15.8	171.756	71.5122
272	1.39	0.4501	4.35	15.8	171.418	71.3583
273	1.37	0.4484	4.36	15.82	171.089	71.3577
274	1.35	0.4458	4.37	15.84	170.9	71.423
275	1.34	0.4469	4.36	15.81	170.792	71.5944
276	1.33	0.4469	4.31	15.88	170.596	71.6817
277	1.32	0.4445	4.32	15.88	170.403	71.5335
278	1.31	0.4442	4.33	15.87	170.362	71.2023
279	1.29	0.4419	4.31	15.88	169.928	71.2941
280	1.29	0.44	4.29	15.88	169.73	71.3079
281	1.28	0.4398	4.29	15.86	169.187	71.3726
282	1.24	0.441	4.33	15.86	168.767	71.3422
283	1.25	0.4354	4.31	15.88	168.561	71.1596
284	1.22	0.4334	4.32	15.87	168.434	71.2612
285	1.22	0.436	4.32	15.84	168.281	71.5147
286	1.21	0.4391	4.32	15.86	167.855	71.2499
287	1.20	0.4375	4.31	15.85	167.623	71.2348
288	1.19	0.437	4.32	15.85	167.36	71.2333
289	1.18	0.439	4.34	15.84	167.04	71.1481
290	1.16	0.4384	4.3	15.85	167.059	70.9595
291	1.14	0.4351	4.3	15.85	166.846	71.1838
292	1.13	0.4349	4.31	15.84	166.758	70.9511
293	1.11	0.4356	4.29	15.83	166.528	70.8508
294	1.11	0.4327	4.33	15.83	166.345	71.0736
295	1.11	0.4294	4.29	15.87	166.306	70.857
296	1.09	0.4304	4.33	15.85	165.963	70.9947
297	1.07	0.4284	4.32	15.84	165.681	70.7981
298	1.06	0.4291	4.31	15.85	165.61	70.6633
299	1.05	0.4255	4.27	15.87	165.775	70.9336
300	1.05	0.4248	4.32	15.85	165.285	70.9696
301	1.02	0.4213	4.28	15.88	165.05	70.9022
302	1.02	0.4222	4.3	15.84	165.218	70.9393
303	1.00	0.422	4.31	15.85	165.229	70.9603



# Stove Builder International Inc.

**Manufacturer:** SBI  
**Model:** 1.4 series  
**Date:** 11-17-20  
**Run:** 1  
**Control #:** G104473478  
**Test Duration:** 398  
**Output Category:** Low

**Technicians:** Claude Pelland  
 \_\_\_\_\_  
 \_\_\_\_\_

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

	HHV Basis	LHV Basis
<b>Overall Efficiency</b>	74.9%	80.2%
<b>Combustion Efficiency</b>	95.4%	95.4%
<b>Heat Transfer Efficiency</b>	79%	84.1%

<b>Output Rate (kJ/h)</b>	15,621	14,818	<b>(Btu/h)</b>
<b>Burn Rate (kg/h)</b>	1.11	2.45	<b>(lb/h)</b>
<b>Input (kJ/h)</b>	20,863	19,791	<b>(Btu/h)</b>

<b>Test Load Weight (dry kg)</b>	7.36	16.22	<b>dry lb</b>
<b>MC wet (%)</b>	16.8		
<b>MC dry (%)</b>	20.19		
<b>Particulate (g )</b>	14.643		
<b>CO (g)</b>	493		
<b>Test Duration (h)</b>	6.63		

<b>Emissions</b>	<b>Particulate</b>	<b>CO</b>
<b>g/MJ Output</b>	0.14	4.75
<b>g/kg Dry Fuel</b>	1.99	66.93
<b>g/h</b>	2.21	74.27
<b>lb/MM Btu Output</b>	0.33	11.05

<b>Air/Fuel Ratio (A/F)</b>	14.61
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VERSION:

2.4

2010-04-15



VERSION: 2.4  
 2010-04-15  
 Manufacturer: SBI  
 Model: 1.4 series  
 Date: 2020-11-18  
 Run: 2  
 Control #: G104473478  
 Test Duration: 445  
 Output Category: Medium

Appliance Type: Non-Cat (Cat, Non-Cat, Pellet)

Temp. Units F (F or C)  
 Weight Units lb (kg or lb)

Default Fuel Values  
 D. Fir 19,810  
 Oak 19,887  
 HHV (kJ/kg) 19,810 19,887  
 %C 48.73 50  
 %H 6.87 6.6  
 %O 43.9 42.9  
 %Ash 0.5 0.5

Wood Moisture (% wet): 16.30  
 Load Weight (lb wet): 19.39  
 Burn Rate (dry kg/h): 0.99  
 Total Particulate Emissions: 11.897 g

Fuel Data  
 Beech  
 HHV 18,800 kJ/kg  
 %C 48.7  
 %H 5.8  
 %O 44.9  
 %Ash 0.6

Note 1: For other fuels, use the heating value and fuel composition determined by analysis of fuel sample in accordance with Clause 9.2.

Averages 0.52 5.51 15.36 234.26 81.09

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%)			Flue Gas Temp. (°F)	Room Temp
		CO	CO <sub>2</sub>	O <sub>2</sub>		
0	19.39	0.24	3.63	16.48	283.1	77.5
1	19.36	0.26	2.29	17.75	269.0	76.6
2	19.34	0.15	1.24	19.19	272.1	76.8
3	19.11	0.16	1.68	18.72	338.4	76.9
4	18.69	0.25	2.98	17.41	445.2	77.3
5	18.49	0.68	10.36	10.27	432.9	76.7
6	18.26	0.40	12.41	8.21	452.9	76.6
7	17.72	0.61	13.98	6.75	473.5	76.7
8	17.84	0.80	14.35	6.52	479.4	76.2
9	17.62	0.57	14.18	6.79	485.8	76.4
10	17.39	0.51	14.29	6.62	495.3	76.3
11	17.20	0.47	14.79	6.17	507.6	76.2
12	16.98	0.58	15.11	5.86	510.0	76.3
13	16.80	0.76	15.10	5.86	497.6	76.2
14	16.60	0.78	14.17	6.76	484.2	76.3
15	16.42	0.62	13.60	7.38	476.0	76.2
16	16.21	0.55	13.48	7.51	471.0	76.6
17	16.04	0.51	13.68	7.34	467.6	76.3
18	15.86	0.43	13.61	7.37	466.5	76.3
19	15.70	0.58	13.58	7.38	464.4	76.0
20	15.51	0.75	13.69	7.22	465.3	76.6
21	15.30	0.88	13.88	6.97	468.1	77.3
22	15.11	0.95	14.25	6.73	470.1	77.3
23	14.90	0.96	14.26	6.62	470.7	77.6
24	14.69	1.01	14.17	6.66	470.7	77.1
25	14.47	0.98	14.08	6.82	470.1	75.6
26	14.30	0.95	13.98	6.86	470.1	74.3
27	14.07	1.00	13.94	6.85	468.4	75.3
28	13.88	1.04	13.85	6.94	466.1	74.6
29	13.67	1.02	13.91	6.91	465.7	74.7
30	13.48	0.97	13.81	6.98	464.7	74.7
31	13.30	0.96	13.80	7.02	462.7	74.5
32	13.09	0.93	13.69	7.08	459.5	74.3
33	12.90	0.92	13.72	7.15	457.0	74.0
34	12.71	0.89	13.49	7.29	454.3	73.8
35	12.54	0.84	13.40	7.41	451.7	74.4
36	12.35	0.79	13.32	7.57	449.2	74.4
37	12.17	0.73	13.17	7.66	446.5	74.3
38	11.99	0.70	13.03	7.81	443.2	74.7
39	11.83	0.64	12.96	7.92	441.0	74.9
40	11.65	0.67	12.93	7.93	438.7	74.8
41	11.47	0.67	12.94	7.90	436.4	75.2
42	11.31	0.68	12.96	7.85	435.0	74.4
43	11.15	0.70	13.16	7.79	434.2	74.6
44	10.98	0.67	13.07	7.81	433.5	75.0
45	10.81	0.65	13.12	7.78	432.8	75.2
46	10.63	0.65	13.24	7.67	432.2	75.4
47	10.46	0.66	13.38	7.59	432.2	75.1
48	10.31	0.66	13.52	7.42	432.4	75.1
49	10.13	0.6775	13.6	7.36	432.936	74.9615
50	9.96	0.6967	13.5	7.31	432.608	74.2432
51	9.82	0.7174	13.37	7.48	432.422	74.9547
52	9.63	0.7435	13.27	7.55	430.679	75.0236
53	9.49	0.702	13.27	7.53	429.941	75.0457
54	9.32	0.6786	13.3	7.54	429.403	75.0261
55	9.17	0.8225	13.02	7.69	425.024	74.8915
56	9.03	0.999	12.76	7.97	420.619	74.8644
57	8.87	0.9318	12.48	8.24	415.928	75.0508
58	8.73	0.8619	12.29	8.42	411.697	74.8109
59	8.59	0.8156	12.21	8.5	408.239	75.2302
60	8.45	0.8136	12.28	8.41	406.317	74.9691
61	8.30	0.85	12.45	8.25	405.32	74.8583
62	8.15	0.8704	12.57	8.08	405.415	74.9696
63	8.01	0.8399	12.69	8.02	405.704	75.2261
64	7.87	0.858	12.8	7.93	405.756	75.0798
65	7.68	0.877	13.09	7.56	407.476	74.302
66	7.57	0.924	13.51	7.16	408.713	76.0465
67	7.45	0.7523	12.85	7.75	403.709	77.1903
68	7.35	0.4711	12.03	8.47	397.181	77.5151
69	7.24	0.2996	11.67	8.99	391.849	77.6855
70	7.16	0.2468	11.41	9.23	388.102	77.7409
71	7.06	0.2179	11.36	9.41	384.239	77.9819
72	6.96	0.2049	11.24	9.55	380.172	77.917
73	6.85	0.1988	11.14	9.72	376.464	78.2137
74	6.76	0.2031	10.84	9.95	372.303	78.1157
75	6.67	0.2481	10.76	10.03	368.123	78.7608
76	6.58	0.2399	10.77	10.09	364.851	78.1102
77	6.48	0.2379	10.62	10.21	362.239	78.5326
78	6.41	0.2081	10.37	10.37	359.222	78.9585
79	6.35	0.1785	10.11	10.62	355.846	79.089
80	6.26	0.1641	9.91	10.78	352.645	79.02
81	6.18	0.1664	9.82	10.9	348.717	79.4417
82	6.11	0.1718	9.63	11.09	345.103	79.1382
83	6.02	0.1673	9.4	11.34	341.526	79.4567
84	5.95	0.1755	9.04	11.56	338.051	79.7163
85	5.89	0.1738	8.9	11.71	334.532	79.4168
86	5.81	0.1873	8.74	11.89	331.18	79.1533
87	5.73	0.1966	8.65	12.01	327.832	79.0299

Note 2: In cases where the "Fuel Weight Remaining" is the same for three or more readings in a row, a "divide by zero error" will occur in the calculation sheet. In such cases, adjust the weight values by interpolation between the first occurrence and the next reading showing a decrease in weight.

