



TEST REPORT

SCOPE: EMISSIONS, EFFICIENCY AND OUTPUT

FUEL: CORDWOOD

TEST STANDARD: EPA

MODEL: CW2900 WOOD INSERT

Notice to reader: Our CW2900 wood insert was tested as part of our 2.3 Series (Escape 1800) firebox. Therefore, the 2.3 Series (Escape 1800) is referenced throughout the attached test report.



LISTING REPORT FOR APPLICANT

ISSUED: Nov 30 2017 11:01AM

INSPECTION TESTS AND EVALUATION OF
SBI - Series 2.3 Escape 1800 Emissions and Efficiency (35697)

RENDERED TO
Stove Builder International Inc.
250, rue de Copenhague
St-Augustin-de-Desmaures, QC G3A 2H3
Canada

GENERAL: This report gives the results of the inspection, tests and evaluation of the above for compliance with applicable requirements of the following standards: CSA B415.1 (2010), ASTM E2515 (2010),

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

CORRELATION FOR MULTIPLE LISTEES

Applicant/Basic Listee:

Stove Builder International Inc.
250, rue de Copenhagen
St-Augustin-de-Desmaures, QC G3A 2H3
Canada

Applicant/Manufacturer(s):

Stove Builder International Inc. (Laguadeloupe) Contact: Claude Pare
Phone: 418-878-3040 ext 255
Fax: 418-878-3001
Email: cpare@sbi-international.com

Parties Authorized to Apply Mark:

PRODUCT DESCRIPTION

Product Covered:

SBI - Series 2.3 Escape 1800 Emissions and Efficiency

Product Description:

Product covered:

Series 2.3 wood Fuel Room Heaters

Final emission results are as follows:

Model:	Escape 1800	Units
Maximum Output:	28,600	Btu/hr
Weighted average Emission Rate	1.54	g/hr
Weighted Average CO Emissions Rate:	1.49	g/min
Weighted Average Efficiency	69	%HHV
Test Fuel:	Cordwood	

Testing was also run as per WK47329-16. See Appendix I of testing report.

Attribute	Value
Criteria	CSA B415.1 (2010)
Criteria	ASTM E2515 (2010)
CSI Code	10 30 00 Fireplaces and Stoves
Intertek Services	Certification
Listed or Inspected	LISTED
Listing Section	SOLID FUEL EMISSIONS AND EFFICIENCY
Report Number	103124842MTL-001
Spec ID	35697
Test Original Issue Date	21-July-2017
Verification Testing	No

DRAWING INDEX

Certificate of Conformity - Series 2.3 Escape 1800 Adjustable Burn Rate Wood Burning Heater Emissions & Efficiency

Certificate of Conformity - Series 2.3 Escape 1800 Adjustable Burn Rate Wood Burning Heater Emissions & Efficiency



Certificate of Conformity

Emissions – Adjustable Burn Rate Wood Burning Heater

EPA 40 CFR Part 60, Subpart AAA, ASTM E2515-2011, CSA B415.1-2010

Certificate number: WHI17 – 21514307

Organization:

Company Name: Stove Builder International Inc.
Address: 250 de Copenhagen
City, State: St-Augustin-de-Desmaures, QC
Zip Code: G3A 2H3
Country: Canada

Product: Model 2.3 Series Escape 1800

Maximum Output: 28,600 Btu/hour
Weighted Average Emissions Rate: 1.54 g/hr
Weighted Average CO Emissions Rate: 1.49 g/min
Weighted Average Efficiency: 69% HHV
Test Fuel Type: Cordwood
Compliance: Certified to comply with 2020 particulate emissions standard.
Report Number: 103124842MTL-001

Certification body: Intertek Testing Services NA, Inc.
Initial registration: August 29, 2017
Date of expiry: No expiry date
Issue status: 4

Dustin Behling
Certification Coordination Manager
Name


Signature

11/30/2017
Date

www.intertek.com

Registered address:
Intertek Testing Services NA, Inc. 545 E. Algonquin Rd. Arlington Heights, IL 60005 USA

The certificate and schedule are held in force by regular annual surveillance visits by Intertek Testing Services NA, Inc. and the reader or user should contact Intertek to validate its status. This certificate remains the property of Intertek Testing Services NA, Inc. and must be returned to them on demand. This Certificate is for the exclusive use of Intertek's Client and is provided pursuant to the Certification 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 certificate. Only the Client is authorized to permit copying or distribution of this certificate and then only in its entirety. Use of Intertek's Certification mark is restricted to the conditions laid out in the agreement. Any further use of the Intertek name for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek. Initial Factory Assessments and Follow up Services are for the purpose of assuring appropriate usage of the Certification mark in accordance with the agreement, they are not for the purposes of production quality control and do not relieve the Client of their obligations in this respect.

MANUFACTURING INFORMATION

Product Covered

The series 2.3 -Escape 1800 is constructed of sheet steel.

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

The Escape 1800 is a freestanding wood burning stove constructed of carbon steel from the 2.3 Series. The outer dimensions of the Escape 1800 are 25.625-inches wide, 33.5-inches high and 26.75-inches deep. The unit has a front door with a viewing glass.

Drawings are reproduced in this specification.

SIGNATURE PAGE

Reported By:



Reviewed By:



DRAWING INDEX

100 - Owner's manual ESCAPE 1800

200 - Label Escape 1800

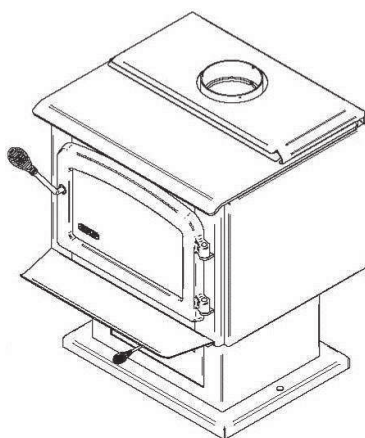
300 - Drawings Escape 1800

100 - Owner's manual ESCAPE 1800



Installation and Operation Manual **Escape 1800** (DB03105 models)

"U.S. ENVIRONMENTAL PROTECTION AGENCY Certified to comply with 2020 particulate emission standards using cord wood."



Safety tested according to ULC S627, UL 737 and UL
1482 Standards
by an accredited laboratory

www.drolet.ca

Stove Builder International Inc.

250, rue de Copenhague, St-Augustin-de-Desmaures (Quebec) Canada G3A 2H3
After-sale service: 418-908-8002 E-mail: tech@sbi-international.com



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

READ AND KEEP THIS MANUAL FOR REFERENCE

Printed in Canada

45904A
18-07-2017

100 - Owner's manual ESCAPE 1800 (2 of 59)

Installation and Operation Manual for Escape 1800

THANK YOU FOR CHOOSING THIS DROLET WOOD STOVE

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. We want to help you get maximum satisfaction as you use this product.

In the pages that follow you will find general advice on wood heating, detailed instructions for safe and effective installation, and guidance on how to get the best performance from this stove as you build and maintain fires, and maintain your wood heating system.

We recommend that our wood burning hearth products be installed and serviced by professionals who are certified in the United States by NFI (National Fireplace Institute®) or in Canada by WETT (Wood Energy Technology Transfer) or in Quebec by APC (Association des Professionnels du Chauffage).

Congratulations on making a wise purchase.

When this stove is not properly installed, a house fire may result. To reduce the risk of fire, follow the installation instructions. Contact local building or fire officials about restrictions and installation inspection requirements in your area.

Please read this entire manual before you install and use your new stove. Failure to follow instructions may result in property damage, bodily injury, or even death. It is important that you follow the installations guidelines exactly.

You may need to obtain a building permit for the installation of this stove and the chimney that it is connected to. Consult your municipal building department or fire department before installation to determine the need to obtain one. We recommend that you also inform your home insurance company to find out if the installation will affect your policy.

REGISTER YOUR WARRANTY ONLINE

To receive full warranty coverage, you will need to show evidence of the date you purchased your stove. Keep your sales invoice. We also recommend that you register your warranty online at:

<http://www.drolet.ca/en/service-support/warranty-registration>

Registering your warranty online will help us to quickly track the information we need about your stove.

100 - Owner's manual ESCAPE 1800 (3 of 59)

Installation and Operation Manual for Escape 1800

Table of content

PART A - OPERATION AND MAINTENANCE	5
1 Safety Information	5
1.1 Summary of Operation and Maintenance Cautions and Warnings	5
2 General Information on Escape 1800.....	6
2.1 Appliance performance ⁽¹⁾	6
2.2 General Features	7
2.3 Zone Heating and How to Make it Work for You.....	10
2.4 The Benefits of Low Emissions and High Efficiency	10
2.5 The SBI Commitment to You and the Environment	11
2.5.1 What is Your New Stove Made Of?	11
3 Fuel.....	12
3.1 Materials That Should Not be Burned.....	12
3.2 How to Prepare or Buy Good Firewood.....	12
3.2.1 What is Good Firewood?	12
3.2.2 Tree Species	12
3.2.3 Log Length	13
3.2.4 Piece Size	13
3.2.5 How to Dry Firewood	14
3.2.6 Judging Firewood Moisture Content	15
3.3 Manufactured Logs	15
4 Operating Your Stove.....	16
4.1 The use of a fire screen.....	Erreur ! Signet non défini.
4.2 Your First Fires.....	16
4.3 Lighting Fires	16
4.3.1 Conventional Fire Starting	17
4.3.2 The Top Down Fire	16
4.3.3 Two Parallel Logs	17
4.3.4 Using Fire Starters.....	17
4.4 Maintaining Wood Fires.....	18
4.4.1 General Advice.....	18
4.4.2 Ash Removal	18
4.4.3 Raking Charcoal	19
4.4.4 Firing Each New Load Hot.....	20
4.4.5 Turning Down the Air Supply	20
4.4.6 Building Different Fires for Different Needs.....	21
5 Maintaining Your Wood Heating System.....	24
5.1 Stove Maintenance	24
5.1.1 Cleaning Door Glass.....	24
5.1.2 Door adjustment	25
5.1.3 Replacing the Door Gasket.....	25
5.1.4 Replacing the Glass Gasket and/or the Glass.....	26

100 - Owner's manual ESCAPE 1800 (4 of 59)

Installation and Operation Manual for Escape 1800

5.1.5	Cleaning and Painting the Stove.....	27
5.2	Chimney and Chimney Connector Maintenance.....	27
5.2.1	Why Chimney Cleaning is Necessary	27
5.2.2	How Often Should You Clean the Chimney?	27
5.2.3	Cleaning the Chimney	28
PART B - INSTALLATION		29
6	Safety Information	29
6.1	Summary of Installation Cautions and Warnings	29
6.2	Regulations Covering Stove Installation	30
7	Clearances to Combustible Material.....	30
7.1	Location of the certification label	30
7.2	Clearances to Walls and Ceiling.....	31
7.3	Floor protector.....	35
7.4	Reducing Wall and Ceiling Clearances Safely.....	36
7.4.1	Shield Construction Rules.....	36
7.4.2	Table of Clearance Reduction Percentages.....	38
8	The Venting System	39
8.1	General	39
8.2	Suitable Chimneys	39
8.2.1	Factory-built Metal Chimneys	40
8.2.2	Factory-built Metal Chimneys in mobile homes.....	40
8.2.3	Masonry Chimneys	41
8.3	Minimum Chimney Height	41
8.4	The Relationship Between the Chimney and the House.....	42
8.4.1	Why inside chimneys are preferred.....	42
8.4.2	Why the chimney should penetrate the highest heated space	43
8.5	Supply of Combustion Air	43
8.5.1	Combustion Air Supply in Mobile Homes	44
8.5.2	Air Supply in Conventional Houses.....	44
8.6	Installing the Chimney Connector.....	44
8.6.1	Installation of Single Wall Chimney Connector.....	45
	Appendix 1: Installing the Legs (DB03112 Only)	47
	Appendix 2: Installing the Optional Fresh Air Intake Kit (AC01336)	49
	Appendix 3: Installing the Optional Fire Screen (AC01315).... Erreur ! Signet non défini.	
	Appendix 4: Use and Installation of the Optional Blower and Thermodisc	51
	Appendix 5: Installation of Secondary Air Tubes and Baffle	54
	Appendix 6: Exploded Diagram and Parts List	56
	DROLET LIMITED LIFETIME WARRANTY	59

100 - Owner's manual ESCAPE 1800 (5 of 59)

Installation and Operation Manual for Escape 1800

PART A - OPERATION AND MAINTENANCE

Please see Part B for installation instructions.

1 Safety Information

1.1 Summary of Operation and Maintenance Cautions and Warnings

- **HOT WHILE IN OPERATION, KEEP CHILDREN, CLOTHING AND FURNITURE AWAY. CONTACT MAY CAUSE SKIN BURNS. GLOVES MAY BE NEEDED FOR STOVE OPERATION.**
- **USING A STOVE WITH CRACKED OR BROKEN COMPONENTS, SUCH AS GLASS OR FIREBRICKS OR BAFFLES MAY PRODUCE AN UNSAFE CONDITION AND MAY DAMAGE THE STOVE.**
- **OPEN THE AIR CONTROL FULLY BEFORE OPENING FIRING DOOR.**
- **THIS STOVE HAS BEEN TESTED FOR USE WITH AN OPEN DOOR IN CONJUNCTION WITH A FIRE SCREEN (AC01315, SOLD SEPARATELY). THE DOOR MAY BE OPEN OR FIRE SCREEN REMOVED ONLY DURING LIGHTING PROCEDURES OR RELOADING. ALWAYS CLOSE THE DOOR OR PUT BACK THE FIRE SCREEN AFTER IGNITION. DO NOT LEAVE THE STOVE UNATTENDED WHEN THE DOOR IS OPENED WITH OR WITHOUT FIRE SCREEN.**
- **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 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.**
- **DO NOT BURN:**
 - **GARBAGE OF ANY KIND,**
 - **COAL OR CHARCOAL,**
 - **TREATED, PAINTED OR COATED WOOD,**
 - **PLYWOOD OR PARTICLE BOARD,**
 - **FINE PAPER, COLORED PAPER OR CARDBOARD,**
 - **SALT WATER DRIFTWOOD OR**
 - **RAILROAD TIES.**
- **DO NOT ELEVATE THE FIRE BY USING A GRATE IN THIS STOVE.**
- **THIS WOOD HEATER NEEDS PERIODIC INSPECTION AND REPAIR FOR PROPER OPERATION. IT IS AGAINST FEDERAL REGULATIONS TO OPERATE THIS WOOD HEATER IN A MANNER INCONSISTENT WITH OPERATING INSTRUCTIONS IN THIS MANUAL.**

100 - Owner's manual ESCAPE 1800 (6 of 59)

Installation and Operation Manual for Escape 1800

2 General Information on Escape 1800

DB03105 Escape 1800 - On pedestal - black door

2.1 Appliance performance⁽¹⁾

Fuel type	Dry cordwood	
Recommended heating area ^[1]	500 to 2,100 ft ² (47 to 195 m ²)	
Firebox volume	2.02 ft ³ (0.057 m ³)	
Maximum burn time ^[1]	8 h	
Maximum heat output ⁽²⁾ (dry cordwood)	75,000 BTU/h (22.0 kW)	
Overall heat output rate (min. to max.) ⁽²⁾⁽³⁾	14,800 BTU/h to 28,600 BTU/h (4.3 kW to 8.4 kW)	
Average overall efficiency ⁽³⁾ - Dry cordwood	69% (HHV ⁽⁴⁾)	74% (LHV ⁽⁵⁾)
Optimum efficiency ⁽²⁾⁽⁶⁾	77%	
Average particulate emissions rate ⁽⁷⁾	1.54 g/h	
Average CO ⁽⁸⁾	89 g/h ; 1 g/min	

^[1] Recommended heating area and maximum burn time may vary subject to location in home, chimney draft, heat loss factors, climate, fuel type and other variables. The recommended heated area for a given appliance is defined by the manufacturer as its capacity to maintain a minimum acceptable temperature in the designated area in case of a power failure.

⁽¹⁾ Values are as measured per test method, except for the recommended heating area, firebox volume, maximum burn time and maximum heat output.

⁽²⁾ The maximum heat output (dry cordwood) is based on a loading density varying between 15 lb/ft³ and 20 lb/ft³. Other performances are based on a fuel load prescribed by the standard. The specified loading density varies between 7 lb/ft³ and 12 lb/ft³. The moisture content is between 19% and 25%.

⁽³⁾ As measured per CSA B415.1-10 stack loss method.

⁽⁴⁾ Higher Heating Value of the fuel.

⁽⁵⁾ Lower Heating Value of the fuel.

⁽⁶⁾ Optimum overall efficiency at a specific burn rate (LHV).

⁽⁷⁾ This appliance is officially tested and certified by an independent agency.

⁽⁸⁾ Carbon monoxide.

100 - Owner's manual ESCAPE 1800 (7 of 59)

Installation and Operation Manual for Escape 1800

2.2 General Features

Maximum log length	20 in (508 mm) east-west*
Flue outlet diameter	6 in (152 mm)
Recommended connector pipe diameter	6 in (152 mm)
Type of chimney	CAN/ULC S629, UL 103 HT (2100 °F)
Baffle material	Vermiculite
Approved for alcove installation	Not approved
Approved for mobile home installation [‡]	Yes
Shipping weight (without option)	382 lb (173 kg)
Appliance weight (model with legs)	325 lb (147 kg)
Appliance weight (model with pedestal)	329 lb (149 kg)
Type of door	Single, glass with cast iron frame
Type of glass	Ceramic glass
Blower	Optional (up to 130 CFM)
Particulate emission standard	EPA / CSA B415.1-10
USA standard (safety)	UL 1482, UL 737
Canadian standard (safety)	ULC S627

** East-west: through the door you see the longitudinal sides of the logs; north-south: through the door you see the tips of the logs.

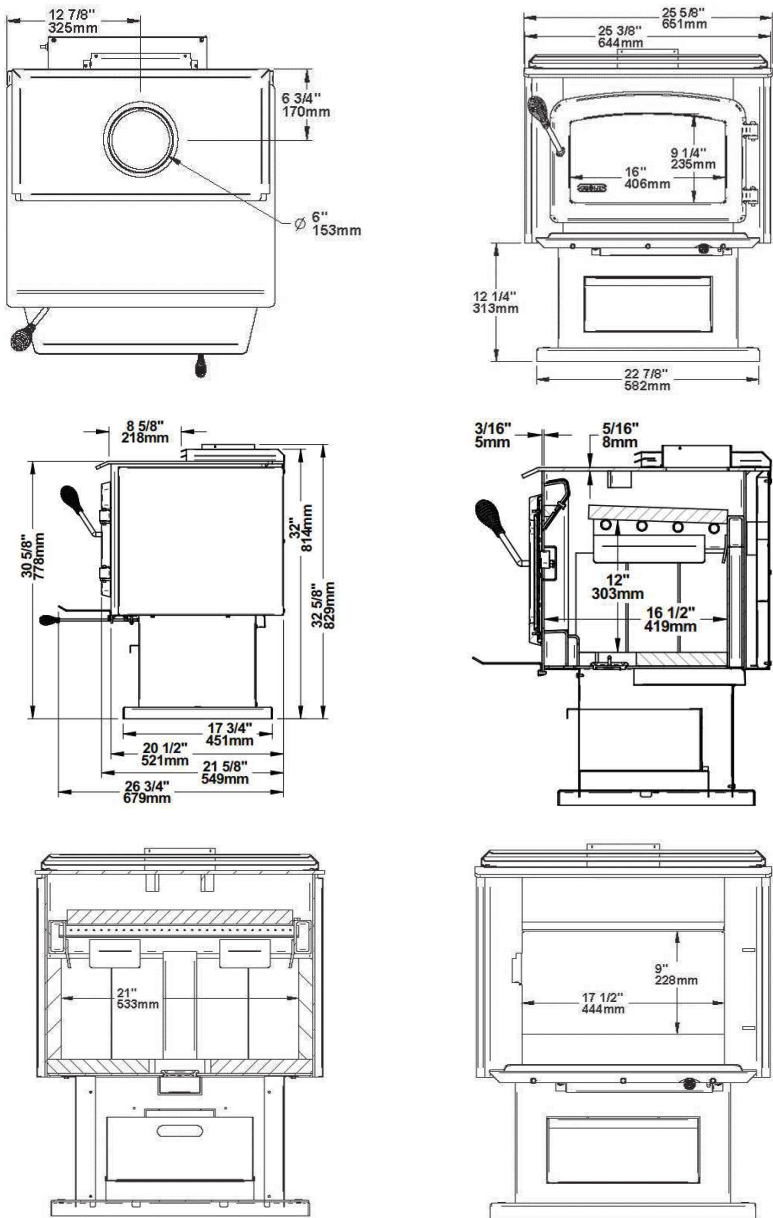
‡ Mobile home (Canada) or manufactured home (USA): The US department of Housing and Urban Development describes "manufactured homes" better known as "mobile homes" as followed; buildings built on fixed wheels and those transported on temporary wheels/axles and set on a permanent foundation. In Canada, 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

The Escape 1800 wood burning stove is certified to comply with 2020 particulate emission standards. Not approved for sale after day/month/year (as per compliance certificate).

100 - Owner's manual ESCAPE 1800 (8 of 59)

Installation and Operation Manual for Escape 1800

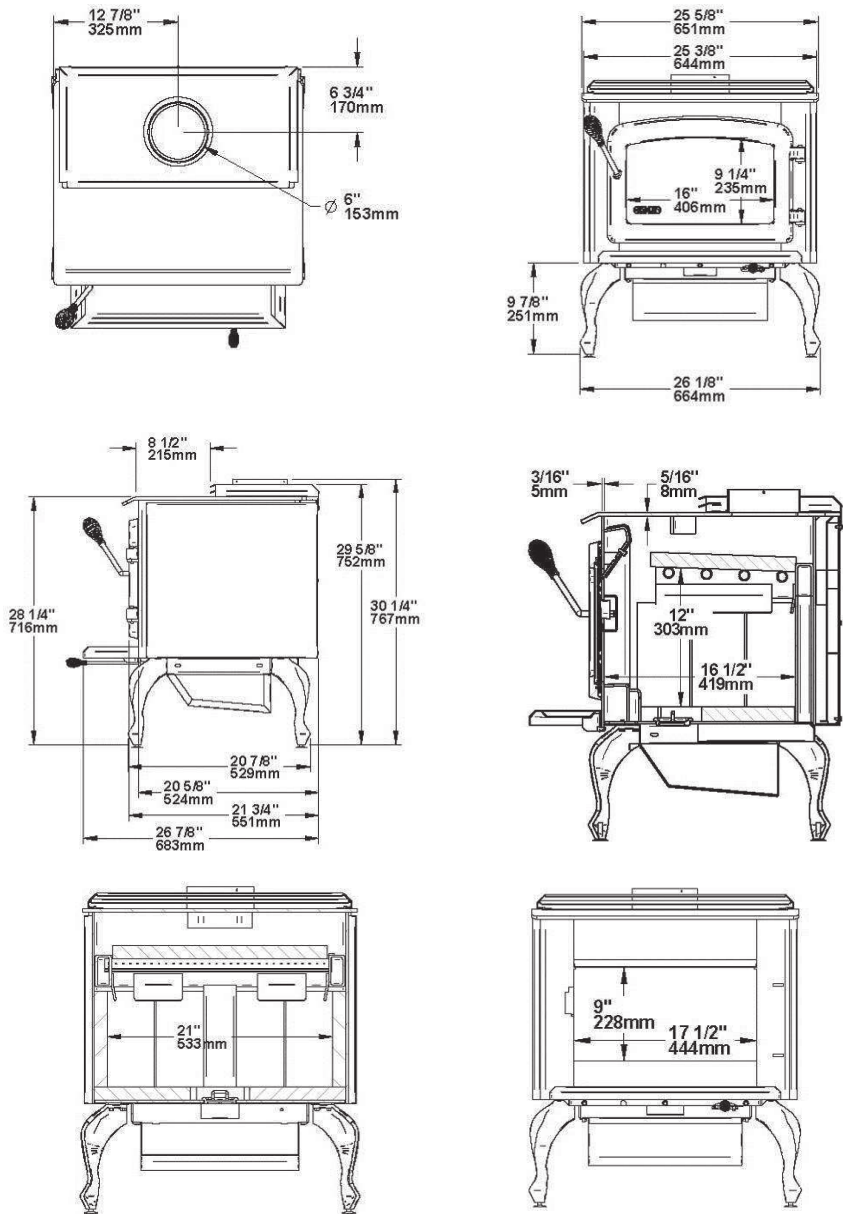
Models on pedestal



100 - Owner's manual ESCAPE 1800 (9 of 59)

Installation and Operation Manual for Escape 1800

Model on legs



100 - Owner's manual ESCAPE 1800 (10 of 59)

Installation and Operation Manual for Escape 1800

2.3 Zone Heating and How to Make it Work for You

Your new Escape 1800 wood 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 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 located 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. By locating the stove in this area, you will get the maximum benefit of the heat it produces and will achieve the highest possible heating efficiency and comfort. The space where you spend most of your time will be warmest, while bedrooms and basement (if there is one) will stay cooler. In this way, you will burn less wood than with other forms of heating.

