TEST REPORT

TEST OF A NON-CATALYTIC WOOD BURNING STOVE FOR EMISSIONS AND EFFICIENCY

PER EPA METHODS ALT-125, ASTM E2515, ASTM E3053 and CSA B415.1,

Client:
ICC Industrial Chimney Company
400 Rue John F. Kennedy,
St-Jérôme
Qc, J7Y 4B7

Model Name: FF-JLAB 047

Attention: Rafael Sanchez

TESTED BY:
Services Polytests inc.
695-B Gaudette
St-jean-sur-Richelieu, QC, J3B 7S7

TEST DATES: January 15th and 16th 2020
REPORT DATE: January 21st 2020
Project number: PI-20219

Tested:

Maxime Martin

written by:

Danick Power, P. Eng

Verified by third party certifier UL:

SUMMARY

List of Appendix

1 INTRODUCTION

1.1 GENERAL

Laboratory

- Location: Services Polytests Inc., 695-B Gaudette St-jean-sur-Richelieu QC, Canada J3B 7S7
- Elevation: 100 feet above sea level

Test program

- Purpose: unit qualification NSPS 2020 cord wood
- Test dates: January 15th and 16th 2020
- Test methods used:
  - Particulate emissions: ASTM E3053-17; ASTM E2515-11 methods ALT-125 as referred into 40 CFR Part 60 Subpart AAA
  - Efficiency: CSA B415.1-10

1.2 TEST UNIT INFORMATION

General

- Manufacturer: ICC Industrial Chimney Company
- Product type: wood heater,
- Combustion system: non-catalytic
- Unit tested: FF-JLAB047 stove (marketing name: Focus 3600s)
- Similar models: Pearl 3600 (Perle 3600 in French), Focus 3600, Focus 3600i and Focus 3600s

Particularities

- Optional Blower

The FF-JLAB047 (development name) is a non-catalytic system composed of a common firebox and combustion system that is the basis for: two zero-clearance built-in models (not free standing), one free-standing stove and one insert. The only difference between the four models is the dressing around the firebox, anything related to the combustion is identical.

For the two zero-clearance built-in models, which are not free standing, the firebox is thus enclosed in a double insulated casing. Each facing has openings for the lower and the upper louvers to allow the convection heat to circulate around the firebox and into the room. These units will require 6" diameter Excel insulated chimney manufactured by Industrial Chimney Company (ICC).

For the free-standing stove model, the firebox is enclosed in a decorative steel casing offering openings located around the door frame. These openings allow convective heat to circulate around the firebox and into the room

in addition to the radiant heat generated. This unit will require 6" diameter single or double wall black pipe to connect the stove to a 6" diameter UL-103HT and/or ULC-S629 listed chimney.

For the insert model, the firebox is enclosed in a minimalist steel casing along with a surround. Openings around the door frame allow convection heat to circulate around the firebox and enter the room. This unit is to be installed in a masonry fireplace. It has a 6" diameter flue outlet and must be installed in accordance with the appropriate American or Canadian regulations.

The firebox is made of regular low carbon steel. The combustion chamber is almost all lined with refractory cement bricks. The baffle that closes the top of the combustion chamber is made of a ceramic fiber panel.

The unit uses primary, secondary and tertiary air for combustion. They all share the same main inlet which may be connected to the outside. Outside air can be connected in various fashions depending on the particular model but none of those connections are restrictive in any way. The primary air intake is located at the bottom on both sides of the unit with its control handle located either below or above the glass door towards the right. The primary air control handle allows the homeowner to decide the basic burn rate: anything from the minimum to the maximum.

The secondary air intake is at the bottom of the back of the firebox. Air is fed to an opening into the secondary air boxes on each side. These boxes feed all four secondary air tubes that are located just below the firebox baffle. The secondary air is not user controlled.

The tertiary air intake is below the front of the firebox. It fuels the coal bed directly with fresh air. There is no user control for the tertiary air.

All four models have a glass door that uses ceramic glass.

All four models will be marketed as part of the RSF line under the following names:

- "Pearl 3600" ("Perle 3600" in French): zero-clearance built-in stove with a fancy decorative facing and an arched door.
- "Focus 3600": zero-clearance built-in stove with a simple facing and a rectangular door.
- "Focus 3600i": insert with a simple facing and a rectangular door.
- "Focus 3600s": free-standing stove with a decorative casing and a rectangular door.

Various options will be available to increase the efficiency and help with the heat distribution:

- Gravity Vent Option: option to install one or two naturally drafting insulated ducts, that must be installed above the unit (max. 15' long). Permitted only on the "Pearl 3600" and the "Focus 3600".
- Internal Fan Option: installed inside the casing of the unit just below or behind the firebox. The internal fan increases heat circulation around the firebox without any additional ducting.
- Heat Dump Option: small inline fan that can redirect heat downwards or upwards through insulated ducting (max. 8' long). Permitted only on the "Pearl 3600" and the "Focus 3600".

The unit that was used to conduct all tests was a free-standing stove with a rectangular door. The optional internal fan was installed. A complete test series was executed with the fan running.

1.3 RESULTS

Emission results obtained

- Weighted Average Emissions Rate: 1.49 g/hr
- Weighted Average Overall Efficiency: 73.8 %

Conformity: NSPS Phase 2020, cord wood test method ALT-125

1.4 PRETEST INFORMATION

Unit condition: The unit was received by carrier during November 2019 in good condition. The 50hrs of aging was done by the manufacturer as screening tests.

Set up

- Venting system type: 6 inches diameter inch steel pipe and insulated chimney
- System height from floor: 15 feet
- Particularities: The unit was tested with an optional fan installed (Revcor DC3-C1086-4G96-MTL) and turned ON as per the test procedure. See Appendix 6 for fan details.

2 SUMMARY OF TEST RESULTS

2.1 MODEL IDENTIFICATION

Model name number	FF-JLAB047
Manufacturer	ICC Industrial Chimney Company
address	400 Rue John F. Kennedy, St-Jérôme Qc, J7Y 4B7
appliance category	Built-in stove, Stove, Insert
Usable Firebox Volume – ft3	1,57
Catalytic/Non-Cat	Non-Cat
convection air fan (no, standard, Optional)	OPTION

2.2 LABORATORY INFORMATION

Testing laboratory	Polytests Services
address	695-B Gaudette, St-jean-sur-richelieu
ISO/ Accreditation info	17025
Dates tested	January 15th & 16th 2020
Test Methods / Standard	ALT-125
Dilution Tunnel Inside diameter – in	8
Filter diameter	47

Filter material	PTFE Pall

2.3 TEST CONDITION SUMMARY

Model Name(s) / number(s)	FF-JLAB047		
Usable firebox Volume-ft3	1,57		
Convection Air Fan (No, Standard, Optional)	OPTION		
Test runs #	1.1	1.2	2.1
Date tested	January 15th 2020	January 15th 2020	January 16th 2020
test run category (L, M, H)	H	L	M
average barometric pressure – in Hg	29,97	29,97	29,74
Max observe Ambient temp. °F	75,07	76,88	76,11
Min observe Ambient Temp °F	67,44	73,57	72,02
Max observe Filter temp °F	90,06	88,82	89,96
Run air settings			
Primary (measured up from minimum)	full open	minimum setting	medium setting
Secondary (measured up from minimum)	fix	fix	fix
Convection air setting	ON	ON	ON
Test fuel load			
Cordwood fuel species	Oak	Oak	Oak
specific Gravity (from Table 1)	0,66	0,66	0,66
Higher heating value - Btu/lb (from Annex A1)	8690	8690	8690
Nom. Test fuel piece length - in	12 & 16	12 & 16	12 & 16
Number of test fuel pieces	6	6	6
Test fuel Weight			
Kindling - as fired lb.	2,98	NA	NA
Kindling Wt. - as % of test fuel load	19,0%	NA	NA
Kindling Moisture % Db	9,0	NA	NA
Kindling Kg DB	1,24	NA	NA
SU Fuel Wt- as fired lb	4,65	NA	NA
SU Fuel wt. - as % of test fuel load	29,7%	NA	NA
SU Fuel moisture - % DB	20,0	NA	NA
SU fuel- Kg DB	1,76	NA	NA
Test Fuel Load - As Fired lb	15,66	17,94	18,28
Ave. Test Fuel Load MC % DB	20,78	22,46	21,77
Test Fuel Load - kg DB	5,88	6,64	6,81
Test fuel Loading density lb./ft3	9,97	11,42	11,64
Residual SU fuel wt. - as fired lb.	2,8	NA	NA

Residual SU fuel wt.- as % of test fuel load	17,9%	NA	NA
Test run duration - minutes	142	437	359
Test run duration - h	2,37	7,28	5,98
Test fuel load wt at the end of the test - as fired lb	1,5	0	0
total fuel burned kg Db	6,93	6,64	6,81
% test fuel load wt at end of the test	9,6%	0,0%	0,0%

2.4 TEST RUN RESULTS SUMMARY

Model name / number	FF-JLAB047		
Usable Firebox volume	1,57		
Convection air Fan (no, Standard, option)	OPTION		
Test runs nu.	1.1	1.2	2.1
Date tested	January 15th 2020	January 15th 2020	January 16th 2020
Test run category	H	L	M
Burn rate - Kg/hr DB	3,06	0,91	1,14
Burn rate as % of low to high Midpoint	NA	29,8%	57,6%
Burn duration - h	2,37	7,28	6
Heat output btu/hr	44 135	13 138	15 987
Average Dilution Tunnel Flow Rate - dscfm	352,5	362,3	356,5
Average Sample Flow Rates - dscfm			
Train 1	0,1739	0,1704	0,1739
train 2	0,1617	0,1560	0,1604
Total PM Emissions - g			
Train 1 g	8,16	11,37	2,67
train 2 g	8,35	11,06	2,67
Average	8,25	11,22	2,67
PM emission train precision %	1,16%	1,40%	0,04%
PM emission g/kg	1,19	1,69	0,39
PM emission rate g/h	3,49	1,54	0,45
Total Co Emission g	105,0	495,0	607,6
Co emission Rate g/h	63,0	68,0	101,6
1st hour emission rate g/h	7,5	10,6	1,6
Overall Efficiency - CSA B415,1			
% HHV Basis	72,51%	75,09%	73,23%
% LHV Basis	78,02%	80,80%	78,80%