88	5.68	0.2108	8.47	12.19	325.481	78.8411
89	5.62	0.2	8.38	12.27	322.77	78.8621
90	5.54	0.1985	8.36	12.25	320.813	78.5864
91	5.48	0.2219	8.27	12.38	318.45	78.6721
92	5.43	0.2326	8.14	12.47	315.965	78.6139
93	5.35	0.2475	8.1	12.57	313.988	78.9643
94	5.29	0.2528	8.03	12.64	312.178	78.2735
95	5.23	0.2617	8.01	12.67	310.733	78.6195
96	5.16	0.2579	8.02	12.65	308.967	78.4973
97	5.10	0.2528	8.04	12.61	307.568	77.9324
98	5.04	0.2596	7.79	12.82	304.711	78.5608
99	5.00	0.2395	7.48	13.1	301.459	78.5734
100	4.95	0.2248	7.38	13.27	299.392	78.6688
101	4.90	0.2149	7.27	13.39	297.414	78.2919
102	4.84	0.2125	7.21	13.49	295.779	77.9189
103	4.81	0.2173	7.13	13.59	293.143	78.2728
104	4.74	0.2328	7.07	13.66	290.881	77.9551
105	4.71	0.2409	7.06	13.69	288.998	78.0423
106	4.65	0.25	7.06	13.67	288.018	77.929
107	4.61	0.2506	7.19	13.61	286.416	77.9
108	4.55	0.2677	7.15	13.61	285.105	77.8733
109	4.50	0.2701	7.19	13.59	283.814	77.981
110	4.44	0.2786	7.22	13.57	283.25	78.1745
111	4.40	0.2913	7.3	13.52	282.537	77.9194
112	4.33	0.2667	7.33	13.5	282.51	77.552
113	4.28	0.2624	7.37	13.48	282.156	77.6999
114	4.23	0.2693	7.34	13.55	281.175	77.2863
115	4.18	0.2803	7.38	13.53	280.82	77.5497
116	4.13	0.2699	7.41	13.48	280.207	77.2623
117	4.07	0.2664	7.39	13.51	280.218	77.1565
118	4.01	0.2652	7.4	13.47	279.905	77.2938
119	3.96	0.2504	7.4	13.47	280.411	77.0258
120	3.92	0.1637	7.42	13.46	279.809	76.988
121	3.88	0.1389	7.23	13.64	277.834	76.8801
122	3.83	0.1288	6.75	14.06	275.377	77.148
123	3.81	0.1355	6.4	14.3	272.558	76.8544
124	3.77	0.1388	6.05	14.7	269.17	77.1916
125	3.74	0.1635	5.89	14.86	266.608	76.983
126	3.70	0.1889	5.76	14.98	264.038	76.6879
127	3.68	0.2133	5.68	15.04	262.329	76.7662
128	3.64	0.2313	5.66	15.06	260.313	76.7547
129	3.61	0.2408	5.72	15.01	258.352	77.2166
130	3.59	0.2659	5.71	15.03	256.66	76.8111
131	3.56	0.2758	5.74	14.99	254.712	76.9617
132	3.53	0.3017	5.65	15.08	252.682	76.2627
133	3.51	0.3246	5.36	15.32	248.701	76.8632
134	3.49	0.4376	4.87	15.82	245.233	76.8019
135	3.47	0.5111	4.5	16.15	241.856	76.7695
136	3.46	0.5956	4.27	16.38	238.682	76.881
137	3.44	0.5883	4.24	16.39	235.799	76.5796
138	3.42	0.6041	4.25	16.39	233.222	76.4985
139	3.41	0.6029	4.22	16.4	230.979	76.2067
140	3.37	0.5987	4.27	16.39	228.811	76.2245
141	3.35	0.6067	4.23	16.4	226.621	76.3385
142	3.34	0.6197	4.23	16.39	224.513	75.7197
143	3.33	0.6062	4.2	16.41	222.857	75.9185
144	3.31	0.6086	4.27	16.39	221.451	76.1574
145	3.31	0.6354	4.23	16.39	220.147	76.191
146	3.29	0.6548	4.29	16.31	219.131	75.7215
147	3.28	0.6389	4.32	16.31	217.867	75.977
148	3.26	0.6207	4.31	16.32	216.544	75.7635
149	3.24	0.6128	4.35	16.33	215.334	75.9022
150	3.22	0.6051	4.38	16.28	214.599	75.7374
151	3.20	0.6051	4.35	16.28	213.378	75.9336
152	3.18	0.6044	4.33	16.31	212.554	75.9786
153	3.17	0.5984	4.32	16.33	211.662	75.7622
154	3.15	0.6007	4.37	16.35	210.74	75.6615
155	3.13	0.6035	4.33	16.33	210.278	75.7589
156	3.10	0.5992	4.31	16.35	209.377	75.4896
157	3.07	0.603	4.28	16.37	208.94	73.6602
158	3.37	0.5905	4.28	16.43	215.106	74.0605
159	2.98	0.3308	2.49	18.35	213.239	74.1536
160	2.96	0.562	4.45	15.99	211.04	74.6383
161	2.95	0.6627	4.54	15.91	208.895	74.6846
162	2.93	0.7309	4.39	16.06	206.817	74.7848
163	2.93	0.7557	4.41	16.11	205.361	75.1526
164	2.92	0.7417	4.35	16.17	203.728	74.6509
165	2.90	0.7227	4.32	16.23	202.477	75.036
166	2.88	0.7006	4.3	16.25	201.492	74.4057
167	2.87	0.6905	4.3	16.28	200.59	74.8311
168	2.86	0.674	4.28	16.3	199.797	75.2395
169	2.85	0.6708	4.28	16.29	198.989	75.3402
170	2.82	0.6665	4.34	16.28	198.087	75.5546
171	2.80	0.6585	4.3	16.32	197.31	75.6372
172	2.78	0.6553	4.32	16.29	196.821	75.7407
173	2.77	0.659	4.34	16.3	196.335	75.8075
174	2.75	0.6614	4.36	16.28	195.259	77.8778
175	2.71	0.6663	4.36	16.25	194.209	79.3495
176	2.68	0.6701	4.37	16.2	193.401	79.9744
177	2.66	0.672	4.4	16.19	192.67	80.4992
178	2.61	0.668	4.35	16.21	192.406	80.7053
179	2.59	0.6667	4.39	16.18	192.242	81.0313
180	2.57	0.6664	4.45	16.11	191.858	81.0207
181	2.54	0.6692	4.44	16.08	191.5	81.5899
182	2.53	0.6712	4.38	16.12	190.958	81.9346
183	2.51	0.67	4.43	16.07	190.682	82.5103
184	2.50	0.6681	4.43	16.05	190.783	82.2644
185	2.48	0.6706	4.41	16.04	190.601	82.5836
186	2.46	0.6751	4.41	16.01	190.599	82.5597
187	2.44	0.6716	4.36	15.99	190.558	82.7398
188	2.41	0.6746	4.44	15.93	189.947	83.1619
189	2.39	0.6779	4.05	16.31	189.773	83.0702
190	2.38	0.6569	3.97	16.4	189.022	83.4107
191	2.37	0.6328	3.95	16.4	188.557	83.5909
192	2.36	0.6187	3.96	16.37	188.134	83.5502
193	2.35	0.6141	3.92	16.37	188.012	84.298
194	2.33	0.6095	3.91	16.33	187.682	84.0687
195	2.31	0.6063	3.92	16.33	187.204	84.3261

196	2.29	0.6045	3.93	16.29	186.91	84.2699
197	2.29	0.601	3.96	16.25	186.742	84.6935
198	2.27	0.5982	3.95	16.22	186.271	84.6161
199	2.26	0.5934	3.97	16.2	186.061	84.5511
200	2.24	0.5929	3.92	16.19	185.892	84.9129
201	2.24	0.5865	3.92	16.16	185.602	84.8255
202	2.22	0.5859	3.9	16.14	185.588	84.854
203	2.20	0.5831	3.92	16.08	185.37	84.5992
204	2.18	0.587	3.89	16.07	185.293	84.9758
205	2.18	0.5895	3.92	16.07	185.089	85.099
206	2.16	0.5938	3.9	16.05	184.634	85.3207
207	2.17	0.5887	3.92	16	184.292	84.6486
208	2.15	0.5918	3.93	15.98	184.152	85.2823
209	2.13	0.5867	3.92	15.97	184.017	85.4524
210	2.12	0.5916	3.94	15.91	183.77	85.4138
211	2.11	0.5917	3.98	15.85	183.437	85.4327
212	2.09	0.5866	3.98	15.85	183.4	85.5994
213	2.08	0.6023	3.94	15.86	182.994	85.3924
214	2.08	0.6005	3.93	15.81	183.321	85.155
215	2.05	0.5925	3.98	15.8	182.79	85.514
216	2.04	0.5924	4	15.76	182.756	85.6643
217	2.04	0.5894	3.97	15.75	182.611	85.5651
218	2.03	0.5895	4.01	15.73	182.636	85.4485
219	2.00	0.5822	3.96	15.73	182.371	85.6642
220	2.00	0.5884	4.04	15.68	182.172	85.1981
221	1.99	0.5872	4.02	15.65	182.098	85.1838
222	1.98	0.5813	4.04	15.64	182.144	85.5665
223	1.97	0.5815	4.07	15.62	182.081	85.5577
224	1.96	0.5859	4.07	15.6	182.095	85.3028
225	1.95	0.5868	4.05	15.59	181.968	85.6453
226	1.93	0.5895	4.08	15.58	181.976	85.3808
227	1.92	0.5851	4.13	15.54	181.977	85.4185
228	1.91	0.5822	4.1	15.52	181.974	85.5288
229	1.90	0.5755	4.06	15.55	181.957	85.6848
230	1.89	0.5734	4.06	15.54	181.755	85.6814
231	1.88	0.5777	4.01	15.58	181.709	85.6487
232	1.87	0.5894	3.98	15.62	181.733	85.7667
233	1.86	0.5816	3.98	15.62	181.392	85.7676
234	1.86	0.5788	3.98	15.62	181.318	85.7528
235	1.84	0.5812	3.98	15.63	181.58	85.8699
236	1.82	0.5785	3.96	15.62	181.328	85.4952
237	1.81	0.5769	3.99	15.62	181.098	85.7241
238	1.80	0.5728	3.96	15.65	180.81	85.4695
239	1.79	0.5744	3.99	15.6	180.702	85.2257
240	1.77	0.5991	3.8	16.44	180.891	85.5916
241	1.77	0.5848	3.75	16.49	180.847	85.7024
242	1.76	0.5823	3.77	16.47	180.469	85.3183
243	1.74	0.5874	3.76	16.49	180.583	85.7906
244	1.73	0.5816	3.75	16.5	180.468	85.2315
245	1.72	0.5752	3.76	16.51	180.164	85.4939
246	1.72	0.5709	3.76	16.53	179.772	85.4669
247	1.71	0.5735	3.77	16.5	179.362	85.7265
248	1.70	0.5779	3.79	16.5	179.065	85.2766
249	1.69	0.6139	3.83	16.47	178.961	85.5449
250	1.68	0.6275	3.83	16.45	178.767	85.5668
251	1.67	0.6246	3.82	16.47	178.584	85.3332
252	1.65	0.624	3.86	16.46	178.271	85.5928
253	1.64	0.6226	3.87	16.48	178.272	85.633
254	1.64	0.6161	3.81	16.53	177.949	85.463
255	1.62	0.6199	3.78	16.56	177.623	85.2958
256	1.61	0.6208	3.81	16.53	177.681	85.5221
257	1.59	0.6226	3.77	16.56	177.775	85.6884
258	1.58	0.6372	3.8	16.54	177.647	85.6823
259	1.58	0.6443	3.82	16.53	177.702	85.6221
260	1.57	0.6402	3.89	16.5	177.641	85.6783
261	1.56	0.6402	3.88	16.5	177.19	85.4284
262	1.55	0.6372	3.9	16.51	177.078	85.1861
263	1.54	0.6324	3.91	16.51	176.919	85.6032
264	1.52	0.6267	3.89	16.55	176.848	85.5371
265	1.51	0.6185	3.87	16.57	176.806	85.5469
266	1.50	0.6136	3.86	16.6	176.757	85.5451
267	1.49	0.6018	3.84	16.64	176.647	85.6174
268	1.47	0.5951	3.82	16.67	176.606	85.2458
269	1.47	0.5861	3.8	16.71	176.468	85.5747
270	1.46	0.5879	3.8	16.72	176.45	85.3635
271	1.46	0.5835	3.77	16.74	176.357	85.5205
272	1.44	0.5854	3.78	16.77	176.364	85.5139
273	1.42	0.5831	3.76	16.79	176.261	85.4022
274	1.41	0.588	3.75	16.82	175.971	85.4189
275	1.40	0.5852	3.75	16.83	176.047	85.4694
276	1.39	0.5901	3.75	16.83	176.095	85.2099
277	1.38	0.5856	3.73	16.86	175.958	85.2739
278	1.37	0.5772	3.71	16.9	175.645	85.3294
279	1.36	0.5732	3.72	16.94	175.56	85.5331
280	1.35	0.5753	3.67	16.98	175.543	85.1737
281	1.34	0.5905	3.54	17.13	175.337	85.319
282	1.32	0.5758	3.45	17.22	175.337	84.7451
283	1.32	0.5662	3.45	17.26	175.291	84.9935
284	1.31	0.5679	3.42	17.27	175.34	85.2097
285	1.29	0.5667	3.44	17.27	174.921	85.1528
286	1.30	0.5618	3.42	17.3	174.964	85.2185
287	1.27	0.5591	3.44	17.3	174.771	84.9451
288	1.26	0.5575	3.4	17.35	174.616	85.2205
289	1.26	0.5622	3.41	17.36	174.259	85.2598
290	1.25	0.564	3.36	17.4	174.166	85.2295
291	1.24	0.5608	3.39	17.42	174.021	85.2805
292	1.22	0.554	3.33	17.46	173.956	85.0104
293	1.22	0.5516	3.35	17.46	173.483	85.046
294	1.21	0.549	3.32	17.5	173.27	85.0888
295	1.20	0.5462	3.31	17.53	172.952	85.0344
296	1.19	0.5431	3.33	17.53	172.653	84.9816
297	1.18	0.5417	3.32	17.54	172.299	85.235
298	1.17	0.5441	3.31	17.55	172.088	84.7165
299	1.16	0.5397	3.31	17.58	171.806	84.9616
300	1.15	0.5385	3.28	17.6	171.848	84.8725
301	1.15	0.5377	3.3	17.61	171.66	85.0844
302	1.12	0.5338	3.3	17.62	171.277	85.077
303	1.12	0.534	3.3	17.62	170.875	84.7009