Although the stove may be able to heat the main living areas of your house to an adequate temperature, we strongly recommend that you also have a conventional oil, gas or electric heating system to provide back up heating.

Your success with zone heating will depend on several factors, including the correct sizing and location of the stove, the size, layout and age of your home and your climate zone. Three-season vacation homes can usually be heated with smaller stoves than houses that are heated all winter.

2.4 The Benefits of Low Emissions and High Efficiency

The low smoke emissions produced by the special features inside the Escape 1800 firebox mean that your household will release up to 90 percent less smoke into the outside environment than if you used an older conventional stove. 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, your 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 you to reduce the air supply to control heat output, while maintaining clean and efficient flaming combustion, which boosts the efficient delivery of heat to your home.

The emission control and advanced combustion features of your stove can only work properly if your fuel is in the correct moisture content range of 15 to 20 percent. See **Section 3** of this manual for suggestions on preparing fuelwood and judging its moisture.

100 - Owner's manual ESCAPE 1800 (11 of 59)

Installation and Operation Manual for Escape 1800

2.5 The SBI Commitment to You and the Environment

The SBI team are committed to protecting the environment, so we do everything we can to use only materials in our products that will have no lasting negative impact on the environment.

2.5.1 What is Your New Stove Made Of?

The body of your 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 coat on your stove is very thin. Its VOC content (Volatile Organic Components) is very low. VOCs can be responsible for smog, so all the paint used during the manufacturing process meets the latest air quality requirements with regards to VOC reduction or elimination.

The air tubes are stainless steel, which can also be recycled.

Vermiculite is used for the baffle. Vermiculite is a mineral. Large commercial mines exist in China, Russia, South Africa, and Brazil. Potassium silicate is used as binder to form a rigid board. Vermiculite can withstand temperatures above 2,000 °F. It is not considered hazardous waste. Disposal at a landfill is recommended.

Lightweight firebrick is made of pumice and cement. Pumice is in fact volcanic rock, a naturally green product found in the Northwest United States. Disposal at a landfill 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 landfill is recommended.

The door glass is a 5 mm thick ceramic material that contains no toxic chemicals. It is basically made of raw earth materials such as sand and quartz that are combined in such a way to form a glass at high temperatures. Ceramic glass will not re-melt in the same way as normal glass, so it should not be recycled with your regular household products. Disposal at a landfill is recommended.

100 - Owner's manual ESCAPE 1800 (12 of 59)

Installation and Operation Manual for Escape 1800

3 Fuel

3.1 Materials That Should Not be Burned

- GARBAGE OF ANY KIND, WASTE,
- COAL OR CHARCOAL,
- TREATED, PAINTED OR COATED WOOD, PLASTIC, RUBBER
- PLYWOOD OR PARTICLE BOARD, TREATED WOOD
- FINE PAPER, COLORED PAPER OR CARDBOARD,
- SALT WATER DRIFTWOOD,
- MANUFACTURED LOGS CONTAINING WAX OR CHEMICAL ADDITIVES,
- RAILROAD TIES, OR OTHER DEBRIS
- LIQUIDS SUCH AS KEROSCENE OR DIESEL FUEL TO START A FIRE.

Burning these materials may result in release of toxic fumes or render ther heater ineffective and cause smoke

3.2 How to Prepare or Buy Good Firewood

3.2.1 What is Good Firewood?

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 reduced to 15 to 20 per cent.

3.2.2 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. People who live in the coldest regions of North America usually have only spruce, birch and poplar, other low-density species to burn and yet they can heat their homes successfully.

Homeowners with access to both hardwood and softwood fuel sometimes use both types for different purposes. For example, softer woods make good fuel for relatively 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. You can successfully heat your home by using the less desirable tree species and give the forest a break at the same time.

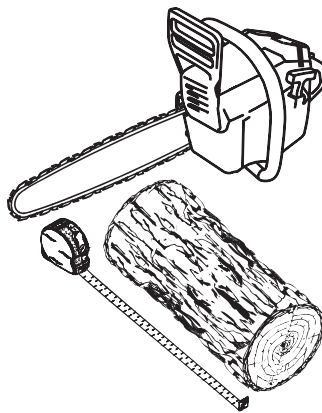
100 - Owner's manual ESCAPE 1800 (13 of 59)

Installation and Operation Manual for Escape 1800

3.2.3 Log Length

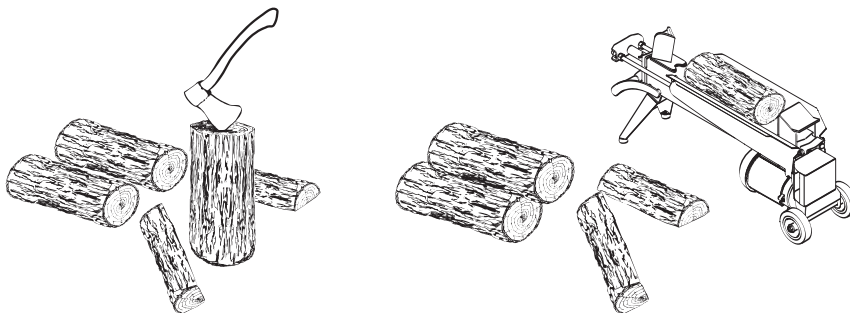
Logs should be cut about 1" (25 mm) shorter than the firebox so they fit in easily. Pieces that are even slightly too long make loading the stove very difficult. The most common standard length of firewood is 16" (400 mm).

The pieces should be a consistent length, with a maximum of 1" (25 mm) variation from piece to piece.



3.2.4 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. Logs as small as 3" (75 mm) should be split to encourage drying.



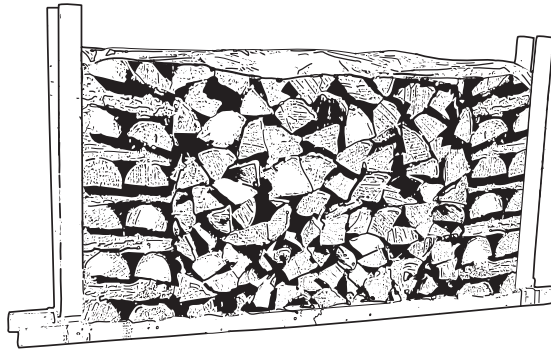
Wood should be split to a range of sizes, from about 3" to 6" (75 mm to 150 mm) in cross section. Having a range of sizes makes starting and rekindling fires much easier. Often, the firewood purchased from commercial suppliers is not split finely enough for convenient stoking. It is sometimes advisable to resplit the wood before stacking to dry.

100 - Owner's manual ESCAPE 1800 (14 of 59)

Installation and Operation Manual for Escape 1800

3.2.5 How to Dry Firewood

Firewood that is not dry enough to burn is the cause of most complaints about wood stoves. The complaints usually involve a lack of heat and dirty door glass.



Here are some things to consider in estimating drying time:

- firewood takes a long time to dry
- 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 damp, maritime climates
- 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 take less time to dry than hardwoods
- softwoods like pine, spruce, and poplar/aspen can be dry enough to burn after being stacked in the open for only 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 in the open where it is exposed to sun and wind; it takes much longer to dry when stacked in a wood shed
- firewood that is ready to burn has a moisture content between 15 and 20% by weight and will allow your stove to produce its highest possible efficiency

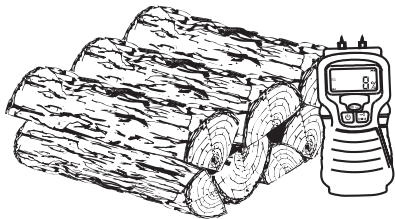
100 - Owner's manual ESCAPE 1800 (15 of 59)

Installation and Operation Manual for Escape 1800

3.2.6 Judging Firewood Moisture Content

You can find out if some firewood is dry enough to burn by using these guidelines:

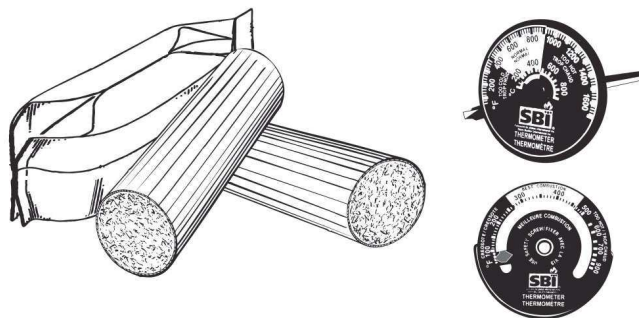
- cracks form at the ends of logs as they dry
- as it dries in the sun, the wood turns from white or cream coloured to grey or yellow,
- bang two pieces of wood together; seasoned wood sounds hollow and wet wood sounds dull,
- dry wood is much lighter in weight than wet wood,
- split a piece, and if the fresh face feels warm and dry it is dry enough to burn; if it feels damp, it is too wet,
- burn a piece; wet wood hisses and sizzles in the fire and dry wood does not.



You could buy a wood moisture meter to test your firewood.

3.3 Manufactured Logs

Do not burn manufactured logs made of wax impregnated sawdust or logs with any chemical additives. Manufactured logs made of 100% compressed sawdust can be burned, but use caution in the number of these logs burned at one time. Start with one manufactured log and see how the stove reacts. You can increase the number of logs burned at a time to making sure the temperature never rises higher than 475 °F (246 °C) on a magnetic thermometer for installation on single wall stove pipes or 900 °F (482 °C) on a probe thermometer for installation on double wall stove pipe. The thermometer should be placed about 18" (457 mm) above the stove. Higher temperatures can lead to overheat and damage your stove.



100 - Owner's manual ESCAPE 1800 (16 of 59)

Installation and Operation Manual for Escape 1800

4 Operating Your Stove

4.1 Your First Fires

Two things will happen as you burn your first few fires; the paint cures and the internal components of the stove are conditioned.

As the paint cures, some of the chemicals vaporize. The vapors are not poisonous, but they do smell bad. Fresh paint fumes can also cause false alarms in smoke detectors. So, when you first light your stove, be prepared by opening doors and/or windows to ventilate the house. As you burn hotter and hotter fires, more of the painted surfaces reach the curing temperature of the paint. The smell of curing paint does not disappear until you have burned one or two very hot fires.

Burn one or two small fires to begin the curing and conditioning process. Then build bigger and hotter fires until there is no longer any paint smell from the stove. Once the paint smell disappears, your stove is ready for serious heating.

4.2 Lighting Fires

Each person who heats with wood develops their own favorite way to light fires. Whatever method you choose, your goal should be to get a hot fire burning quickly. A fire that starts fast produces less smoke and deposits less creosote in the chimney. Here are three popular and effective ways to start wood fires.

4.2.1 BEST PRACTICE : The Top Down Fire

The top down fire starting method solves two problems with the conventional method: first, it does not collapse and smother itself as it burns; and second, it's cleaner. The top down method only works properly if the wood is well-seasoned.

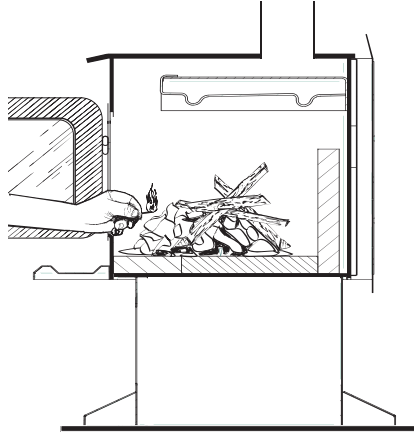
Start by crisscrossing six medium-sized (2-3 inches) pieces of dry firewood in the firebox. Crisscross around 10 finely split and dry kindling (0.5 to 1 in) leaving air space between the pieces. Then put at least 5 news paper sheets to the top of the pieces. The best way to have your ignition clean and environmentally friendly is to roll the news papers to make a long cylinder, then to make 2 knots with it. The goal is to have the news papers as compact as possible to make it burn slowly. After the ignition of the news paper, let the door open of 1 inch for 5-10 minutes. The air control should be open. Let burn until you have a good coal bed. You are now ready for the main load.

100 - Owner's manual ESCAPE 1800 (17 of 59)

Installation and Operation Manual for Escape 1800

4.2.2 Conventional Fire Starting

The conventional way to build a wood fire is to bunch up 5 to 10 sheets of plain newspaper and place them in the firebox. Next, place 10 or so pieces of fine kindling on the newspaper. This kindling should be very thin; less than 1" (25 mm). Next, place some larger kindling pieces on the fine kindling. Open the air control fully and light the newspaper. If you have a tall, straight venting system you should be able to close the door immediately and the fire will ignite. If your venting system has elbows or an outside chimney, you may need to leave the door closed but unlatched for a few minutes as the newspaper ignites and heat in the chimney produces some draft. Once the fire has ignited, close the door and leave the air control fully open.



A conventional kindling fire with paper under finely split wood.

DO NOT LEAVE THE STOVE UNATTENDED WHEN THE DOOR IS SLIGHTLY OPENED DURING IGNITION. ALWAYS CLOSE THE DOOR AFTER IGNITION.

After the kindling fire has mostly burned, you can add standard firewood pieces until you have a fire of the right size for the conditions.

4.2.3 Two Parallel Logs

Place two spit logs in the firebox. Place a few sheets of twisted newspaper between the logs. Now place some fine kindling across the two logs and some larger kindling across those, log cabin style. Light the newspaper.

4.2.4 Using Fire Starters

Many people like to use commercial fire starters instead of newspaper. Some of these starters are made of sawdust and wax and others are specialized flammable solid chemicals. Follow the package directions for use.

Gel starter may be used but only if there are no hot embers present. Use only in a cold firebox to start a fire.

DO NOT USE FLAMMABLE LIQUIDS SUCH AS GASOLINE, NAPHTHA, FUEL OIL, MOTOR OIL, OR AEROSOLS TO START OR REKINDLE THE FIRE.

100 - Owner's manual ESCAPE 1800 (18 of 59)

Installation and Operation Manual for Escape 1800

4.3 Maintaining Wood Fires

4.3.1 General Advice

Wood heating with a space heater is very different than other forms of heating. There will be variations in the temperature in different parts of the house and there will be variations in temperature throughout the day and night. This is normal, and for experienced wood burners these are advantages of zone heating with wood.

Do not expect steady heat output from your stove. It is normal for its surface temperature to rise after a new load of wood is ignited and for its temperature to gradually decline as the fire progresses. This rising and falling of temperature can be matched to your household routines. For example, the area temperature can be cooler when you are active, such as when doing housework or cooking, and it can be warmer when you are inactive, such as when reading or watching television.

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. Do not attempt to produce a steady heat output by placing a single log on the fire at regular intervals. 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 can be matched to the amount of heat needed.

When you burn in cycles, you rarely need to open the stove's loading door while the wood is flaming. This is an advantage because there is more chance that smoke will leak from the stove when the door is opened as a full fire is burning. This is especially true if the chimney connector has 90° elbows and if the chimney runs up the outside wall of the house.

IF YOU MUST OPEN THE DOOR WHILE THE FUEL IS FLAMING, OPEN THE AIR CONTROL FULLY FOR A FEW MINUTES, THEN UNLATCH AND OPEN THE DOOR SLOWLY.

4.3.2 Ash Removal

Ash should be removed from the firebox every two or three days of full time heating. Do not let the ash build up in the firebox because it will interfere with proper fire management.

The best time to remove ash is after an overnight fire when the stove is relatively cool, but there is still some chimney draft to draw the ash dust into the stove and prevent it from coming into the room.

After ashes have been removed from the stove and placed in a tightly covered metal container, they should be taken outside immediately. The closed container of ashes should be placed on a non-combustible floor or on the ground well away from all combustible materials pending final disposal. Ashes normally contain some live charcoal that can stay hot for several days. If the ashes are disposed of by burial in soil or otherwise locally

100 - Owner's manual ESCAPE 1800 (19 of 59)

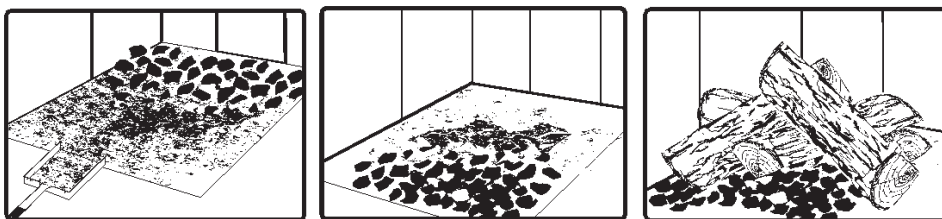
Installation and Operation Manual for Escape 1800

dispersed, they should be retained in the closed container until all cinders have thoroughly cooled. Other waste shall not be placed in this container.

NEVER STORE ASHES INDOORS OR IN A NON-METALIC CONTAINER OR ON A WOODEN DECK.

4.3.3 Raking Charcoal

Rekindle the fire when you notice that the room temperature has fallen. You will find most of the remaining charcoal at the back of the firebox, furthest from the door. Rake these coals towards the door before loading. There are two reasons for this raking of the coals. First, it concentrates them near where most of the combustion air enters the firebox and where they can ignite the new load quickly, and second, the charcoal will not be smothered by the new load of wood. If you were to simply spread the charcoal out, the new load will smoulder for a long time before igniting.



Remove ash first, and then rake charcoal towards the front of the firebox before loading so that it will ignite the new load.

100 - Owner's manual ESCAPE 1800 (20 of 59)

Installation and Operation Manual for Escape 1800

4.3.4 Firing Each New Load Hot

Place the new load of wood on and behind the charcoal, and not too close to the glass. Close the door and open the air control fully. Leave the air control fully open until the firebox is full of flames, the wood has charred to black and its edges are glowing red. Firing each load of wood hot accomplishes a few things:

- drives the surface moisture from the wood,
- creates a layer of char on the wood, which slows down its release of smoke,
- heats the firebox components so they reflect heat back to the fire, and
- heats the chimney so it can produce strong, steady draft for the rest of the cycle.

Although it is important to fire each new load hot to prepare for a clean burn, do not allow the fire to burn at full intensity for more than a few minutes.

DO NOT LEAVE THE STOVE UNATTENDED WHILE A NEW LOAD IS BEING FIRED HOT.

When you burn a new load of wood hot to heat up the wood, the stove and the chimney, the result will be a surge of heat from the stove. This heat surge is welcome when the room temperature is a little lower than desirable, but not welcome if the space is already warm. Therefore, allow each load of wood to burn down so that the space begins to cool off a little before loading. Letting the space cool before loading is one of the secrets to clean burning and effective zone heating.

Never overfire your stove. Overfiring can lead to overheating of combustible materials nearby, damage to the stove, and in extreme cases, cause a fire.

Overfiring is caused by too much air flowing through the stove too quickly, bad gaskets or bad operation of the air control.

Overfiring can be seen by excessive fuel consumption, and may cause parts of the stove or chimney connector to glow red. If you notice signs of overfiring, reduce the air supply to the fire, and make sure all gaskets are in good conditions.

4.3.5 Turning Down the Air Supply

Once the firewood, firebox and chimney are hot, you can begin to reduce the air supply for a steady burn.

As you reduce the air supply to the fire, two important things happen. First, the firing rate slows down to spread the heat energy in the fuel over a longer period of time. Second, the flow rate of exhaust through the stove and flue pipe slows down, which gives more time for the transfer of heat from the exhaust. You will notice that as you reduce the air setting, the flames slow down. This is your indication that the stove is burning at its peak efficiency.

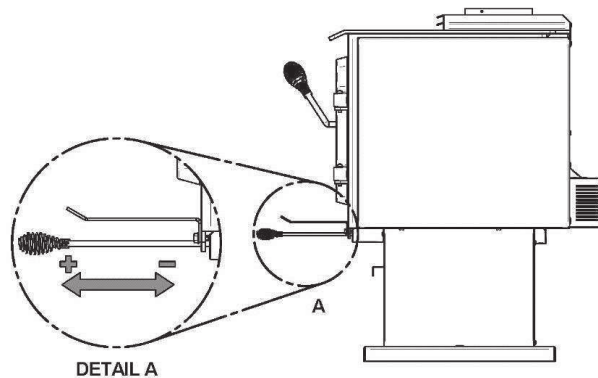
If the flames get small and almost disappear when you turn down the air, you have turned down the air too early, or your firewood is wetter than it should be. With good fuel and

100 - Owner's manual ESCAPE 1800 (21 of 59)

Installation and Operation Manual for Escape 1800

correct air control use, the flames should slow down, but should stay large and steady, even as the air supply is reduced.

THIS WOOD HEATER HAS A MANUFACTURER-SET MINIMUM LOW BURN RATE THAT MUST NOT BE ALTERED. IT IS AGAINST FEDERAL REGULATIONS TO ALTER THIS SETTING OR OTHERWISE OPERATE THIS WOOD HEATER IN A MANNER INCONSISTENT WITH OPERATING INSTRUCTIONS IN THIS MANUAL.



4.3.6 Building Different Fires for Different Needs

Using the air control is not the only way to match the stove's heat output to the heat demand. Your house will need far less heat in October than in January to be kept at a comfortable temperature. If you fill the firebox full in fall weather, you will either overheat the space or turn the stove down so much that the fire will be smoky and inefficient. Here are some suggestions for building fires to match different heat demand.

4.3.6.1 Small Fires to Take the Chill Off the House

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 be only 3" to 4" in diameter. After raking the coals, you can lay two pieces parallel to each other corner to corner 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 when you are around to tend the stove and should provide enough heat for four hours or more. Small fires like this are a good time to use softer wood species so there will be less chance of overheating the house.

4.3.6.2 Long Lasting Low Output Fires

Sometimes you will want to build a fire to last up to eight hours, but don't need intense heat. In this case use soft wood species and place the logs compactly in the firebox so the pieces are packed tightly together. You will need to fire the load hot for long enough to fully char the log surfaces before you can turn the air down. Make sure the fire is flaming brightly before leaving the fire to burn.

100 - Owner's manual ESCAPE 1800 (22 of 59)

Installation and Operation Manual for Escape 1800

4.3.6.3 High Output Fires for Cold Weather

When the heat demand is high during cold weather, you'll need a fire that burns steadily and brightly. This is the time to use your biggest pieces of hardwood fuel if you have it. Put 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 burn your stove is capable of.

You will need to be cautious when building fires like this because if the air is turned down too much, the fire could smoulder. Make sure the wood is flaming brightly before leaving the fire to burn.

4.3.6.4 Maximum Burn Cycle Times

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 length of burn you can expect from your stove, including both the flaming and coal bed phases, will be affected by a number of things, such as:

- firebox size,
- the amount of wood loaded,
- the species of wood you burn,
- the wood moisture content,
- the size of the space to be heated,
- the climate zone you live in and
- the time of year.

The table below provides a very general indication of the maximum burn cycle times you are likely to experience, based on firebox volume.

FIREBOX VOLUME	MAXIMUM BURN TIME
<1.5 cubic feet	3 to 5 hours
1.5 c.f. to 2.0 c.f.	5 to 6 hours
2.0 c.f. to 2.5 c.f.	6 to 8 hours
2.5 c.f. to 3.0 c.f.	8 to 9 hours
>3.0 c.f.	9 to 10 hours

Long burn times are not necessarily an indication of efficient stove operation. When you are home during the day and able to tend the fire, it is preferable to build a smaller fire that might 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 the heat demand of the space.

100 - Owner's manual ESCAPE 1800 (23 of 59)

Installation and Operation Manual for Escape 1800

4.3.6.5 North-South Fires Versus East-West Fires

In fireboxes that are roughly square, wood can be loaded so that looking through the glass door you see the ends of the logs (north-south) or the sides of the logs (east-west).

East-west loads that are built compactly break down slowly when heated, but the amount of wood you can load is limited because if you put in too many pieces, one may fall against the glass. East-west loads are excellent for long, low output fires for relatively mild weather.