2.5 WEIGHTED AVERAGE SUMMARY

Model name / number	FF-JLAB 047		
Usable Firebox volume	1,57		
Convection air Fan (no, Standard, option)	OPTION		
average for each test run category	L	M	H
burn rate kg/h DB	0,91	1,14	3,06
PM Emission rate - g/h	1,54	0,45	3,49
Co emission rate - g/h	67,96	101,56	62,97
Overall Efficiency - CSA B 415,1			
% HHV Basis	75,1%	73,2%	72,5%
% LHV Basis	80,8%	78,8%	78,0%
Heat output - Btu/hr	13138	15987	44135
Category weighting	0,4	0,4	0,2

2.6 WEIGHTED AVERAGE FINAL RESULTS

ASTM E 3053 Weighted averages			
PM Emission Rate - g/h	1,49		
CO Emission Rate g/h	80,4		
Overall Efficiency - CSA B415,1			
% HHV Basis	73,83%		
% LHV Basis	79,44%		
Heat output range - Btu/h	13 138	to	44135
Co Arithmetic average g/min	1,29		

2.7 TEST FACILITY CONDITIONS

Run Number	*Room Temperature*		*Barometric pressure*		*Relative humidity*		*Air Velocity*	
	Before	*After*	*Before*	*After*	*Before*	*After*	*Before*	*After*
	(F)	*(F)*	*(in.Hg)*	*(in.Hg)*	*(%)*	*(%)*	*(ft/min)*	*(ft/min)*
1.1	74	75	29,97	29,97	27,9	23,9	0	0
1.2	74	75	29,97	29,97	27,9	23,9	0	0
2.1	74	75	29,71	29,77	25,3	28,1	0	0

2.8 DILUTION TUNNEL FLOW RATE MEASUREMENTS AND SAMPLING DATA (ASTM E2515)

Average dilution tunnel measurements				*Sample Data*			
Run Number/ test category	*Burn Rate (Min)*	*Volumetric Flow Rate (dscf/min)*	*Total Temperatures (°R)*	*Volume sampled (DSCF)*		*Particulate catch (mg)*	
				1	*2*	*1*	*2*
high Fire test	142	352,50	559,59	24,690	22,956	4,10	3,90
Low fire test	437	362,32	546,60	74,461	68,172	5,50	4,90
medium fire test	359	356,51	544,72	62,419	57,570	1,30	1,20

2.9 DILUTION TUNNEL DUAL TRAIN PRECISION

Run Number / test category	*Sample Ratio*		*Total Emission (g)*		
	Train 1	*Train 2*	*Train 1*	*Train 2*	*% Deviation*
high Fire test	2027,35	2180,50	8,16	8,35	1,16%
Low fire test	2126,41	2322,58	11,37	11,06	1,40%
medium fire test	2050,45	2223,17	2,67	2,67	0,04%

3 PROCESS DESCRIPTION

3.1 DISCUSSION

The wood heater has been received in a good shape by the customer in January 2020. Maximum burn rate has been done on January 15th 2020 followed by a minimum burn rate. On January 16th 2020 the medium burn rate has been done.

3.2 UNIT DIMENSIONS

Baffle

- Location: between top of combustion chamber and hearth
- Restriction: 1 5/8 X 16 5/8 inches at the front of unit
- Dimensions: covers the hearth area minus the restriction at front
- Material: Ceramic Fiber Panel, 5/8 inch thick
- Refer to Appendix 6 for all details

Bricks

- Inside firebox refractory brick 1¼ inch. thick cover all the sides, bottom and the back of the combustion chamber
- Refer to Appendix 6 for details

Flue gas exhaust

- Location: Top
- Dimensions: 6 in. diameter
- Material: Stainless Steel
- Refer to Appendix 6 for details

Gasket

- Refer to Appendix 6 for all details

Overall unit dimension

- Firebox dimensions: 19 ¾ at front and 15 ¾ at back wide x 13 3/16 in. deep x 11 3/8 in. high
- Usable volume: 1.57 cuft.
- Refer to Appendix 6 and 12 for details

Convection fan

- Refer to Appendix 6 for details

Catalyst

- None

3.3 AIR SUPPLY SYSTEM

Description

The unit uses primary, secondary and tertiary air for combustion. They all share the same main inlet which may be connected to the outside. Outside air can be connected in various fashions depending on the particular model but none of those connections are restrictive in any way.

The primary air intake is located at the bottom on both sides of the unit with its control handle located either below or above the glass door towards the right. The primary air control handle allows the homeowner to decide the basic burn rate: anything from the minimum to the maximum. All details of the primary air control are provided in Appendix 6.

The secondary air intake is at the bottom of the back of the firebox. Air is fed to an opening into the secondary air boxes on each side. These boxes feed all four secondary air tubes that are located just below the firebox baffle. The secondary air is not user controlled.

The tertiary air intake is below the front of the firebox. It fuels the coal bed directly with fresh air. There is no user control for the tertiary air.

Characterization

The following table shows the inlet and outlet sections of each system. The air flow system is described in detail in Appendix 14 and throughout drawings in Appendix 6.

AIR INTRODUCTION SYSTEM		INLET (1) sq. in.			OUTLET
Identification	Type	Imin	Imax	Controlled	(sq. in.)
Appendix 14 SH	Shared Inlet	Refer to Appendix 14	Refer to Appendix 14	No	Refer to Appendix 14
Appendix 14 PA	Primary Air	Refer to Appendix 14	Refer to Appendix 14	Yes, manually	Refer to Appendix 14
Appendix 14 SA	Secondary Air	Refer to Appendix 14	Refer to Appendix 14	No	Refer to Appendix 14
Appendix 14 TA	Tertiary Air	Refer to Appendix 14	Refer to Appendix 14	No	Refer to Appendix 14

* This section would be filled by measuring and comparing with the manufacturer's drawings included in the test report.

Legend
Identification: Tag name referred to on drawings in Appendix 14, section airflow pattern
Type: Characterization of air intake

Imin: Minimum air intake of a particular air channel
Imax: Maximum air intake of a particular air channel
Controlled: Determines if a provision for air control is present
Outlet: Total air outlet of a particular air channel

3.4 OPERATION DURING TEST

Run #1.1
This run was performed on January 15th 2020. It lasted 142 minutes and a maximum burn rate was obtained at 3.06 kg/hr & emission at 3.5 gr/hr. The air inlet damper was at the maximum setting.

Run #1.2
This run was performed on January 15th 2020. It lasted 437 minutes and a medium burn rate was obtained at 0.912 kg/hr & emission at 1.54 gr/hr. The air inlet damper was at the lowest setting.

Run #2.1
This run was performed on January 16th 2020. It lasted 357 minutes and a minimum burn rate was obtained at 1.14 kg/hr & emission at 0.45 gr/hr. The air inlet damper was at the medium setting.

- Details: Refer to the front page of each test run data sheets found in appendix for the detailed test sequence showing air supply settings and adjustments, fuel bed adjustments and operational specifics of the test unit.

Test fuel cord wood

- Type of wood: Red Oak, 18% to 25% dry basis moisture content
- Description: for each test, description of the fuel cordwood is found on the front page of each test run data sheet together with photograph in appendix.

3.5 START-UP OPERATION

The complete manufacturer's firing procedure of each burn rate category is fully described in appendix 13.

3.6 SAMPLING LOCATIONS

Particulate samples are collected from the dilution tunnel at a point 15 feet from the tunnel entrance. The tunnel has two elbows in the system ahead of the sampling section. The sampling section is a continuous 20-foot section of 8-inch diameter pipe straight over its entire length. Tunnel velocity pressure is determined by a standard pitot tube located 48 inches from the beginning of the sampling section. Thermocouple is installed on the pitot tube to measure the dry bulb temperature. MC is assumed, as allowed, to be 4%. Tunnel samplers are located 56 inches downstream of the pitot tube and 24 inches upstream from the end of this section.

3.7 DRAWINGS

Various drawings of the stack gas sampling train and of dilution tunnel system are found in Appendix 6.

3.8 EMISSIONS EFFICIENCY TESTING EQUIPMENT LIST

The complete test equipment list together with all corresponding calibration data can be found in Appendix 3.

4 SAMPLING METHODS

4.1 PARTICULATE SAMPLING

Particulates were sampled in strict accordance with ASTM E2515. This method uses two identical sampling systems with Gelman A/E 61631 binder free (or equivalent), 47 mm diameter EMFAB TX40H 120-WW Pall filters. The dryers used in the sample systems are filled with "Drierite" before each test run.

5 QUALITY ASSURANCE

5.1 INSTRUMENT CALIBRATION

5.1.1 GAS METERS

At the conclusion of each test program the gas meters are verified using the reference dry gas meter. This process involves sampling the train operation for 1 cubic foot of volume. With readings made to 0.01 liter, the resolution is 1 %, giving an accuracy higher than the 2% required by the standard.

5.1.2 SCALES

Before each test program, the different scales used are checked with traceable calibration weights to ensure their accuracy.

5.1.3 GAS ANALYZERS

The continuous analyzers are zeroed and spanned before each test with NBS traceable 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.

5.2 TEST METHOD PROCEDURES

5.2.1 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. Pre-test and post-test leak checks are conducted with a vacuum of 5 inches of mercury. Vacuum is monitored during each test and the highest vacuum reached is then used for the post-test vacuum value. If leakage limits are not met, the test run is rejected. During these tests, the vacuum is typically less than 2 inches of mercury. Thus, leakage rates reported are expected to be much higher than actual leakage during the tests.

5.2.2 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.

5.2.3 PM SAMPLING PROPORTIONALITY (ASTM E2515)

Proportionalities were calculated in accordance with ASTM E2515. The data and results are found in appendix.