304	1.11	0.5312	3.27	17.65	170.778	84.9999
305	1.11	0.5281	3.3	17.66	170.303	85.0843
306	1.09	0.5274	3.3	17.67	170.143	85.0755
307	1.09	0.5236	3.29	17.68	170.008	85.0597
308	1.09	0.5215	3.28	17.71	169.876	85.0299
309	1.07	0.5175	3.27	17.73	169.716	85.0156
310	1.06	0.5145	3.27	17.75	169.299	84.6506
311	1.05	0.5098	3.18	17.82	169.072	84.9192
312	1.04	0.5102	3.18	17.85	168.83	84.7164
313	1.03	0.509	3.16	17.88	168.516	84.8493
314	1.03	0.5057	3.16	17.89	168.29	84.8817
315	1.01	0.5098	3.16	17.89	168.026	84.5776
316	1.01	0.5057	3.16	17.92	167.909	84.6171
317	1.00	0.5037	3.15	17.94	167.77	84.6636
318	0.99	0.4999	3.14	17.97	167.582	84.5202
319	0.98	0.5012	3.15	17.96	167.225	84.4573
320	0.97	0.5019	3.15	17.98	167.015	84.2291
321	0.97	0.4966	3.14	18	166.723	84.668
322	0.95	0.4938	3.15	18.03	166.484	84.4371
323	0.95	0.4917	3.11	18.02	166.22	84.5844
324	0.94	0.4946	3.12	18.05	165.989	84.4372
325	0.93	0.4935	3.13	18.07	165.701	84.5283
326	0.92	0.491	3.1	18.09	165.614	84.129
327	0.91	0.4927	3.12	18.1	165.396	84.4616
328	0.90	0.4918	3.09	18.13	165.204	84.0142
329	0.90	0.4875	3.1	18.14	165.057	84.3343
330	0.88	0.485	3.09	18.17	164.902	84.3958
331	0.88	0.4852	3.08	18.19	164.597	84.4031
332	0.87	0.4842	3.09	18.19	164.27	84.4574
333	0.86	0.486	3.09	18.22	164.349	84.2531
334	0.85	0.486	3.06	18.25	164.06	84.2041
335	0.83	0.4822	3.04	18.27	163.851	84.1975
336	0.83	0.4826	3.06	18.3	163.518	84.3451
337	0.82	0.48	3	18.33	163.449	84.0774
338	0.82	0.4813	3.01	18.32	162.964	84.1498
339	0.81	0.4821	3.04	18.31	162.803	84.2437
340	0.80	0.4833	3.06	18.29	162.67	84.153
341	0.79	0.4867	3.04	18.29	162.46	83.8036
342	0.78	0.5041	3.07	18.3	162.386	84.0964
343	0.77	0.5049	3.06	18.31	162.108	84.0188
344	0.77	0.5044	3.09	18.3	161.873	84.0394
345	0.76	0.505	3.05	18.32	161.605	83.5192
346	0.76	0.5016	3.04	18.34	161.275	83.8652
347	0.75	0.5008	3.04	18.34	161.215	83.9713
348	0.73	0.503	3.06	18.33	161.227	83.7576
349	0.73	0.5131	3.12	18.3	161.025	84.0831
350	0.72	0.5127	3.13	18.28	161.013	83.6186
351	0.71	0.5099	3.11	18.29	160.83	83.6286
352	0.71	0.5045	3.09	18.35	160.74	84.0842
353	0.70	0.5034	3.08	18.4	160.732	83.8245
354	0.69	0.4953	3.06	18.39	160.449	83.6265
355	0.68	0.4927	3.01	18.47	160.384	83.6544
356	0.67	0.4978	2.95	18.5	160.168	83.5443
357	0.65	0.5017	2.98	18.52	159.986	83.2248
358	0.65	0.4963	2.92	18.6	159.912	83.279
359	0.63	0.4943	2.85	18.67	159.747	83.3683
360	0.63	0.4961	2.83	18.72	159.435	83.2854
361	0.62	0.4943	2.8	18.71	159.494	83.344
362	0.60	0.4936	2.8	18.74	159.227	83.4289
363	0.59	0.4959	2.79	18.76	159.107	83.3121
364	0.58	0.503	2.77	18.79	159.074	83.2537
365	0.57	0.487	2.79	18.87	158.751	83.3642
366	0.56	0.4848	2.74	18.8	158.446	83.3085
367	0.55	0.4833	2.77	18.85	158.199	83.3086
368	0.54	0.4819	2.75	18.87	158.038	83.4135
369	0.52	0.4831	2.76	18.87	157.983	83.3144
370	0.52	0.4791	2.71	18.93	157.796	83.153
371	0.51	0.4819	2.76	18.9	157.672	83.3912
372	0.50	0.4813	2.71	18.91	157.39	83.2792
373	0.49	0.4796	2.72	18.91	157.216	83.2755
374	0.48	0.4795	2.71	18.93	156.971	83.2737
375	0.48	0.4777	2.72	18.95	156.59	83.1522
376	0.47	0.4746	2.73	18.92	156.456	83.2122
377	0.46	0.4692	2.73	18.96	156.251	83.1453
378	0.45	0.4739	2.75	18.92	156.138	83.1769
379	0.44	0.4715	2.7	18.98	156.155	83.0858
380	0.43	0.4662	2.67	18.99	155.943	83.0222
381	0.41	0.4623	2.65	19.05	155.643	83.1814
382	0.41	0.4608	2.66	19.04	155.515	82.9962
383	0.41	0.4598	2.63	19.06	155.248	83.0824
384	0.39	0.4579	2.64	19.06	154.823	83.0343
385	0.40	0.456	2.62	19.1	154.671	82.9389
386	0.38	0.4551	2.63	19.08	154.39	82.972
387	0.36	0.4507	2.63	19.11	153.906	82.9441
388	0.37	0.4518	2.65	19.09	153.687	82.9918
389	0.36	0.4476	2.61	19.11	153.485	82.9225
390	0.35	0.4443	2.61	19.13	153.286	82.9844
391	0.34	0.4433	2.6	19.17	152.845	82.9205
392	0.34	0.4381	2.57	19.16	152.783	83.0303
393	0.33	0.4344	2.57	19.2	152.471	82.7465
394	0.32	0.4299	2.56	19.24	152.047	82.8716
395	0.32	0.4306	2.55	19.22	151.709	82.7442
396	0.32	0.4288	2.56	19.22	151.662	82.7023
397	0.30	0.4275	2.55	19.24	151.398	82.741
398	0.30	0.4233	2.5	19.25	151.023	82.7317
399	0.29	0.4229	2.53	19.26	150.731	82.6979
400	0.28	0.4284	2.55	19.23	150.391	82.9063
401	0.28	0.423	2.53	19.27	150.119	82.7675
402	0.27	0.423	2.55	19.25	149.998	82.8111
403	0.27	0.4212	2.54	19.27	149.697	82.7874
404	0.25	0.4189	2.49	19.31	149.465	82.6625
405	0.25	0.4168	2.49	19.31	149.234	82.8105
406	0.23	0.4174	2.49	19.32	148.967	82.7608
407	0.23	0.4074	2.49	19.34	148.667	82.752
408	0.23	0.4154	2.47	19.35	148.503	82.7109
409	0.22	0.4042	2.49	19.33	148.188	82.7686
410	0.21	0.4126	2.46	19.31	147.927	82.7085
411	0.21	0.4159	2.48	19.31	147.794	82.8566



# Stove Builder International Inc.

**Manufacturer:** SBI  
**Model:** 1.4 series  
**Date:** 11-18-20  
**Run:** 2  
**Control #:** G104473478  
**Test Duration:** 445  
**Output Category:** Medium

**Technicians:** Claude Pelland  
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## Test Results in Accordance with CSA B415.1-10

	HHV Basis	LHV Basis
<b>Overall Efficiency</b>	73.3%	78.6%
<b>Combustion Efficiency</b>	94.8%	94.8%
<b>Heat Transfer Efficiency</b>	77%	82.9%

<b>Output Rate (kJ/h)</b>	13,686	12,983	<b>(Btu/h)</b>
<b>Burn Rate (kg/h)</b>	0.99	2.19	<b>(lb/h)</b>
<b>Input (kJ/h)</b>	18,663	17,704	<b>(Btu/h)</b>

<b>Test Load Weight (dry kg)</b>	7.36	16.23	<b>dry lb</b>
<b>MC wet (%)</b>	16.3		
<b>MC dry (%)</b>	19.47		
<b>Particulate (g )</b>	11.897		
<b>CO (g)</b>	548		
<b>Test Duration (h)</b>	7.42		

<b>Emissions</b>	<b>Particulate</b>	<b>CO</b>
<b>g/MJ Output</b>	0.12	5.40
<b>g/kg Dry Fuel</b>	1.62	74.48
<b>g/h</b>	1.60	73.94
<b>lb/MM Btu Output</b>	0.27	12.56

<b>Air/Fuel Ratio (A/F)</b>	16.55
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VERSION:

2.4

2010-04-15

VERSION: 2.4  
 2010-04-15  
 Manufacturer: SBI  
 Model: 1.4 series  
 Date: 2020-11-19  
 Run: 3  
 Control #: G104473478  
 Test Duration: 480  
 Output Category: Low

Appliance Type: Non-Cat (Cat, Non-Cat, Pellet)

Temp. Units F (F or C)  
 Weight Units lb (kg or lb)

Default Fuel Values  
 D. Fir 19,810 19,887  
 Oak 48.73 50  
 %H 6.87 6.6  
 %O 43.9 42.9  
 %Ash 0.5 0.5

Wood Moisture (% wet): 16.90  
 Load Weight (lb wet): 19.40  
 Burn Rate (dry kg/h): 0.91  
 Total Particulate Emissions: 9.79 g

Fuel Data  
 Beech  
 HHV 18,800 kJ/kg  
 %C 48.7  
 %H 5.8  
 %O 44.9  
 %Ash 0.6

Note 1: For other fuels, use the heating value and fuel composition determined by analysis of fuel sample in accordance with Clause 9.2.