North-south loads break down more quickly, but much more wood can be loaded at a time. This makes north-south loading good for high output, long lasting fires for cold weather.

100 - Owner's manual ESCAPE 1800 (24 of 59)

Installation and Operation Manual for Escape 1800

5 Maintaining Your Wood Heating System

5.1 Stove Maintenance

Your new stove will give many years of reliable service if you use and maintain it correctly. Some of the internal components of the firebox, such as firebricks, baffles and air tubes, will wear over time under intense heat. You should always replace defective parts with original parts (see **Appendix 6: Exploded Diagram and Parts List**). For firing each load hot to begin a cycle as described above will not cause premature deterioration of the stove. However, letting the stove run with the air control fully open for entire cycles can cause damage over time. The hotter you run the stove throughout burn cycles, the more quickly its components will deteriorate. For that reason, **never leave the stove unattended while a new load is being fired hot.**

5.1.1 Cleaning Door Glass

Under normal conditions, your door glass should stay relatively clear. If your firewood is dry enough and you follow the operating instructions in this manual, a whitish, dusty deposit will form on the inside of the glass after a week or so of use. This is normal and can be easily removed when the stove is cool by wiping with a damp cloth or paper towel and then drying. **Never try to clean the glass when the stove is hot.**

In spring and fall when the stove is run at lower temperatures, you may see some light brown stains forming, especially at the lower corners of the glass. This indicates that the fire has been smoky and some of the smoke has condensed on the glass. When the weather is mild, you may find that letting the fire go out is better than trying to maintain a continuous fire. Use the technique described above for building a fire to take the chill off the house.

If you do get brown stains on the glass you can remove them with special cleaners for wood stove glass doors. **Do not use abrasives to clean your stove's door glass.**

The deposits that form on the glass are the best indication of the quality of your fuel and how well you are doing in operating the stove. Your goal should be clear glass with no brown stains. If you continue to see brown stains on the glass, something about your fuel and operating procedure needs to be changed. Stains on the glass indicate incomplete combustion of the wood, which also means more smoke emissions and faster formation of creosote in the chimney.

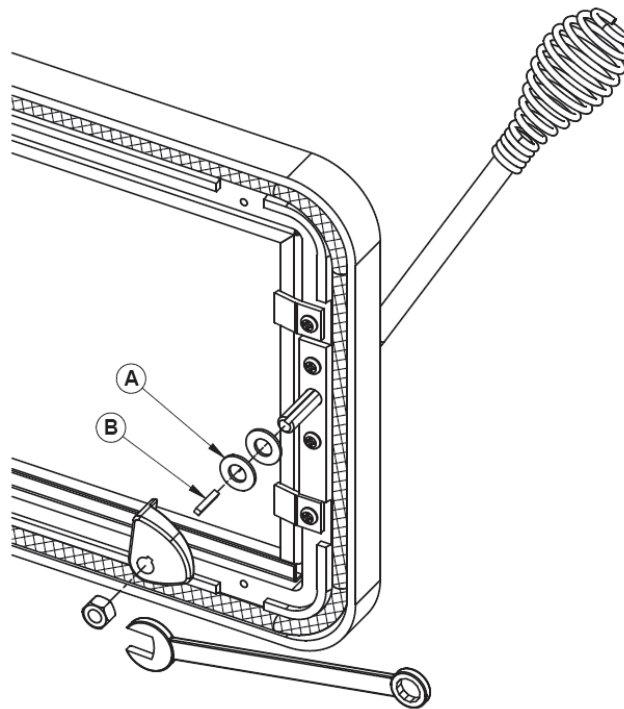
If you see brown streaks coming from the edge of the glass, it is time to replace the gasket around the glass. Visit your stove retailer to get the self-adhesive glass gasket and follow the instructions below for installation.

100 - Owner's manual ESCAPE 1800 (25 of 59)

Installation and Operation Manual for Escape 1800

5.1.2 Door adjustment

1. Unscrew the nut.
2. Remove the door latch and the key path pin (B).
3. Remove or add one washer (A) as needed. Keep the removed washer for future adjustment.
4. Re-install the key path pin in the key-way and slide the latch along it.
5. Secure with the nut.



5.1.3 Replacing the Door Gasket

It is important to maintain the gasket in good condition. After a year or more of use, the door gasket will compress and become hard, which may allow air to leak past it. You can test the condition of the door gasket by closing and latching the door on a strip of paper. Test all around the door. If the paper slips out easily anywhere, it is time to replace the gasket.

Use the correct replacement gasket that you can purchase from your retailer. The diameter and density of the gasket is important to getting a good seal.

Place the door face-down on something soft like a cushion of rags or piece of carpet. Remove the old gasket from the door by pulling and prying it out with an old screw driver.

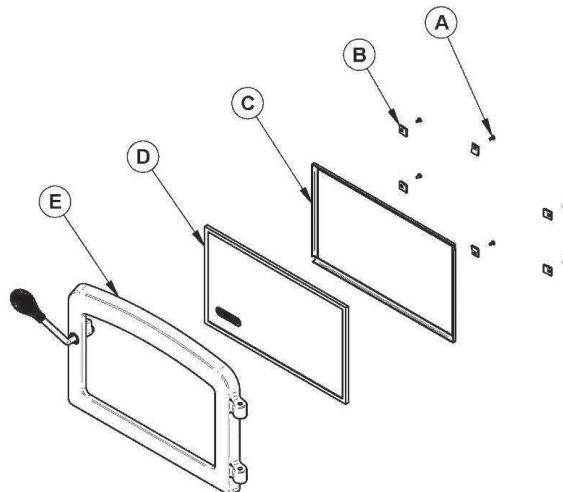
100 - Owner's manual ESCAPE 1800 (26 of 59)

Installation and Operation Manual for Escape 1800

Then use the screwdriver to scrape the old gasket adhesive from the door. Now run a 1/4" (6 mm) bead of high temperature silicone in the door gasket groove. Starting from the middle of the hinge side, press the gasket into the groove. Do not stretch the gasket as you place it. Leave the gasket about 1/2" long when you cut it and press the end into the groove. Tuck any loose fibres under the gasket and into the silicone. Close the door and do not use the stove for 24 hours.

5.1.4 Replacing the Glass Gasket and/or the Glass

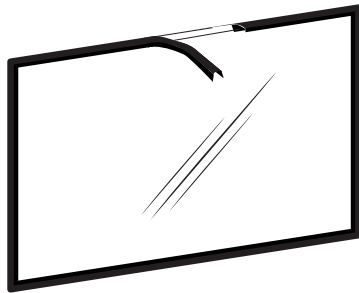
It is a good idea to replace the glass gasket when the door gasket is replaced. The gasket is flat, adhesive-backed, woven fibreglass. Remove the glass retaining screws (A), the clips (B) and the metal frame (C) that holds the glass to the door frame (E). Lift out the glass (D) and pull off the old gasket. This is a good time to clean the glass thoroughly.



The gasket must be centred on the edge of the glass. To do this easily, peel back a section of the paper covering the adhesive and place the gasket on a table with the adhesive side up. 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. Peel off more of the backing and rotate the glass and press the next section onto the gasket. Do not stretch the gasket as you place it. Continue until you get to the start and trim the gasket to length. Now pinch the gasket to the glass in a U shape, all around the glass. Reinstall the glass, being careful to centre the glass carefully in the door. Do not over-tighten the screws. Note that the two main causes of broken door glass are uneven placement in the door and over-tightening of retaining screws.

100 - Owner's manual ESCAPE 1800 (27 of 59)

Installation and Operation Manual for Escape 1800



Do not abuse the glass door by striking or slamming shut. Do not use the stove if the glass is broken. To change the glass, perform the same operation described above.

5.1.5 Cleaning and Painting the Stove

Do not attempt to clean or paint the stove when the unit is hot. Painted surfaces can be wiped down with a damp cloth. Plated surfaces may be scratched by abrasive cleaners. To maintain the finish at its original brilliance, use only a damp soft cloth to clean plated surfaces.

If the paint becomes scratched or damaged, you can give your wood stove a brand new look by repainting it with heat-resistant paint. Before painting, roughen the surface with fine sand paper, wipe it down to remove dust, and apply two thin coats of paint. For best results, use the same paint that was originally used on the stove, which is available in spray cans. See your dealer for details.

5.2 Chimney and Chimney Connector Maintenance

5.2.1 Why Chimney Cleaning is Necessary

Wood smoke can condense inside the chimney connector and chimney, forming a combustible deposit called creosote. If creosote is allowed to build up in the venting system it can ignite when a hot fire is burned in the stove and 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 you avoid smouldering so the exhaust from the chimney is mostly clear, creosote builds up more slowly. Your new stove has the right characteristics to help you to burn clean fires with little or no smoke, resulting in less creosote in the chimney.

5.2.2 How Often Should You Clean the Chimney?

It is not possible to predict how much or how quickly creosote will form in your chimney. It is important, therefore, to check the build-up in your chimney monthly when getting used to the new stove until you determine the rate of creosote formation. Even if creosote forms slowly in your system, the chimney should be cleaned and inspected at least once each year.

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.

100 - Owner's manual ESCAPE 1800 (28 of 59)

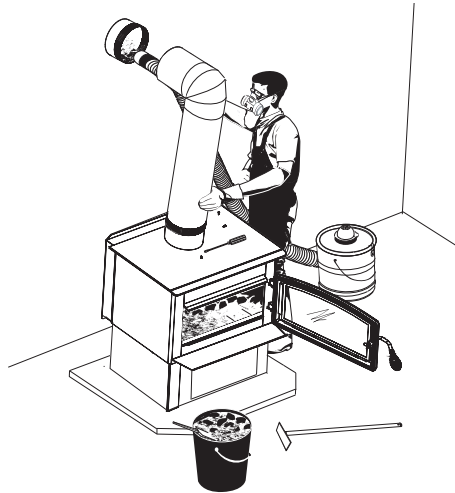
Installation and Operation Manual for Escape 1800

5.2.3 Cleaning the Chimney

Chimney cleaning can be a difficult and dangerous job. If you don't have experience cleaning chimneys, you might want to hire a professional chimney sweep to clean and inspect the system for the first time. After having seen the cleaning process, you can decide if it is a job you would like to take on.

The most common equipment used are fibreglass rods with threaded fittings and stiff plastic brushes. The brush is forced up and down inside the chimney flue to scrub off the creosote.

The chimney connector assembly should always be cleaned at the same time the chimney is cleaned.



CAUTION: Operation of your stove without the baffle may cause unsafe and hazardous temperature conditions and will void the warranty. **NOTE:** Before installing the firebrick, check to ensure that none are broken or damaged in any way. If so, have the damaged ones replaced. Check the firebrick for damage at least annually and replace any broken or damaged ones with new ones. Inspection and cleaning of the chimney is facilitated by the removable baffle.

100 - Owner's manual ESCAPE 1800 (29 of 59)

Installation and Operation Manual for Escape 1800

PART B - INSTALLATION

6 Safety Information

6.1 Summary of Installation Cautions and Warnings

- 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/OR 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).
- 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 OR SPACE.
- 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.
- MAY BE INSTALLED IN A MOBILE HOME
- THIS MOBILE HOME APPROVED STOVE REQUIRES INSTALLATION OF A FRESH AIR KIT, SOLD SEPARATELY.

WARNING: DO NOT INSTALL IN SLEEPING ROOM.

WARNING: THE STOVE MUST BE ATTACHED TO THE STRUCTURE OF THE MOBILE HOME.

CAUTION: THE STRUCTURAL INTEGRITY OF THE MOBILE HOME FLOOR, WALL, AND CEILING/ROOF MUST BE MAINTAINED.

- INSTALL AT LEAST ONE SMOKE DETECTOR ON EACH FLOOR OF YOUR HOME. DETECTORS SHOULD BE LOCATED AWAY FROM THE HEATING APPLIANCE AND CLOSE TO SLEEPING AREAS. FOLLOW THE SMOKE DETECTOR MANUFACTURER'S INSTALLATION INSTRUCTIONS.

100 - Owner's manual ESCAPE 1800 (30 of 59)

Installation and Operation Manual for Escape 1800

6.2 Regulations Covering Stove Installation

When installed and operated as described in these instructions, the Escape 1800 wood stove is suitable for use as a freestanding heater in residential installations. The Escape 1800 wood stove is not intended for installation in a sleeping room of a mobile home.

In Canada, the CSA B365 Installation Code for Solid Fuel Burning Appliances and Equipment and the CSA C22.1 Canadian National Electrical Code are to be followed in the absence of local code requirements. In the USA, the ANSI NFPA 211 Standard for Chimneys, Fireplaces, Vents and Solid Fuel-Burning Appliances and the ANSI NFPA 70 National Electrical Code are to be followed in the absence of local code requirements.

This stove must be connected to a chimney complying with the requirements for Type HT chimneys in the Standard for Factory-Built Chimneys for Residential Type and Building Heating Appliances, UL 103 and ULC S629 or to a code-approved masonry chimney with a flue liner.

7 Clearances to Combustible Material

The clearances shown in this section have been determined by test according to procedures set out in safety standards ULC S627 (Canada), UL1482 (U.S.A.) and UL737 (U.S.A.). When the stove is installed so that its surfaces are at or beyond the minimum clearances specified, combustible surfaces will not overheat under normal and even abnormal operating conditions.

No part of the stove or flue pipe may be located closer to combustibles than the minimum clearance figures given.

7.1 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/or web sites) it is important to refer to it in order to have a safe and compliant installation. In addition, you will find information about your stove (model, serial number, etc.). You can find the certification label on the back of the stove.

100 - Owner's manual ESCAPE 1800 (31 of 59)

Installation and Operation Manual for Escape 1800

7.2 Clearances to Walls and Ceiling

The clearances to combustible walls may be slightly different in Canada and the U.S.A. and may also differ depending on whether you use single or double wall flue pipe. Please be sure to choose the correct clearance for your location and type of flue pipe. See figure **Clearances to combustible materials and floor protection** to match each letter to a clearance.

APPLIANCE CLEARANCES (INSTALLATION WITH SINGLE WALL PIPE CONNECTOR)			APPLIANCE CLEARANCES (INSTALLATION WITH DOUBLE WALL PIPE CONNECTOR)		
	CANADA	USA		CANADA	USA
A	15" (381 mm)	15" (381 mm)	A	6" (152 mm)	6" (152 mm)
B	17" (432 mm)	17" (432 mm)	B	17" (432 mm)	17" (432 mm)
C	10" (254 mm)	10" (254 mm)	C	5" (127 mm)	5" (127 mm)
K	48" (1220 mm)	48" (1220 mm)	K	48" (1220 mm)	48" (1220 mm)
L	84" (213 cm)	84" (213 cm)	L	84" (213 cm)	84" (213 cm)

If the above clearances are met, then the distances measured from the flue outlet will be:

DISTANCES* FROM PIPE CONNECTOR TO THE COMBUSTIBLE MATERIALS			DISTANCES* FROM PIPE CONNECTOR TO THE COMBUSTIBLE MATERIALS		
	CANADA	USA		CANADA	USA
D	18¾" (476 mm)	18¾" (476 mm)	D	9¾" (248 mm)	9¾" (248 mm)
E	27" (686 mm)	27" (686 mm)	E	27" (686 mm)	27" (686 mm)
F	21¼" (540 mm)	21¼" (540 mm)	F	16¼" (413 mm)	16¼" (413 mm)

*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. However, you can install the stove at reduced clearances; follow the instructions in Section 7.4: *Reducing Wall and Ceiling Clearances Safely*. Where they are followed, the new distance of the pipe to combustible materials must be respected in the appropriate certification of the pipe.

100 - Owner's manual ESCAPE 1800 (32 of 59)

Installation and Operation Manual for Escape 1800

Clearances with ceiling (L) lowered to 76" (193 cm)

	APPLIANCE CLEARANCES (INSTALLATION WITH SINGLE WALL PIPE CONNECTOR)			APPLIANCE CLEARANCES (INSTALLATION WITH DOUBLE WALL PIPE CONNECTOR)	
	CANADA	USA		CANADA	USA
A	15" (381 mm)	15" (381 mm)	A	8" (203 mm)	8" (203 mm)
B	17" (432 mm)	17" (432 mm)	B	17" (432 mm)	17" (432 mm)
C	14" (356 mm)	14" (356 mm)	C	9" (229 mm)	9" (229 mm)
K	48" (1220 mm)	48" (1220 mm)	K	48" (1220 mm)	48" (1220 mm)
L	76" (193 cm)	76" (193 cm)	L	76" (193 cm)	76" (193 cm)

If the above clearances are met, then the distances measured from the flue outlet will be:

	DISTANCES* FROM PIPE CONNECTOR TO THE COMBUSTIBLE MATERIALS			DISTANCES* FROM PIPE CONNECTOR TO THE COMBUSTIBLE MATERIALS	
	CANADA	USA		CANADA	USA
D	18¾" (476 mm)	18¾" (476 mm)	D	11¾" (298 mm)	11¾" (298 mm)
E	27" (686 mm)	27" (686 mm)	E	27" (686 mm)	27" (686 mm)
F	25¼" (641 mm)	25¼" (641 mm)	F	20¼" (514 mm)	20¼" (514 mm)

*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. However, you can install the stove at reduced clearances; follow the instructions in Section 7.4: *Reducing Wall and Ceiling Clearances Safely*. Where they are followed, the new distance of the pipe to combustible materials must be respected in the appropriate certification of the pipe.

100 - Owner's manual ESCAPE 1800 (33 of 59)

Installation and Operation Manual for Escape 1800

Clearances for mobile homes

	MOBILE HOME APPLIANCE CLEARANCES (INSTALLATION WITH DOUBLE WALL PIPE CONNECTOR)	
	CANADA	USA
A	14" (356 mm)	14" (356 mm)
B	19" (483 mm)	19" (483 mm)
C	13" (330 mm)	13" (330 mm)
K	48" (1220 mm)	48" (1220 mm)
L	84" (213 cm)	84" (213 cm)

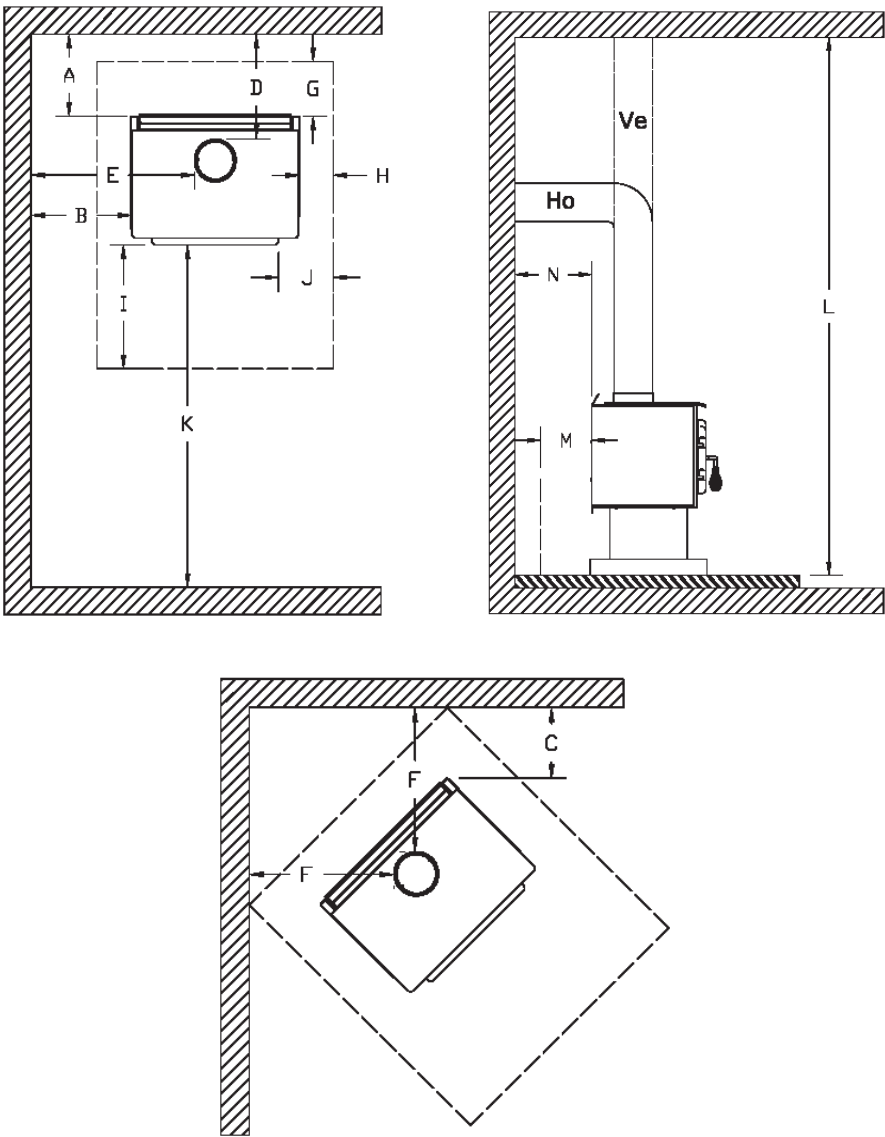
If the above clearances are met, then the distances measured from the flue outlet will be:

	DISTANCES* FROM PIPE CONNECTOR TO THE COMBUSTIBLE MATERIALS	
	CANADA	USA
D	17¾" (451 mm)	17¾" (451 mm)
E	29" (737 mm)	29" (737 mm)
F	24¼" (616 mm)	24¼" (616 mm)

*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. However, you can install the stove at reduced clearances; follow the instructions in Section 7.4: *Reducing Wall and Ceiling Clearances Safely*. Where they are followed, the new distance of the pipe to combustible materials must be respected in the appropriate certification of the pipe.

100 - Owner's manual ESCAPE 1800 (34 of 59)

Installation and Operation Manual for Escape 1800



Clearances to combustible materials and floor protection

100 - Owner's manual ESCAPE 1800 (35 of 59)

Installation and Operation Manual for Escape 1800

7.3 Floor protector

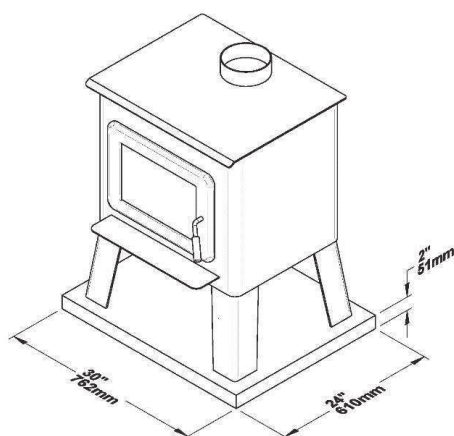
Your stove is designed to keep the floor from overheating. It should be placed on a non combustible surface to protect the floor of hot embers that could fall from the stove during loading and maintenance. As shown in the table below and by the dotted area in the figure **Clearances to combustibles and floor protection**, there are differences between the floor protections in Canada and in the United States.

	FLOOR PROTECTOR*	
	CANADA	USA
G	8" (203 mm) – Note 1	N/A (Canada only)
H	8" (203 mm)	N/A (Canada only)
I	18" (457 mm) From door opening	16" (406 mm) From door opening
J	N/A (USA only)	8" (203 mm)
M	8" (203 mm)	N/A (Canada only)
N	N/A (USA only)	Note 2

*Steel with a minimum thickness of 0.015" (0.38 mm) or ceramic tiles sealed together with grout. No protection is required if the unit is installed on a non-combustible floor (ex: concrete).

Note 1: 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).

Note 2: Only required under the horizontal section of the connector. Must exceed each side of the connector by at least 2 inches (51 mm).



Important Note: Addition required to the floor protection when the stove is installed in a mobile home and assembled on legs version only:

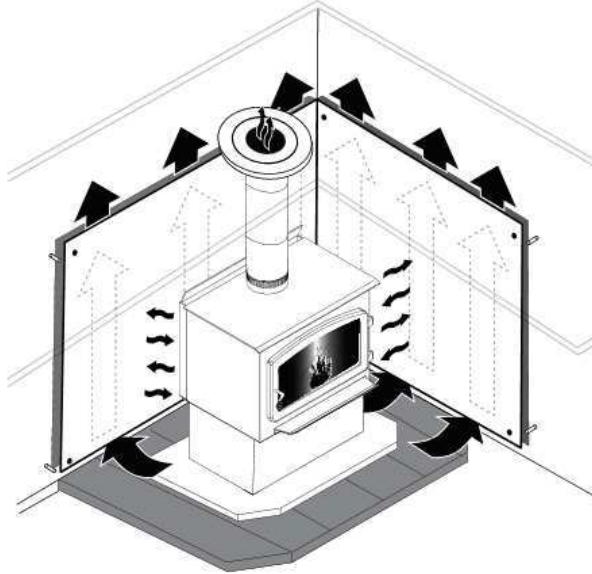
In addition to meeting the minimum size of the floor protection, the stove must be placed on a podium having a maximum dimension of 30" (762 mm) x 24" (610 mm) and a minimum height of 2" (51 mm). This podium can be constructed of combustible materials as long as it is covered of non-combustible materials. See figure beside.