APPENDIX 1: Raw data, forms and results

POLYTESTS
TESTING THROUGH YOUR REALITY

Date: 2020-01-15 Manufacturer: ICC Model: FF-J/ab 047

Project #: pI 20219 Run: 1 Tech: MM Reviewer: SD

- kindling 7.5 LBS SUAM FIRE (1 min torche)
- At 1:30 sec close DOOR
- At 9.8 LBS insert load
- ~~At 4.9 LBS~~ At 5 min close DOOR
- At 1:00 open Fan (High) 20 min after insert load
- At 42 LBS stop pompe and close Fan
- At 3.5 LBS insert load
- At 5 min close DOOR
- At 13 min close air inlet 1/2 ~~pouce~~ inch
- At 15 min close air inlet completely
- At 50 min open Fan (High)

TEST LOAD CONFIGURATION

POLYTESTS
TESTING THROUGH YOUR REALITY

PRE / POST CHECKS

Date: 2020-01-15 Manufacturer: LC Model: FP-3146 047

Project #: PJ 20.219 Run: 1 Tech: M M Reviewer: BP

Moisture Meter Calibration Check:	Equipment #	Time	12%	22%
	Em-191	7:00	ok	ok

Pre-Test Post-Test

Facility Conditions:

	Pre-Test	Post-Test
Air Velocity from less than 2 feet	0 (max50 Fpm)	0 (max50 Fpm)
Smoke Capture Check (Tunnel velocity)	ok	NA
Picture (4 sides)	ok	ok

Wood Heater Conditions:

Date Wood Heater Stack Cleaned	2020-01-15
Date Dilution Tunnel Cleaned	2020-01-15
Induced Draft Check (max 0.005 H2O)	ok
Traverse before ignition	ok

Temperature System:

Ambient (65°-90°F)	ok °F

Proportional Checks:

Thermocouple check	ok
Pitot Clean	ok
Pitot verification	ok

Sampling Train ID Numbers:

	High fire test			Medium low fire test		
	1st hour	Train 1	Train 2	1st hour	Train 1	Train 2
Probe	21	34	36	16	20	50
Filter Front	425	427	429	438	501	503
Filter Back	426	428	430	500	503	504
Filter Thermocouple	h	h	12	h	h	12
Filter (80°F ≥ <90°F)	ok	ok	ok	ok	ok	ok

POLYTESTS
TESTING THROUGH YOUR REALITY

SAMPLING EQUIPMENT CHECK OUT

Date: 2020-01-15 Manufacturer: ICC Model: FF-J196-047

Project #: PT 2019 Run: 1 Tech: MM Reviewer: DP

Leakage Checks Tunnel Samplers

High fire test	System 1st hour		System 1		System 2	
Unplugged Flow Rate = .25cfm	Pre-Test ASTM (-15) CSA B415 (-5)	Post-Test (max test)	Pre-Test ASTM (-15) CSA B415 (-5)	Post-Test (Max test)	Pre-Test ASTM (-15) CSA B415 (-5)	Post-Test (Max test)
Vacuum (inches Hg.)	-15	-15	-15	-15	-15	-15
Final 1minute DGM (Liter)	115193,22	115923,38	115193,70	115923,60	059216,80	059899,60
Initial 1minute DGM (Liter)	115193,12	115923,38	115193,60	115923,44	059216,60	059899,45
Change © (Liter)	0,10	0,01	0,05	0,14	0,20	0,15
Allowable leakage .04 x Sample rate or 0.28Lpm CSA B415 (0.56)						
Check OK	Ok	Ok	Ok	Ok	Ok	Ok

Low medium fire test	System 1st hour		System 1		System 2	
Unplugged Flow Rate = .25cfm	Pre-Test ASTM (-15) CSA B415 (-5)	Post-Test (max test)	Pre-Test ASTM (-15) CSA B415 (-5)	Post-Test (Max test)	Pre-Test ASTM (-15) CSA B415 (-5)	Post-Test (Max test)
Vacuum (inches Hg.)	-15	-15	-15	-15	-15	-15
Final 1minute DGM (Liter)	115925,30	118144,90	115925,45	118144,98	059901,40	061943,45
Initial 1minute DGM (Liter)	115925,30	118144,85	115925,40	118144,92	059901,20	061943,25
Change © (Liter)	0	0,05	0,05	0,06	0,20	0,20
Allowable leakage .04 x Sample rate or 0.28Lpm CSA B415 (0.56)						
Check OK	Ok	Ok	Ok	Ok	Ok	Ok

POLYTESTS
TESTING THROUGH YOUR REALITY

SAMPLING EQUIPMENT CHECK OUT

Date: 2020-01-15 Manufacturer: Ice Model: FF-5166 042

Project #: PI 2019 Run: 1 Tech: MM Reviewer: DP

Leakage Checks Flue Gas Sampler

Plugged Probe	Pre-Test	Post Test
Vacuum (inches Hg.)	-5	-5
Rotameter Reading (mml/min.)	0	0
Flow Rate (lpm)	1.5	1.5
Allowable (.02 x Sample Rate)	30	30
Check OK	ok	ok

Leakage Checks Pitot

Plugged Probe	Pre Test 3 H2o static	Pre Test 0.4-0.5 H2o velocity	Post Test 3 H2o Static	Post Test 0.4-0.5 H2o velocity
Vacuum (inches Hg.)	3	.4	3	.5
Check OK (no change after 15 sec.)	ok	ok	ok	ok

POLYTESTS
TESTING THROUGH YOUR REALITY

PRE-TEST SCALE AUDIT

Date: 2020-02-15 Manufacturer: ICC Model: FF-J/ab 047

Project #: QT 2219 Run: 1 Tech: MM Reviewer: DP

Scale Type	Audit		Measured Weight
	Equipment #	Weight	
Platform	EM 090	44 lbs, Class F	44 lbs
Wood	EM-090	44 lbs, Class F	44 lbs
Analytical	EM-128	100 mg, Class S	100 mg
Analytical	EM-129	200 g, Class S	200 g

LIMITS OF WEIGHT RANGES

ANALYTICAL SCALE: ..... 50%-150% of dry filter weight, ± 0.1 mg
PLATFORM SCALE ..... 20%-80% of ideal test load weight, ± 0.1 lbs or 1%
WOOD SCALE ..... 20%-80% of ideal test load weight, ± 0.01 lbs or 1%

POLYTESTS
TESTING THROUGH YOUR REALITY

CONTINUOUS ANALYZERS

Date: 2020-02-15 Manufacturer: [illegible] Model: FF-J/ab 047

Project #: PI 2019 Run: 1 Tech: MM Reviewer: BP

FOR TUNNELS < 12 in

Barometric pressure (P_{bar}) 101.5 (KPa.) Static pressure (P_q) 0.19 (inches w.c.)
Inside diameter: Port A _____ Port B ____.
Tunnel cross sectional area: .1963Ft^2
Pitot tube type: Standard

Traverse Point	Position (inches)			Velocity Head Δ_p (inches H_2O)	Tunnel Temperature (°F)
	6 po	7 po	8 po		
A- Centroid	3.00	3.50	4	0.077	70.23
B - Centroid	3.00	3.50	4	0.076	70.51
A-1	0.40	0.50	0.50	0.065	70.48
A-2	1.50	1.75	2	0.064	70.36
A-3	4.50	5.25	6	0.074	70.29
A-4	5.60	6.5	7.5	0.063	70.29
B-1	0.40	0.50	0.50	0.064	70.23
B-2	1.50	1.75	2	0.081	70.48
B-3	4.50	5.25	6	0.070	70.48
B-4	5.60	6.5	7.5	0.064	70.36
				AVERAGE	

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

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

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

POLYTESTS
TESTING THROUGH YOUR REALITY

CONTINUOUS ANALYZERS

Date: 2020-01-15 Manufacturer: Ice Model: F F-J1a 047

Project #: pt 2019 Run: 1 Tech: MM Reviewer: DP

Pre-Test (Adjust and Record)

	ZERO		SPAN		CAL. (Record Only)	
CO	0	0	2 950	3 000	0 921	1 000
Tolerance CO		+/- 0.02		+/- 0.15		+/- 0.05
CO_2	0	0	17 91	18 00	9 73	10 00
Tolerance CO2		+/- 0.02		+/- 0.5		+/- 0.5
O_2 informative CSA B415 calculated value	na	na	na	na	na	na
	Actual	Should Be	Actual	Should Be	Actual	Should Be

Post Test (Record Only)

	Zero	Span	Cal.	Zero Drift	Limit	Span Drift	Limit	Cal. Drift	Limit	OK?	Not OK*
CO	0	2 993	0 998	0	0.02	0 003	0.15	0,007	0.05	✓	
CO_2	0	17 96	9 77	0	0.02	0 05	0.5	0,04	0.5	✓	

POLYTESTS
TESTING THROUGH YOUR REALITY

TEST DATA LOG

Date: 2020-01-15 Manufacturer: ICC Model: FF-J/26047

Project #: PI 20219 Run: 1 Tech: MM Reviewer: DP

RAW DRY GAS METER READINGS

		System 1	System 2	Blank
High fire test	Final (Liter)	115 923 00	059 898 15	95, 60
	Initial (Liter)	115 194 16	059 217 46	959 08
Low medium fire test	Final (Liter)	118 143 68	061 943 01	091 68
	Initial (Liter)	115 926 22	059 903 05	991 60

AMBIENT CONDITIONS

	Before	After
Barometer (kPa):	101,5	101,5
Dry Bulb (F):	74,3	75,1
Humidity (%):	27 9	23 9

POLYTESTS
TESTING THROUGH YOUR REALITY

FUEL DATA

Date: 15-01-20 Manufacturer: ICC Model: FF-JLAB 047

Project #: P1-2049 Run: 1 Tech: SP Reviewer: SP

FUEL DESCRIPTION:

Type of wood:

KINDLING AND START-UP LOAD

Piece Size	Weight	Meter Moisture Content (% dry)				
x x 16 in.	4.654 lbs.	20	20	20		
x x 12 in.	2.980 lbs.	9	9	9		
x x in.	lbs.					
x x in.	lbs.					
x x in.	lbs.					
x x in.	lbs.					
x x in.	lbs.					
x x in.	lbs.					
x x in.	lbs.					

HIGHFIRE TEST LOAD

Piece Size	Weight	Meter Moisture Content (% dry)				
3 x 3 x 12 in.	2.516 lbs.	19.6	18.2	18.4		
3 x 2 x 12 in.	2.424 lbs.	20.8	18.1	19.3		
3 x 3 x 16 in.	3.190 lbs.	18.3	18.7	22.2		
x x in.	lbs.					
2.5 x 2.5 x 12 in.	2.010 lbs.	19.3	18.5	20.5		
2.5 x 2.5 x 12 in.	2.150 lbs.	24.4	19.6	26.0		
4 x 3.5 x 16 in.	3.366 lbs.	22.4	21.3	27.2		
x x in.	lbs.					
x x in.	lbs.					