Averages 0.42 5.71 14.46 224.66 76.44

Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas Composition (%)			Flue Gas Temp. (°F)	Room Temp
		CO	CO <sub>2</sub>	O <sub>2</sub>		
0	19.40	0.31	2.89	16.47	291.8	77.9
1	19.39	0.20	1.95	17.40	276.0	77.2
2	19.36	0.20	3.41	15.98	263.0	76.4
3	19.21	0.15	1.32	18.15	284.5	77.9
4	18.98	0.12	1.27	18.27	338.5	77.5
5	18.62	0.15	2.01	17.60	396.9	77.1
6	18.46	0.19	2.94	16.75	389.2	76.8
7	18.30	0.68	9.01	11.06	404.2	76.9
8	18.09	0.42	9.98	10.30	424.6	76.2
9	17.90	0.29	11.30	9.17	450.1	76.4
10	17.65	0.21	12.23	8.48	476.3	76.0
11	17.42	0.26	13.61	7.26	494.4	76.2
12	17.23	0.50	14.99	5.97	497.3	76.3
13	17.02	0.97	15.77	5.27	498.7	75.9
14	16.83	0.76	15.07	5.89	499.0	75.5
15	16.63	0.54	14.52	6.42	491.0	76.8
16	16.45	0.42	14.42	6.59	471.5	77.0
17	16.30	0.39	14.29	6.88	449.2	76.4
18	16.14	0.28	13.04	7.96	431.1	76.5
19	16.00	0.21	11.55	9.30	417.0	76.9
20	15.87	0.19	10.56	10.17	406.0	76.0
21	15.76	0.19	10.18	10.61	397.8	77.4
22	15.62	0.19	9.90	10.81	391.3	78.2
23	15.50	0.20	9.95	10.88	386.7	78.1
24	15.38	0.21	9.94	10.91	384.4	78.5
25	15.25	0.22	9.99	10.81	382.6	78.0
26	15.11	0.24	10.11	10.74	381.5	78.5
27	14.97	0.25	10.26	10.63	378.8	78.6
28	14.84	0.28	10.20	10.74	378.2	79.4
29	14.71	0.26	10.34	10.66	376.6	78.5
30	14.58	0.34	10.17	10.77	375.2	80.0
31	14.43	0.31	10.32	10.70	373.9	80.8
32	14.28	0.31	10.43	10.66	373.3	81.4
33	14.14	0.28	10.48	10.58	373.8	81.9
34	14.00	0.28	10.59	10.55	375.0	82.4
35	13.87	0.27	10.76	10.41	376.4	82.6
36	13.73	0.24	11.15	10.02	378.1	83.2
37	13.58	0.31	11.19	9.99	379.2	83.6
38	13.45	0.31	11.26	10.02	379.8	83.9
39	13.31	0.30	11.21	9.99	381.3	84.2
40	13.17	0.28	11.47	9.81	382.7	84.9
41	13.02	0.30	11.63	9.63	384.5	84.6
42	12.89	0.29	11.79	9.53	386.4	83.1
43	12.76	0.30	11.90	9.36	389.6	79.3
44	12.66	0.32	11.89	9.39	392.1	78.4
45	12.56	0.31	11.83	9.44	394.3	78.1
46	12.46	0.33	11.92	9.28	395.5	78.7
47	12.33	0.36	12.12	9.08	397.3	79.6
48	12.21	0.39	12.50	8.72	398.2	79.0
49	12.07	0.3822	12.57	8.58	399.941	78.3891
50	11.94	0.3981	12.74	8.47	401.404	78.3611
51	11.77	0.4082	12.93	8.3	403.613	78.9344
52	11.63	0.4369	13.1	8.12	405.985	78.6525
53	11.50	0.4701	13.33	7.92	407.654	78.0397
54	11.35	0.4697	13.49	7.72	408.585	77.9911
55	11.19	0.5152	13.46	7.72	410.677	78.4663
56	11.04	0.5246	13.77	7.49	411.142	78.7055
57	10.89	0.5165	13.82	7.46	412.319	78.6006
58	10.74	0.5702	13.73	7.49	412.4	78.9707
59	10.57	0.6065	13.77	7.38	412.43	78.3953
60	10.44	0.6746	13.69	7.44	411.864	78.3645
61	10.30	0.6915	13.61	7.52	412.171	77.853
62	10.13	0.7025	13.65	7.5	411.601	78.5286
63	9.96	0.7112	13.51	7.59	411.568	78.0716
64	9.83	0.7157	13.54	7.61	410.795	78.1066
65	9.67	0.719	13.66	7.57	410.524	78.189
66	9.52	0.7355	13.54	7.6	410.208	77.7755
67	9.37	0.7536	13.53	7.63	410.613	77.8017
68	9.23	0.7615	13.56	7.59	410.99	78.0966
69	9.08	0.7494	13.7	7.56	410.566	77.3119
70	8.93	0.7546	13.75	7.52	410.488	77.3734
71	8.77	0.7712	13.68	7.55	410.542	77.9669
72	8.63	0.7982	13.65	7.56	410.842	77.9785
73	8.48	0.7937	13.79	7.47	409.788	78.1944
74	8.34	0.7958	13.69	7.53	408.898	78.1084
75	8.19	0.7654	13.53	7.61	407.745	77.7758
76	8.05	0.7406	13.51	7.68	406.559	78.1009
77	7.92	0.7359	13.43	7.78	404.954	77.7611
78	7.78	0.7211	13.25	7.94	403.682	78.0771
79	7.63	0.7292	13.16	8.03	401.564	78.3809
80	7.50	0.6651	13.16	8.07	400.107	78.2087
81	7.37	0.5951	13.24	8.06	397.891	78.277
82	7.22	0.563	13.18	8.15	395.217	76.9349
83	7.10	0.5267	12.97	8.3	392.78	75.0324
84	6.96	0.4807	12.76	8.46	390.099	74.6211
85	6.81	0.4587	12.54	8.63	387.036	74.5658
86	6.71	0.4648	12.55	8.7	385.584	74.5081
87	6.55	0.4523	12.47	8.7	383.502	73.6468

Note 2: In cases where the "Fuel Weight Remaining" is the same for three or more readings in a row, a "divide by zero error" will occur in the calculation sheet. In such cases, adjust the weight values by interpolation between the first occurrence and the next reading showing a decrease in weight.

88	6.41	0.4551	12.5	8.68	382.285	73.9985
89	6.28	0.4545	12.54	8.67	379.98	73.3873
90	6.15	0.4481	12.43	8.71	379.172	72.9248
91	6.01	0.438	12.32	8.74	379.479	72.858
92	5.91	0.3929	12.45	8.71	379.793	73.2437
93	5.77	0.3626	12.63	8.48	379.98	73.5763
94	5.66	0.3748	12.52	8.44	379.439	73.4484
95	5.54	0.4107	12.66	8.3	379.544	73.165
96	5.43	0.4541	12.66	8.23	379.573	73.1442
97	5.32	0.494	12.72	8.05	379.43	73.4001
98	5.19	0.5043	12.66	8.02	377.231	72.823
99	5.08	0.5482	12.55	8.17	373.818	72.9983
100	4.99	0.5123	12.26	8.45	370.012	72.9435
101	4.90	0.3993	11.78	8.92	365.793	72.4633
102	4.80	0.2749	11.33	9.36	361.358	72.9348
103	4.73	0.308	11.02	9.66	356.374	72.8078
104	4.65	0.2782	10.78	9.77	350.762	72.8567
105	4.58	0.2315	10.47	10.19	344.11	72.1462
106	4.51	0.192	9.94	10.61	338.68	72.8722
107	4.46	0.146	9.38	11.14	332.582	72.4801
108	4.40	0.0963	9.06	11.46	325.773	71.5524
109	4.37	0.0704	8.58	11.91	319.449	72.212
110	4.31	0.0709	8.15	12.42	313.691	72.0174
111	4.25	0.0569	7.87	12.7	308.325	72.5626
112	4.22	0.0543	7.7	12.83	302.908	72.5812
113	4.18	0.0634	7.59	12.96	298.59	72.607
114	4.13	0.0755	7.49	13.06	294.69	72.1464
115	4.11	0.0832	7.42	13.13	291.511	72.3033
116	4.06	0.1035	7.37	13.19	287.929	73.2412
117	4.01	0.093	7.32	13.2	284.69	72.6787
118	3.99	0.0858	7.24	13.22	282.128	72.0189
119	3.94	0.0767	7.21	13.24	278.147	72.4712
120	3.93	0.0716	7.08	13.35	274.228	71.9122
121	3.91	0.1132	6.65	13.73	270.503	72.1739
122	3.89	0.1488	6.32	14.01	266.815	71.6441
123	3.86	0.1651	6.2	14.09	263.306	71.8457
124	3.82	0.1825	6.24	14.16	260.362	71.29
125	3.79	0.1895	6.05	14.3	257.157	71.0454
126	3.77	0.1943	6.01	14.37	254.506	70.9663
127	3.73	0.2022	5.98	14.42	252.037	71.346
128	3.71	0.2163	5.93	14.49	249.341	71.8911
129	3.68	0.2325	5.97	14.51	246.867	71.6845
130	3.68	0.2405	5.89	14.57	244.831	71.0167
131	3.64	0.2497	5.88	14.61	242.782	71.6164
132	3.62	0.2612	5.82	14.66	240.817	71.3853
133	3.60	0.2694	5.81	14.72	239.05	71.0624
134	3.58	0.2773	5.77	14.8	237.171	71.5523
135	3.55	0.2905	5.71	14.87	235.083	71.259
136	3.55	0.2968	5.72	14.89	233.536	71.3934
137	3.54	0.3019	5.69	14.89	231.761	71.0887
138	3.51	0.309	5.65	14.94	230.391	71.1746
139	3.48	0.3172	5.69	14.95	229.06	71.2471
140	3.47	0.3251	5.67	14.99	227.628	71.001
141	3.45	0.3307	5.65	15.02	226.429	70.7191
142	3.43	0.3462	5.66	15.01	225.482	71.014
143	3.41	0.3473	5.67	14.99	223.917	70.7169
144	3.39	0.3407	5.64	15.04	222.623	70.6479
145	3.37	0.3575	5.66	15.08	221.518	70.6413
146	3.35	0.3717	5.6	15.14	220.097	70.5405
147	3.33	0.3861	5.56	15.2	218.882	70.7707
148	3.32	0.4131	5.49	15.24	217.687	70.7738
149	3.31	0.4448	5.42	15.34	216.542	70.814
150	3.27	0.4569	5.45	15.35	215.511	70.2453
151	3.27	0.4606	5.49	15.34	214.563	70.3936
152	3.24	0.4672	5.42	15.42	213.491	70.5311
153	3.21	0.4725	5.41	15.42	212.441	69.965
154	3.20	0.472	5.43	15.45	211.321	71.158
155	3.17	0.4754	5.38	15.46	209.846	70.2424
156	3.16	0.4799	5.38	15.49	209.037	70.4766
157	3.14	0.4853	5.31	15.61	207.723	70.6017
158	3.12	0.4768	5.26	15.66	206.532	70.3042
159	3.09	0.508	4.92	16.04	205.439	70.1068
160	3.09	0.6299	4.78	16.12	204.423	70.0396
161	3.06	0.6286	4.73	16.1	203.42	70.3765
162	3.05	0.6185	4.76	16.07	202.784	70.0116
163	3.04	0.6027	4.78	16.07	201.961	69.9703
164	3.01	0.5844	4.81	16.05	201.366	69.7807
165	2.99	0.5805	4.84	16.01	200.69	70.1525
166	2.98	0.5674	4.92	15.97	200.028	70.1966
167	2.96	0.552	4.87	16.02	199.335	70.153
168	2.94	0.5406	4.9	16.01	198.357	70.3779
169	2.93	0.5358	4.95	15.98	197.53	70.6022
170	2.91	0.5268	4.94	16	196.787	70.2303
171	2.90	0.5233	4.93	15.98	196.287	70.4524
172	2.89	0.5173	4.93	15.99	195.748	70.3966
173	2.87	0.5168	4.87	16.02	195.168	70.7697
174	2.86	0.5211	4.88	16.06	194.485	70.4394
175	2.85	0.5114	4.88	16.08	194.005	70.1769
176	2.83	0.5021	4.86	16.08	193.7	70.1138
177	2.82	0.4989	4.81	16.13	193.054	70.2211
178	2.80	0.497	4.87	16.11	192.497	70.1217
179	2.78	0.4956	4.89	16.11	192.157	69.9153
180	2.77	0.4855	4.85	16.15	191.445	69.6454
181	2.74	0.4825	4.76	16.23	190.803	69.9675
182	2.73	0.4913	4.67	16.3	190.432	69.7993
183	2.72	0.4848	4.69	16.31	189.82	69.9029
184	2.70	0.4841	4.67	16.35	189.306	69.9575
185	2.68	0.4795	4.69	16.33	189.052	70.227
186	2.68	0.4749	4.65	16.36	188.79	69.9381
187	2.65	0.4732	4.65	16.38	188.305	69.7396
188	2.64	0.4693	4.64	16.38	188.134	69.8594
189	2.62	0.4657	4.63	16.37	187.428	69.6869
190	2.61	0.4658	4.67	16.36	187.025	69.8822
191	2.59	0.4631	4.65	16.35	186.603	69.9626
192	2.57	0.4631	4.69	16.35	186.353	69.5724
193	2.55	0.4604	4.66	16.35	186.099	69.504
194	2.54	0.4612	4.67	16.34	185.478	69.8351
195	2.52	0.4626	4.65	16.35	185.198	70.0218