100 - Owner's manual ESCAPE 1800 (36 of 59)

Installation and Operation Manual for Escape 1800

7.4 Reducing Wall and Ceiling Clearances Safely

It is often desirable to reduce the minimum installation clearances by placing the stove closer to walls so the installation takes up less floor space. You can safely reduce the minimum clearances by permanently installing a shield between the stove and combustible material. The rules for safe shields can be complicated, so read them carefully and follow them exactly. Note that there may be minor regional differences in clearance reduction rules so be sure to check with your building or fire inspector before proceeding.



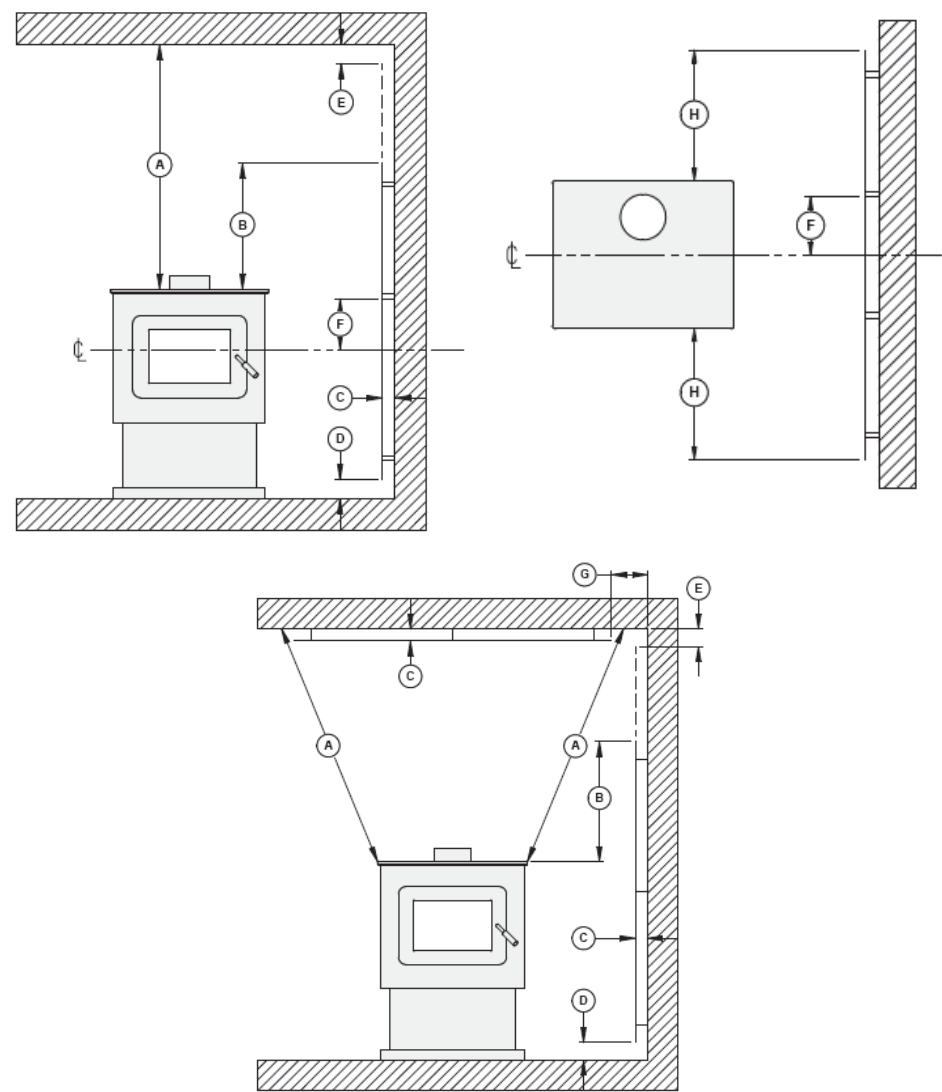
7.4.1 Shield Construction Rules

See figure **Clearances for shield construction** to match each letter to a clearance.

- 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: 1118 mm (44 in.).
- B** Shield extension above appliance: 500 mm (20 in.).
- C** Minimum space behind shield: 25 mm (1 in.). In Canada 21 mm (7/8 in.).
- D** Clearance along the bottom of shield: minimum: 25 mm (1 in.) and maximum: 75 mm (3 in.).
- E** Minimum clearance along the top of shield at ceiling: 75 mm (3 in.).
- F** Mounting hardware must not be located closer than 200 mm (8 in.) from the vertical centre line of the appliance.
- G** Edge clearance for ceiling shields to side and back walls: 75 mm (3 in.).
- H** Shield extension beyond each side of appliance: 450 mm (18 in.).

100 - Owner's manual ESCAPE 1800 (37 of 59)

Installation and Operation Manual for Escape 1800


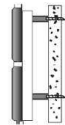
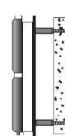

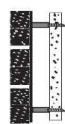


Clearances for shield construction

100 - Owner's manual ESCAPE 1800 (38 of 59)

Installation and Operation Manual for Escape 1800

7.4.2 Table of Clearance Reduction Percentages

Type of shield	Clearances may be reduced by these percentages				
	Sides and rear %		Top % (ceiling)		
	Can/US A (%)	USA min.	Can/US A (%)	USA min.	
Sheet metal, a minimum of 24 gauge (0.61 mm) in thickness , spaced out at least 25 mm (1 in)* by non-combustible spacers	67	12 in	50	18 in	
Ceramic tiles, or equivalent non-combustible material, on non-combustible board spaced out at least 25 mm (1 in)* by non-combustible spacers	50	18 in	33	24 in	
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 25 mm (1 in)* by non-combustible spacers	67	12 in	50	24 in	
Brick, spaced out at least 25 mm (1 in)* by non-combustible spacers	50	18 in	N/A	N/A	
Brick, with a minimum of 24 gauge (0.61 mm) sheet metal backing, spaced out at least 25 mm (1 in)* by non-combustible spacers	67	12 in	N/A	N/A	

* In Canada this space can be 21 mm (7/8 in).

100 - Owner's manual ESCAPE 1800 (39 of 59)

Installation and Operation Manual for Escape 1800

8 The Venting System

8.1 General

The venting system, made up of the chimney and the connecting pipe between the stove and the chimney, acts as the engine that drives your wood heating system. Even the best stove will not function safely and efficiently as intended 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. You can think of heat in the flue gas as the fuel the chimney uses to make draft.

Overdraft can be caused by a very tall chimney even if it is the recommended size, and can cause overfiring of your stove. Signs of an overdraft include rapid fuel consumption, inability to slow the fire, and parts of the stove or chimney connector glowing red. It is important that you follow the chimney guidelines in this manual, including size, type, and height to avoid draft problems.

8.2 Suitable Chimneys

Your wood stove will provide optimum efficiency and performance when connected to a 6-inch diameter chimney flue system. The connection to a chimney having a diameter of at least 5 inches (Canada only) or no more than 7 inches 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 inches.

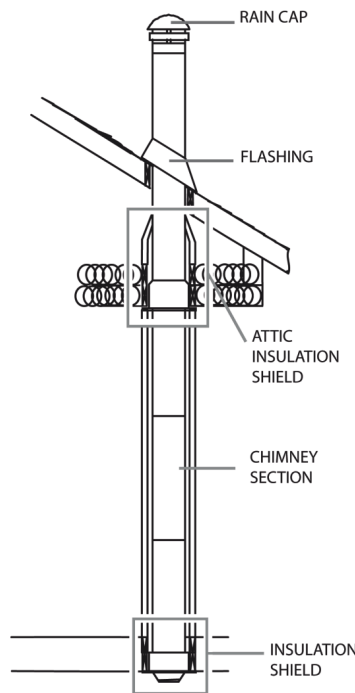
To be suitable, a factory-built metal chimney must comply with UL 103 (U.S.A.) or ULC S629 (Canada).

100 - Owner's manual ESCAPE 1800 (40 of 59)

Installation and Operation Manual for Escape 1800

8.2.1 Factory-built Metal Chimneys

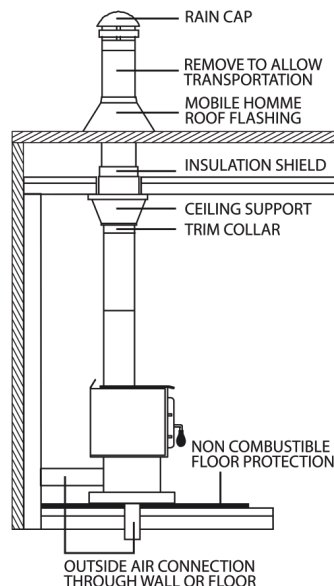
These are sometimes referred to as 'high temp' chimneys because they have the special characteristics to withstand the temperatures that can be created by wood burning stoves. Factory-built chimneys are tested as a system with all the necessary components for installation. The instructions provided with 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. **Use only components intended for the brand and model of chimney you are using. Never substitute parts from other chimney brands or fabricate your own components. The chimney must be a type suitable for solid fuel.**



8.2.2 Factory-built Metal Chimneys in mobile homes

For use in a mobile home, this stove is to be connected to a 6" in diameter double wall factory built chimney conforming to CAN/UCL-S629, 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, install a mobile home roof flashing and seal it with silicone.

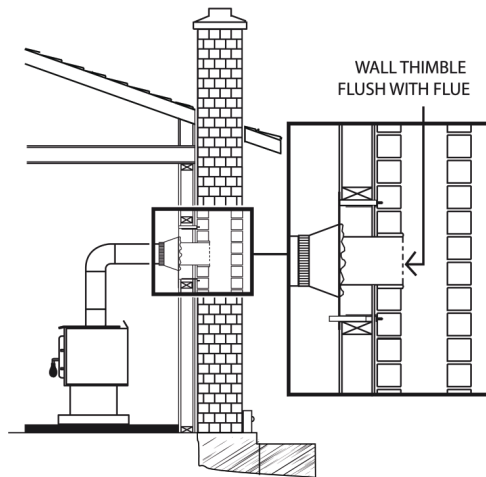


100 - Owner's manual ESCAPE 1800 (41 of 59)

Installation and Operation Manual for Escape 1800

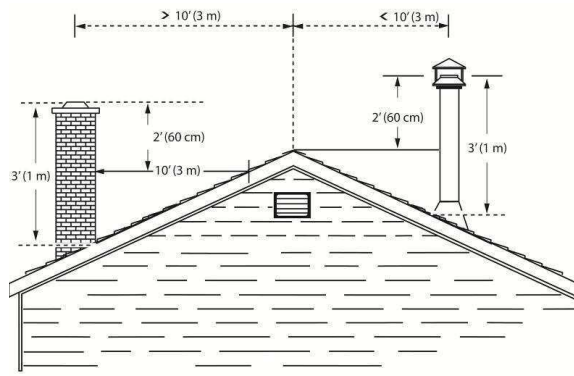
8.2.3 Masonry Chimneys

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.



8.3 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 1 m (3 ft.) above the highest point of contact with the roof, and at least 60 cm (2 ft.) higher than any roof line or obstacle within a horizontal distance of 3 m (10 ft.).



100 - Owner's manual ESCAPE 1800 (42 of 59)

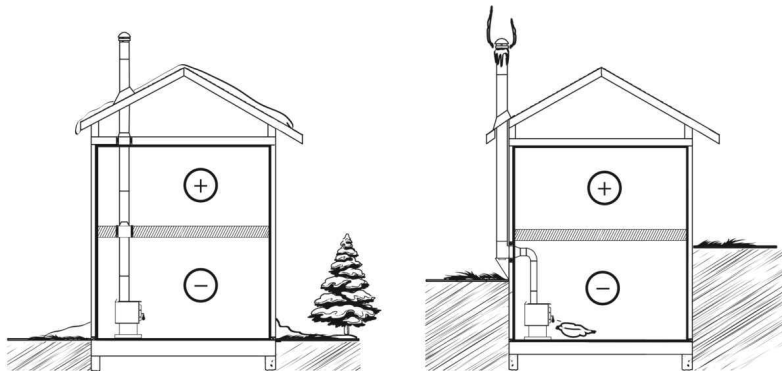
Installation and Operation Manual for Escape 1800

8.4 The Relationship Between the Chimney and the House

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 backdrafting 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 the top of the building at or near the highest heated space.

8.4.1 Why inside chimneys are preferred

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 you light a fire, the initial smoke goes up the chimney and strong draft builds 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.



Good System Design

Inside chimneys are preferred because even when no fire is burning, there is normally upward flow in the system.

Inferior System Design

Outside chimneys are a problem because when no fire burns they will go into cold backdraft if the stove is installed low in the house.

100 - Owner's manual ESCAPE 1800 (43 of 59)

Installation and Operation Manual for Escape 1800

8.4.2 Why the chimney should penetrate the highest heated space

When it is cold outside, the warm air in the house is buoyant so it tends to rise. This tendency of warm air to rise creates a slight pressure difference in the house. Called 'stack effect', it produces a slightly negative pressure low in the house (relative to outside) and a slightly positive pressure zone high in 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 low in the house will compete against the desired upward flow in the chimney.

There are two reasons why the chimney in the house at right will cold backdraft when it is cold outside and there is no fire burning in the stove. 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 low in the house will pull outside air down the chimney, through the stove and into the room. Even the finest stove will not work well when connected to this chimney.



8.5 Supply of Combustion Air

In Canada, wood stoves are not required to have a supply of combustion air from outdoors (except in mobile homes) because research has shown that these supplies do not give protection against house depressurization and may fail to supply combustion air during windy weather.

However, to protect against the risk of smoke spillage due to house depressurization, **a carbon monoxide (CO) detector/alarm is required** in the room in which the stove is installed. The CO detector will provide warning if for any reason the wood stove fails to function correctly. Carbon monoxide, is a colorless, odorless gas that is produced during combustion of wood and other fuels. **CO fumes are toxic and can be fatal.** CO is not specifically heavier or lighter than air. Therefore, it is best to install the detector at table top level rather than on the ceiling like a smoke detector.

100 - Owner's manual ESCAPE 1800 (44 of 59)

Installation and Operation Manual for Escape 1800

8.5.1 Combustion Air Supply in Mobile Homes

Only a wood stove certified and labelled as 'mobile home approved' may be installed in a mobile home. This Escape 1800 stove is 'mobile home approved'. Wood stoves installed in mobile homes must have a ducted supply of combustion air from outdoors. This air supply should be routed down through the house floor into the vented crawl space under the mobile home. The air supply duct should be non-combustible aluminum flex duct with a screened weatherhood on the outside end.

Note: Fabric duct may also be used, provided it is suitable for HVAC use and meets the requirements of ULC-S110 or UL-181 Class 1 standards. It must have a non-combustible insulation and be corrosion resistant.

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.

8.5.2 Air Supply in Conventional Houses

The safest and most reliable supply of combustion air for your 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.

Some jurisdictions in the United States require that wood stoves have a supply of combustion air from outdoors. If you do install an air supply through the wall of the house, be aware that its pressure can be affected during windy weather. If you notice changes in wood stove performance in windy weather, and in particular if smoke puffs from the stove, you should disconnect the outdoor air duct from the stove and remove the duct. In some windy conditions, negative pressure at the duct weatherhood 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.

8.6 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 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.

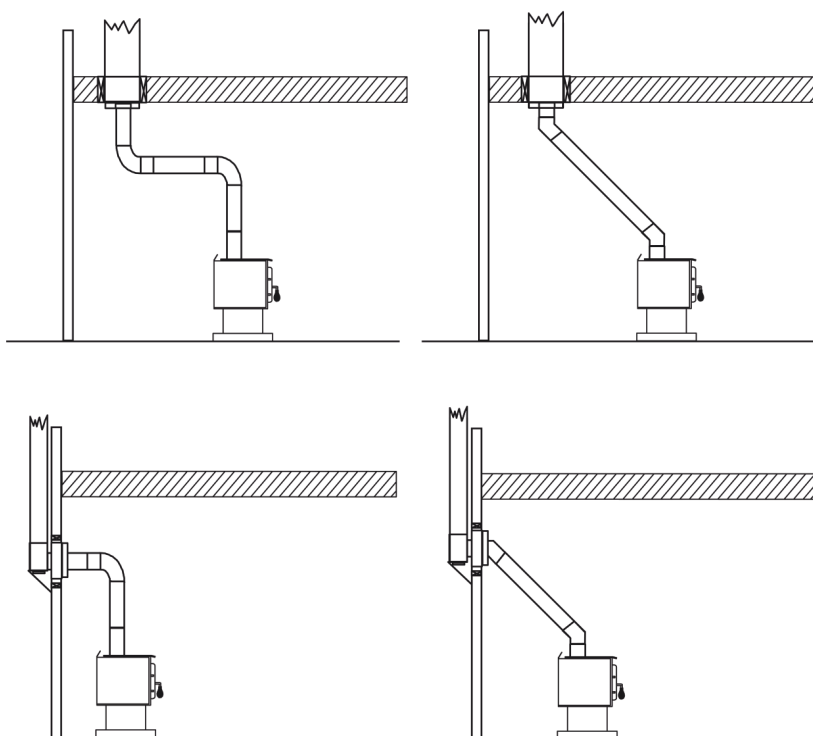
100 - Owner's manual ESCAPE 1800 (45 of 59)

Installation and Operation Manual for Escape 1800

8.6.1 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.



Use 45° elbows where possible, instead of 90° elbows.

100 - Owner's manual ESCAPE 1800 (46 of 59)

Installation and Operation Manual for Escape 1800

The rules below are based on those found in the CSA B365 installation code. Please carefully follow these installation instruction rules, or those enforced where you live.

- Maximum overall length of straight pipe: 3 m (10 ft.) including elbows.
- Minimum clearance from combustible material: 450 mm (18 in.). The minimum clearance may be reduced by 50 percent to 225 mm (9 in.) 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° elbows is often preferable to a single 90° elbow because less turbulence is created in the exhaust flow and they result in less horizontal run.
- Maximum number of 90° elbows: 2.
- Maximum unsupported horizontal length: 1 m (3 feet).
- 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 30 mm (1 1/4 in.)
- Each joint in the assembly must be fastened with at least three screws.
- The assembly must have 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: 20 mm/m (1/4 in/ft.).
- 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.

The ideal flue pipe assembly is one that rises straight up from the appliance flue collar and directly into the chimney with no elbows. 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 stronger draft. Straight assemblies also need less maintenance because there are no corners to collect creosote.

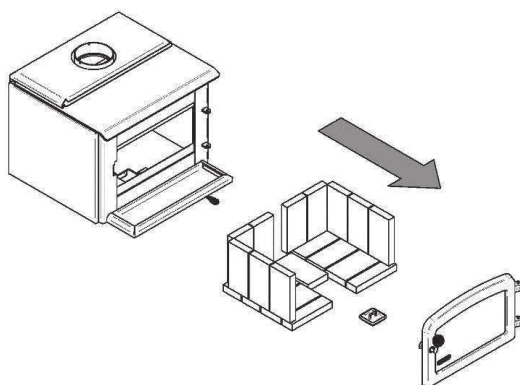
The chimney connector must be in good condition.

100 - Owner's manual ESCAPE 1800 (47 of 59)

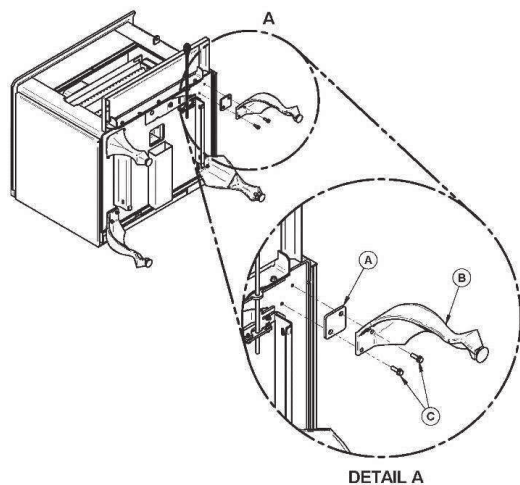
Installation and Operation Manual for Escape 1800

Appendix 1: Installing the Legs (DB03105 Only)

The leg kit must be assembled to the firebox before positioning the stove. See installation instructions below:



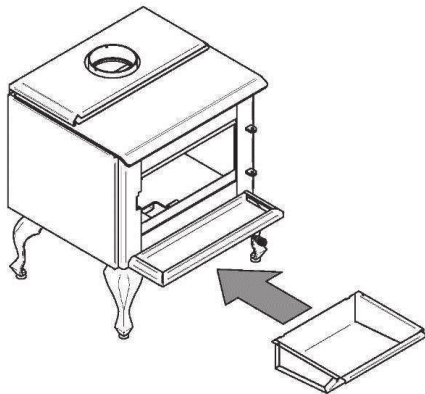
- 1- Remove the firebricks, the ash dump plug and the loading door from the stove to avoid breaking any parts and facilitate handling in the followings steps.



- 2- Gently flip the stove on its back.
- 3- Secure the shims (A) and legs (B) with the bolts (C).

100 - Owner's manual ESCAPE 1800 (48 of 59)

Installation and Operation Manual for Escape 1800



- 4- Gently flip the stove back on its legs making sure not to put too much weight on the rear legs.
- 5- Open the ash drawer lid then slide it on the left and right bend of the support brackets.
- 6- Position the stove for its installation and reinstall the door, the bricks and the ash dump plug (see **Appendix 6: Exploded Diagram and Parts List** for layout).

Note: Make sure that baffle components have not moved during the leg installation process since a flue blockage may occur.

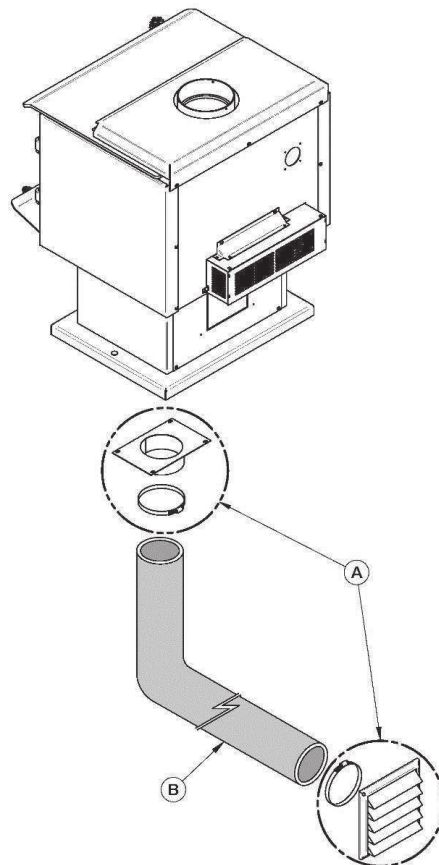
100 - Owner's manual ESCAPE 1800 (49 of 59)

Installation and Operation Manual for Escape 1800

Appendix 2: Installing the Optional Fresh Air Intake Kit (AC01336)

This mobile home approved stove requires installation of a fresh air intake kit (A) and an insulated fresh air intake pipe (B), sold separately.