POLYTESTS
TESTING THROUGH YOUR REALITY

FUEL DATA

Date: 15-01-20 Manufacturer: CC Model: FF-JLAB 047

Project #: PI-20219 Run: 1 Tech: SP Reviewer: YP

FUEL DESCRIPTION:

Type of wood:

LOW OR MEDIUM TEST LOAD

Piece Size	Weight		Meter Moisture Content (% dry)				
4 x 3 x 12 in.	3.110	lbs.	23.0	18.8	18.3		
2.5 x 2 x 12 in.	2.830	lbs.	21.7	19.6	24.0		
4 x 4 x 16 in.	3.832	lbs.	27.7	18.9	21.9		
x x in.		lbs.					
2.5 x 3 x 12 in.	2.118	lbs.	27.6	19.5	20.4		
3 x 3 x 12 in.	2.782	lbs.	27.9	22.3	26.3		
4 x 3.5 x 16 in.	3.764	lbs.	23.0	18.7	27.5		
x x in.		lbs.					
x x in.		lbs.					
x x in.		lbs.					
x x in.		lbs.					
x x in.		lbs.					
x x in.		lbs.					
x x in.		lbs.					

POLYTESTS
TESTING THROUGH YOUR REALITY

DILUTION TUNNEL PARTICULATE SAMPLER DATA

Date: 2020-01-14 Manufacturer: ICC Model: FF-J/a6047

Project #: pI 20219 Run: 1 Tech: MM Reviewer: [illegible]

		HIGHFIRE TEST FILTERS								
		SYSTEM 1 – 1st hour				SYSTEM 1				
Pre-test Weight Record		Probe & Housing Number	Front Filter Number	Back Filter Number	gaskets	Probe & Housing Number	Front Filter Number	Back Filter Number	gaskets	Blanck
Date	Time	21	425	426	21	34	427	428	28	431
2020-01-14	17:00	108,7391	0,1752		35,3939	110,1046	0,1726		35,4232	0,0866
2020-01-15	7:15	108,7392	0,1753		35,3940	110,1047	0,1727		35,4233	0,0866

		SYSTEM 1 – 1st hour				SYSTEM 1				
Post-test Weight Record		Probe & Housing Number	Front Filter Number	Back Filter Number	gaskets	Probe & Housing Number	Front Filter Number	Back Filter Number	gaskets	Blanck
Date	Time	21	425	426	21	34	427	428	28	431
2020-01-15	14:00	108,7401	0,1800		35,3949	110,1058	0,1731		35,4241	0,0868
2020-01-20	8:00	108,7393	0,1788		35,3941	110,1048	0,1730		35,4233	0,0867
2020-01-20	17:00	108,7393	0,1788		35,3941	110,1048	0,1730		35,4233	0,0867

POLYTESTS
TESTING THROUGH YOUR REALITY

DILUTION TUNNEL PARTICULATE SAMPLER DATA

Date: 2020-01-14 Manufacturer: Ice Model: FF-J/ab 047

Project #: PI 20219 Run: 1 Tech: MM Reviewer: DP

		HIGH FIRE TEST FILTERS			
		SYSTEM 2			
Pre-test Weight Record		Probe & Housing Number	Front Filter Number	Back Filter Number	gaskets
Date	Time	36	429	430	31
2020-01-14	17:00	107 7240	0 1771		33 9131
2020-01-15	7:15	107 7241	0 1771		33 9131

		SYSTEM 2			
Post-test Weight Record		Probe & Housing Number	Front Filter Number	Back Filter Number	gaskets
Date	Time	36	429	430	31
2020-01-15	14:00	107 7249	0 1810		33 9142
2020-01-20	8:00	107 7243	0 1807		33 9132
2020-01-20	17:00	107 7243	0 1807		33 9132

POLYTESTS
TESTING THROUGH YOUR REALITY

DILUTION TUNNEL PARTICULATE SAMPLER DATA

Date: 2020-01-14 Manufacturer: ICC Model: FF-J/a6 047

Project #: PI 20219 Run: 1 Tech: MM Reviewer: SP

Pre-test Weight Record

		MEDIUM / LOW FIRE TEST FILTERS								
		SYSTEM 1 – 1st hour				SYSTEM 1				
		Probe & Housing Number	Front Filter Number	Back Filter Number	gaskets	Probe & Housing Number	Front Filter Number	Back Filter Number	gaskets	Blanck
Date	Time	16	438	500	10	20	501	502	11	505
2020-01-14	17:00	108 7534	0,1730		35 2573	108 8436	0,1770		35 5231	0,0882
2020-01-15	12:30	108 7534	0,1730		35 2573	108 8437	0,1771		35 5232	0,0883

Post-test Weight Record

		SYSTEM 1 – 1st hour				SYSTEM 1				
		Probe & Housing Number	Front Filter Number	Back Filter Number	gaskets	Probe & Housing Number	Front Filter Number	Back Filter Number	gaskets	Blanck
Date	Time	16	438	500	10	20	501	502	11	505
2020-01-15	21:00	108 7546	0,1792		35 2587	108 8442	0,1778		35 5243	0,0885
2020-01-20	8:00	108 7536	~~0,1785~~ 0,1776 mm		35 2575	108 8438	0,1774		35 5233	0,0885
2020-01-20	17:00	108 7536	0,1776		35 2575	108 8438	0,1774		35 5233	0,0885

POLYTESTS
TESTING THROUGH YOUR REALITY

DILUTION TUNNEL PARTICULATE SAMPLER DATA

Date: 2020-01-14 Manufacturer: ICC Model: FF-J/26 047

Project #: pT 2019 Run: 1 Tech: 1 Reviewer: [signature]

		MEDIUM / LOW FIRE TEST FILTERS			
		SYSTEM 2			
Pre-test Weight Record		Probe & Housing Number	Front Filter Number	Back Filter Number	gaskets
Date	Time	50	503	504	42
2020-01-14	17:00	107,6477	0,1747		34,6420
2020-01-15	12:00	107,6478	0,1748		34,6419

		SYSTEM 2			
Post-test Weight Record		Probe & Housing Number	Front Filter Number	Back Filter Number	gaskets
Date	Time	50	503	504	42
2020-01-15	21:00	107,6485	0,1797		34,6437
2020-01-20	8:00	107,6482	0,1792		34,6420
2020-01-20	17:00	107,6482	0,1792		34,6420

Paramètres

Tous les facteurs de corrections et autres paramètres qui peuvent être modifiés par l'utilisateur du fichier sont regroupés ici.

Code verrouillage:	ICC

Description du test

Test standard	EPA	
Run #	1	
Date	15-01-2020	
Technicien	M.M	
Project #	PI 20219	

Description de l'unité

Manufacturier	ICC	
Modèle	FF-JLAB 047	
Combustion system	Non-Cat	
Appliance type	FIREPLACE	
Firebox volume	1,57	cu ft.
Appliance weight empty	n.a	lbs
Fan (no, Standard, Option)	OPTION	

Paramètres du test

Logging time	1	min
Manufacturer's rated heat output	n.a	BTU/h Donnée fournie par le manfacturier
Targeted category	1	
Targeted output	n.a	BTU/h
Cp steel	n.a	BTU/lb-°F

Échantillonnage

Blank sampling rate	0,20	cuft/min
Internal probe diameter	0,18	in.
Calibration Factor (DGM #1):	0,995	Dimensionless
Equipment number (DGM #1):	EM 178	
Calibration Factor (DGM #2):	0,990	Dimensionless
Equipment number (DGM #2):	EM 179	
Calibration Factor (DGM #3):	0,997	
Equipment number (DGM #3):	EM 070	Dimensionless

Tunnel

Targeted tunnel flow rate	300	scfm
Tunnel diameter	8	in.
Molecular weight	28,78	May be assumed to be 28,78 (EPA) Si B-415 = 29
Pitot tube type	Standard	
Pitot tube coefficient	0,99	Dimensionless

Project nu.	PI 20219
Date	15-01-2020
Technicien	m.m

Fuel data

Fuel type	Cord	
Fuel specie	Oak	
HHV	20207,0	kJ/kg
%C	49,5	
%H	6,6	
%O	43,7	
%Ash	0,2	
HHV	8689,9	Btu/lb
LHV	7600,4	Btu/lb

Default Fuel Values

	D. Fir	Oak/Maple
HHV	19 810	20 207
%C	48,73	49,5
%H	6,87	6,62
%O	43,9	43,7
%Ash	0,5	0,2
HHV (Btu/lb)	8519	8690
LHV (Btu/lb)	7451	7600

Adjunct to ASTM E XXXX Wood Heater Cordwood Test Method - May 10, 2017 Version

Cordwood Fuel Load Calculators - 10 lb/ft^3 Nominal Load Density

Core 45-65% of Total Load Weight, Remainder 35-55% of Total Load Weight

Values to be input manually

For All Usable Firebox Volumes - High Fire Test Only

Nominal Required Load Density (wet basis)	10	lb/ft^3				
Usable Firebox Volume	1,57	ft^3				
Total Nom. Load Wt. Target	15,70	lb				
Total Load Wt. Allowable Range	14,90	to	16,50	lb		
Core Target Wt. Allowable Range	7,10	to	10,20	lb		
Remainder Load Wt. Allowable Range	5,50	to	8,60	lb		
						Mid-Point
Core Load Pc. Wt. Allowable Range	2,40	to	3,90	lb		3,15
Remainder Load Pc. Wt. Allowable Range	1,60	to	8,60	lb		5,10
	Pc. #					
Core Load Piece Wt. Actual	1	2,52	lb	In Range		
	2	2,42	lb	In Range		
	3	3,19	lb	In Range		
Core Load Total. Wt. Actual		8,13	lb	In Range		
	Pc. #					
Remainder Load Piece Wt.	1	2,01	lb	In Range		
(1 to 3 Pcs.)	2	2,15	lb	In Range		
	3	3,37	lb	In Range		
Remainder Load Tot. Wt. Act		7,53	lb	In Range		
Total Load Wt. Actual		15,66	lb	In Range		
Core % of Total Wt.		52%		In Range	45-65%	
Remainder % of Total Wt.		48%		In Range	35-55%	
Actual Load % of Nominal Target		100%		In Range	95-105%	
Actual Fuel Load Density		10,0	lb/ft^3			
Kindling and Start-up Fuel						
Maximim Kindling Wt. (20% of Tot. Load Wt.)		3,13	lb			
Actual Kindling Wt.		2,98	lb	In Range	19,0%	
Maximum Start-up Fuel Wt. (30% of Tot. Load Wt.)		4,70	lb			
Actual Start-up Fuel Wt.		4,65	lb	In Range	29,7%	
Allowable Residual Start-up Fuel Wt. Range	1,6	to	3,1	lb		Mid-Point
Actual Residual Start-up Fuel Wt.		2,8	lb	In Range		2,3
Total Wt. All Fuel Added (wet basis)		23,29	lb			
High Fire Test Run End Point Range	Low		High			Mid-Point
Based on Fuel Load Wt. (w/tares)	1,4	to	1,7	lb		1,6
Actual Fuel Load Ending Wt.		1,5	lb	In Range		

Load pieces Length in. 12 16 in.