196	2.50	0.4637	4.63	16.36	184.986	69.8233
197	2.48	0.461	4.63	16.37	184.904	69.6649
198	2.47	0.459	4.64	16.38	184.905	69.6213
199	2.45	0.4613	4.6	16.4	184.683	69.5462
200	2.45	0.4632	4.58	16.42	184.526	69.0403
201	2.44	0.4638	4.59	16.42	184.196	69.3347
202	2.43	0.4626	4.59	16.42	183.841	70.1337
203	2.43	0.4606	4.57	16.44	183.69	70.6909
204	2.42	0.4603	4.58	16.44	183.269	70.8826
205	2.41	0.4639	4.53	16.47	183.051	71.0002
206	2.40	0.4642	4.55	16.48	183.582	71.2642
207	2.39	0.4654	4.52	16.49	183.532	71.2933
208	2.38	0.4704	4.49	16.52	183.353	71.4902
209	2.37	0.4703	4.51	16.51	183.744	71.7252
210	2.36	0.4651	4.47	16.53	183.595	71.5071
211	2.35	0.4651	4.52	16.52	183.393	71.8643
212	2.34	0.4647	4.55	16.52	183.411	72.042
213	2.33	0.4676	4.46	16.56	183.264	72.0457
214	2.31	0.4727	4.48	16.56	183.28	72.0727
215	2.31	0.4779	4.47	16.6	182.378	72.0754
216	2.30	0.4801	4.41	16.65	181.911	72.4368
217	2.28	0.4984	4.36	16.71	181.285	72.3711
218	2.27	0.4875	4.29	16.74	181.027	72.4938
219	2.26	0.4782	4.33	16.74	180.665	72.3535
220	2.26	0.4703	4.3	16.77	180.23	72.409
221	2.24	0.4668	4.31	16.78	179.737	72.6151
222	2.23	0.4662	4.34	16.8	179.398	72.4895
223	2.23	0.4638	4.31	16.78	179.28	72.7534
224	2.21	0.4651	4.24	16.85	178.422	72.5161
225	2.21	0.4647	4.24	16.9	178.126	72.3327
226	2.19	0.4646	4.21	16.9	177.854	72.2972
227	2.17	0.4649	4.23	16.9	177.823	72.4144
228	2.17	0.4643	4.23	16.91	177.45	72.4185
229	2.16	0.4627	4.18	16.94	176.916	72.5415
230	2.15	0.4596	4.2	16.94	176.68	72.6486
231	2.13	0.4608	4.17	16.96	176.279	72.1214
232	2.13	0.4582	4.17	16.98	175.989	72.3296
233	2.11	0.4563	4.14	17.02	175.736	72.8034
234	2.09	0.4566	4.15	17.01	175.478	72.8305
235	2.07	0.4529	4.13	17.04	175.313	72.9324
236	2.06	0.4485	4.13	17.02	174.714	72.8288
237	2.04	0.4481	4.09	17.05	174.524	73.0574
238	2.04	0.4448	4.11	17.04	174.191	73.1075
239	2.02	0.4444	4.1	17.07	173.969	72.7122
240	2.02	0.4093	4.11	16.14	173.791	72.635
241	2.01	0.4182	4.12	16.14	173.468	72.881
242	2.00	0.4182	4.06	16.15	173.203	72.5982
243	1.99	0.4187	4.09	16.15	172.792	72.6909
244	1.98	0.4198	4.02	16.18	172.424	72.8478
245	1.97	0.4221	4.05	16.16	172.378	72.4271
246	1.96	0.4199	4	16.19	172.324	72.5257
247	1.94	0.4211	4	16.18	172.331	72.9188
248	1.94	0.4174	3.98	16.22	172.278	72.9173
249	1.91	0.4214	3.97	16.24	171.699	72.6474
250	1.90	0.4201	3.97	16.24	171.627	72.9998
251	1.89	0.4222	3.97	16.23	171.265	72.6857
252	1.87	0.4237	4.03	16.17	171.094	73.0135
253	1.87	0.4279	4.02	16.16	170.898	72.935
254	1.86	0.4251	4	16.16	170.818	72.7272
255	1.85	0.4228	4.02	16.15	170.669	73.0376
256	1.84	0.4488	3.96	16.18	170.462	72.7596
257	1.82	0.4158	3.85	16.27	169.621	73.3839
258	1.80	0.4123	3.84	16.26	169.241	73.7418
259	1.78	0.4126	3.89	16.21	169.127	74.1235
260	1.76	0.4146	3.81	16.26	168.939	74.2889
261	1.74	0.4177	3.82	16.24	168.727	74.4978
262	1.72	0.4152	3.82	16.23	168.473	74.4579
263	1.71	0.4144	3.8	16.2	168.004	74.5016
264	1.70	0.4142	3.82	16.16	167.884	74.6974
265	1.67	0.4135	3.83	16.1	167.54	74.8952
266	1.66	0.4128	3.79	16.1	167.519	74.9573
267	1.65	0.4104	3.82	16.05	167.175	74.8641
268	1.64	0.4106	3.8	16.03	167.044	75.033
269	1.63	0.4131	3.85	15.95	166.973	75.1524
270	1.62	0.4133	3.85	15.93	166.511	75.1908
271	1.61	0.4102	3.86	15.9	166.347	75.1872
272	1.59	0.4088	3.87	15.88	166.309	75.2554
273	1.58	0.4076	3.85	15.84	166.203	75.4826
274	1.57	0.4121	3.87	15.8	166.02	75.6913
275	1.55	0.4101	3.89	15.76	165.578	76.5537
276	1.54	0.4088	3.88	15.73	165.082	77.0977
277	1.53	0.4115	3.87	15.7	164.896	77.3808
278	1.52	0.4067	3.85	15.68	164.852	77.5863
279	1.51	0.4025	3.83	15.73	164.701	77.8344
280	1.50	0.397	3.74	15.77	164.668	77.9661
281	1.49	0.3955	3.72	15.77	164.699	78.0078
282	1.46	0.3959	3.75	15.72	164.722	78.2427
283	1.46	0.3954	3.76	15.73	164.679	78.328
284	1.45	0.3937	3.72	15.72	164.471	77.8005
285	1.46	0.3933	3.72	15.7	165.21	76.1277
286	1.47	0.3928	3.73	15.69	165.33	75.8807
287	1.47	0.3954	3.81	15.64	165.535	75.0496
288	1.47	0.4102	3.85	15.6	165.425	74.9233
289	1.47	0.4132	3.81	15.62	165.369	74.6435
290	1.48	0.4181	3.83	15.6	165.176	74.5223
291	1.48	0.4186	3.82	15.59	164.806	74.4633
292	1.48	0.4169	3.81	15.59	164.64	74.0404
293	1.48	0.417	3.83	15.61	163.851	74.6535
294	1.45	0.4163	3.81	15.62	163.161	75.532
295	1.43	0.4159	3.83	15.61	162.59	76.2227
296	1.40	0.4149	3.8	15.62	162.201	76.6692
297	1.39	0.4127	3.8	15.63	161.924	77.0016
298	1.37	0.4174	3.78	15.62	161.882	77.2668
299	1.35	0.4195	3.79	15.62	161.591	77.4524
300	1.34	0.4156	3.76	15.62	161.715	77.6103
301	1.32	0.4168	3.76	15.61	161.945	77.7738
302	1.29	0.4183	3.77	15.58	161.932	77.9157
303	1.29	0.4177	3.79	15.58	161.897	78.1628

304	1.27	0.419	3.79	15.56	161.71	78.2002
305	1.27	0.4155	3.79	15.55	161.845	78.4264
306	1.26	0.4173	3.75	15.55	161.678	78.4616
307	1.25	0.4225	3.6	15.68	161.705	78.6166
308	1.23	0.4158	3.52	15.76	161.558	78.6612
309	1.22	0.4076	3.5	15.77	161.475	78.8587
310	1.21	0.4043	3.49	15.78	161.36	78.9332
311	1.20	0.3994	3.44	15.81	161.279	79.0362
312	1.19	0.3973	3.42	15.81	161.458	79.0039
313	1.17	0.3961	3.4	15.81	160.898	79.0875
314	1.17	0.3953	3.4	15.8	160.829	79.155
315	1.15	0.3941	3.4	15.81	160.438	79.1737
316	1.14	0.3928	3.36	15.82	160.115	79.2969
317	1.14	0.3909	3.35	15.83	159.985	79.4088
318	1.13	0.3905	3.34	15.81	159.792	79.3756
319	1.12	0.3887	3.32	15.83	159.561	79.4334
320	1.11	0.3884	3.29	15.83	159.189	79.5263
321	1.10	0.3873	3.28	15.82	158.919	79.3041
322	1.09	0.385	3.25	15.85	158.564	79.5574
323	1.08	0.3848	3.26	15.83	158.262	79.5374
324	1.07	0.3862	3.27	15.82	158.105	79.4327
325	1.07	0.3852	3.26	15.83	157.875	79.5822
326	1.06	0.3844	3.24	15.82	157.59	79.6282
327	1.05	0.3836	3.23	15.83	157.323	79.7301
328	1.05	0.3834	3.22	15.83	157.124	79.6782
329	1.04	0.3822	3.2	15.85	156.956	79.6639
330	1.03	0.3766	3.19	15.94	156.605	79.1987
331	1.02	0.375	3.19	15.87	156.414	79.7213
332	1.02	0.3761	3.14	15.89	156.333	79.7106
333	1.01	0.3703	3.11	15.9	156.001	79.8325
334	1.00	0.3685	3.11	15.92	155.583	79.7527
335	0.99	0.3681	3.07	15.95	155.256	79.7779
336	0.98	0.3666	3.07	15.94	154.894	79.7435
337	0.98	0.3637	3.06	15.95	154.809	79.7773
338	0.96	0.3645	3.06	15.93	154.553	79.7164
339	0.96	0.3648	3.08	15.93	154.381	79.7525
340	0.95	0.3656	3.07	15.93	153.908	79.8997
341	0.96	0.3652	3.05	15.92	153.68	79.908
342	0.94	0.3654	3.07	15.93	153.65	79.8155
343	0.94	0.3662	3.05	15.95	153.273	79.9495
344	0.93	0.3641	3.06	15.94	153.019	79.8323
345	0.93	0.3644	3.06	15.95	152.728	79.887
346	0.93	0.3652	3.02	15.96	152.448	79.91
347	0.92	0.3668	3.07	15.94	152.174	79.7276
348	0.91	0.3639	3.02	15.97	151.961	79.8083
349	0.90	0.3639	3.05	15.98	151.752	79.8029
350	0.89	0.362	3.01	15.98	151.414	79.8365
351	0.89	0.3641	3.04	15.96	151.129	79.8792
352	0.89	0.3644	3.04	15.97	151.21	79.9481
353	0.88	0.3629	3.01	16.01	150.761	79.9141
354	0.87	0.361	2.99	16.04	150.607	79.9567
355	0.86	0.3578	2.95	16.08	150.166	79.9287
356	0.86	0.3617	2.98	16.06	149.831	80.0719
357	0.85	0.355	2.92	16.13	149.682	80.0256
358	0.85	0.3487	2.55	16.71	149.393	80.0548
359	0.84	0.3529	2.53	16.39	149.19	79.9911
360	0.84	0.633	3.67	15.23	149.02	80.1902
361	0.84	0.6212	3.73	15.15	148.638	80.1133
362	0.82	0.5904	3.67	15.18	148.52	79.5807
363	0.83	0.5677	3.62	15.27	148.493	79.1822
364	0.83	0.5532	3.62	15.29	163.423	78.5857
365	0.79	0.5396	3.59	15.35	160.057	79.5056
366	0.78	0.5296	3.55	15.37	156.738	79.9144
367	0.78	0.5215	3.55	15.4	154.784	79.8437
368	0.77	0.5182	3.56	15.41	153.551	79.9459
369	0.77	0.5114	3.52	15.46	152.917	80.0509
370	0.77	0.5077	3.54	15.46	152.686	80.0267
371	0.76	0.5078	3.53	15.45	152.496	80.0631
372	0.74	0.5061	3.54	15.48	152.318	80.1457
373	0.73	0.5005	3.53	15.49	152.354	80.046
374	0.73	0.503	3.54	15.48	152.404	80.1781
375	0.71	0.4997	3.54	15.51	152.564	80.2164
376	0.71	0.5053	3.58	15.49	152.884	80.2147
377	0.70	0.5029	3.53	15.55	152.838	80.3493
378	0.70	0.4987	3.55	15.56	152.956	80.2835
379	0.68	0.4975	3.54	15.58	153.229	80.3444
380	0.67	0.4955	3.49	15.6	153.248	80.4645
381	0.67	0.4979	3.44	15.69	153.679	80.4284
382	0.67	0.4941	3.41	15.71	154.012	80.4329
383	0.65	0.4876	3.42	15.74	153.895	80.4889
384	0.65	0.4809	3.4	15.74	154.214	80.5394
385	0.64	0.478	3.44	15.73	154.316	80.5168
386	0.63	0.4746	3.43	15.75	154.17	80.5927
387	0.62	0.4703	3.43	15.78	154.154	80.5509
388	0.61	0.464	3.41	15.81	154.222	80.5621
389	0.60	0.4601	3.39	15.81	154.378	80.5696
390	0.59	0.4569	3.39	15.83	154.443	80.5095
391	0.59	0.4582	3.37	15.87	154.387	80.577
392	0.58	0.4623	3.33	15.93	154.523	80.6219
393	0.57	0.4543	3.24	15.98	154.632	80.7172
394	0.56	0.452	3.26	16	154.58	80.8114
395	0.55	0.4472	3.23	16.05	154.729	80.814
396	0.55	0.4478	3.22	16.04	154.607	80.7336
397	0.54	0.4447	3.17	16.09	154.565	80.899
398	0.53	0.4426	3.18	16.1	154.464	80.9473
399	0.53	0.443	3.17	16.12	154.291	80.9583
400	0.52	0.4425	3.18	16.13	154.114	80.8538
401	0.50	0.439	3.14	16.17	153.988	80.884
402	0.50	0.443	3.14	16.16	153.875	80.8407
403	0.49	0.4419	3.16	16.17	153.794	80.9425
404	0.49	0.441	3.15	16.18	153.737	80.9559
405	0.48	0.4398	3.18	16.18	153.52	80.9002
406	0.48	0.4418	3.14	16.18	153.315	80.9565
407	0.47	0.4411	3.15	16.2	153.223	80.871
408	0.45	0.4472	3.18	16.18	153.283	80.8426
409	0.45	0.4475	3.18	16.2	153.22	80.9309
410	0.45	0.4461	3.19	16.2	153.092	80.8755
411	0.43	0.4458	3.17	16.21	152.818	81.0316