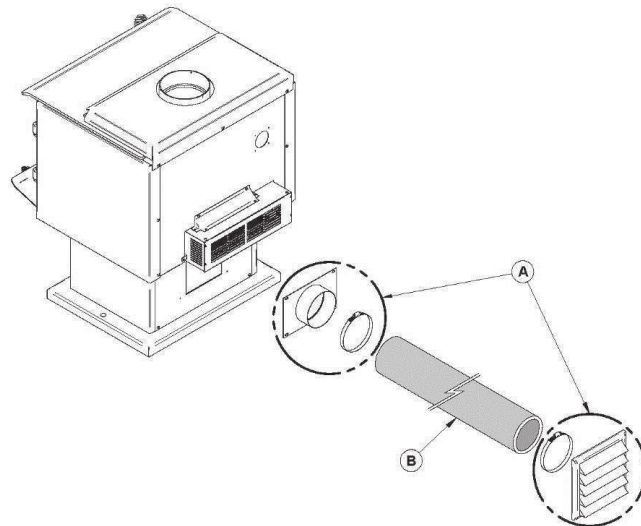
Installation on the bottom for models on pedestal (AC01336):



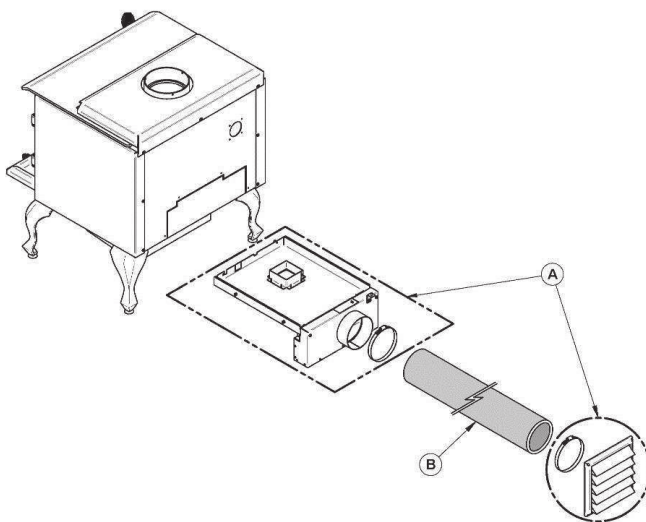
100 - Owner's manual ESCAPE 1800 (50 of 59)

Installation and Operation Manual for Escape 1800

Installation on the back for models on pedestal (AC01336):



Installation on the back for models on legs (AC01316):

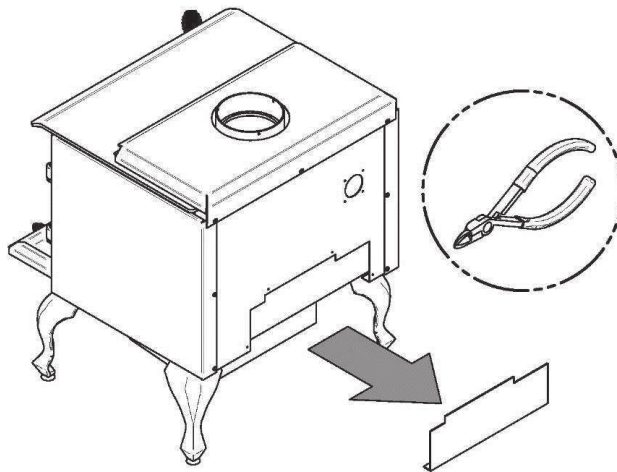


100 - Owner's manual ESCAPE 1800 (51 of 59)

Installation and Operation Manual for Escape 1800

Appendix 3: Use and Installation of the Optional Blower and Thermodisc

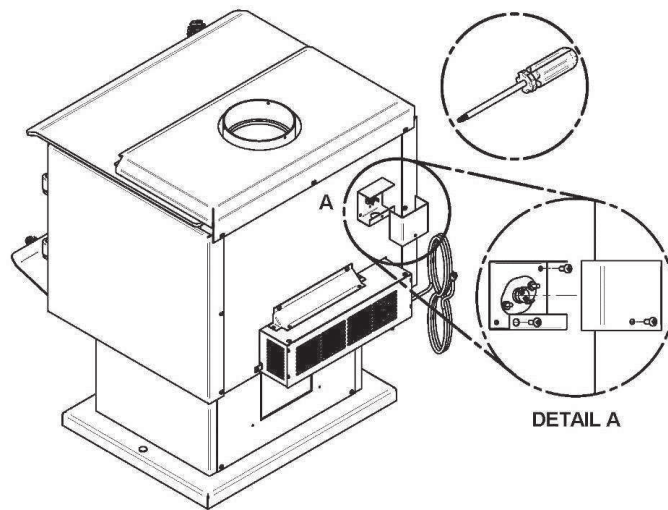
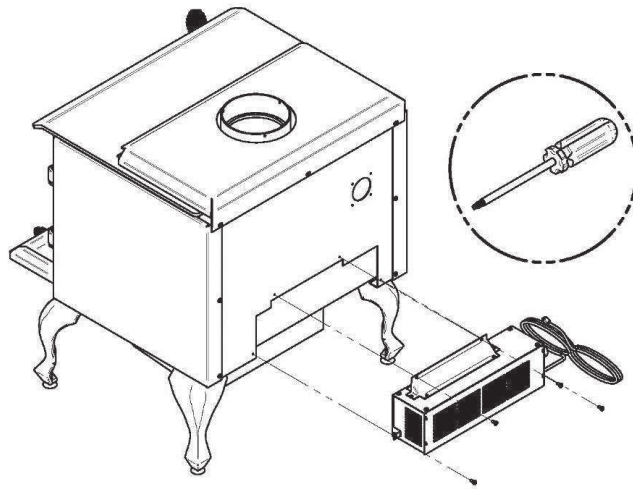
An optional blower may be installed on the back of the stove to increase the flow of air past heat exchange surfaces and to help circulate warm air in the room. When used regularly, the blower can provide a small increase in efficiency, up to 2 percent. However, the use of a blower should not be used as a way to gain more output from a stove that is undersized for the space it is intended to heat.



When using the blower, allow the stove to reach operating temperature (approximately one hour), before turning it on. The increased airflow from the blower cools the firebox and could affect the start-up combustion efficiency if the blower is turned on too early. You can also install an optional thermodisc kit to enable the blower to start or stop automatically when the stove is hot or too cold. The thermodisc part number is AC05530 for a basic model and ACO2055 for a quick connect model. Installation instructions are supplied with the blower and the thermodisc.

100 - Owner's manual ESCAPE 1800 (52 of 59)

Installation and Operation Manual for Escape 1800

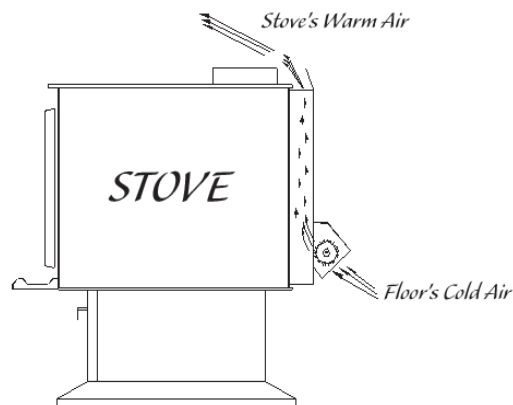
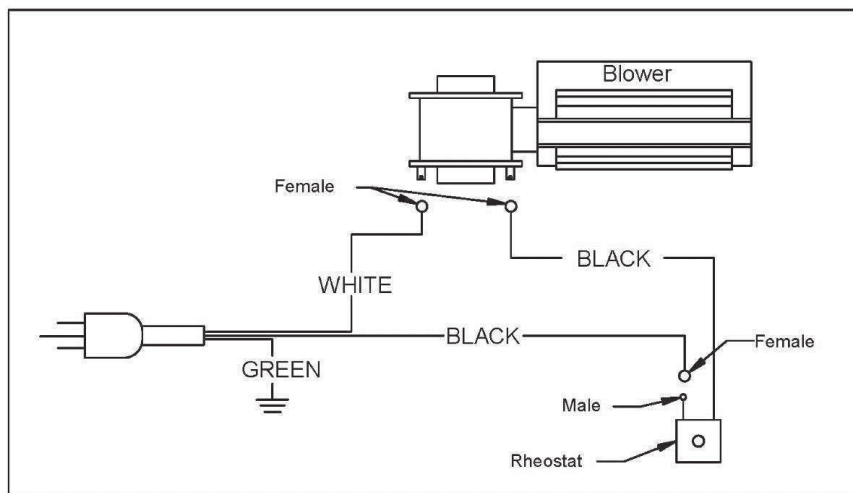


Characteristics of the thermodisc:

- Starts the blower when the stove's temperature reaches 43 °C (110 °F).
- Cuts the electrical contact when the temperature falls to 32 °C (90 °F).

100 - Owner's manual ESCAPE 1800 (53 of 59)

Installation and Operation Manual for Escape 1800

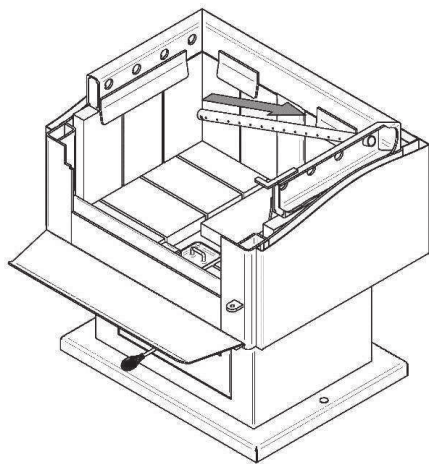


CAUTION: ENSURE THAT THE BLOWER'S POWER CORD IS NOT IN CONTACT WITH ANY SURFACE OF THE STOVE TO PREVENT ELECTRICAL SHOCK OR FIRE DAMAGE. DO NOT RUN THE POWER CORD BENEATH THE STOVE.

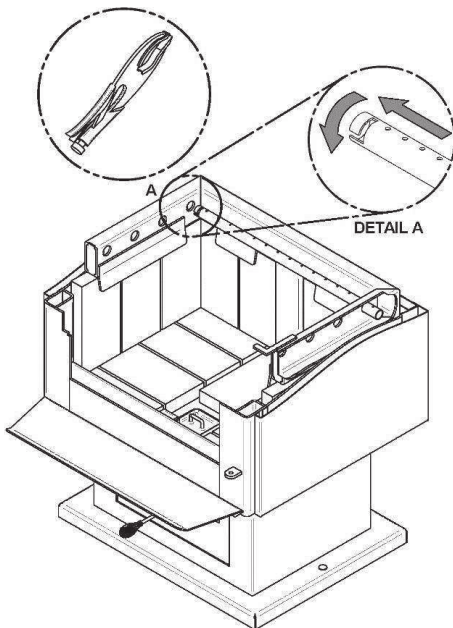
100 - Owner's manual ESCAPE 1800 (54 of 59)

Installation and Operation Manual for Escape 1800

Appendix 4: Installation of Secondary Air Tubes and Baffle



- 1- Starting with the rear tube, lean and insert the right end of the secondary air tube into the rear right channel hole. Then lift and insert the left end of the tube into the rear left channel.

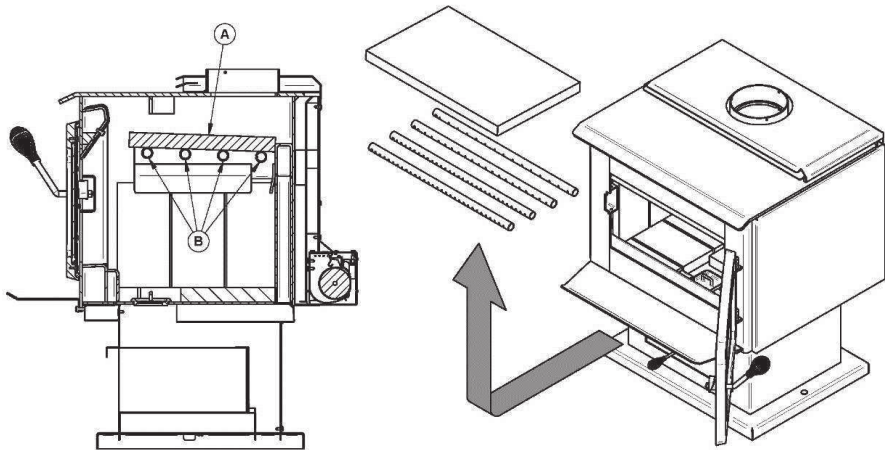


- 2- Align the notch in the left end of the tube with the key of the left air channel hole. Using a « Wise grip » hold the tube and lock it in place by turning the tube as shown in **detail A**. Make sure the notch reaches the end of the key way.
- 3- Repeat **step 1** and **2** for the other secondary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

100 - Owner's manual ESCAPE 1800 (55 of 59)

Installation and Operation Manual for Escape 1800

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



Important Notes:

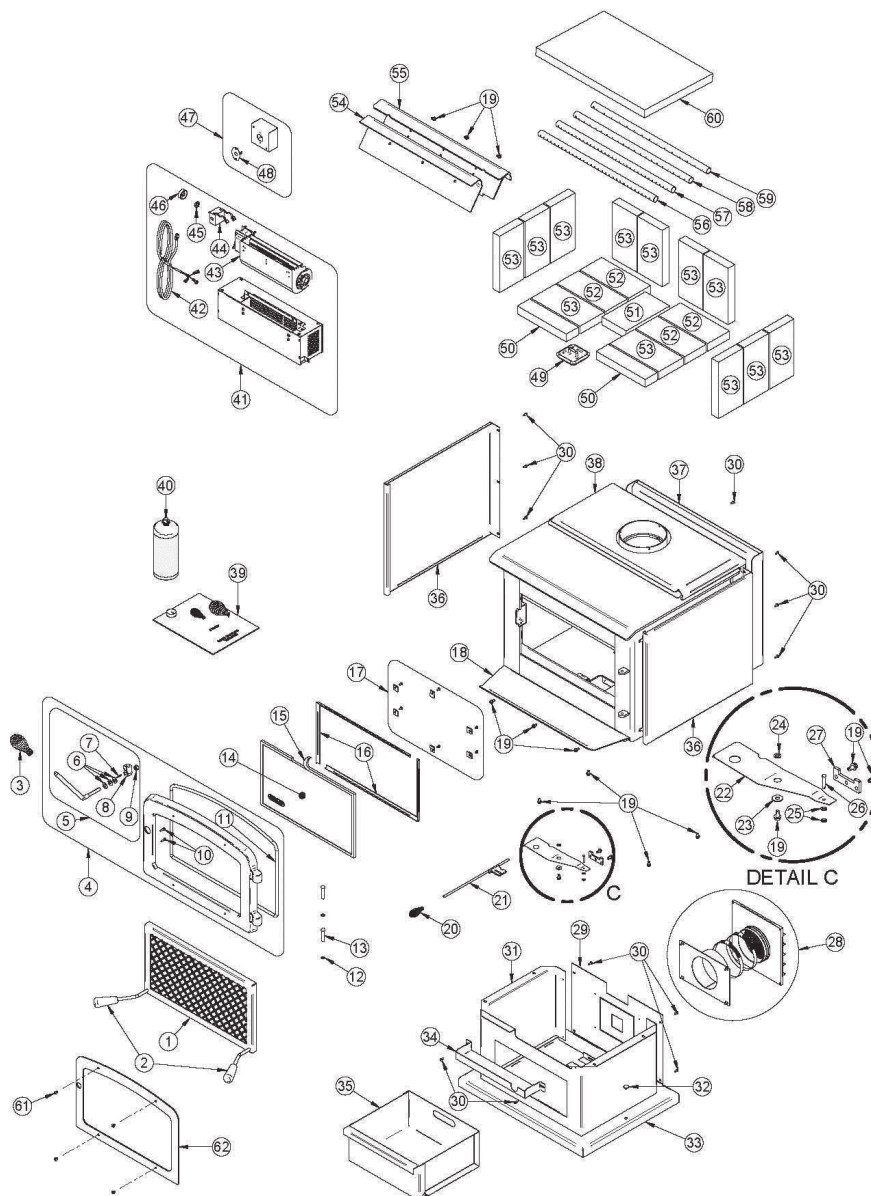
The air tubes are identified for placement as follows:

Model	Type of tube
Escape 1800 (All models)	Front ► 30 holes of 0.147" Middle front ► 30 holes of 0.147" Middle rear ► 30 holes of 0.147" Rear ► 30 holes of 0.147"

100 - Owner's manual ESCAPE 1800 (56 of 59)

Installation and Operation Manual for Escape 1800

Appendix 5: Exploded Diagram and Parts List DB03105



100 - Owner's manual ESCAPE 1800 (57 of 59)

Installation and Operation Manual for Escape 1800

IMPORTANT: THIS IS DATED INFORMATION. When requesting service or replacement parts for your stove, please provide the model number and the serial number. We reserve the right to change parts due to technology upgrade or availability. Contact an authorized dealer to obtain any of these parts. Never use substitute materials. Use of non-approved parts can result in poor performance and safety hazards.

#	Item	Description	Qty
1	AC01315	FIRE SCREEN	1
2	30569	ROUND WOODEN HANDLE BLACK	2
3	AC07866	1/2" BLACK COIL HANDLE	1
3	AC07867	1/2" CHROME PLATED COIL HANDLE	1
4	SE24107	REPLACEMENT DOOR WITH GASKET AND HANDLE (BLACK)	1
4	SE24107-07	REPLACEMENT DOOR WITH GASKET AND HANDLE (BRUSHED NICKEL)	1
5	AC09167	HANDLE AND LATCH KIT ESCAPE 1800	1
6	30205	ZINC WASHER ID 13/32" X OD 13/16"	3
7	30533	LATCH KEY PATH PIN	1
8	30033	STEEL DOOR LATCH	1
9	30224	LOCKNUT 3/8"-16 HEX	1
10	30123	SCREW #8 - 32 X 5/8" PAN QUADREX ZINC	2
11	AC06500	SILICONE AND 5/8" X 8' BLACK GASKET KIT	1
12	30055	HINGE PIN RETAINING RING 5/16" ID X 0.512" OD	2
13	30169	DOOR HINGE PIN 5/16" DIA. X 1 3/4" L	2
14	SE55103	REPLACEMENT GLASS WITH GASKET 10 3/16" X 17 1/8"	1
15	AC06400	BLACK SELF-ADHESIVE GLASS GASKET KIT (6')	1
16	PL55041	GLASS RETAINER FRAME	2
17	SE53585	GLASS RETAINER KIT WITH SCREWS (12 PER KIT)	1
18	PL65566	ASH LIP	1
19	30060	THREAD-CUTTING SCREW 1/4-20 x 1/2" F HEX STEEL SLOT WASHER C102 ZINC	11
20	AC07865	1/4" CHROME PLATED COIL HANDLE	1
20	AC07866	1/4" BLACK COIL HANDLE	1
21	SE65562	AIR CONTROL ROD ASSEMBLY	1
22	PL65579	AIR CONTROL DAMPER	1
23	30206	ZINC WASHER ID=5/16" X OD=3/4"	1
24	30187	ZINC WASHER ID 17/64" X OD 1/2"	1
25	30059	5/32" ID PUSHNUT	2
26	30064	3/16" X 1" CLEVIS PIN	1
27	PL65572	AIR CONTROL ROD GUIDE	1
28	AC01336	FRESH AIR INTAKE KIT FOR UNITS ON PEDESTAL	1
29	PL65565	REAR OF PEDESTAL	1
30	30131	BLACK METAL SCREW #10 X 1/2" TYPE "A" PAN QUADREX	13
31	99999	BUILD TO ORDER	1
32	30418	FINISHING PLUG 3/8"	2

100 - Owner's manual ESCAPE 1800 (58 of 59)

Installation and Operation Manual for Escape 1800

#	Item	Description	Qty
33	99999	BUILD TO ORDER	1
34	PL53664	AIR CONTROL COVER	1
35	SE08304-03	ASH DRAWER	1
36	PL65577	LEFT OR RIGHT DECORATIVE SIDE PANEL	2
37	99999	BUILD TO ORDER	1
38	SE53659	TOP AIR MATE	1
39	SE45617	INSTRUCTION MANUAL KIT	1
39	SE45617-01	INSTRUCTION MANUAL KIT	1
39	SE45617-03	INSTRUCTION MANUAL KIT	1
40	AC05959	METALLIC BLACK STOVE PAINT - 342 g (12oz) AEROSOL	1
41	AC03095	ULTRA-QUIET 130 CFM BLOWER WITH VARIABLE SPEED CONTROL	1
42	60013	POWER CORD 96" X 18-3	1
43	44070	CROSSFLOW BLOWER 115V-60Hz-56W (B)	1
44	44080	RHEOSTAT WITH NUT	1
45	44087	RHEOSTAT NUT	1
46	44085	RHEOSTAT KNOB	1
47	AC05530	THERMODISC KIT	1
48	44046	THERMODISC F110-20F	1
49	SE16059	ASH DUMP PLUG	1
50	PL36018	2 1/4" X 8 3/4" X 1 1/4" REFRACTORY BRICK	2
51	PL36028	4 1/2" X 8 1/8" X 1 1/4" REFRACTORY BRICK	1
52	29015	4" x 9" X 1 1/4" REFRACTORY BRICK	4
53	29020	4 1/2" X 9" X 1 1/4" REFRACTORY BRICK HD	12
54	21387	TOP AIR DEFLECTOR INSULATION	1
55	PL65505	TOP AIR DEFLECTOR PROTECTOR	1
56	PL65514	SECONDARY AIR TUBE	1
57	PL65514	SECONDARY AIR TUBE	1
58	PL65514	SECONDARY AIR TUBE	1
59	PL65514	SECONDARY AIR TUBE	1
60	21388	VERMICULITE BAFFLE 20" X 12 1/2" X 1 1/4"	1
61	PL65726	BRUSHED NICKEL OVERLAY	1
62	30253	1/4-20 X 5/16" BUTTONHEAD HEX SCREW #5/32 INOX 18-8	4

100 - Owner's manual ESCAPE 1800 (59 of 59)

Installation and Operation Manual for Escape 1800

DROLET LIMITED LIFETIME WARRANTY

The warranty of the manufacturer extends only to the original retail purchaser and is not transferable. This warranty covers brand new products only, which have not been altered, modified nor repaired since shipment from factory. Proof of purchase (dated bill of sale), model name and serial number must be supplied when making any warranty claim to your DROLET dealer.

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 service call related to an improper installation is not covered by this warranty.

The manufacturer may require that defective products be returned or that digital pictures be provided to support the claim. Returned products are to be shipped prepaid to the manufacturer for investigation. Transportation fees to ship the product back to the purchaser will be paid by the manufacturer. Repair work covered by the warranty, executed at the purchaser's domicile by an authorized qualified technician requires the prior approval of the manufacturer. All parts and labour costs covered by this warranty are limited according to the table below.

The manufacturer, at its discretion, may decide to repair or replace any part or unit after inspection and investigation of the defect. The manufacturer may, at its discretion, fully discharge all obligations with respect to this warranty by refunding the wholesale price of any warranted but defective parts. The manufacturer shall, in no event, be responsible for any uncommon, indirect, consequential damages of any nature, which are in excess of the original purchase price of the product. A one-time replacement limit applies to all parts benefiting from lifetime coverage. This warranty applies to products purchased after March 1st, 2015.

DESCRIPTION	WARRANTY APPLICATION*	
	PARTS	LABOUR
Combustion chamber (welds only) and cast iron door frame.	Lifetime	3 years
Surrounds, heat shields, ash drawer, steel legs, pedestal, trims (aluminum extrusions), plating (defective manufacture**), and convector air-mate.	5 years	3 years
Removable stainless steel combustion chamber components, secondary air tubes**, deflectors, and supports.	5 years	N/A
Glass retainers, handle assembly, and air control mechanism.	3 years	1 year
Carbon steel combustion chamber components, vermiculite baffle**, and C-Cast baffle**.	2 years	N/A
Standard blower, heat sensors, switches, rheostat, wiring, and other electronics.	1 year	1 year
Optional blower, paint (peeling**), ceramic glass (thermal breakage only**), ceramic fibre blankets, gaskets, insulation, and other options.	1 year	N/A
Firebricks.	N/A	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 part.