Fuel Piece Moisture Reading (%-dry basis)						Pc. Wt. Dry Basis		
1	2	3	Ave.					
19,6	18,2	18,4	18,7	In Range		2,12 lb	0,96 kg	
20,8	18,1	19,3	19,4	In Range		2,03 lb	0,92 kg	
18,3	18,7	22,2	19,7	In Range		2,66 lb	1,21 kg	
19,3	18,5	20,5	19,4	In Range		1,68 lb	0,76 kg	
24,4	19,6	26	23,3	In Range		1,74 lb	0,79 kg	
22,4	21,3	27,2	23,6	In Range		2,72 lb	1,23 kg	
Total Load Ave. MC (%-dry basis)			20,8	In Range				
Total Load Ave. MC % (wet basis)			17,2					
Total Test Load Weight (dry basis)						12,96 lb	5,88 kg	
Kindling Moisture (%-dry basis)								
9	9	9	9,0	In Range		2,73 lb	1,24 kg	
Start-up Fuel Moisture Readings (%-dry basis)								
20	20	20	20,0	In Range		3,88 lb	1,76 kg	
Total Wt. All Fuel Added (dry basis)						19,57 lb	8,88 kg	
Total Wt. All Fuel Burned (dry basis)						15,3 lb	6,9 kg	

Load high fire

Adjunct to ASTM E XXXX Wood Heater Cordwood Test Method - May 10, 2017 Version

Cordwood Fuel Load Calculators - 12 lb/ft^3 Nominal Load Density

Core 45-65% of Total Load Weight, Remainder 35-55% of Total Load Weight

Values to be input manually

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

Nominal Required Load Density (wet basis)	12	lb/ft^3				
Usable Firebox Volume	1,57	ft^3				
Total Nom. Load Wt. Target	18,84	lb				
Total Load Wt. Allowable Range	17,90	to	19,78	lb		
Core Target Wt. Allowable Range	8,478	to	12,25	lb		
Remainder Load Wt. Allowable Range	6,59	to	10,36	lb		
						Mid-Point
Core Load Fuel Pc. Wt. Allowable Range	2,83	to	4,71	lb		3,77
Remainder Load Pc. Wt. Allowable Range	1,88	to	5,65	lb		3,77
	Pc. #					
Core Load Piece Wt. Actual	1	3,11	lb	In Range		
	2	2,83	lb	In Range		
	3	3,83	lb	In Range		
Core Load Total. Wt. Actual		9,77	lb	In Range		
	Pc. #					
Remainder Load Piece Wt.	1	2,12	lb	In Range		
(2 or 3 Pcs.)	2	2,28	lb	In Range		
	3	3,76	lb	In Range		
Remainder Load Piece Weight Ratio - Small/Large		56%		In Range		≤ 67%
Remainder Load Tot. Wt. Act		8,16	lb	In Range		
Total Load Wt. Actual		17,94	lb	In Range		
Core % of Total Wt.		54%		In Range		45-65%
Remainder % of Total Wt.		46%		In Range		35-55%
Actual Load % of Nominal Target		95%		In Range		95-105%
Actual Fuel Load Density		11,4	lb/ft^3			
Allowable Charcoal Bed Wt. Range (lb)	1,8	to	3,5			Mid-Point
Actual Charcoal Bed Wt.		3,5	lb	In Range		2,7
Actual Fuel Load Ending Wt.		0,0	lb	Valid Test		≥ 90%
Total Wt. of Fuel Burned During Test Run lb.		17,9	lb			
Load pieces Length in.		12 & 16	in.			

Fuel Piece Moisture Reading (%-dry basis)

1	2	3	Ave.		Pc. Wt. Dry Basis			
23	18,8	18,3	20,0	In Range	2,59	lb	1,18	kg
21,7	18,6	24	21,4	In Range	2,33	lb	1,06	kg
27,7	18,9	21,9	22,8	In Range	3,12	lb	1,42	kg
27,6	19,5	20,4	22,5	In Range	1,73	lb	0,78	kg
27,9	22,3	26,3	25,5	In Range	1,82	lb	0,82	kg
23	18,7	27,5	23,1	In Range	3,06	lb	1,39	kg
Total Load Ave. MC % (dry basis)			22,5	In Range				
Total Load Ave. MC % (wet basis)			18,3					
Total Test Load Weight (dry basis) →					14,65	lb	6,64	kg
Total Fuel Weight Burned During Test Run (dry basis)					14,6	lb	6,64	kg

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

Nominal Required Load Density (wet basis)	12	lb/ft^3				
Usable Firebox Volume		ft^3				
Total Nom. Load Wt. Target	0	lb				
Total Load Wt. Allowable Range	0,00	to	0,00	lb		
Core Target Wt. Allowable Range	0,00	to	0,00	lb		
Remainder Load Wt. Allowable Range	0,00	to	0,00	lb		
						Mid-Point
Core Load Fuel Pc. Wt. Allowable Range	0,00	to	0,00	lb		0,00
Remainder Load Pc. Wt. Allowable Range	0,00	to	0,00	lb		0,00
	Pc. #					
Core Load Piece Wt. Actual	1		lb	In Range		
	2		lb	In Range		
	3		lb	In Range		
Core Load Total. Wt. Actual		0,00	lb	In Range		
	Pc. #					
Remainder Load Piece Wt.	1		lb	In Range		
(3 or 4 Pcs.)	2		lb	In Range		
	3		lb	In Range		
	4		lb	NA		
Remainder Load Piece Weight Ratio - Small/Large		#NOMBRE!		#NOMBRE!		≤ 67%
Remainder Load Tot. Wt. Act		0,00	lb	In Range		
Total Load Wt. Actual		0,00	lb	In Range		
Core % of Total Wt.		#DIV/0!		#DIV/0!		45-65%
Remainder % of Total Wt.		#DIV/0!		#DIV/0!		35-55%
Actual Load % of Nominal Target		#DIV/0!		#DIV/0!		95-105%
Actual Fuel Load Density		#DIV/0!	lb/ft^3			
Allowable Charcoal Bed Wt. Range (lb)	0,1	to	-0,1			Mid-Point
Actual Charcoal Bed Wt.			lb	Out of Range		0,0
Actual Fuel Load Ending Wt.			lb	Valid Test		≥ 90%
Total Wt. of Fuel Burned During Test Run lb.		0,0	lb			

Fuel Piece Moisture Reading (%-dry basis)

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

	Start	End
Barometer (kPa):	101,5	101,5
Barometer (in.Hg):	29,972939	29,97293872
Dry Bulb (F):	74,3	75,1
Humidity (%):	27,9	23,9
Air velocity (ft/min)	0	0

High fire test						
DGM #1	Final:	4093,782	cuft	Final:	115923,000	Liter
	Initial:	4068,043	cuft	Initial:	115194,160	Liter
DGM #2	Final:	2115,283	cuft	Final:	59898,150	Liter
	Initial:	2091,245	cuft	Initial:	59217,460	Liter
DGM room				Final:	991,600	cuft
				Initial:	959,080	cuft

min or med burnrate						
DGM #1	Final:	4172,205	cuft	Final:	118143,680	Liter
	Initial:	4093,896	cuft	Initial:	115926,220	Liter
DGM #2	Final:	2187,461	cuft	Final:	61942,010	Liter
	Initial:	2115,421	cuft	Initial:	59902,050	Liter
DGM room				Final:	1091,680	cuft
				Initial:	991,600	cuft

Numéro de la ligne dans "Raw data" à partir duquel les données du test commence	86
Numéro de la ligne dans "Raw data" à partir duquel les données du highfire test commence	126
Numéro de la ligne dans "Raw data" à partir duquel les données du min ou medium fire test commence	257

Autres données à rentrer: dans preload data, load data, traverse et filter set weight

Project nu.	PI 20219
Date	15-01-2020
Technicien	M.M

Filter set weight highfire

	System 1 (g) 1st hour				System 1 (g)				System 2 (g)				Ambient blank (g)	Date	Heure
	probe	front / Back		gasket	probe	front / Back		gasket	probe	front / Back		gasket	Filter		
Number	21	425	426	21	34	427	428	28	36	429	430	31	431		
Before (1)															
Before (2)															
Before (3)															
Before (4)															
Before (5)	108,7391	0,1752		35,3939	110,1046	0,1726		35,4232	107,7240	0,1771		33,9131	0,0866	2020-01-14	17:00
Before (6)	108,7392	0,1753		35,3940	110,1047	0,1727		35,4233	107,7241	0,1771		33,9131	0,0866	2020-01-15	07:15
After (1)	108,7401	0,1800		35,3949	110,1058	0,1731		35,4241	107,7249	0,1810		33,9142	0,0868	2020-01-15	14:00
After (2)	108,7393	0,1788		35,3941	110,1048	0,1730		35,4233	107,7243	0,1807		33,9132	0,0867	2020-01-20	08:00
After (3)	108,7393	0,1788		35,3941	110,1048	0,1730		35,4233	107,7243	0,1807		33,9132	0,0867	2020-01-20	17:00
After (4)															
After (5)															
After (6)	108,7393	0,1788		35,3941	110,1048	0,1730		35,4233	107,7243	0,1807		33,9132	0,0867	2020-01-20	17:00
Difference	0,0001	0,0035	0,0000	0,0001	0,0001	0,0003	0,0000	0,0000	0,0002	0,0036	0,0000	0,0001	0,0001		
Total (mg)		3,7				4,1				3,9			0,1		
Total ajusté (mg)		**3,60**				**4,00**				**3,80**					