# Stove Builder International Inc.

**Manufacturer:** SBI  
**Model:** 1.4 series  
**Date:** 11-19-20  
**Run:** 3  
**Control #:** G104473478  
**Test Duration:** 480  
**Output Category:** Low

**Technicians:** Claude Pelland  
 \_\_\_\_\_  
 \_\_\_\_\_

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

	HHV Basis	LHV Basis
<b>Overall Efficiency</b>	74.3%	79.6%
<b>Combustion Efficiency</b>	96.1%	96.1%
<b>Heat Transfer Efficiency</b>	77%	82.9%

<b>Output Rate (kJ/h)</b>	12,780	12,124	<b>(Btu/h)</b>
<b>Burn Rate (kg/h)</b>	0.91	2.02	<b>(lb/h)</b>
<b>Input (kJ/h)</b>	17,193	16,309	<b>(Btu/h)</b>

<b>Test Load Weight (dry kg)</b>	7.32	16.12	<b>dry lb</b>
<b>MC wet (%)</b>	16.9		
<b>MC dry (%)</b>	20.34		
<b>Particulate (g )</b>	9.79		
<b>CO (g)</b>	425		
<b>Test Duration (h)</b>	8.00		

<b>Emissions</b>	<b>Particulate</b>	<b>CO</b>
<b>g/MJ Output</b>	0.10	4.16
<b>g/kg Dry Fuel</b>	1.34	58.09
<b>g/h</b>	1.22	53.13
<b>lb/MM Btu Output</b>	0.22	9.66

<b>Air/Fuel Ratio (A/F)</b>	16.33
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VERSION:

2.4

2010-04-15

VERSION: 2.4 2010-04-15  
**Manufacturer:** SBI  
**Model:** 1.4 series  
**Date:** 2020-11-20  
**Run:** 4  
**Control #:** G104473478  
**Test Duration:** 160  
**Output Category:** High

**Appliance Type:** Non-Cat (Cat, Non-Cat, Pellet)

**Temp. Units** F (F or C)  
**Weight Units** lb (kg or lb)

**Default Fuel Values**

	D. Fir	Oak
HHV (kJ/kg)	19,810	19,887
%C	48.73	50
%H	6.87	6.6
%O	43.9	42.9
%Ash	0.5	0.5

**Wood Moisture (% wet):** 16.50  
**Load Weight (lb wet):** 14.22  
**Burn Rate (dry kg/h):** 2.02  
**Total Particulate Emissions:** 7.573 g

**Fuel Data**

	Beech	kJ/kg
HHV	18,800	
%C	48.7	
%H	5.8	
%O	44.9	
%Ash	0.6	

Note 1: For other fuels, use the heating value and fuel composition determined by analysis of fuel sample in accordance with Clause 9.2.

		Averages	0.39	8.38	12.08	369.08	70.48	
							Temp. (°F)	
Elapsed Time (min)	Fuel Weight Remaining (lb)	Flue Gas CO	Composition (%) CO <sub>2</sub>	O <sub>2</sub>	Flue Gas	Room Temp		
0	14.22	0.07	2.98	17.54	430.7	72.6		
1	14.18	0.14	4.05	16.30	394.8	72.0		
2	14.09	0.42	4.87	15.62	379.5	72.2		
3	13.97	0.38	5.02	15.36	369.7	71.6		
4	13.80	0.26	9.40	11.23	395.0	71.5		
5	13.64	0.19	10.40	10.28	418.8	72.4		
6	13.48	0.20	10.59	10.00	431.8	72.2		
7	13.27	0.30	12.30	8.43	453.3	72.1		
8	13.04	0.42	13.35	7.46	474.5	71.6		
9	12.83	0.76	14.79	5.89	501.9	71.7		
10	12.58	0.94	15.21	5.52	522.8	72.0		
11	12.32	1.04	15.56	5.15	537.8	71.7		
12	12.11	1.15	15.65	4.95	548.2	72.3		
13	11.86	1.17	15.73	4.91	556.0	72.4		
14	11.61	1.09	15.82	4.80	562.8	72.0		
15	11.38	1.08	15.97	4.74	566.4	71.9		
16	11.15	1.05	15.93	4.67	568.4	71.6		
17	10.89	1.10	16.18	4.54	570.8	72.3		
18	10.65	1.07	16.09	4.59	573.0	72.6		
19	10.40	1.10	16.07	4.57	573.6	73.1		
20	10.19	1.13	16.31	4.42	573.3	72.8		
21	9.95	1.09	16.17	4.45	572.5	71.7		
22	9.72	1.05	16.15	4.52	572.0	72.3		
23	9.50	0.96	16.04	4.69	570.9	72.1		
24	9.28	0.91	15.91	4.73	569.0	71.4		
25	9.07	0.92	15.85	4.86	566.9	71.8		
26	8.83	0.97	15.81	4.77	565.6	71.7		
27	8.61	1.01	15.75	4.83	564.0	71.1		
28	8.38	1.00	15.43	5.16	562.4	70.8		
29	8.15	0.96	15.48	5.16	559.9	71.1		
30	7.94	0.92	15.29	5.26	557.2	71.1		
31	7.73	0.98	15.36	5.16	555.3	71.1		
32	7.51	0.88	15.64	5.01	554.0	71.0		
33	7.31	0.75	15.52	5.08	552.6	70.8		
34	7.11	0.67	15.46	5.21	550.6	71.1		
35	6.89	0.60	15.36	5.31	549.1	71.0		
36	6.70	0.54	15.41	5.30	547.7	71.5		
37	6.52	0.48	15.31	5.36	545.3	71.2		
38	6.32	0.41	15.34	5.40	543.0	71.6		
39	6.13	0.34	15.10	5.59	539.0	70.8		
40	5.95	0.34	14.91	5.81	534.6	71.1		
41	5.76	0.32	14.53	6.10	529.5	70.8		
42	5.59	0.27	14.38	6.31	522.7	70.7		
43	5.44	0.23	14.02	6.56	516.2	71.4		
44	5.28	0.23	13.77	6.74	511.2	71.4		
45	5.13	0.32	13.46	6.92	507.7	71.2		
46	4.98	0.27	13.29	7.14	503.1	70.4		
47	4.84	0.14	12.87	7.54	497.2	71.3		
48	4.71	0.07	12.40	7.99	489.6	70.6		
49	4.58	0.0328	11.52	8.9	479.757	71.0262		
50	4.47	0.0266	10.73	9.71	468.036	70.845		
51	4.34	0.0284	10.43	10.11	457.121	71.0608		
52	4.25	0.033	10.18	10.28	448.317	71.2316		
53	4.14	0.0367	10.04	10.48	439.884	71.0879		
54	4.05	0.0232	9.66	10.79	432.29	70.8006		

Note 2: In cases where the "Fuel Weight Remaining" is the same for three or more readings in a row, a "divide by zero error" will occur in the calculation sheet. In such cases, adjust the weight values by interpolation between the first occurrence and the next reading showing a decrease in weight.

55	3.95	0.0195	9.4	11.03	424.813	70.7664
56	3.87	0.0236	8.94	11.4	416.422	70.9046
57	3.80	0.0356	8.31	11.99	407.426	70.8306
58	3.73	0.0376	8.14	12.16	399.195	70.6571
59	3.65	0.0432	8.04	12.29	392.167	70.2605
60	3.59	0.0429	7.97	12.31	386.521	70.3331
61	3.52	0.0424	7.87	12.4	381.651	70.5483
62	3.46	0.0533	7.9	12.43	378.239	69.9626
63	3.38	0.0552	7.91	12.36	376.026	70.2607
64	3.32	0.0502	7.94	12.36	373.839	69.9536
65	3.26	0.0484	7.92	12.41	371.95	69.8377
66	3.19	0.0497	7.84	12.42	369.29	69.9911
67	3.13	0.0557	7.89	12.41	367.138	70.0011
68	3.07	0.0536	7.87	12.39	365.585	69.9595
69	3.00	0.0654	7.74	12.57	362.423	69.4022
70	2.92	0.0797	7.76	12.55	360.224	69.7619
71	2.87	0.0856	7.76	12.6	358.668	70.2298
72	2.80	0.0761	7.78	12.57	356.873	70.5192
73	2.74	0.0785	7.71	12.69	355.197	70.3557
74	2.68	0.0783	7.7	12.63	354.15	70.3188
75	2.63	0.0754	7.75	12.62	353.375	70.3462
76	2.56	0.0711	7.78	12.59	351.984	70.2662
77	2.50	0.072	7.67	12.69	350.459	70.1147
78	2.42	0.0731	7.73	12.67	350.189	69.8478
79	2.38	0.0715	7.83	12.55	350.338	69.954
80	2.31	0.0752	7.75	12.62	349.629	69.6169
81	2.25	0.0816	7.69	12.69	348.206	69.5147
82	2.19	0.0796	7.67	12.71	347.243	69.5969
83	2.13	0.0765	7.69	12.73	347.238	69.5381
84	2.07	0.0748	7.68	12.68	345.837	69.7299
85	2.01	0.0712	7.66	12.77	345.291	69.6635
86	1.96	0.07	7.71	12.69	344.872	69.3608
87	1.89	0.0685	7.69	12.7	345.041	69.4927
88	1.85	0.0663	7.77	12.66	345.035	69.5008
89	1.79	0.0629	7.7	12.71	344.143	69.3809
90	1.73	0.0887	7.29	13.08	342.166	69.3684
91	1.69	0.1465	7.11	13.23	337.671	69.5165
92	1.64	0.1387	6.98	13.3	334.788	68.8766
93	1.59	0.149	6.61	13.65	330.601	69.2787
94	1.55	0.1565	6.53	13.75	326.892	69.4655
95	1.50	0.16	6.48	13.83	323.646	69.0663
96	1.45	0.1666	6.44	13.84	321.396	69.2186
97	1.41	0.1685	6.46	13.89	318.883	68.8449
98	1.36	0.1646	6.44	13.93	316.763	69.127
99	1.33	0.1645	6.18	14.2	314.132	69.2306
100	1.28	0.1521	6.1	14.33	311.17	68.9366
101	1.23	0.15	6.09	14.35	309.291	69.3898
102	1.20	0.1521	6.01	14.41	307.466	68.9766
103	1.15	0.1514	6.03	14.43	305.677	68.8457
104	1.11	0.1524	6.05	14.43	304.695	68.8773
105	1.07	0.1552	6.03	14.44	303.249	68.5623
106	1.02	0.1557	6.1	14.41	301.77	68.7723
107	0.97	0.1471	6.13	14.35	301.207	69.1493
108	0.93	0.1495	6.1	14.38	301.584	68.9406
109	0.89	0.1477	6.11	14.37	301.239	68.7707
110	0.85	0.1479	5.87	14.54	300.849	68.6603
111	0.83	0.2228	5.43	14.87	297.21	69.0396
112	0.79	0.2493	5.08	15.14	292.072	68.6484
113	0.77	0.4532	4.47	15.77	286.378	68.78
114	0.75	0.5118	4.28	15.97	281.049	68.7257
115	0.72	0.5258	4.21	16.02	276.052	68.7496
116	0.70	0.5599	4.18	16.12	271.394	68.8884
117	0.67	0.5631	4.07	16.21	267.46	68.5318
118	0.65	0.5568	4.05	16.26	263.786	68.4353
119	0.64	0.5497	4.01	16.29	260.466	68.3843
120	0.61	0.5381	4.01	16.3	257.654	68.6119
121	0.58	0.539	4.05	16.26	254.942	68.6338
122	0.57	0.5323	4.05	16.29	252.227	68.6015
123	0.56	0.5209	4.01	16.35	249.857	68.4432
124	0.54	0.5112	3.99	16.41	247.777	68.5148
125	0.52	0.5023	3.97	16.42	245.324	68.5673
126	0.50	0.4911	3.92	16.46	243.594	68.4852
127	0.48	0.4929	3.92	16.49	241.672	69.1174
128	0.45	0.4929	3.9	16.52	239.167	69.6398
129	0.45	0.49	3.9	16.56	237.114	69.9929