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

200 - Label Escape 1800



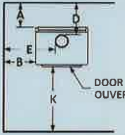
Intertek
Control number: 4002461
Certified to/Certifié selon ULC S627
Conforms to/Conforme à UL 1482
Conforms to/Conforme à UL 737
CSA B415.1-10

LISTED SOLID FUEL BURNING
APPLIANCE
POÊLE À COMBUSTIBLE SOLIDE
HOMOLOGUÉ
MODEL / MODÈLE :
ESCAPE 1800

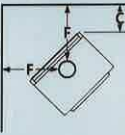
Serial Number
No. de Série


1

Clearances to combustibles / Dégagements aux combustibles



DOOR OPENING
OUVERTURE DE PORTE





Back / Arrière
Floor protection
Protection de plancher

**MOBILE HOME
MAISONS MOBILES**
Double wall connector
Tuyau à paroi double

A: 14 in./po. (356 mm)
B: 19 in./po. (483 mm)
C: 13 in./po. (330 mm)
D: 17.75 in./po. (451 mm)
E: 29 in./po. (737 mm)
F: 24.25 in./po. (616 mm)

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
A: 15 in./po. (381 mm)	A: 6 in./po. (152 mm)	A: 15 in./po. (381 mm)	A: 6 in./po. (152 mm)
B: 17 in./po. (432 mm)	B: 17 in./po. (432 mm)	B: 17 in./po. (432 mm)	B: 17 in./po. (432 mm)
C: 10 in./po. (254 mm)	C: 5 in./po. (127 mm)	C: 10 in./po. (254 mm)	C: 5 in./po. (127 mm)
D: 18.75 in./po. (476 mm)	D: 9.75 in./po. (248 mm)	D: 18.75 in./po. (476 mm)	D: 9.75 in./po. (248 mm)
E: 27 in./po. (686 mm)	E: 27 in./po. (686 mm)	E: 27 in./po. (686 mm)	E: 27 in./po. (686 mm)
F: 21.25 in./po. (540 mm)	F: 16.25 in./po. (413 mm)	F: 21.25 in./po. (540 mm)	F: 16.25 in./po. (413 mm)
Minimum floor to ceiling distance / Distance minimale plafond-plancher: 84 in./po. (213cm)			

PREVENT HOUSE FIRES

- Install and use only in accordance with the manufacturer's installation and operating instructions.
- Contact local building or fire officials about restrictions and installation inspection in your area.
- Use listed 152 mm / 6 in. diameter single or double wall connectors with prefabricated chimneys approved UL 103 HT (US) and ULC S629 (CAN) suitable for solid fuels or lined masonry chimneys.
- See local building code and manufacturer's instructions for precautions required for passing a chimney through a combustible wall or ceiling.
- Do not pass connector through combustible wall or ceiling.
- Do not connect this unit to a chimney serving another appliance.
- Use with wood only. Do not use other fuels.
- Operate only with door closed or door open with firescreen installed. Open door or remove firescreen to feed the stove only.
- Do not obstruct the space underneath the stove.
- Do not use grate or elevate fire. Build fire directly on hearth.
- Do not overfire. If heater or chimney connector glows, you are overfiring.
- Inspect and clean chimney frequently. Under certain condition of use, creosote buildup may occur rapidly.
- Replace glass with ceramic type only.
- Install unit on a non-combustible material extending as shown above on this label.
- Suitable for mobile-home installation. Floor protection may vary from pedestal to legs version refer to owner's manual.
- Combustion air openings shall not be obstructed.
- This wood heater needs periodic inspection and repair for proper operation. Consult the owner's manual for further information. It is against US Federal regulations to operate this wood heater in a manner inconsistent with the operating instructions in the owner's manual.


PRÉVENEZ LES INCENDIES

- Installer et utiliser conformément au manuel d'utilisation du fabricant.
- Contacter les autorités de votre localité ayant juridiction concernant les restrictions et inspections d'installation.
- Utiliser des tuyaux d'évacuation à parois simple ou double homologués d'un diamètre de 6 po. (152 mm) avec une cheminée préfabriquée approuvée UL 103 HT (US) et ULC S629 (CAN) pour utilisation au bois ou une cheminée de maçonnerie gainée.
- Voir les codes locaux et le manuel d'installation du fabricant pour le passage de la cheminée à travers un mur ou un plafond combustible.
- Ne pas traverser un plafond ou un mur combustible avec un tuyau d'évacuation.
- Ne pas raccorder cet appareil à une cheminée desservant un autre appareil.
- Brûler du bois seulement. Ne pas utiliser d'autres combustibles.
- Garder la porte fermée ou le pare-tincelle en place en tout temps. Ouvrir la porte ou retirer le pare-tincelle que lors du chargement.
- Ne rien entreposer sous l'appareil.
- Ne pas utiliser de grilles ou de chenets pour surélever le feu. Préparer le feu directement sur l'âtre.
- Ne pas surchauffer. Si l'appareil ou le tuyau rougit, il y a surchauffe.
- Inspecter et nettoyer la cheminée fréquemment. Sous certaines conditions, l'accumulation de crésote peut être rapide.
- Remplacer la vitre seulement avec un verre de céramique.
- Installer l'appareil sur une plaque non combustible tel qu'indiqué sur l'étiquette.
- Poêle approuvé pour maison mobile. La protection de plancher peut varier entre la version piédestal et sur pattes. Voir le manuel d'instructions.
- Les entrées d'air servant à la combustion ne doivent pas être obstruées.
- Cet appareil de chauffage requiert des inspections et réparations périodiques. Consulter le manuel de l'utilisateur pour plus d'information. Opérer cet appareil de chauffage de façon inconsistante par rapport au manuel de l'utilisateur consiste une violation de la loi fédérale (USA).

Blower: (115V, 0.8A, 60Hz) 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 : 1.54 g/h
When tested in accordance with / Lorsque testé selon : ASTM E2515 & WK47329




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
10/08/2017 (# test)



Fabricant de poêles international
Stove Builder International

Fabriqué à St-Augustin-de-Desmaures (Qc), Canada
10/08/2017 (# test)

27706

Stove Builder International Inc. | 35697 | Rev: Nov 30 2017 11:01AM | Uncontrolled Copy Page 68 of 245

Appendix I - EPA correspondence



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Research Triangle Park, NC 27711

SEP 28 2016

Mr. Vincent Pelletier, Jr. Eng.
Stove Builder International
Chemical Engineer
250 rue de Copenhagen
Saint-Augustin-de-Desmaures
Quebec Canada, G3A 2H3

**OFFICE OF
ADMINISTRATION
AND RESOURCES
MANAGEMENT**

Dear Mr. Pelletier,

I am writing in response to your September 26, 2016 letter regarding the 2.3 series of wood stoves. You are requesting an alternative test method using cordwood as referenced in Section 60.534 (a) (ii) of 40 CFR Part 60 Subpart AAA, Standards of Performance for New Residential Wood Heaters. You request to use the procedures and specifications found in the ASTM draft cordwood test method, ASTM work Item WK47329-14, titled "Standard Method for Determining Particulate Matter Emissions from Wood Heaters using Cordwood Test Fuel."

With the caveats listed below, we approve your alternative method request for testing the 2.3 series of wood stoves which includes the following fourteen models (Solution 2.3 Freestanding, Solution 2.3 Insert, XTD 1.9 Freestanding, XTD 1.9 Insert, Osburn 2000 Freestanding, Osburn 2000 Insert, Escape 1800 Freestanding, Escape 1800 Insert, CW 2900 Insert, Dundee 1.9 Freestanding, Matrix Freestanding, Matrix Insert, Destination 2.3 Freestanding, Destination 2.3 Insert). As required in Subpart AAA Standards of Performance for New Residential Wood Heaters Section 60.534 (d), the manufacturer or approved test lab 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 and Section 60.534 (e) the manufacturer must have the approved test laboratory measure the efficiency, heat output and carbon monoxide emissions of the tested wood heater using Canadian Standards Administration (CSA) Method B415.1-10. For particulate matter emission concentrations ASTM 2515-11 should be used, four inch filters are also acceptable to use.

The following changes to ASTM work Item WK47329-14, titled "Standard Method for Determining Particulate Matter Emissions from Wood Heaters using Cordwood Test Fuel" must be followed:

1. The wood heater must be aged for 50 hours as stated in Appendix A-8 to Part 60 Test Methods 26 through 30B, procedures section 2.1.4 and not the 48 hours a stated in WK47329-14 section 9.1.4.
2. The end of test criteria is defined when the weight scale indicates the remaining weight of the test fuel as 0.0 lbs (0.00 kg) or less for 30 seconds. This criteria should be used for the high fire, low and medium burn rates.

Internet Address (URL) • <http://www.epa.gov>

Recycled/Recyclable • Printed with Vegetable Oil Based Inks on Recycled Paper (Minimum 25% Postconsumer)

Appendix I - EPA correspondence (2 of 18)

2

3. Section 9.5.1 Start-up Condition. The average heater surface temperature per 9.2.2 and flue-gas temperature per 9.2.4 at the start of the test run must be less than a 10°F above ambient for the high fire test category.
4. Section 9.6.14 Invalid Test Run. The test run shall be considered invalid if less than the full test fuel weight has been consumed and there is no measurable weight loss (<0.1 lb (0.05 kg) or 1.0% of the test fuel weight, whichever is greater) for at least 30 minutes.
5. 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.
6. The pre burn cycle burn rate category, leading into a test run, should be the same as the attempted burn rate category of the actual test. Example: If a low burn category is the desired test, the preburn should be at a low burn setting and likewise for the medium low, medium high and high burn rate categories.

The following changes to ASTM E2515-11 "Standard Test Method for Determination of Particulate Matter Emissions Collected by a Dilution Tunnel" must be followed:

1. The filter temperature must be maintained between 80 and 90 degree F during testing.
2. A glass cyclone must be used between the sampling probe and filter holders when the total particulate catch is expected to exceed 100 mg or when water droplets are present in the stack gas. This cyclone and its contents must be included in the pre-test weighing and post-test desiccation and weighing.
3. Filters must be weighed in pairs to reduce weighing error propagation. See ASTM E2515-11 Section 10.2.1 Analytical Procedure.
4. Sample filters must be Pall TX-40 or equivalent Teflon coated glass fiber, and of 47 mm, 90 mm, 100 mm or 110 mm.
5. Only one point is allowed outside the +/- 10% proportionality range per test run.

Please include this approval in your certification test report. If you have additional questions regarding these decisions, please contact Michael Toney of my staff at (919) 541-5247.

Sincerely,



Steffan Johnson, Group Leader
Measurement Technology Group

Appendix I - EPA correspondence (3 of 18)

3

cc: Michael Toney, EPA/AQAD (143-02)
Rafael Sanchez, EPA/OECA (2227A)
Adam Baumgart-Getz, EPA/OID (C311M)
David Cole, EPA/OID (C311M)
Amanda Aldridge, EPA/OID (C311M)

Appendix I - EPA correspondence (4 of 18)



OMB Control No. 2060-0161
Approval expires 3/31/2019

OMB Control No. 2060-0693
Approval expires 3/31/2019

EPA Form 6400-03

RESIDENTIAL WOOD HEATER CERTIFICATE OF COMPLIANCE APPLICATION

INSTRUCTIONS

Pursuant to the 2015 Clean Air Act Standards of Performance for New Residential Wood Heaters, New Residential Hydronic Heaters and Forced-Air Furnaces, 40 CFR Part 60 Subparts AAA and QQQQ (2015 Wood Heater Rule), any manufacturer of an affected residential wood heater must apply to the EPA for a certificate of compliance for each model line. Without applying for and obtaining a certificate of compliance, a manufacturer may not manufacture, advertise for sale, offer for sale, or sell affected residential wood heaters in the United States.

Under Subpart AAA, affected residential wood-burning room heaters currently include, but are not limited to, adjustable burn rate stoves, catalytic adjustable burn rate stoves; hybrid adjustable burn rate stoves; single burn rate stoves; and pellet stoves.

Under Subpart QQQQ, affected residential wood-burning central heaters currently include, but are not limited to, indoor hydronic heaters ("wood boilers"); outdoor hydronic heaters ("outdoor wood boilers"); and forced-air furnaces ("warm air furnaces").

By completing and submitting this application to EPA, you will satisfy the requirement to apply for a certificate of compliance. To submit a complete application, this application must include the following:

- (1) Certification test report prepared by an EPA-approved test laboratory
- (2) Certification of conformity by an EPA-approved third party certifier
- (3) Quality assurance plan
- (4) All required supporting documentation and manufacturer statements pursuant to the 2015 Wood Heater Rule (Sections 60.533 or 60.5475)

This application must be signed by a responsible representative of the manufacturer or an authorized representative. Once completed with all required information/documentation included, this application must be submitted to WoodHeaterReports@epa.gov.

The public reporting and recordkeeping burden for this collection of information is estimated to average 8 hours per response. Send comments on the Agency's need for this information, the accuracy of the provided burden estimates, and any suggested methods for minimizing respondent burden, including through the use of automated collection techniques to the Director, Regulatory Support Division, U.S. Environmental Protection Agency (EPA) (2822T), 1200 Pennsylvania Ave., NW, Washington, D.C. 20460. Include the OMB control number in any correspondence. Do not send the completed application to this address.

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

Appendix I - EPA correspondence (5 of 18)

564-7028, Residential Wood Heater Compliance Program Lead, or via email at sanchez.rafael@epa.gov.

MANUFACTURER INFORMATION

Manufacturer's Name: Stove Builder International

Manufacturer's Physical Address:
250 rue de Copenhague
Saint-Augustin-de-Desmaures,
Canada, G3A 2H3

Manufacturer's Mailing Address (if different from physical address):

Name and Title of Manufacturer's Responsible/Authorized Representative Submitting this Application:
Guillaume Thibodeau-Fortin

Manufacturer's Contact E-mail: gthibodeaufortin@sbi-international.com

Manufacturer's Phone Number: 1-418-878-3040 x224

Manufacturer's Website Address:
www.sbi-international.com

Manufacturer's Website Address where the test report and owner's manual will be posted, if known:
www.drolet.ca

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": 2.3 Series

Model Number(s) (as appearing on the certification test report): Escape 1800

Heater Type (Check one):	<input checked="" type="checkbox"/> Adjustable Burn Rate Wood Stove	<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)
Hydronic Heater Type (Check one):	<input type="checkbox"/> Full Storage	<input type="checkbox"/> Partial Storage	<input type="checkbox"/> Indoor	<input type="checkbox"/> Outdoor	
Forced-Air Furnace Type (Check one):	<input type="checkbox"/> Small (less than 65,000 BTU/hr heat output)		<input type="checkbox"/> Large (greater than 65,000 BTU/hr heat output)		
Fuel Tested (Check one):	<input type="checkbox"/> Crib	<input type="checkbox"/> Pellet	<input checked="" type="checkbox"/> Cordwood	<input type="checkbox"/> Wood Chips	<input type="checkbox"/> Other:
Certification Step:	<input type="checkbox"/> 2015	<input type="checkbox"/> 2016 (FAFs only)	<input type="checkbox"/> 2017 (FAFs only)	<input checked="" type="checkbox"/> 2020 (ALL HEATERS)	
Was this heater tested using an EPA-approved Alternative Test Method (ATM)? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If yes, provide date of EPA approval and attach copy of EPA approved ATM letter): 9/28/2016 If not, what Test Method(s) did the test laboratory use for the certification test? (List all applicable test methods):				Heater equipped with a catalytic combustor? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	

Appendix I - EPA correspondence (6 of 18)

Date of submission of 30-Day Notice to the EPA: 6/2/2017		
What was the proposed date(s) of testing? <u>7/4/2017</u>		
What was the actual date(s) of testing? <u>7/6/2017</u>		
Was the compliance test postponed or suspended? <input checked="" type="checkbox"/> Y <input type="checkbox"/> N If yes, date of EPA notification of postponement or suspension: <u>7/7/2017</u>		
Explain reason for postponing or suspending the certification test: 1) New CO cell of gas analyser not received for July 4 th 2) Probes weight not stable		
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, 32nd avenue		
City: Lachine	State: Québec	ZIP Code: H8T 3J1
Phone: 1-514-631-3100 x277	Email: claudio.pellant@intertek.com	
EPA-APPROVED THIRD PARTY CERTIFIER		
Name of EPA-Approved Third-Party Certifier: Intertek		
Name(s) of Person(s) Authorized and/or Responsible for Reviewing Test Report and/or Issuing Certification of Conformity: Brian Ziegler		
Position/Title: Technical Team Leader		
Address: 8431 Murphy Drive		
City: Middleton	State: WI	ZIP Code: 53562
Phone: 608-824-7425	Email: brian.ziegler@intertek.com	

Appendix I - EPA correspondence (7 of 18)

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.

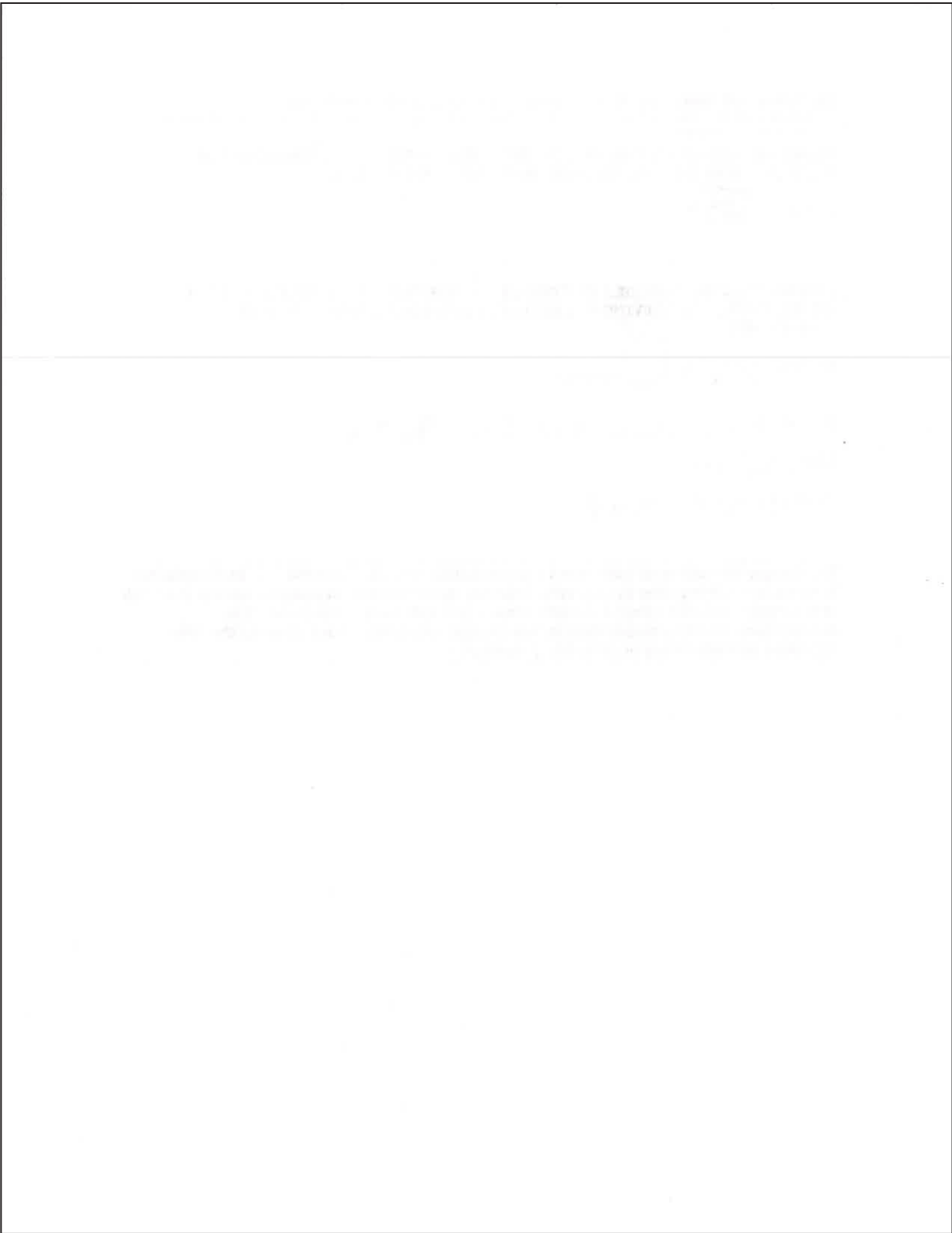
12. Transferability Acknowledgement Statement

A statement of acknowledgment that the certificate of compliance cannot be transferred to another manufacturer or model line without written approval by the EPA.

Appendix I - EPA correspondence (8 of 18)

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: Engineer.
Date: 10/27/2017
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.

Appendix I - EPA correspondence (9 of 18)



Appendix I - EPA correspondence (10 of 18)



Fabricant de poêles international inc.
Stove Builder International Inc.

Notre passion devient source d'énergie
We Turn Into Energy

November 11th, 2017

Air Branch/Wood Heater Program Lead
Monitoring, Assistance, and Media Programs Division
Office of Compliance
U.S. EPA
1200 Pennsylvania Ave., NW
MS:2227A
Washington, DC 20004
Attn: EPA Administrator

Subject: Compliance Statements and Acknowledgements

Dear Administrator,

As stated in the application for certificate of compliance, Stove Builder International Inc (SBI) states and acknowledges the 13 items below.

1. SBI provided all engineering drawing (including specifications for each component listed in paragraphs (k)(2), (3) and (4) of 60.533(b) and 60.5475(b) available in Intertek Test Report 103124842MTL-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 provided to Residential Wood Heater Compliance Program Lead the Confidential Business Information (CBI) report including all test data and drawings by mail on September 5th, 2017 and by email to Sanchez.Rafael@epa.gov October 10th, 2017.
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 103124842MTL-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 103124842MTL-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

250, rue De Copenhague, Saint-Augustin-de-Desmaures, Qc G3A 2H3 • Tél.: 418-878-3040 • Fax : 418-878-3001
www.sbi-international.com

Appendix I - EPA correspondence (11 of 18)



Fabricant de poêles international inc.
Stove Builder International Inc.


Notre passion devient source d'énergie
We Turn Into Energy

- heated area for a given appliance is defined by the manufacturer as its capacity to maintain a minimum acceptable temperature in the designated area in case of a power failure."
6. SBI, with the help of the certification laboratory, Intertek, built a Quality Assurance Program. A quality control is performed for each unit produced and 4 times a year, Intertek audits our production line to make sure that the models in production comply with the certification unit.
 7. SBI confirms that the certification model was sealed by Intertek as per picture of Appendix H. Permanent straps holds the unit on a wooden palette and prevent the door from opening. Intertek logo is painted over the unit and the strap as a protection. The sealed unit will be store at SBI laboratory as long as the unit is in production, but a least for 5 years after certification test.
 8. SBI states that the units produce under this certificate will be:
 - a. Similar in all material respects that would affect emissions as defined in § 60.531 to the wood heater submitted for certification testing, and labeled as prescribed in § 60.536 and 60.5478.
 - b. Accompanied by an owner's manual that meets the requirements in § 60.536 and 60.5478. A copy of the owner's manual was submitted to the Administrator and will be available to the public on the manufacturer's web site at production launch.
 9. SBI has entered into contracts with an approved laboratory and third-party certifier which is Intertek. Intertek Montreal is the approved laboratory and the third-party certifier is the Middleton chapter of Intertek.
 10. SBI allows the approved laboratory and approved third-party certifier to submit information to Residential Wood Heater Compliance Program Lead on behalf of SBI, including any claimed to be CBI.
 11. SBI will place a copy of the certification test report, summary and all non-CBI on the manufacturer's web site available to the public within 30 days after the Administrator issues a certificate of compliance.
 12. SBI acknowledges that the certificate of compliance cannot be transferred to another manufacturer or model line without written approval by the Administrator.
 13. SBI acknowledges that it is unlawful to sell, distribute or offer to sell or distribute an affected wood heater without a valid certificate of compliance.

Print name and title: Guillaume Thibodeau-Fortin, Engineer

Date: 22/11/2017

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

 Eng

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.

Appendix I - EPA correspondence (12 of 18)



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.

Instructions: The manufacturer of an affected wood/pellet heater/central heater model line must notify the Administrator of the date that certification testing is scheduled to begin by email to WoodHeaterReports@epa.gov. This notice must be received by the EPA at least 30 days before the start of testing.

GENERAL INFORMATION						
Manufacturer's Name: Stove Builder International						
Heater Type (Check one):	<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:
Hydronic Heater Type (Check one):	<input type="checkbox"/> Full Storage	<input type="checkbox"/> Partial Storage	<input type="checkbox"/> Indoor	<input type="checkbox"/> Outdoor	<input type="checkbox"/> Other:	
Forced-Air Furnace Type (Check one):	<input type="checkbox"/> Small (less than 65,000 BTU/hr heat output)		<input type="checkbox"/> Large (greater than 65,000 BTU/hr heat output)			
Fuel Tested (Check one):	<input type="checkbox"/> Crib	<input type="checkbox"/> Pellet	<input checked="" type="checkbox"/> Cordwood	<input type="checkbox"/> Wood Chips	<input type="checkbox"/> Other:	
Model Name(s) (as will appear on test report): Solution 2.3 Freestanding, Solution 2.3 Insert, XTD 1.9 Freestanding, XTD 1.9 Insert, Osburn 2000 Freestanding, Osburn 2000 Insert, Escape 1800 Freestanding, Escape 1800 Insert, CW2900 Insert, Dundee 1.9 Freestanding, Matrix Freestanding, Matrix Insert, Destination 2.3 Freestanding, Destination 2.3 Insert, HEI240 insert						
Model Number(s) (as will appear on test report): Not created yet.						
Equipped with a catalytic combustor? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No						

Appendix I - EPA correspondence (13 of 18)



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.