Project nu.	PI 20219
Date	15-01-2020
Technicien	

Filter set weight Low/ medium fire

	System 1 (g) 1st hour				System 1 (g)				System 2 (g)				Ambient blank (g)	Date	Heure
	probe	front / Back		gasket	probe	front / Back		gasket	probe	front / Back		gasket	Filter		
Number	16	438	500	10	20	501	502	11	50	503	504	42	505		
Before (1)															
Before (2)															
Before (3)															
Before (4)															
Before (5)	108,7534	0,1730		35,2573	108,8436	0,1770		35,5231	107,6477	0,1747		34,6420	0,0882	2020-01-14	17:00
Before (6)	108,7534	0,1730		35,2573	108,8437	0,1771		35,5232	107,6478	0,1748		34,6419	0,0883	2020-01-15	12:00
After (1)	108,7546	0,1792		35,2587	108,8442	0,1778		35,5243	107,6485	0,1797		34,6437	0,0885	2020-01-15	21:00
After (2)	108,7536	0,1776		35,2575	108,8438	0,1774		35,5233	107,6482	0,1792		34,6420	0,0885	2020-01-20	08:00
After (3)	108,7536	0,1776		35,2575	108,8438	0,1774		35,5233	107,6482	0,1792		34,6420	0,0885	2020-01-20	17:00
After (4)															
After (5)															
After (6)	108,7536	0,1776		35,2575	108,8438	0,1774		35,5233	107,6482	0,1792		34,6420	0,0885	2020-01-20	17:00
Difference	0,0002	0,0046	0,0000	0,0002	0,0001	0,0003	0,0000	0,0001	0,0004	0,0044	0,0000	0,0001	0,0002		
Total (mg)		5				5,5				4,9			0,2		
Total ajusté (mg)		**4,80**				**5,30**				**4,70**					