130	0.45	0.4876	3.86	16.61	235.42	70.1852
131	0.43	0.4855	3.89	16.54	233.602	70.6142
132	0.42	0.4794	3.85	16.61	231.817	70.7919
133	0.41	0.4766	3.8	16.65	230.656	70.9104
134	0.38	0.4782	3.82	16.67	229.144	70.72
135	0.38	0.4776	3.81	16.64	228.076	70.7646
136	0.37	0.4783	3.81	16.66	226.183	70.9295
137	0.34	0.4786	3.8	16.67	224.774	71.15
138	0.34	0.4762	3.77	16.71	223.73	71.1525
139	0.32	0.4746	3.78	16.72	222.278	71.2965
140	0.31	0.4723	3.76	16.74	220.985	71.1678
141	0.29	0.4748	3.77	16.72	219.701	71.1946
142	0.27	0.4722	3.74	16.75	218.612	71.1237
143	0.26	0.4696	3.74	16.76	217.376	71.1958
144	0.25	0.4688	3.71	16.74	216.304	71.2708
145	0.22	0.4693	3.73	16.77	215.509	71.1976
146	0.22	0.4739	3.72	16.75	214.617	71.4903
147	0.20	0.4748	3.76	16.73	213.753	71.4292
148	0.19	0.4757	3.75	16.76	212.94	71.3665
149	0.18	0.4741	3.73	16.75	212.237	71.1147
150	0.14	0.4747	3.72	16.77	211.287	71.2904
151	0.13	0.4845	3.75	16.74	210.604	71.2829
152	0.11	0.4768	3.67	16.79	209.718	71.3079
153	0.09	0.4729	3.7	16.79	208.813	71.1413
154	0.09	0.4707	3.67	16.83	208.069	71.42
155	0.07	0.4736	3.68	16.82	207.203	71.4737
156	0.05	0.4719	3.68	16.81	206.261	71.3002
157	0.04	0.4649	3.65	16.87	205.482	71.2954
158	0.04	0.4658	3.64	16.86	204.641	71.3842
159	0.01	0.4587	3.63	16.9	203.867	71.4376
160	0.00	0.4562	3.57	16.93	203.252	71.2675

# Stove Builder International Inc.

**Manufacturer:** SBI  
**Model:** 1.4 series  
**Date:** 11-20-20  
**Run:** 4  
**Control #:** G104473478  
**Test Duration:** 160  
**Output Category:** High

**Technicians:** Claude Pelland  
 \_\_\_\_\_  
 \_\_\_\_\_

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

	HHV Basis	LHV Basis
<b>Overall Efficiency</b>	73.5%	78.7%
<b>Combustion Efficiency</b>	96.7%	96.7%
<b>Heat Transfer Efficiency</b>	76%	81.4%

<b>Output Rate (kJ/h)</b>	27,910	26,475	<b>(Btu/h)</b>
<b>Burn Rate (kg/h)</b>	2.02	4.45	<b>(lb/h)</b>
<b>Input (kJ/h)</b>	37,981	36,029	<b>(Btu/h)</b>

<b>Test Load Weight (dry kg)</b>	5.39	11.87	<b>dry lb</b>
<b>MC wet (%)</b>	16.5		
<b>MC dry (%)</b>	19.76		
<b>Particulate (g )</b>	7.573		
<b>CO (g)</b>	254		
<b>Test Duration (h)</b>	2.67		

<b>Emissions</b>	<b>Particulate</b>	<b>CO</b>
<b>g/MJ Output</b>	0.10	3.41
<b>g/kg Dry Fuel</b>	1.41	47.13
<b>g/h</b>	2.84	95.21
<b>lb/MM Btu Output</b>	0.24	7.93

<b>Air/Fuel Ratio (A/F)</b>	12.06
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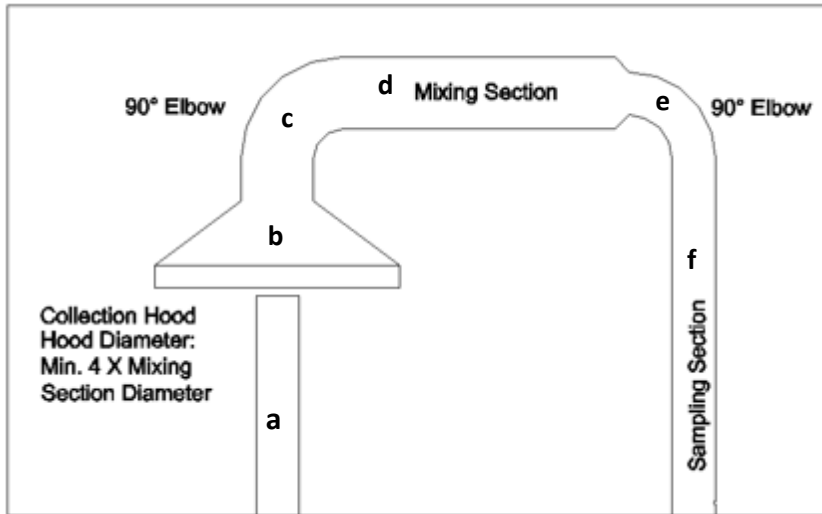
VERSION:

2.4

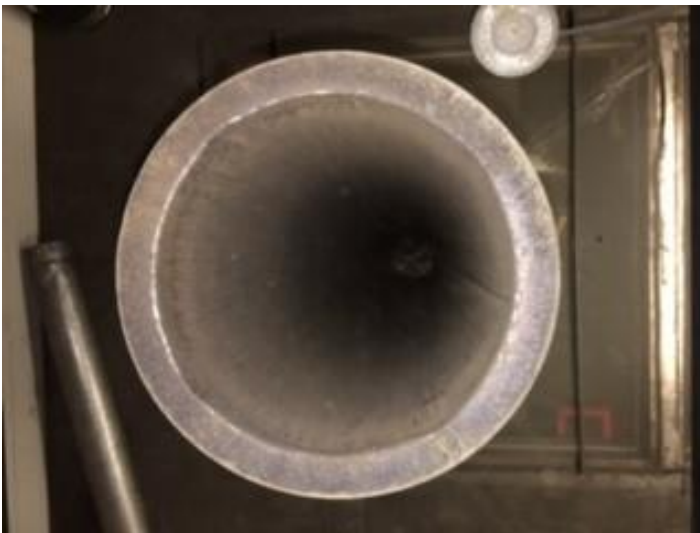
2010-04-15



**1. Tunnel cleaning pictures**



a. Picture of the chimney



b. Picture of the collecting hood



c. Picture of the first elbow



d. Picture of the mixing section



e. Picture of the second elbow



- f. Picture of the sampling section



**2. Identification pictures**

- a. Front view



b. Rear view



c. Iso view



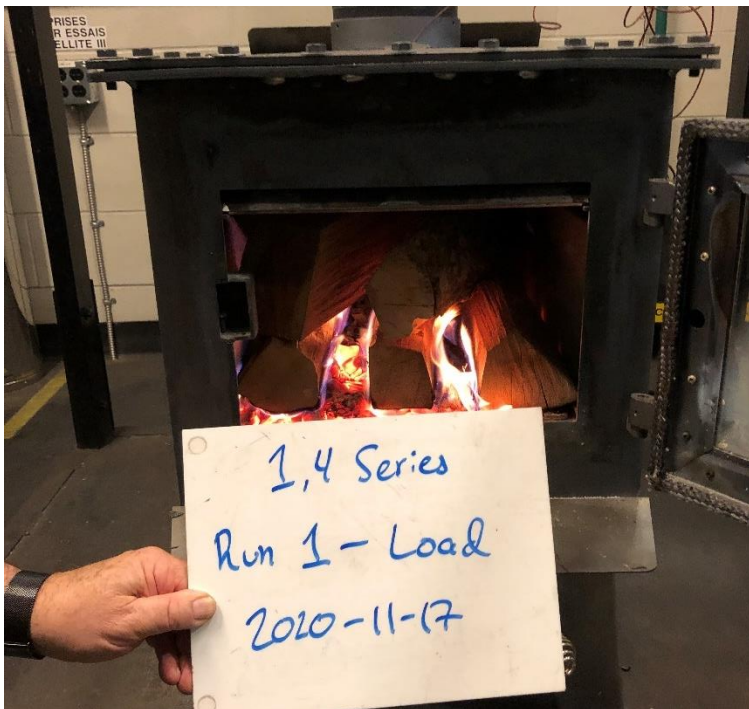
### 3. Test run pictures

#### a. Run #1

##### i. Picture of the load

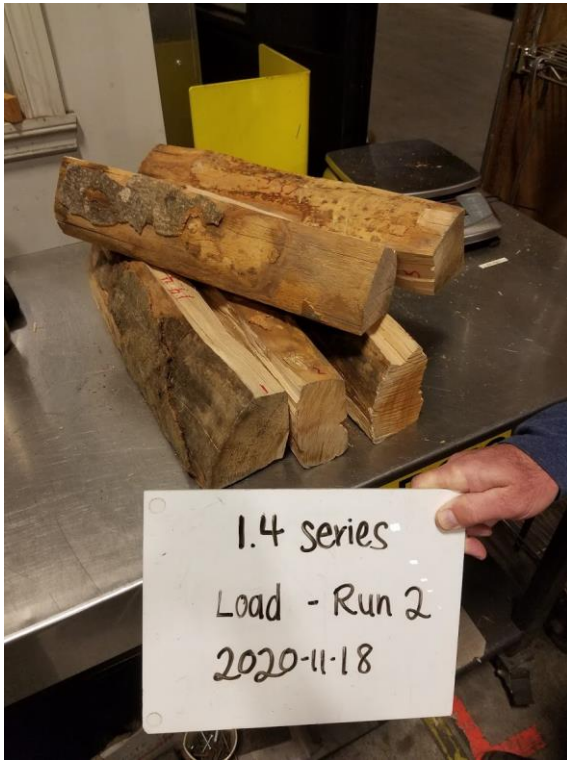


##### ii. Picture of the load inside of the combustion chamber

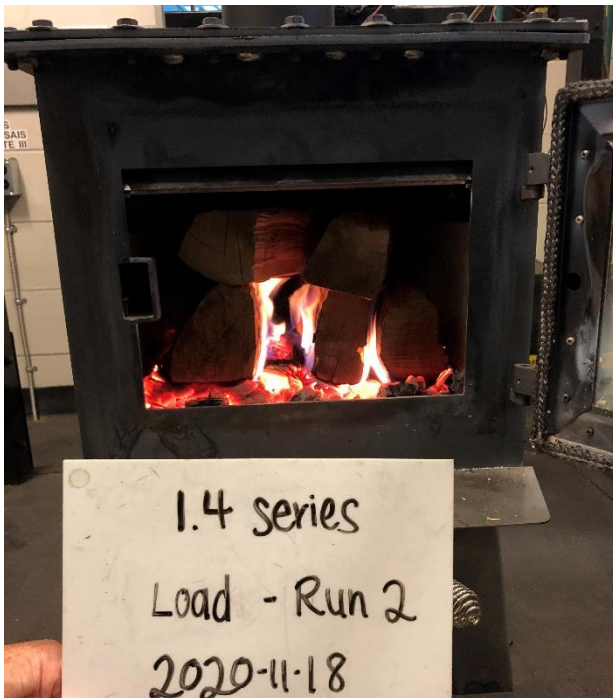


b. Run #2

i. Picture of the load



ii. Picture of the load inside the combustion chamber



iii. Picture before test fuel load adjustment (2:37:30 run time)



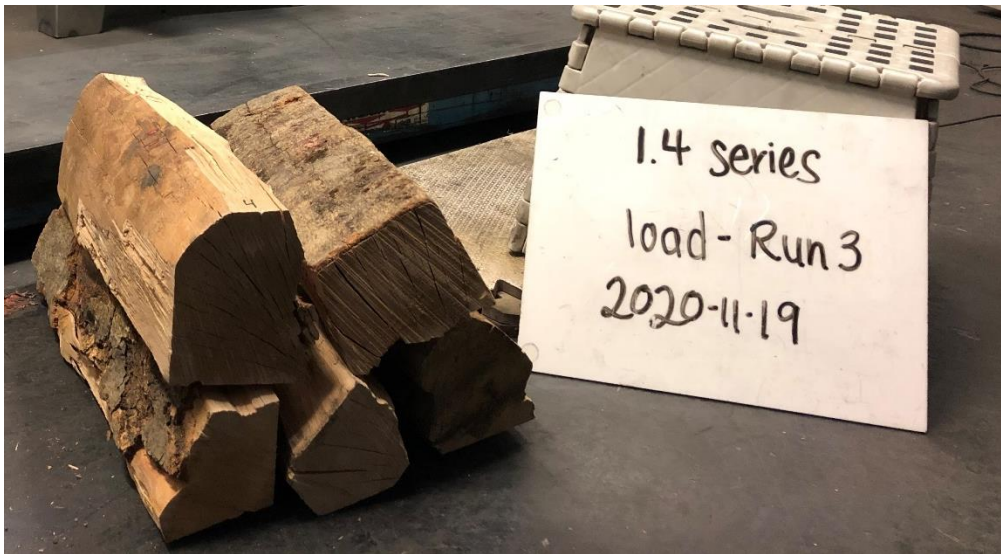
iv. Picture after test fuel load adjustment (2:38:00 run time)