Instructions: The manufacturer of an affected wood/pellet heater/central heater model line must notify the Administrator of the date that certification testing is scheduled to begin by email to WoodHeaterReports@epa.gov. This notice must be received by the EPA at least 30 days before the start of testing.

Mailing Address:		
Same as street address.		
Street Address:		
250 rue de Copenhagen		
City: Saint-Augustin-de-Desmaures	State: QC	ZIP Code: G3A 2H3
Phone: 1-418-878-3040 x224	Fax: 1-418-878-3001	Web Site: http://www.sbi-international.com
Address of Manufacturer: 250 rue de Copenhagen		
City: Saint-Augustin-de-Desmaures	State: QC	ZIP Code: G3A 2H3
EPA APPROVED TEST LABORATORY		
Name and Title of Authorized Representative: Claude Pelland, Project Engineer		
Company: Intertek		
Phone: 1 514 631 3100 x277	E-mail: claudio.pelland@intertek.com	Fax: 1 514 631 1133

Appendix I - EPA correspondence (14 of 18)



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.

Instructions: The manufacturer of an affected wood/pellet heater/central heater model line must notify the Administrator of the date that certification testing is scheduled to begin by email to WoodHeaterReports@epa.gov. This notice must be received by the EPA at least 30 days before the start of testing.

City: Lachine	State: QC	ZIP Code: H8T 3J1
EPA APPROVED THIRD-PARTY CERTIFIER		
Name and Title of Authorized Representative: Claude Pelland, Project Engineer		
Company: Intertek		
Phone: 1 514 631 3100 x277	E-mail: claudio.pelland@intertek.com	Fax: 1 514 631 1133
City: Lachine	State: QC	ZIP Code: H8T 3J1
COMPLIANCE TEST INFORMATION		
Test Method(s): Alternative method WK47329-14 with EPA caveats from the letter of September 28 th , 2016		
Date(s) of Proposed Test: 4 th of July 2017		

Appendix I - EPA correspondence (15 of 18)



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.

Instructions: The manufacturer of an affected wood/pellet heater/central heater model line must notify the Administrator of the date that certification testing is scheduled to begin by email to WoodHeaterReports@epa.gov. This notice must be received by the EPA at least 30 days before the start of testing.

Testing Location (Name and Address):

Stove Builder International
250 rue de Copenhagen
Saint-Augustin-de-Desmaures
G3A 2H3
QC, Canada

Contact Name: Guillaume Thibodeau-Fortin

Title: Engineer

Phone Number: 1-418-878-3040 x224

Email Address: gthibodeaufortin@sbi-international.com

Appendix I - EPA correspondence (16 of 18)



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.

Instructions: The manufacturer of an affected wood/pellet heater/central heater model line must notify the Administrator of the date that certification testing is scheduled to begin by email to WoodHeaterReports@epa.gov. This notice must be received by the EPA at least 30 days before the start of testing.

Louis-Pierre Côté, Engineering Manager

Print Name and Title of Authorized Official

Signature

2017-06-02

Date

Telephone Number: 1-418-878-3040 x212

Email Address: lpote@sbi-international.com

Remarks:

v1

Appendix I - EPA correspondence (17 of 18)



September 26th, 2016

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: Approval of alternative cord wood test method.

Dear Administrator,

The U.S. Environmental Protection Agency 40 CFR Part 60 Standards of Performance for New Residential Hydronic Heaters and Forced-Air Furnaces; Final Rule, Section §60.534(a)(ii), states that certification testing may be conducted using cord wood with an alternative test method if approved by the Administrator.

Stove Builder International Inc. (SBI) would like to use ASTM WK47329-14 Draft dated September 8th, 2016 to certify a model line named 2.3 Series that currently holds a certificate using method 28 and 5G-3. The ASTM WK47329-14 Draft method includes the latest modifications following resolution of some negatives formulated by EPA and we believe that it can now be used without any modifications.

The 2.3 series include the following model name:

- Solution 2.3 Freestanding
- Solution 2.3 Insert
- XTD 1.9 Freestanding
- XTD 1.9 Insert
- Osburn 2000 Freestanding
- Osburn 2000 Insert
- Escape 1800 Freestanding
- Escape 1800 Insert
- CW2900 Insert
- Dundee 1.9 Freestanding
- Matrix Freestanding
- Matrix Insert

Appendix I - EPA correspondence (18 of 18)



Fabricant de poêles international inc.
Stove Builder International Inc.

- Destination 2.3 Freestanding
- Destination 2.3 Insert

Testing will be done using an Osburn 2000 Freestanding as a representative model of this model line. In annex, you can find an evaluation of the similarities between these models that was done by Intertek back in 2013. No modifications were done on these models since then on any of the items included in Section §60.533(k)(2) of 40 CFR Part 60.

ASTM WK47329-14 will be used in conjunction with ASTM E2515 to measure particulate emission concentrations and CSA B415.1-10 to measure efficiencies and CO emission rates.

I would also like to make a request that the list of certified wood heaters be updated to include all of the model names above. A request was made back in 2013 when the test report was sent but it never was updated.

We will await your response as soon as possible. Should you need additional documents or clarification, please let us know.

Sincerely,

Vincent Pelletier, Jr. Eng.
Chemical Engineer
Stove Builder International

Test report #103124842MTL-001

TEST REPORT



REPORT NUMBER: 103124842MTL-001
REPORT DATE: 21 July 2017

EVALUATION CENTER
Intertek Testing Services NA Inc.
1829 32nd Avenue
Montreal (Lachine), QC
Canada H8T 3J1

RENDERED TO
Stove Builder International Inc.
250 de Copenhagen
St-Augustin-de-Desmaures, QC
Canada G3A 2H3

PRODUCT EVALUATED:

MODEL 2.3 Series –Escape 1800 WOOD FUEL ROOM HEATER

Report of Testing Model Series 2.3 Escape 1800 Wood Fuel Room Heater for compliance as an “Affected Wood Heater” with the applicable requirements of the following criteria: EPA 40 CFR Part 60 “Standards of Performance for New Residential Wood Heaters, New Residential Hydronic Heaters and Forced-Air Furnaces”, March 16, 2015.

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 copy or distribute this report and then only in its entirety. Any use of the Intertek name or one of its marks for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek. The observations and test results in this report are relevant only to the sample tested. This report by itself does not imply that the material, product, or service is or has ever been under an Intertek certification program.

Test report #103124842MTL-001 (2 of 15)

Stove Builder International Inc.
Project No. G103124842

Date: 21 July 2017
Page 2 of 15

Contents

I. INTRODUCTION..... 4

 I.A PURPOSE OF TEST4

 I.B LABORATORY4

 I.C DESCRIPTION OF UNIT4

 I.D REPORT ORGANIZATION 5

II. SUMMARY..... 5

 II.A PRETEST INFORMATION.....5

 II.B INFORMATION LOG.....5

 II.B(1) TEST STANDARD.....5

 II.B(2) Deviation from Standard Method..... 6

 II.C SUMMARY OF TEST RESULTS 7

 II.D DESCRIPTION OF TEST RUNS..... 7

 II.D SUMMARY OF OTHER DATA.....7

 TABLE 1. - EMISSIONS..... 7

 TABLE 3. - TEST FACILITY CONDITIONS..... 8

 TABLE 4. - DILUTION TUNNEL FLOW RATE MEASUREMENTS AND SAMPLING DATA..... 9

 TABLE 5. - DILUTION TUNNEL DUAL TRAIN PRECISION..... 9

 TABLE 6. - GENERAL SUMMARY OF RESULTS.....9

III. PROCESS DESCRIPTION10

 III.A TEST SET-UP DESCRIPTON.....10

 III.B AIR SUPPLY SYSTEM10

 III.C TEST FUEL PROPERTIES10

IV. SAMPLING SYSTEMS.....10



Test report #103124842MTL-001 (3 of 15)

Stove Builder International Inc.

Date: 21 July 2017

Project No. G103124842

Page 3 of 15

IV.A. SAMPLING LOCATIONS	10
IV.A.(1) DILUTION TUNNEL.....	11
IV.B. OPERATIONAL DRAWINGS.....	12
IV.B.(1). DILUTION TUNNEL SAMPLE SYSTEMS.....	12
V. SAMPLING METHODS	12
V.A. PARTICULATE SAMPLING	13
VI. QUALITY ASSURANCE	13
VI.A. INSTRUMENT CALIBRATION.....	13
VI.A. (1). DRY GAS METERS	13
VI.A.(2). STACK SAMPLE ROTAMETER.....	14
VI.A.(3). GAS ANALYZERS	14
VI.B. TEST METHOD PROCEDURES	14
VI.B.(1). LEAK CHECK PROCEDURES	14
VI.B.(2). TUNNEL VELOCITY/FLOW MEASUREMENT.....	15
VI.B.(3). PM SAMPLING PROPORTIONALITY.....	15
VII. CONCLUSION	15

REVISION SUMMARY

DATE	SUMMARY
August 23-2017	Clarification of cold start emissions for run #3. ". For this run, emission collection started with a cold unit. See raw data in appendix for confirmation." text was added to run #3 description
November 29-2017	Addition of the deviation from standards agreed upon between EPA and SBI as described in Appendix I of the full test report See section II.B(2).

Intertek

Test report #103124842MTL-001 (4 of 15)

Stove Builder International Inc.

Date: 21 July 2017

Project No. G103124842

Page 4 of 15

I. INTRODUCTION

Intertek Testing Services NA (Intertek) has conducted testing for Stove Builder International Inc., on model Series 2.3 – Escape 1800 Wood Burning Room Heater to evaluate all applicable performance requirements included in “Determination of particulate matter emissions from wood heaters.”

I.A PURPOSE OF TEST

The test was conducted to determine if the unit is in compliance 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 6 July 2017 to 13 July 2017. The following test methods were applicable:

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

WK47329-14 - Standard Test Method for Determining Particulate Matter Emissions from Wood Heaters using Cordwood Test Fuel

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

I.B LABORATORY

The tests on the model 2.3 Series Escape 1800 Wood Burning Heater were conducted at the client facility in St-Augustin-de-Desmaures, Quebec located at 250 de Copenhague, St-Augustin-de-Desmaures, Quebec, Canada G3A 2H3. The laboratory elevation is 213 feet above sea level. The test was conducted by Claude Pelland, Eng. and observed by Guillaume Thibodeau-Fortin of Stove Builder International Inc.

I.C DESCRIPTION OF UNIT

The model Series 2.3 – Escape 1800 Wood Fuel Room Heater is constructed of sheet steel. The outer dimensions are 26.75-inches deep, 33.5-inches high, and 25.625-inches wide. The unit has a door located on the front with a viewing glass.

(See product drawings.)

Intertek

Test report #103124842MTL-001 (5 of 15)

Stove Builder International Inc.

Date: 21 July 2017

Project No. G103124842

Page 5 of 15

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.

I.D REPORT ORGANIZATION

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

II. SUMMARY

II.A PRETEST INFORMATION

A sample was submitted to Intertek directly from the client. The sample was not independently selected for testing. The test unit was handed to the Intertek representative at client's facility in St-Augustin-de-Desmaures, Quebec. The unit was inspected upon receipt and found to be in good condition. The unit was set up following the manufacturer's instructions without difficulty.

Following assembly, the unit was placed on the test stand. Prior to beginning the emissions tests, the manufacturer operated the unit for a minimum of 50 hours at high-to-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 21 June 2017 to 28 June 2017. The fuel used for the break-in process was cord wood.

Following the pre-burn break-in process the unit was allowed to cool and ash and residue was removed from the firebox. The unit's chimney system and laboratory dilution tunnels were cleaned using standard wire brush chimney cleaning equipment. On 30 June 2017, the unit was set-up for testing.

II.B INFORMATION LOG

II.B(1) TEST STANDARD

From 6 July 2017 to 13 July 2017, the unit was tested for EPA emissions. For Wood

Intertek

Test report #103124842MTL-001 (6 of 15)

Stove Builder International Inc.

Date: 21 July 2017

Project No. G103124842

Page 6 of 15

stoves, the test was conducted in accordance with WK47329-14 - Standard Test Method for Determining Particulate Matter Emissions from Wood Heaters using Cordwood Test Fuel. The fuel used for the test run was cordwood.

The applicable EPA regulatory limits are:

Step 1 – 2015 – 4.50 grams per hour.

Step 2 – 2020 – 2.50 grams per hour.

II.B(2) Deviation from Standard Method

The following were modified from initial version of the standards utilized for this test program:

Changes to ASTM WK47329-14 are:

- 1- The wood heater must be aged for 50 hours.
- 2- The end of test criteria is defined when the weight scale indicates the remaining weight of the test fuel as 0.0 lbs or less for 30 seconds.
- 3- Section 9.5.1 START-UP CONDITION. The heater surface temperature per 9.2.2 and flue-gas temperature per 9.2.4 at the start of the test run must be less than a 10degF above ambient for the high fire test category.
- 4- Section 9.6.14 invalid test run. The test run shall be considered invalid if less than the full test fuel weight has been consumed and there is no measurable weight loss or 1% of the test fuel weight, whichever is greater for at least 30 minutes.
- 5- Coal bed condition prior to loading test fuel. The coal bed should be at a level plane without valleys or ridges for all test runs in the high fire, low and medium burn rate categories.
- 6- The pre burn cycle burn rate category, leading into a test run, should be the same as the attempted burn rate category of the actual test.

Changes to ASTM E2515-11 must be as followed:

- 1- The filter temperature must be maintained between 80 and 90 Degrees F during testing.
- 2- A glass cyclone must be used between the sampling probe and filter holders when the total particulate catch is expected to exceed 100mg or when water droplets are present in the stack gas. This cyclone and its contents must be included in the pre-test weighting and post-test desiccation and weighing.
- 3- Filters must be weighed in pairs to reduce weighing error propagation.
- 4- Sample filters must be Pall TX-40 or equivalent Teflon coated glass fiber and of 47 mm, 100mm or 110mm.
- 5- Only one point allowed outside the +/- 10% proportionality range per test run.

Intertek

Test report #103124842MTL-001 (7 of 15)

Stove Builder International Inc.

Date: 21 July 2017

Project No. G103124842

Page 7 of 15

II.C SUMMARY OF TEST RESULTS

The appliance tests resulted in the following performance:

Particulate Emissions: 1.54 g/hr

Carbon Monoxide Emissions: 89 g/hr

Heating Efficiency: 69% (Higher Heating Value Basis)

II.D DESCRIPTION OF TEST RUNS

RUN #1 (6 July 2017) Air control set at the targeted burn rate, burn time was 430 minutes with a category medium burn rate of 1.3 kg/hr. Took 1 minute to set the load and let the door ajar for 5 minutes, and then closed. The air control was open for 16 minutes or when 15% of the load weight has been consumed, and then set at the targeted burn rate. The fan energized and set at low speed at 30 minutes.

RUN #2 (7 July 2017) Air control set at the targeted burn rate, burn time was 490 minutes with a category Low burn rate of 1.1 kg/hr. Load within 1 minute let the door ajar for 5 minutes, and then closed. The air control was open for 16 minutes or when 15% of the load weight has been consumed, and then set at the targeted burn rate. The fan was energized and set at low speed at 30 minutes.

RUN #3 (13 July 2017) Air control set fully opened, burn time was 280 minutes with a category High burn rate of 2.6 kg/hr. The door was open for 5 minutes, then closed. The air control was fully opened. Fan was energized and set at full speed. For this run, emission collection started with a cold unit. See raw data in appendix for confirmation.

II.D SUMMARY OF OTHER DATA

TABLE 1. - EMISSIONS

Run Number	Test Date	Burn Rates (kg/hr)(Dry)	Particulate Emission Rate (g/hr)	1 st Hour Emissions (g)	CO Emissions (g/hr)	CO Emissions (g/min)	Heating Efficiency (% HHV)
1	6 July 2017	1.3	0.83	4.79	84	1	67
2	7	1.1	2.10	14.53	116	2	70



Test report #103124842MTL-001 (8 of 15)

Stove Builder International Inc.

Date: 21 July 2017

Project No. G103124842

Page 8 of 15

	July 2017						
3	13 July 2017	2.6	1.85	5.45	47	1	72

TABLE 2. - WEIGHTED AVERAGE CALCULATION

Test No.	Burn Rate	(E) Average Emission Rate g/hr	(CO) Average Emission Rate g/hr	Heat Output (Btu/hr)	HHV	LHV	(K) Weighting Factor	(KxE) g/hr	(KxCO) g/hr	(KxCO) g/min	(KxHHV)	(KxLHV)
2	1.1	2.10	116	14800	70	75	0.4	0.84	46	0.77	28	30
1	1.3	0.83	84	16300	67	72	0.4	0.33	34	0.56	27	29
3	2.6	1.85	47	28600	72	77	0.2	0.37	9	0.16	14	15
Totals:							1	1.54	89	1.49	69	74

TABLE 3. - TEST FACILITY CONDITIONS

Run	Room Temp. °F before	Room Temp °F after	Baro. Pres. In. Hg before	Baro. Pres. In. Hg after	R.H.% before	R.H.% after	Air Vel. Ft/min before	Air Vel. Ft/min after
1	78	82	30.0	29.8	33	50	0	0
2	81	76	29.8	29.7	59	55	0	0
3	73	82	30.1	30.1	47	38	0	0

Intertek

Test report #103124842MTL-001 (9 of 15)

Stove Builder International Inc.

Date: 21 July 2017

Project No. G103124842

Page 9 of 15

TABLE 4. - DILUTION TUNNEL FLOW RATE MEASUREMENTS AND SAMPLING DATA

Run No.	Burn Time (min)	Velocity (ft/sec)	Volumetric Flow Rate (dscf/min)	Ave. Temp. (°R)	Sample Volume (DSCF)		Particulate Catch (mg)	
					1	2	1	2
1	430	21.28	417.92	551	49.323	47.766	1.6	1.6
2	490	17.59	343.51	552	56.595	55.472	5.8	5.6
3	280	21.95	421.54	567	31.014	29.030	2.3	2.1

TABLE 5. - DILUTION TUNNEL DUAL TRAIN PRECISION

Run No.	Sample Ratios		Total Emissions (g)		% Deviation	g/kg Deviation
	Train 1	Train 2	Train 1	Train 2		
1	3643	3762	5.830	6.020	1.60	0.02
2	2974	3034	17.250	16.992	0.75	0.03
3	3806	4066	8.753	8.538	1.24	0.02

TABLE 6. - GENERAL SUMMARY OF RESULTS

Run No.	Burn Rate (kg/hr)(Dry)	Change In Surface Temp (°F)	Initial Draft (in/H ₂ O)	Run Time (min)	Average Draft (in/H ₂ O)
1	1.3	58	0.040	430	0.052
2	1.1	91	0.038	490	0.048
3	2.6	77	0.005	280	0.066

TABLE 7. - CSA B415.1 RESULTS

Burn Rate (kg/hr)(Dry)	CO Emissions (g/hr)	Heating Efficiency (% HHV)	Heating Efficiency (% LHV)	Heat Output (Btu/hr)
High – 2.6	47	72	77	28,600
Medium – 1.3	84	67	72	16,300
Low – 1.1	116	70	75	14,800

Intertek

Test report #103124842MTL-001 (10 of 15)

Stove Builder International Inc.

Date: 21 July 2017

Project No. G103124842

Page 10 of 15

III. PROCESS DESCRIPTION

III.A 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.

III.B AIR SUPPLY SYSTEM

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

III.C TEST FUEL PROPERTIES

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

IV. SAMPLING SYSTEMS

IV.A. SAMPLING LOCATIONS

Particulate samples are collected from the dilution tunnel at point 20 feet from the tunnel entrance. The tunnel has two elbows and two mixing baffles in the system ahead of the sampling section. (See Figure 3.) The sampling section is a continuous 13-foot section of 8-inch diameter pipe straight over its entire length. Tunnel velocity pressure is determined by a type "S" Pitot tube located 100 inches from the beginning of the sampling section. The dry bulb thermocouple is located six inches downstream from the Pitot tube. Tunnel samplers are located 48 inches downstream of the Pitot tube and 36 inches upstream from the end of this section. (See Figure 1.)

Stack gas samples are collected from the steel chimney section 8 feet \pm 6 inches above the scale platform. (See Figure 2.)



Test report #103124842MTL-001 (11 of 15)

Stove Builder International Inc.

Date: 21 July 2017

Project No. G103124842

Page 11 of 15

IV.A.(1)

DILUTION TUNNEL

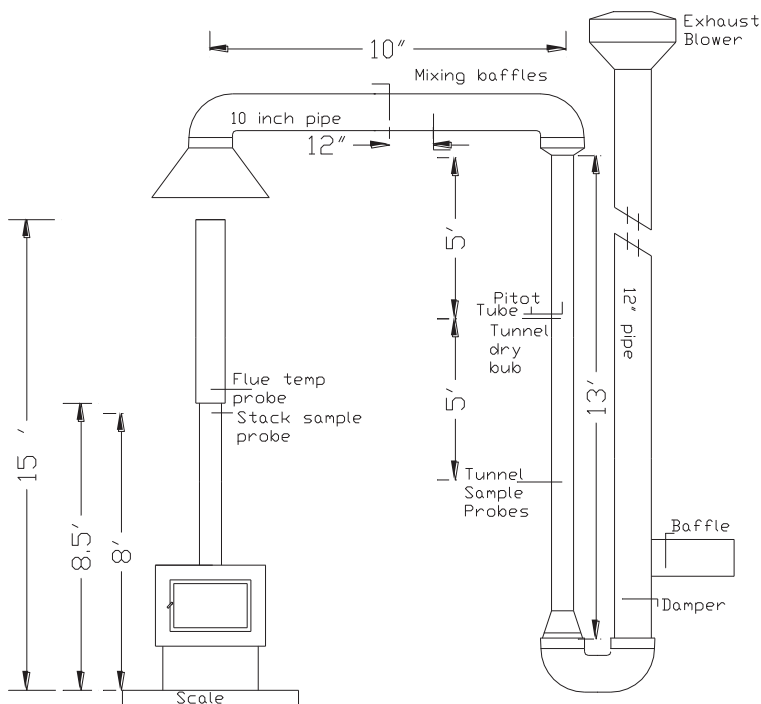


FIGURE 1



Test report #103124842MTL-001 (12 of 15)

Stove Builder International Inc.

Date: 21 July 2017

Project No. G103124842

Page 12 of 15

IV.B. OPERATIONAL DRAWINGS

IV.B.(1). DILUTION TUNNEL SAMPLE SYSTEMS

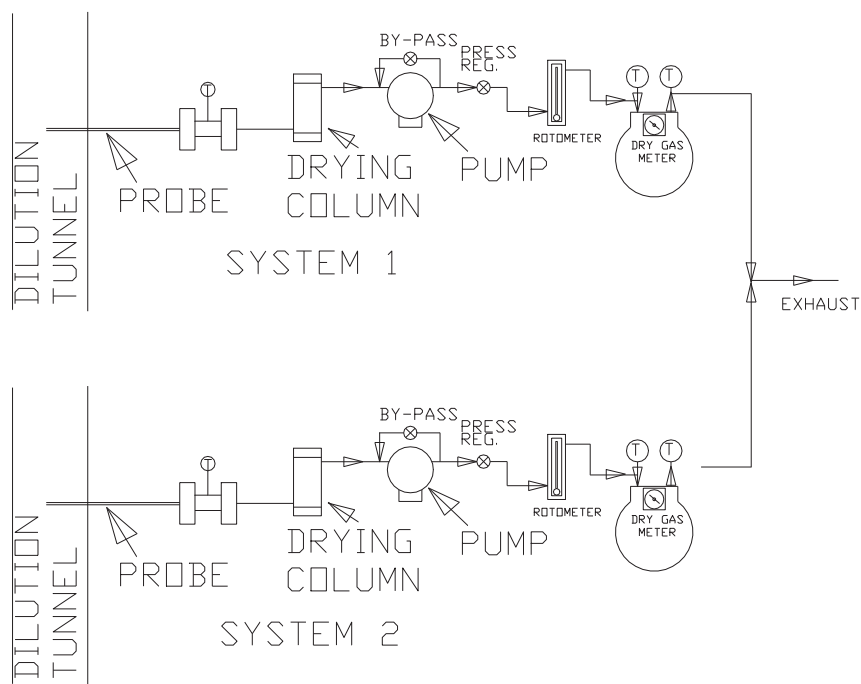


Figure 3



Test report #103124842MTL-001 (13 of 15)

Stove Builder International Inc.