Project nu.	PI 20219
Date	15-01-2020
Technicien	

Elapsed		Weight			Flue	Room	Tunnel	Unit	Unit	Unit	Unit	Unit	Reading	Inlet T	Outlet T	Temp	Reading	Inlet T	Outlet T	Temp
Time	Raw data row	Remaining	CO	CO_2	Gas	Temp	Dry Bulb	Top	Back	R.Side	L.Side	Bottom								
min		lbs	%	%	°F	°F	°F	°F	°F	°F	°F	°F	cuft/min	oF	oF	oF	cuft/min	oF	oF	oF
0,00	86,00	7,4	0,0	0,2	128,4	70,0	78,7	92,5	128,4	101,2	109,0	#######	0,18	72,79	72,13	88,69	0,16	72,67	72,18	88,34
1,0	87,0	7,3	0,1	5,2	307,0	69,9	82,3	259,6	127,6	100,8	108,6	#######	0,18	72,87	72,09	88,09	0,16	72,72	72,14	87,80
2,0	88,0	7,1	0,2	8,0	539,1	70,0	88,6	520,2	126,5	100,6	108,2	251,1	0,18	72,91	72,07	87,52	0,16	72,76	72,11	87,29
3,0	89,0	6,9	0,2	12,8	643,5	70,1	96,0	681,9	125,5	100,4	107,9	#######	0,18	72,94	72,08	86,96	0,16	72,80	72,09	86,81
4,0	90,0	6,7	0,2	13,4	737,7	70,6	103,0	779,8	124,8	100,4	107,9	#######	0,18	73,02	72,11	86,41	0,16	72,91	72,11	86,30
5,0	91,0	6,4	0,2	15,9	786,9	70,7	109,0	841,7	124,7	100,7	108,2	#######	0,18	73,17	72,15	85,91	0,16	73,06	72,13	85,85
6,0	92,0	6,1	0,1	17,0	765,2	71,0	110,3	913,0	125,8	101,9	109,0	#######	0,18	73,37	72,20	85,45	0,16	73,26	72,21	85,40
7,0	93,0	6,0	0,1	15,9	719,2	71,0	108,8	937,9	129,1	103,9	110,4	#######	0,18	73,57	72,27	84,79	0,16	73,48	72,28	85,00
8,0	94,0	5,7	0,1	14,8	687,8	70,7	106,6	943,4	134,1	107,1	112,4	#######	0,18	73,73	72,34	84,17	0,16	73,65	72,35	84,59
9,0	95,0	5,6	0,1	13,5	655,0	70,9	104,6	924,3	139,5	111,3	115,4	#######	0,18	73,89	72,39	83,68	0,16	73,78	72,42	84,24
10,0	96,0	5,5	0,2	12,1	626,3	71,0	103,4	906,4	143,4	116,1	119,0	#######	0,18	73,91	72,44	85,70	0,16	73,86	72,47	86,43
11,0	97,0	5,3	0,3	11,7	621,0	70,8	102,1	899,6	146,4	121,7	123,3	#######	0,18	73,90	72,46	88,14	0,16	73,91	72,52	88,63
12,0	98,0	5,2	0,2	12,0	595,3	70,5	101,3	873,7	148,8	127,9	128,4	#######	0,18	73,93	72,50	88,44	0,16	73,97	72,58	88,48
13,0	99,0	5,0	0,3	10,5	559,3	70,9	99,6	833,8	150,4	134,1	134,1	#######	0,18	73,98	72,55	88,09	0,16	74,06	72,65	88,05
14,0	100,0	4,9	0,3	9,8	545,2	71,0	97,9	814,1	152,2	139,7	140,1	#######	0,18	73,98	72,58	87,63	0,16	74,08	72,70	87,58
15,0	101,0	4,8	0,3	9,2	535,8	70,9	97,9	795,4	154,6	144,6	146,1	#######	0,18	73,99	72,62	87,15	0,16	74,12	72,73	87,14
16,0	102,0	4,7	0,4	10,1	534,9	70,7	97,2	803,6	156,8	149,3	152,3	#######	0,18	73,99	72,64	86,66	0,16	74,13	72,77	86,69
17,0	103,0	4,6	0,5	10,2	503,5	71,1	96,1	772,2	158,7	153,3	158,6	#######	0,18	73,95	72,66	86,07	0,16	74,15	72,81	86,28
18,0	104,0	4,5	0,6	7,3	467,6	71,0	94,7	716,3	160,4	157,7	164,4	#######	0,18	73,92	72,69	85,58	0,16	74,16	72,84	85,84
19,0	105,0	4,4	0,7	6,5	439,1	70,8	93,2	675,4	162,9	163,0	170,0	#######	0,18	73,93	72,74	85,01	0,16	74,17	72,88	85,45
20,0	106,0	4,3	0,8	5,9	425,3	71,1	91,9	649,6	166,2	168,1	176,5	#######	0,18	73,96	72,76	84,37	0,16	74,19	72,90	85,08
21,0	107,0	4,2	0,7	6,4	420,2	70,9	91,9	635,3	170,5	173,1	183,2	#######	0,18	73,93	72,78	83,84	0,16	74,19	72,95	84,64
22,0	108,0	4,2	0,7	6,7	417,6	70,9	91,2	623,0	174,5	178,1	191,3	#######	0,18	73,82	72,77	84,26	0,16	74,11	72,95	84,23
23,0	109,0	4,0	0,6	6,9	424,7	71,2	91,3	620,7	178,7	182,9	199,4	686,2	0,18	73,75	72,76	86,87	0,16	74,06	72,96	85,98
24,0	110,0	3,9	0,6	7,9	429,0	70,9	91,7	627,3	183,2	187,4	207,5	#######	0,18	73,78	72,80	88,35	0,16	74,07	72,99	88,61
25,0	111,0	3,8	0,5	7,7	429,2	70,8	91,4	627,4	187,5	191,5	215,9	#######	0,18	73,83	72,82	88,04	0,16	74,08	73,02	88,63
26,0	112,0	3,8	0,5	7,5	432,2	70,7	91,7	625,9	192,0	195,6	224,6	#######	0,18	73,84	72,85	87,51	0,16	74,10	73,05	88,19
27,0	113,0	3,7	0,4	7,8	454,4	70,8	92,9	642,9	196,5	199,6	233,5	#######	0,18	73,83	72,87	86,96	0,16	74,10	73,07	87,66
28,0	114,0	3,6	0,3	8,5	454,2	71,0	92,4	646,1	201,1	203,7	242,5	#######	0,18	73,80	72,88	86,47	0,16	74,07	73,10	87,13
29,0	115,0	3,5	0,3	7,8	447,4	70,9	91,5	644,1	205,8	207,8	251,4	#######	0,18	73,79	72,91	85,85	0,16	74,06	73,13	86,73
30,0	116,0	3,4	0,4	7,3	440,5	70,8	91,5	646,0	210,6	212,1	260,4	#######	0,18	73,80	72,92	85,27	0,16	74,07	73,14	86,30
31,0	117,0	3,3	0,5	6,8	431,9	71,0	91,4	640,5	215,5	216,7	269,2	#######	0,18	73,83	72,94	84,62	0,16	74,10	73,15	85,87
32,0	118,0	3,2	0,7	6,1	408,5	71,0	89,9	613,6	220,7	221,4	278,0	#######	0,18	73,88	72,96	84,07	0,16	74,13	73,18	85,45
33,0	119,0	3,2	0,8	5,6	419,9	71,0	94,5	593,3	226,0	226,2	285,7	#######	0,18	73,97	72,98	83,77	0,16	74,14	73,20	85,04
34,0	120,0	3,1	0,6	6,3	406,9	70,5	91,8	581,0	231,4	231,2	291,8	#######	0,18	74,01	73,02	86,31	0,16	74,17	73,24	84,54
35,0	121,0	3,0	0,7	6,2	392,7	71,0	89,5	564,4	236,9	236,4	297,0	#######	0,18	74,05	73,04	88,39	0,16	74,20	73,26	84,29
36,0	122,0	3,0	0,6	5,9	385,3	71,0	88,7	551,7	242,3	241,5	301,5	#######	0,18	74,15	73,09	88,07	0,16	74,24	73,30	86,87
37,0	123,0	2,9	0,6	5,9	382,1	70,5	88,5	544,1	247,6	246,4	305,3	#######	0,18	74,19	73,09	87,44	0,16	74,30	73,31	88,76
38,0	124,0	2,8	0,7	5,8	379,5	70,6	88,2	545,6	253,0	251,6	309,0	#######	0,18	74,28	73,15	86,90	0,16	74,33	73,37	88,49
39,0	125,0	2,8	0,7	5,8	377,3	70,8	88,1	542,3	258,2	256,5	312,4	#######	0,18	74,31	73,17	86,34	0,16	74,34	73,39	88,00
40,0	126,0	18,4	0,7	5,9	398,1	70,9	124,5	518,1	265,6	261,6	315,7	#######	0,18	74,34	73,19	85,88	0,16	74,39	73,42	87,58
41,0	127,0	18,4	0,2	5,0	480,1	71,0	108,0	547,3	270,5	267,3	318,4	#######	0,18	74,36	73,21	85,45	0,16	74,38	73,45	87,14
42,0	128,0	18,4	0,4	5,5	561,4	71,0	111,2	627,6	275,3	272,1	321,1	#######	0,18	74,31	73,24	85,00	0,16	74,41	73,50	86,68
43,0	129,0	17,9	0,6	7,7	613,5	71,1	109,8	688,9	279,6	277,1	323,5	#######	0,18	74,32	73,26	84,56	0,16	74,43	73,51	86,27
44,0	130,0	17,4	0,7	8,8	538,4	71,1	100,2	685,5	283,7	281,3	326,1	#######	0,18	74,35	73,30	84,07	0,16	74,45	73,54	85,83
45,0	131,0	17,2	0,6	9,7	539,2	71,3	99,8	692,7	287,7	284,9	328,5	#######	0,18	74,31	73,33	83,72	0,16	74,45	73,57	85,39
46,0	132,0	17,1	0,5	10,8	543,4	71,3	98,5	712,0	290,8	287,5	330,8	#######	0,18	74,31	73,35	86,25	0,16	74,49	73,60	85,02
47,0	133,0	16,9	0,4	10,6	546,1	71,1	98,6	738,0	293,6	289,5	332,8	#######	0,18	74,33	73,37	88,54	0,16	74,51	73,61	84,65
48,0	134,0	16,8	0,3	10,4	542,4	71,5	98,4	744,3	295,9	291,1	335,1	#######	0,18	74,43	73,40	88,58	0,16	74,58	73,67	84,41
49,0	135,0	16,6	0,3	9,8	532,7	71,6	98,4	739,5	297,7	292,2	337,1	#######	0,18	74,53	73,44	87,99	0,16	74,66	73,70	86,94
50,0	136,0	16,5	0,3	9,2	536,1	71,0	98,7	750,4	299,2	292,6	339,2	#######	0,18	74,60	73,48	87,29	0,16	74,71	73,74	88,77
51,0	137,0	16,3	0,2	9,9	535,6	71,3	98,7	764,8	300,5	293,0	341,2	#######	0,18	74,69	73,54	86,77	0,16	74,79	73,80	88,54
52,0	138,0	16,2	0,2	10,2	539,2	71,4	99,5	780,2	301,3	293,3	343,0	#######	0,18	74,76	73,57	86,27	0,16	74,86	73,82	88,14
53,0	139,0	16,0	0,2	9,9	546,5	71,4	100,0	798,7	302,2	293,3	344,4	#######	0,18	74,86	73,60	85,70	0,16	74,94	73,87	87,72
54,0	140,0	15,8	0,2	11,5	584,2	71,5	101,5	854,8	302,7	293,2	345,6	#######	0,18	74,93	73,65	85,20	0,16	75,01	73,92	87,30
55,0	141,0	15,6	0,2	12,5	586,1	71,6	102,1	877,6	303,0	293,3	346,5	#######	0,18	74,98	73,70	84,75	0,16	75,06	73,95	86,90
56,0	142,0	15,5	0,3	11,8	584,4	71,8	101,6	891,4	303,4	293,5	347,5	#######	0,18	75,04	73,75	84,28	0,16	75,12	74,00	86,50
57,0	143,0	15,3	0,3	12,1	590,3	67,4	100,8	916,3	303,7	293,9	347,9	#######	0,18	75,05	73,77	83,72	0,16	75,15	74,04	86,11
58,0	144,0	15,1	0,3	12,2	591,2	69,1	101,1	928,9	303,9	294,6	348,2	#######	0,18	75,05	73,79	83,74	0,16	75,14	74,05	85,55
59,0	145,0	15,0	0,3	12,1	590,4	69,3	102,1	935,4	304,2	295,8	348,4	#######	0,18	75,09	73,84	85,92	0,16	75,18	74,07	85,09
60,0	146,0	14,8	0,3	12,2	588,1	70,1	101,4	917,1	304,6	297,1	352,4	#######	0,18	75,09	73,89	85,22	0,16	75,23	74,08	84,65
61,0	147,0	14,6	0,2	12,2	588,7	70,8	101,6	916,3	306,0	298,1	355,3	#######	0,18	75,19	73,94	82,27	0,16	75,27	74,13	84,29
62,0	148,0	14,4	0,1	13,3	596,8	70,8	101,9	925,6	307,4	300,2	357,5	#######	0,18	75,22	73,99	83,32	0,16	75,34	74,17	86,35
63,0	149,0	14,2	0,1	13,7	598,9	71,7	102,1	924,3	309,5	302,5	359,3	#######	0,18	75,29	74,06	84,59	0,16	75,45	74,24	88,77
64,0	150,0	14,1	0,1	13,8	600,2	72,2	102,3	920,4	311,3	304,9	361,2	#######	0,18	75,46	74,13	88,98	0,16	75,56	74,31	88,74
65,0	151,0	13,9	0,1	13,9	599,7	71,5	102,8	915,7	313,2	306,8	363,0	#######	0,18	75,58	74,18	89,76	0,16	75,65	74,34	88,36
66,0	152,0	13,7	0,1	13,8	596,8	71,7	103,1	912,8	314,9	309,4	364,6	#######	0,18	75,77	74,23	89,83	0,16	75,78	74,40	87,95
67,0	153,0	13,5	0,1	13,7	592,0	71,9	103,4	910,7	316,8	311,9	366,6	#######	0,18	75,97	74,30	89,65	0,16	75,89	74,44	87,55
68,0	154,0	13,3	0,1	13,5	586,1	72,1	103,2	899,8	318,6	314,2	368,8	#######	0,18	76,15	74,39	89,04	0,16	76,04	74,52	87,17
69,0	155,0	13,2	0,1	13,3	582,6	72,0	102,5	888,7	320,5	316,6	371,2	#######	0,18	76,24	74,45	88,38	0,16	76,14	74,60	86,78
70,0	156,0	13,0	0,1	13,1	578,5	72,1	102,7	884,2	322,4	318,8	373,9	#######	0,18	76,30	74,50	87,73	0,16	76,21	74,67	86,40
71,0	157,0	12,8	0,2	13,1	578,5	72,3	102,3	884,4	324,4	321,5	376,5	#######	0,18	76,35	74,56	87,15	0,16	76,27	74,70	86,03
72,0	158,0	12,6	0,1	13,3	580,3	72,3	103,0	886,5	326,4	324,1	379,3	#######	0,18	76,43	74,65	86,58	0,16	76,37	74,78	85,72
73,0	159,0	12,4	0,1	13,5	587,1	72,3	102,8	897,4	328,3	326,4	382,1	#######	0,18	76,51	74,69	86,16	0,16	76,44	74,84	85,39
74,0	160,0	12,3	0,1	13,8	588,6	72,3	102,7	908,0	330,3	329,8	385,3	#######	0,18	76,52	74,77	85,67	0,16	76,49	74,88	85,08
75,0	161,0	12,1	0,1	13,7	587,2	72,4	102,5	911,1	332,4	332,7	388,4	#######	0,18	76,50	74,84	85,18	0,16	76,54	74,95	84,79
76,0	162,0	11,9	0,1	13,4	584,7	72,6	102,9	912,5	334,4	336,1	392,0	#######	0,18	76,50	74,88	84,81	0,16	76,57	75,00	84,48
77,0	163,0	11,8	0,1	13,5	587,2	72,6	103,0	915,3	336,4	339,3	395,0	#######	0,18	76,55	74,95	84,48	0,16	76,64	75,05	84,51
78,0	164,0	11,6	0,1	13,8	592,3	72,9	102,5	921,0	338,4	342,6	398,7	#######	0,18	76,65	75,03	84,14	0,16	76,72	75,12	87,49
79,0	165,0	11,4	0,1	14,1	598,7	72,9	103,8	932,7	340,4	345,9	402,4	#######	0,18	76,74	75,09	83,83	0,16	76,83	75,22	89,16
80,0	166,0	11,2	0,1	14,3	602,7	73,0	104,6	941,0	342,5	349,7	405,8	#######	0,18	76,85	75,18	83,57	0,16	76,93	75,30	88,97
81,0	167,0	11,1	0,1	14,4	605,5	73,2	104,9	946,7	344,6	352,8	409,5	#######	0,18	77,01	75,24	83,37	0,16	77,05	75,35	88,62
82,0	168,0	10,8	0,1	14,6	610,3	73,1	105,5	954,3	346,6	356,2	412,6	#######	0,18	77,14	75,29	84,16	0,16	77,14	75,42	88,22