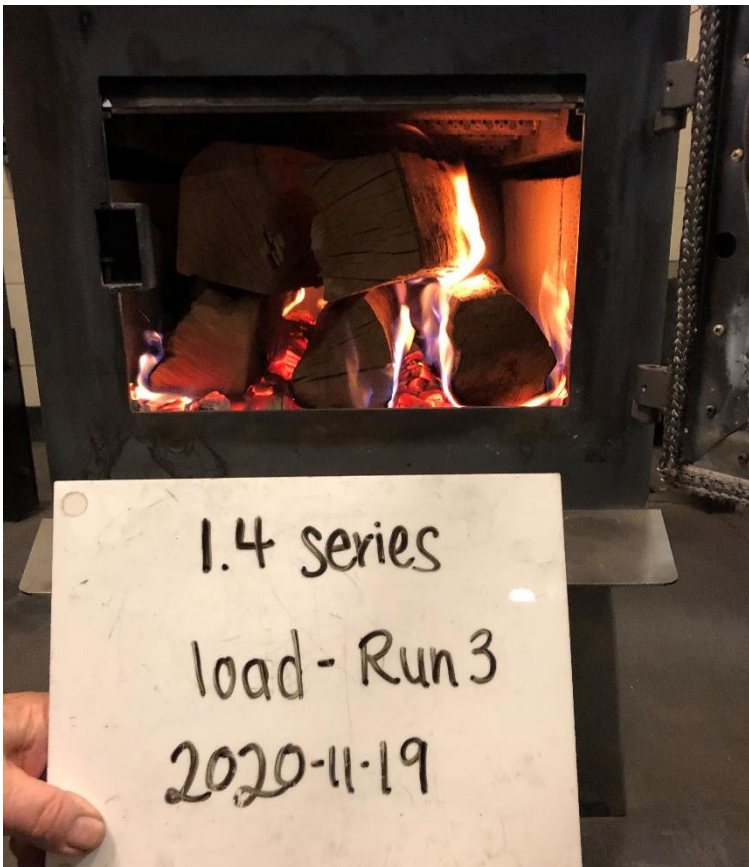


c. Run #3

i. Picture of the load



ii. Picture of the load inside the combustion chamber



iii. Picture before test fuel load adjustment (6:03:30 run time)



iv. Picture after test fuel load adjustment (6:04:00 run time)



d. Run #4

i. Picture of the kindling and start-up fuel.



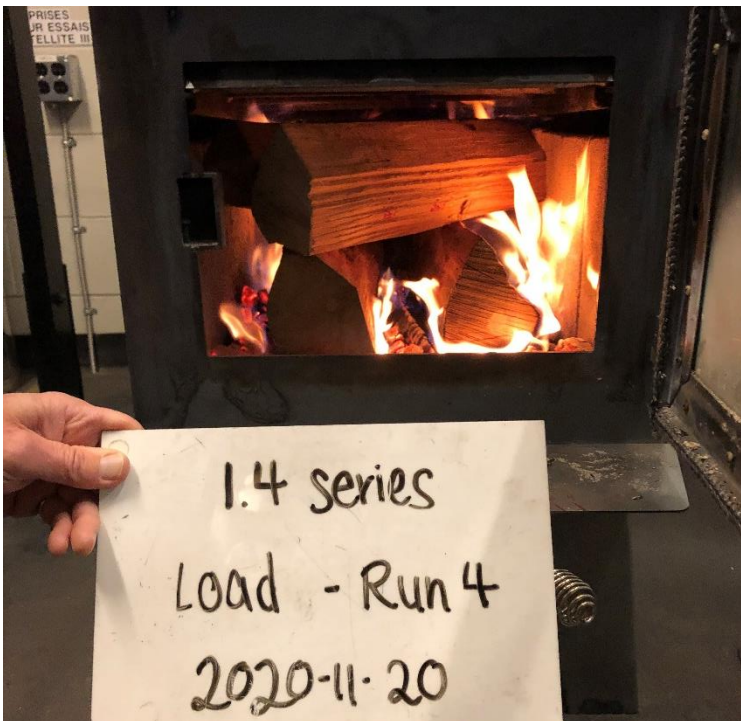
ii. Picture of kindling and start-up fuel after loading.



iii. Picture of the high fire test fuel load.



iv. Picture of the load inside of the combustion chamber.



## 4. Picture of the sealed unit

### a. Front view



### b. Rear View



c. Iso view





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.

GENERAL INFORMATION						
<b>Manufacturer's Name:</b> Stove Builder International						
<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):</b> 1.4 Series						
<b>Model Number(s) (as will appear on test report):</b> These are preliminary names subject to change. Official names will be on Test Report : Escape 1200, Spark II, Fox, Déco Nano, S250, Osburn 950, Solution 1.4, HES140, Gateway 1400						
<b>Equipped with a catalytic combustor?</b> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No						



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





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

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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>City:</b> Lachine	<b>State:</b> Québec	<b>ZIP Code:</b> H8T 3J1
<b>EPA APPROVED THIRD-PARTY CERTIFIER</b>		
<b>Name and Title of Authorized Representative:</b> Charles Meyers, Director, Product Certification		
<b>Company:</b> Intertek Testing Services NA, Inc.		
<b>Phone:</b> 312-906-7783	<b>E-mail:</b> charles.meyers@intertek.com	<b>Fax:</b>
<b>City:</b> Arlington Heights	<b>State:</b> IL	<b>ZIP Code:</b> 60005
<b>COMPLIANCE TEST INFORMATION</b>		
<b>Test Method(s):</b> ASTM E3053-17 as per letter the Broadly Applicable Alternative Test Method from EPA of 2/28/2018 (Alt-125)		
<b>Date(s) of Proposed Test:</b> November 17 <sup>th</sup> , 2020		



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

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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

#### 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

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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

10-13-2020

Date

1-418-878-3040 x 5224

Telephone Number:

[gthibodeaufortin@sbi-international.com](mailto:gthibodeaufortin@sbi-international.com)

Email Address:

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:

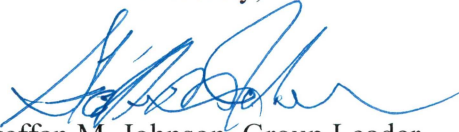
1. The filter temperature must be maintained between 80 and 90 degrees F during testing.
2. Filters must be weighed in pairs to reduce weighing error propagation; see ASTM 2515-11, Section 10.2.1 Analytical Procedure.
3. Sample filters must be Pall TX-40 or equivalent Teflon-coated glass fiber, and of 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.

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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) [www.enerzone-intl.com](http://www.enerzone-intl.com)  
[www.osburn-mfg.com](http://www.osburn-mfg.com) [www.century-heating.com](http://www.century-heating.com)  
[www.occanada.com](http://www.occanada.com) [www.empirestove.com](http://www.empirestove.com)

### AFFECTED WOOD HEATER MODEL INFORMATION

**Model Name(s) (as appearing on the certification test report).** Please note: the model name and design number must clearly distinguish one model from another. The name and design number cannot include the EPA symbol or logo or name or derivatives such as "EPA": 1.4 Series

**Model Number(s) (as appearing on the certification test report):** Osburn 950, Escape 1200, Gateway 1400, Solution 1.4, Spark II, Fox, Déco Nano, S250, Harmony 1.4, HES140

<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	
If yes, provide date of EPA approval and attach copy of EPA approved ATM letter: 2/28/2018					
If not, what Test Method(s) did the test laboratory use for the certification test? (List all applicable test methods):					



Date of submission of 30-Day Notice to the EPA:10/13/2020

What was the proposed date(s) of testing? 11/17/2020

What was the actual date(s) of testing? 11/17/2020

Was the compliance test postponed or suspended? Y N If yes, date of EPA notification of postponement or suspension:

Explain reason for postponing or suspending the certification test:

**EPA-APPROVED TEST LABORATORY**

Name of EPA-Approved Test Laboratory: Intertek

Name(s) of Person(s) Authorized and/or Responsible for Conducting Certification Test: Claude Pelland, Eng.

Position/Title: Project Engineer

Address: 1829, 32<sup>nd</sup> avenue

City: Lachine	State: Québec	ZIP Code: H8T 3J1
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Phone: 1-514-631-3100 x277	Email: claud.pellant@intertek.com
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**EPA-APPROVED THIRD PARTY CERTIFIER**

Name of EPA-Approved Third-Party Certifier: Intertek

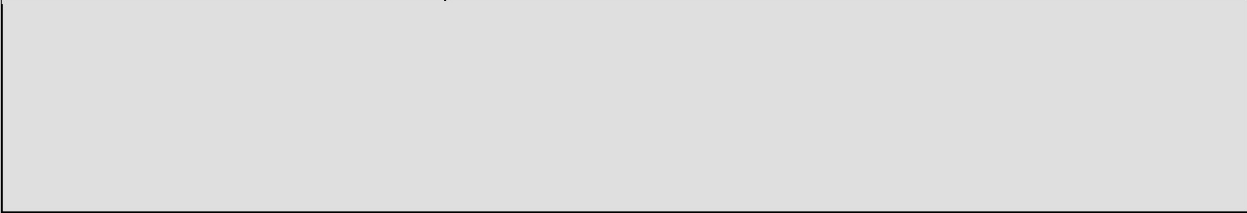
Name(s) of Person(s) Authorized and/or Responsible for Reviewing Test Report and/or Issuing Certification of Conformity: Charles Meyers

Position/Title: Director, Product Certification

Address: 545 E Algonquin Rd

City: Arlington Heights	State: IL	ZIP Code: 60005
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Phone: 312-906-7783	Email: charles.meyers@intertek.com
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## 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: 

**Print Name: Guillaume Thibodeau-Fortin**

**Title: Laboratory Engineer**

**Date: 2020-11-27**

**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.**



Fabricant de poêles international inc.  
Stove Builder International Inc.

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

November 30<sup>th</sup>, 2020

Air Branch/Wood Heater Program Lead  
Monitoring, Assistance, and Media Programs Division  
Office of Compliance  
U.S. EPA  
1200 Pennsylvania Ave., NW  
MS:2227A  
Washington, DC 20004  
Attn: EPA Administrator

Subject: Compliance Statements and Acknowledgements for 1.4 Series

Dear Administrator,

As stated in the application for certificate of compliance, Stove Builder International Inc (SBI) states and acknowledges the 13 items below.

1. SBI provided all engineering drawing (including specifications for each component listed in paragraphs (k)(2), (3) and (4) of 60.533(b) and 60.5475(b) available in Intertek Test Report 104473478MTL-001 at Appendix D. Tolerances are identified on all part draft and cannot reasonably be anticipated to cause wood heater in the model line to exceed the applicable emission limits. The user's manual shows how to replace and inspect emission-critical part such as the secondary tubes.
2. SBI confirm that the firebox or any firebox component (including the materials listed in paragraph (k)(3) of 60.533(b) and 60.5475(b) will be composed of material similar from the material used for the firebox or firebox component in the wood heater on which certification testing was performed. Individual brick size and color may vary but the specification of the material remains the same. The inner firebox brick coverage remains also always the same. If other differences occur over time, a description of any such differences and demonstration that any such differences may not reasonably be anticipated to adversely affect emissions or efficiency will be communicate with Residential Wood Heater Compliance Program Lead.
3. SBI will provide to Residential Wood Heater Compliance Program Lead the Confidential Business Information (CBI) report including all test data and drawings by e-mail to [Sanchez.Rafael@epa.gov](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 104473478MTL-001. SBI confirms that the burn rate for the low burn rate category is no greater than the rate that an operator can achieve in home use and no greater than is advertised by the manufacturer or retailer.
5. SBI provided in Appendix D of Intertek Test Report 104473478MTL-001 a copy of the warranty that stated: "This warranty is void if the unit is used to burn materials other than cordwood (for which the unit is not certified by the EPA) and void if not operated according to the owner's manual. This warranty applies to normal residential use only. Damages caused by misuse, abuse, improper installation, lack of maintenance, over firing, negligence or accident during transportation, power failures, downdrafts, venting problems or under-estimated heating area are not covered by this warranty. The recommended heated area for a given appliance is defined by the manufacturer as its capacity to maintain a minimum



Fabricant de poêles international inc.  
Stove Builder International Inc.

Notre *passion* devient source d'énergie  
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 Arlington Heights chapter of Intertek.
  10. SBI allows the approved laboratory and approved third-party certifier to submit information to Residential Wood Heater Compliance Program Lead on behalf of SBI, including any claimed to be CBI.
  11. SBI will place a copy of the certification test report, summary and all non-CBI on the manufacturer’s web site available to the public within 30 days after the Administrator issues a certificate of compliance.
  12. SBI acknowledges that the certificate of compliance cannot be transferred to another manufacturer or model line without written approval by the Administrator.
  13. SBI acknowledges that it is unlawful to sell, distribute or offer to sell or distribute an affected wood heater without a valid certificate of compliance.

Print name and title : Guillaume Thibodeau Fortin, Ing. Date : 2020-11-30

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.