Date: 21 July 2017

Project No. G103124842

Page 13 of 15

V. SAMPLING METHODS

V.A. PARTICULATE SAMPLING

Particulates were sampled in strict accordance with ASTM E2515-2011. This method uses two identical sampling systems with Pall TX-40 binder free, 47-mm diameter filters. The dryers used in the sample systems are filled with "Drierite" before each test run. In order to measure first-hour emissions rates, a third sample systems with filter is used at the first hour into the test run. The two filter sets used for this train are analyzed individually to determine the first hour emissions rate.

VI. QUALITY ASSURANCE

VIA. INSTRUMENT CALIBRATION

VIA. (1). DRY GAS METERS

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

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

The standard dry gas meter is calibrated every 6 months using a Reference Dry Gas Meter. The process involves sampling the train operation for 5 cubic foot of volume. With readings made to .001 ft³, the resolution is .1%, giving an accuracy higher than the ±2% required by the standard.



Test report #103124842MTL-001 (14 of 15)

Stove Builder International Inc.

Date: 21 July 2017

Project No. G103124842

Page 14 of 15

VI.A.(2). *STACK SAMPLE ROTAMETER*

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

VI.A.(3). *GAS ANALYZERS*

The continuous analyzers are zeroed and spanned before each test with appropriate gases. A mid-scale multi-component calibration gas is then analyzed (values are recorded). At the conclusion of a test, the instruments are checked again with zero, span and calibration gases (values are recorded only). The drift in each meter is then calculated and must not exceed 5% of the scale used for the test.

At the conclusion of each unit test program, a three-point calibration check is made. This calibration check must meet accuracy requirements of the applicable standards. Consistent deviations between analyzer readings and calibration gas concentrations are used to correct data before computer processing. Data is also corrected for interferences as prescribed by the instrument manufacturer's instructions.

VI.B. *TEST METHOD PROCEDURES*

VI.B.(1). *LEAK CHECK PROCEDURES*

Before and after each test, each sample train is tested for leaks. Leakage rates are measured and must not exceed 0.02 CFM or 4% of the sampling rate. Leak checks are performed checking the entire sampling train, not just the dry gas meters. Pre-test and post-test leak checks are conducted with a vacuum of 10 inches of mercury. Vacuum is monitored during each test and the highest vacuum reached is then used for the post test vacuum value. If leakage limits are not met, the test run is rejected. During, these tests the vacuum was typically less than 2 inches of mercury. Thus, leakage rates reported are expected to be much higher than actual leakage during the tests.



Test report #103124842MTL-001 (15 of 15)

Stove Builder International Inc.

Date: 21 July 2017

Project No. G103124842

Page 15 of 15

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

The tunnel velocity is calculated from a center point Pitot tube signal multiplied by an adjustment factor. This factor is determined by a traverse of the tunnel as prescribed in EPA Method 1. Final tunnel velocities and flow rates are calculated from EPA Method 2, Equation 6.9 and 6.10. (Tunnel cross sectional area is the average from both lines of traverse.)

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

VI.B.(3). PM SAMPLING PROPORTIONALITY

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

VII. CONCLUSION

This test demonstrates that this unit is an affected facility under the definition given in the regulation. The emission rate of 1.54 g/hr meets the EPA requirements for the Step 2 limits.

Model Series 2.3 – Escape 1800 therefore qualifies as mentioned above.

INTERTEK TESTING SERVICES NA

Evaluated by:



Claude Pelland, Eng.
Project Engineer – B&C

Reviewed by:

Brian Ziegler
Chief Engineer - Hearth

Intertek

COMPONENTS

ETL Mark Minimum Labeling Requirements (new Intertek Mark)

MINIMUM MARKING REQUIREMENTS FOR PRODUCTS BEARING THE ETL MARK

The ETL Listing Mark consists of the following four items:

1. The ETL Certification Mark with "US" and/or "C" as identifiers. The letter "C" adjacent and to the lower left side of the ETL Certification Mark indicates that the product complies with a Canadian standard. The letters "US" adjacent and to the lower right side of the ETL Certification Mark indicates that the product complies with a US standard. The required minimum size of the identifiers is 2 mm.
2. The word, "Listed" or "Classified" or "Recognized Component" (whichever is appropriate). The word, "Listed" is to be incorporated into the ETL Certification Mark. If upon reduction, the word "listed" is not legible as part of the trademark, it shall also appear separately.
3. The Control Number issued by Intertek Testing Services. This five to eleven digit number is unique to the manufacturing site for each applicant.
4. A standard description, which refers to the national standard used for certification shall be used.
Example:
 - For US standards, the words, "Conforms to" shall appear with the standard number along with the word, "Standard" or "Std." Example: "Conforms to ANSI/UL Std. XX."
 - For Canadian standards, the words "Certified to CAN/CGA Standard CXX No. XX", shall be used, or abbreviated, "Cert. to CAN/CSA Std CXX No. XX".
 - If the manufacturer wishes, they may use the standard title, example "Telephone Equipment."

Nothing selected
Nothing selected

Listing Report General Information

LISTING REPORT GENERAL INFORMATION

The Applicant have agreed to produce, test and label Intertek Listed products in accordance with the requirements of this Report. The Applicant has also agreed to notify Intertek and request authorization prior to using alternate parts, components or materials.

INSTRUCTIONS FOR USE

- One copy of this Report is submitted to the Applicant and used by the Intertek Field Representative for Follow-up Service Inspections; and
- One copy is retained in files at the Intertek Regional Certification Center.

The Applicant is to use this Report as a guide for the operation of the certification program, and will

manufacture the Listed product(s) in accordance with the specifications information stated herein.

The Intertek Field Representative shall determine that the product is manufactured in accordance with this Report and that certification procedures are followed.

In the case where a discrepancy exists between the product and this Report, this Report will be considered correct, and therefore the Applicant has the responsibility for making the necessary corrections so that the product will meet the specifications stated herein.

COMPONENTS

Components used shall be those itemized in this Intertek Report covering the product, including any amendments and/or revisions.

CERTIFICATION MARK

The Intertek Certification Mark applied to the products shall either be separable in form, such as labels purchased from Intertek, or on a product nameplate or other media only as specifically authorized by Intertek. Use of the Intertek Certification Mark is subject to the control of Intertek.

MANUFACTURING AND PRODUCTION TESTS

Manufacturing and Production Tests shall be performed as required in this Report.

FOLLOW-UP SERVICE

Periodic unannounced Follow-up Service Inspections of the manufacturing facility shall be conducted by Intertek. A Follow-up Service Inspection Report shall be issued after each visit. Special attention will be given to the following:

1. Conformance of the manufactured product to the descriptions in this Report.
2. Conformance of the use of the Intertek Certification Mark with the requirements of this Report and the Intertek Certification Agreement.
3. In-plant quality control procedures and personnel.
4. Manufacturing processes and changes.
5. Performance of specified manufacturing and production tests.

In the event that the Intertek Field Representative identifies variance(s) to any provision of this Report, the Applicant shall take one or more of the following actions:

1. Correct the non-conformance.
2. Remove the Intertek Certification Mark from non-conforming product.
3. Contact the Intertek office that issued this Report for additional instructions.

GENERAL REQUIREMENTS AND DEFINITIONS

Accepted - Accepted by Intertek. All inquiries regarding change to Listed products must be presented to Intertek in writing for consideration and acceptance.

Authorized - Authorized by Intertek. All inquiries regarding change to Listed products must be presented to Intertek in writing for consideration and approval.

C.S.A. - Canadian Standards Association.

Certified - Equipment or material included in a list published by a nationally recognized certification agency that conducts periodic inspections of production of Listed equipment or materials and whose listing stated either that the equipment or material meets recognized standards or has been tested and found suitable for use in a specified manner.

Construction Details - For specific construction details, reference should be made to the following photographs and descriptions. All dimensions are approximate unless specified as exact or within a tolerance. In addition to the specific construction details described in this Report, the following general requirements may also apply as applicable.

Discrepancy - A difference between this Report and a product described in this Report. This will result in the filing of a Variance Report on which a management level decision for the corrective action will be based.

Installation, Operating and Safety Instructions - Instructions for installation and use of this product are provided by the Manufacturer as required by the standard.

Listed - Equipment or materials included in a list published by a nationally recognized certification agency that conducts periodic inspections of production of listed equipment or materials, and whose listing states either that the equipment or materials meets nationally recognized standards, or has been tested and found suitable for use in a specified manner.

Listed Component - Identifies any product covered under the Listing or Certification service of an NRTL (US) or a CO (Canada).

Markings - The Intertek Certification Mark shall be visible after installation. Other markings may be required as identified in this Report. If evaluated to a Canadian standard, the products may be required to have markings in both French and English. If so, it is the responsibility of the Applicant to determine any such requirement and provide bilingual markings, where applicable, in accordance with the Provincial Regulatory Authorities.

N.F.P.A. - National Fire Protection Association.

Production Test Requirements - When applicable, the Manufacturer shall have the necessary test facilities to carry out production tests on the Listed product.

Products - The product as described under "Authorization to Mark" is eligible to carry the Intertek Certification Mark.

Recognized Component - Identifies any component, part or sub-assembly, covered under the recognition service of an NRTL (US) or a CO (Canada), and intended for use in Intertek Listed, Intertek Classified, or Intertek Recognized products.

Records - Records of the use of the Intertek Certification Mark must be maintained by the Applicant and must be available for review during normal business hours.

Shipping - As practically as possible, each Listed product is to be shipped completely assembled and incorporate the necessary safety and installation instructions.

Standards - The Manufacturer shall have in his possession all the current standards/specifications for the Listed product.

U.L. - Underwriters Laboratories Inc.

ULC - Underwriters' Laboratories of Canada.

Unlisted Component – Because unlisted components are uncontrolled, and they do not fall under a third party follow up program, ITS may require these components to be tested and/or evaluated at least once annually, more often for certain components, as part of the independent certification process.

Use of Mark - The Components containing the Intertek Certification Mark (i.e. ink stamps, labels) must be kept in a secure area, preferably locked and must not leave the designated manufacturing plant(s) location(s) unless authorized by Intertek. Records on the use of the mark are to be maintained up-to-date. The Intertek Certification Mark and associated product identification must be clearly visible and legible when applied to the finished product. Products to be marked must have successfully passed the production tests and scrutiny of the quality control personnel, determining that the product complies with the specifications stated in this Report. Failure to comply with procedures constitutes ground for withdrawal of Intertek authorization to use the Intertek Certification Mark.

Ordering Labels - It is the responsibility of the Applicant to ensure that an adequate stock of labels is maintained. Label quantities in stock are indicated on all packing slips issued by Intertek.

Modification Procedure - Intertek may approve modifications of a product based on an additional evaluation or tests. Fees are charged for this service. If modifications are desired, such as substituting a different material, changing the cosmetic appearance, changing the rating, altering a component to simplify the manufacturing or improve the product, or any other change, the following procedure must be followed:

1. Write the Intertek office that issued this Report requesting an evaluation of the modification required. Include a clear description and detailed drawings if required showing exactly what is involved, and state your reason for wanting to make the modifications.
2. Wait until written authorization is received from Intertek complete with additional or revised pages to be inserted into your Report. Only after written authorization is received may the Applicant proceed with the modification.

INITIAL FACTORY AUDIT

Purpose - The purpose of this audit is to ensure the following:

1. The Plant Manager, Foreman and Quality Control Personnel are familiar with this Report.
2. The Plant Quality Control Program will assure that the product is manufactured to the requirements in this Report.
3. Key personnel are familiar with and recognize the need for Follow-up Service Inspections as

well as proper handling of the Intertek Certification Mark and the use of log sheets, where applicable.

4. The duties of the Controller of the Intertek Certification Mark are properly understood.

Equipment or Supplies Needed

1. Applicable Specifications.
2. Applicable Standards.
3. Supply of log sheets where applicable.
4. Intertek Certification Mark Controller instruction sheet with sample log sheet.
5. Supply of open stock/custom labels or stamp, etc.

Initial Factory Audit Procedures - The initial inspection (pre-arranged with date and time agreeable to both the Applicant and the Intertek Field Representative) will consist of an initial meeting with the Plant Manager, Plant Foreman, Quality Control Manager and other key personnel. The initial meeting will cover a complete review of the Report and production facilities.

INTERTEK FOLLOW-UP SERVICE INSPECTIONS

The Intertek Field Representative shall determine that the product is manufactured in accordance with this Report, and that label procedures are followed.

Label Control - Record serial numbers of labels if applicable, in the plant. Inspect label log sheets. The following information should be recorded in the label log sheets by the manufacturer:

1. Label numbers, date labeled or shipped, product labeled, and destination.
2. Labels removed from, returned, freight damage, or rejected products should be picked up.

Examination of Product - At each Follow-up Service Inspection the Intertek Field Representative shall determine that the product which is intended to bear the Intertek Certification Mark is manufactured in accordance with the specified standards as per the test program and stated herein. The Intertek Field Representative shall pay special attention to the following:

1. Materials used must be free from defects that could affect the performance of the product.
2. Suitable protective packaging.
3. Complete safety and installation instructions are supplied with each product. No modification to these instructions shall be made without Intertek authorization.

Examination of Applicant's Inspection Programs - At each Follow-up Service Inspection, the Intertek Field Representative shall determine that the Applicant's methods of inspection conform to the specifications included in the quality control procedures. The Intertek Field Representative will pay attention to:

1. The Applicant's quality control report is complete and conforms to the procedure accepted by Intertek and included in this Report.
2. The equipment used for inspection conforms to the specification in the quality control procedure. The work area is suitable for a good quality control program.
3. Regular manufacturing production line tests are carried out by the Applicant.

Discrepancies - The Intertek Field Representative shall complete his Follow-up Service Inspection sheet detailing the discrepancy and issue a Variance Report. A signature on the Intertek Field Representative's copy shall be obtained from the Applicant's representative, giving evidence that they were issued a copy. Copies shall be forwarded to the Intertek Regional Certification Office.

The Intertek Field Representative shall require that the Applicant remove the Intertek Certification Mark from all products which do not meet the conformance requirements of this Report, and advise the Applicant not to use the Intertek Certification Mark until further advised.

In the case of minor cosmetic changes the Intertek Field Representative will note the variance on his Follow-up Services Inspection Report and determine the action to be taken by the Applicant. Actions may be to have the Applicant apply to Intertek for an evaluation of the variance and if approved, the subsequent modification of this Report, or to have the Applicant agree to correct the variance on all affected units.

On subsequent routine Follow-up Service Inspections, the Intertek Field Representative will pay special attention to any variances listed in previous Follow-up Inspection Reports. If it is found that a variance has not been corrected as agreed to by the Applicant, the Intertek Field Representative will contact Intertek Regional Certification Center for appropriate instructions. In extreme cases, service could be immediately suspended.

In the case of a difference existing between this Report and the product that could result in a safety hazard, the Intertek Field Representative will fill out a Variance Report. The determination of what constitutes a variance is left to the discretion of the Intertek Field Representative, but any modification or change that could affect the operating characteristics of a product must be reported. The action taken by Intertek will be:

1. Removal of all labels or the Intertek Certification Mark or halting the shipping of the affected product until the Applicant corrects the variance, or has an evaluation carried out by Intertek, the modification approved, and this Report updated.
2. For units already shipped, procedures must be taken per Intertek SOP 7.14.2.

February 15th, 2018

Letter Report No. 103124842MTL-001
Project No. G103124842

Guillaume Thibodeau- Fortin
Stove Builders International Inc.
250 Rue de Copenhagen
St-Augustin-de-Desmaures QC G3A 2H3

Ph: 418-878-3040

[email:gthibodeaufortin@sbi-international.com](mailto:gthibodeaufortin@sbi-international.com)

Subject: Comparative evaluation of the Escape 1800 Stove, Escape 1800-I insert, 2000 Stove, 2000-I Insert, Harmony 2.3 Stove, Solution 2.3 Stove, Solution 2.3-I Insert, XTD 1.9 Stove, XTD 1.9-I Insert, CW2900 Insert, Destination 2.3-I Insert, HEI 240 Insert, HEI 240R Insert, Matrix-I Insert with the previously recognized Escape 1800 Stove wood burning Stove.

Dear Mr. Thibodeau- Fortin,

This letter represents the results of an evaluation on free standing and insert stove models listed in object when compared to the previously Escape 1800 Stove as mentioned in appendix.

The Models listed in subject are either inserts or stove models manufactured based on the construction of the Escape 1800. The combustion room of all the mentioned units are identical so is their combustion air intake.

The variations are esthetical only and they are as follows:

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

This investigation was authorized by SBI in December 2017. Drawings were received on December 15th, 2017 at the Intertek Lachine facility.

The Models mentioned in Subject shares similar features and are designed after an EPA certified wood burning stove Model Escape 1800.



Design drawings were evaluated to determine similarities between the above mentioned models. Drawings show internal fire box size to be the same at 16 1/2" deep, 11 1/8" high (from brick to higher tube) and 21" wide. All appliances share a 6" flue collar and have the same primary air intake controls.

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.

In conclusion, all models evaluated respect the components of the k-list as per U.S. Environmental Protection Agency 40 CFR Part 60 Standards of Performance for New Residential Wood Heaters; Final Rule, SECTION 60.533(k). Changes made are only aesthetical and do not alter particulate emission limit.

This letter report completes our evaluation of the various models described. If there are any questions regarding the results contained in this report, or any of the other services offered by Intertek, please do not hesitate to contact the undersigned.

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

Completed by:	Jacques St.Denis	Reviewed by:	Claude Pelland, Eng.
Title:	B&C Department Manager	Title:	B&C Project Engineer
Signature:		Signature	



Fabricant de poêles international inc.
Stove Builder International Inc.

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

February 14th, 2018

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: Rafael Sanchez

RE: Additional model for the certificate # 101-17

Dear Mr. Sanchez,

Under the U.S. Environmental Protection Agency 40 CFR Part 60 Standards of Performance for New Residential Wood Heaters; Final Rule, SECTION 60.533(k), Stove Builder International Inc. is asking for a waiver for the addition of models to the current certification of the appliances listed on the certificate # 101-17.

These modifications should be reflected on the EPA Directory (List of certified units on EPA's website).

Several new models, which are listed below, have been designed based on an existing model, the Escape 1800 stove that appears on the certificate #101-17. Please waive the certification of these models:

1. Escape 1800 Stove (base use for certification),
2. Escape 1800-I insert,
3. 2000 Stove,
4. 2000-I Insert,
5. Harmony 2.3 Stove,
6. Solution 2.3 Stove,
7. Solution 2.3-I Insert,
8. XTD 1.9 Stove,
9. XTD 1.9-I Insert
10. CW2900 Insert,
11. Destination 2.3-I Insert,
12. HEI 240 Insert,
13. HEI 240R Insert,
14. Matrix-I Insert,

The changes will not affect the particulate matter emissions. The main design variations between the new models and the Escape 1800 are:



Fabricant de poêles international inc.
Stove Builder International Inc.

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

Loading doors

- The main change is the shape of the cast iron door and their dimensions.
- The door sealing is the same
- The door handle can be at the left or right side.

Façade

- Some aesthetical component of the façade of the stove differs such as the shape of ash shelf, ash pan, decorative add-on faceplate.
- Material is the same

Decorative side panel

- Thickness of the outer side panel varies
- Some models have aesthetical holes on the side panels
- Material is the same

Pedestal and legs

- Pedestals differ in height and shapes
- Legs differ in height and shapes
- The material is cast iron for legs and steel sheet plate for pedestal

Everything else remained the same such as: firebox dimensions, position and construction of the secondary air tubes, air inlets and outlets cross sectional area, sealings, flue dimension and location, baffles, primary air outlet, pilot air outlet. Therefore, these modifications to the original solid fuel stove do not alter EPA approved emission rates applicable to the certificate #101-17.

Attached with this e-mail are drawings of each models mentioned above with modifications highlighted to better show in details what changed. Also, a copy of the actual certificate is attached.

Should you need additional documents, please let us know.

Sincerely,

Guillaume Thibodeau-Fortin, Eng.

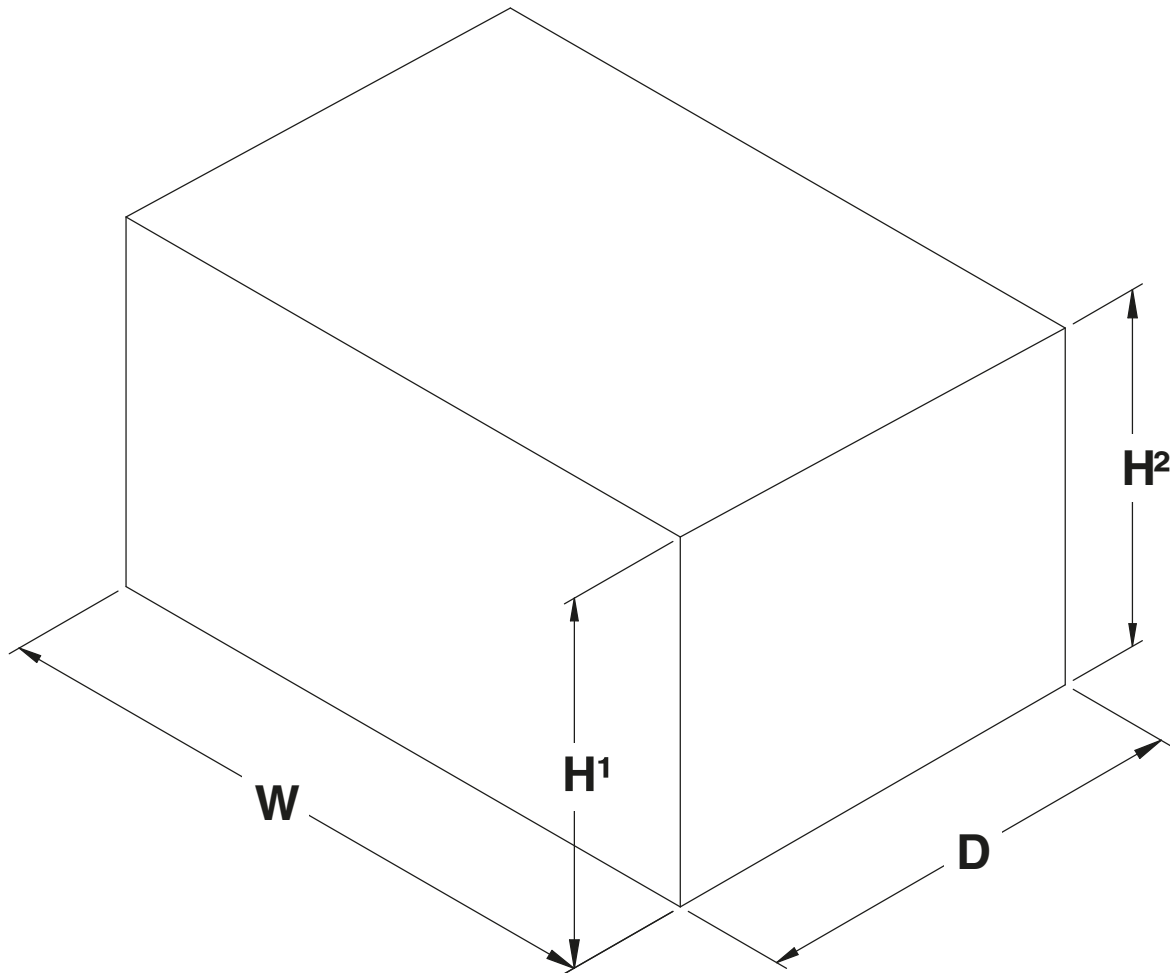
Mechanical Engineer

Stove Builder International

Firebox Volume For Stove

Series: 2.3

Model: Escape 1800, Escape 1800-I Insert, 2000 Stove, 2000-I Insert, Harmony 2.3 Stove, Solution 2.3 Stove, Solution 2.3-I Insert, XTD 1.9 Stove, XTD 1.9-I Insert, CW2900 Insert, Destination 2.3-I Insert, HEI 240 Insert, HEI 240R Insert, Archway 2300, FW2900, FW2900-SD, Gateway 2300, Inspire 2000, Inspire 2000-I, Inspire 2000-IWB, Matrix, Matrix-I, Destination 2.3 and Green Mountain Insert 70 Insert



W: 21.0 in **D:** 14.5 in **H¹:** 11.8 in

H²: 11.3 in

Volume: 3515 in³

Volume: 2.03 ft³