83,0	169,0	10,7	0,2	14,7	611,1	72,7	105,3	959,2	349,0	359,5	415,5	#######	0,18	77,32	75,38	87,91	0,16	77,27	75,48	87,80
84,0	170,0	10,5	0,2	14,6	611,1	73,5	105,4	963,5	351,3	363,1	418,8	#######	0,18	77,45	75,44	89,87	0,16	77,41	75,56	87,47
85,0	171,0	10,3	0,1	14,5	609,8	73,5	105,1	958,9	353,6	366,4	422,1	#######	0,18	77,56	75,49	90,06	0,16	77,48	75,61	87,15
86,0	172,0	10,2	0,1	14,5	607,9	73,7	105,2	957,6	356,1	369,5	424,9	#######	0,18	77,63	75,57	89,70	0,16	77,55	75,69	86,79
87,0	173,0	10,0	0,1	14,6	606,2	73,4	105,0	961,6	358,7	372,5	428,2	#######	0,18	77,73	75,64	89,25	0,16	77,65	75,76	86,49
88,0	174,0	9,9	0,1	14,5	606,2	73,4	103,9	961,3	361,2	376,3	431,1	#######	0,18	77,78	75,71	88,77	0,16	77,74	75,82	86,15
89,0	175,0	9,7	0,1	14,4	604,2	73,9	105,1	962,1	363,8	378,9	433,9	#######	0,18	77,85	75,77	88,27	0,16	77,82	75,86	85,90
90,0	176,0	9,5	0,1	14,4	600,7	73,8	105,5	960,8	366,5	381,5	436,7	#######	0,18	77,89	75,82	87,83	0,16	77,88	75,94	85,62
91,0	177,0	9,3	0,1	14,4	602,3	73,9	105,3	960,4	369,1	384,9	439,9	#######	0,18	77,93	75,88	87,42	0,16	77,95	75,98	85,32
92,0	178,0	9,2	0,1	14,5	603,4	73,8	105,2	960,5	371,9	388,6	442,7	#######	0,18	78,00	75,94	86,96	0,16	78,01	76,05	85,07
93,0	179,0	9,0	0,1	14,5	604,2	74,0	105,6	962,2	374,7	391,6	445,3	#######	0,18	78,11	76,02	86,60	0,16	78,11	76,12	84,81
94,0	180,0	8,9	0,1	14,7	608,9	73,9	105,5	966,8	377,6	395,2	448,2	#######	0,18	78,16	76,08	86,15	0,16	78,15	76,17	84,55
95,0	181,0	8,7	0,2	14,9	613,5	74,1	105,5	975,6	380,5	398,4	451,3	#######	0,18	78,10	76,13	85,83	0,16	78,17	76,21	84,35
96,0	182,0	8,5	0,2	15,2	615,5	73,9	105,1	980,6	383,6	400,6	454,3	#######	0,18	78,10	76,18	85,56	0,16	78,22	76,27	85,84
97,0	183,0	8,4	0,2	14,8	603,0	73,8	105,2	974,7	386,8	403,4	457,5	#######	0,18	78,21	76,25	85,27	0,16	78,30	76,34	88,85
98,0	184,0	8,3	0,1	13,7	588,4	73,4	104,5	961,5	390,0	406,5	460,4	#######	0,18	78,29	76,30	85,02	0,16	78,36	76,37	89,03
99,0	185,0	8,1	0,1	13,2	580,2	74,3	104,2	945,3	393,1	409,1	463,8	#######	0,18	78,37	76,37	84,78	0,16	78,39	76,42	88,76
100,0	186,0	7,9	0,1	13,1	573,1	74,1	103,3	934,7	396,2	411,9	466,9	#######	0,18	78,38	76,39	84,51	0,16	78,40	76,44	88,42
101,0	187,0	7,8	0,1	13,0	569,4	74,5	102,6	926,2	399,3	414,9	469,7	#######	0,18	78,41	76,44	84,24	0,16	78,46	76,53	88,04
102,0	188,0	7,7	0,1	12,9	566,0	74,4	102,9	924,0	402,7	417,3	472,8	#######	0,18	78,47	76,53	84,06	0,16	78,54	76,57	87,69
103,0	189,0	7,6	0,1	12,9	561,5	74,6	102,4	917,6	406,0	420,4	475,8	#######	0,18	78,46	76,56	83,82	0,16	78,56	76,62	87,35
104,0	190,0	7,5	0,1	12,8	559,3	74,6	102,1	915,6	409,2	422,9	478,4	#######	0,18	78,50	76,62	83,65	0,16	78,61	76,67	87,02
105,0	191,0	7,4	0,1	12,8	558,6	74,4	102,5	915,7	412,6	425,6	481,2	#######	0,18	78,55	76,67	83,49	0,16	78,64	76,72	86,71
106,0	192,0	7,2	0,1	12,7	556,6	74,6	101,9	913,8	415,7	428,2	483,4	#######	0,18	78,60	76,71	84,58	0,16	78,69	76,75	86,36
107,0	193,0	7,1	0,1	12,7	555,2	74,6	102,3	910,6	419,0	430,4	485,5	#######	0,18	78,68	76,77	86,42	0,16	78,74	76,82	86,07
108,0	194,0	7,0	0,1	12,6	555,0	74,3	101,7	909,1	422,2	433,1	487,6	#######	0,18	78,67	76,79	87,91	0,16	78,74	76,86	85,74
109,0	195,0	6,9	0,1	12,7	555,0	74,4	102,2	909,7	425,2	436,4	490,2	#######	0,18	78,63	76,83	88,37	0,16	78,75	76,87	85,48
110,0	196,0	6,7	0,1	12,5	551,7	74,8	102,1	909,1	428,3	438,7	492,8	#######	0,18	78,61	76,86	88,31	0,16	78,75	76,89	85,21
111,0	197,0	6,6	0,1	12,5	549,1	73,8	101,8	907,8	431,6	441,8	494,7	#######	0,18	78,65	76,91	88,07	0,16	78,78	76,93	84,90
112,0	198,0	6,5	0,1	12,5	549,4	74,4	101,6	905,8	434,7	444,9	497,0	#######	0,18	78,65	76,93	87,82	0,16	78,80	76,98	84,62
113,0	199,0	6,4	0,1	12,6	551,4	74,1	101,5	905,0	437,9	447,0	499,0	#######	0,18	78,71	77,00	87,47	0,16	78,85	77,04	84,44
114,0	200,0	6,3	0,1	12,7	550,5	74,1	101,6	903,2	441,2	449,5	500,5	#######	0,18	78,75	77,03	87,13	0,16	78,89	77,08	87,10
115,0	201,0	6,2	0,1	12,6	546,5	74,5	101,2	897,5	444,3	452,6	502,5	#######	0,18	78,84	77,10	86,86	0,16	78,97	77,13	89,21
116,0	202,0	6,1	0,1	12,4	542,7	74,3	101,2	892,5	447,4	455,2	505,2	#######	0,18	78,87	77,13	86,57	0,16	78,99	77,17	89,06
117,0	203,0	6,0	0,1	12,0	534,0	74,7	100,5	875,1	450,7	457,4	506,5	#######	0,18	78,95	77,19	86,28	0,16	79,05	77,21	88,74
118,0	204,0	5,9	0,1	11,5	524,1	74,9	99,5	857,9	453,9	460,5	508,0	#######	0,18	78,95	77,22	85,96	0,16	79,03	77,24	88,38
119,0	205,0	5,7	0,1	11,1	517,0	74,5	99,6	840,0	457,2	463,1	510,1	#######	0,18	78,91	77,24	85,74	0,16	79,04	77,27	88,02
120,0	206,0	5,7	0,1	11,1	513,0	74,4	99,2	829,0	460,4	465,1	511,3	#######	0,18	78,97	77,31	85,48	0,16	79,07	77,32	87,66
121,0	207,0	5,6	0,1	11,0	509,4	74,9	98,9	819,1	463,7	467,7	513,4	#######	0,18	79,00	77,33	85,25	0,16	79,09	77,33	87,31
122,0	208,0	5,5	0,1	10,9	503,0	74,9	98,9	807,9	466,9	469,9	514,9	#######	0,18	79,10	77,37	84,98	0,16	79,15	77,38	86,98
123,0	209,0	5,4	0,1	10,4	494,1	74,5	98,4	796,2	470,0	472,7	516,5	#######	0,18	79,19	77,41	84,75	0,16	79,21	77,41	86,62
124,0	210,0	5,4	0,1	10,1	486,8	74,8	97,5	785,2	473,1	474,6	517,8	#######	0,18	79,20	77,44	84,50	0,16	79,22	77,45	86,35
125,0	211,0	5,3	0,1	9,9	485,3	74,8	97,8	781,1	476,3	476,8	519,3	#######	0,18	79,24	77,48	84,29	0,16	79,23	77,49	86,02
126,0	212,0	5,2	0,1	10,4	481,7	74,9	97,4	773,4	479,1	478,5	520,0	#######	0,18	79,30	77,53	84,11	0,16	79,31	77,55	85,70
127,0	213,0	5,1	0,1	10,2	476,3	74,2	97,2	765,7	482,1	480,0	521,3	#######	0,18	79,33	77,56	83,84	0,16	79,32	77,57	85,40
128,0	214,0	5,1	0,1	10,1	469,7	74,3	96,3	754,0	485,0	481,5	521,9	#######	0,18	79,37	77,61	83,86	0,16	79,36	77,62	85,15
129,0	215,0	5,0	0,1	9,7	464,3	74,8	95,9	741,7	488,0	482,8	522,9	#######	0,18	79,39	77,66	85,44	0,16	79,40	77,66	84,85
130,0	216,0	4,9	0,1	9,5	459,0	74,5	95,9	728,6	490,7	484,3	524,6	#######	0,18	79,42	77,69	87,36	0,16	79,42	77,68	84,58
131,0	217,0	4,8	0,2	9,3	453,5	74,8	96,0	716,5	493,5	485,3	525,2	#######	0,18	79,45	77,74	88,40	0,16	79,47	77,74	84,37
132,0	218,0	4,8	0,2	9,2	450,0	75,1	95,8	707,6	496,3	486,3	526,1	#######	0,18	79,51	77,79	88,51	0,16	79,50	77,81	86,97
133,0	219,0	4,7	0,2	9,1	446,7	74,6	95,4	698,6	499,0	487,6	526,7	#######	0,18	79,56	77,85	88,30	0,16	79,55	77,81	89,21
134,0	220,0	4,6	0,2	9,1	444,8	74,5	95,5	694,8	501,8	488,9	527,4	#######	0,18	79,55	77,86	88,02	0,16	79,57	77,85	89,17
135,0	221,0	4,6	0,2	9,2	444,7	74,7	94,9	694,9	504,6	489,7	528,4	#######	0,18	79,62	77,91	87,73	0,16	79,58	77,89	88,80
136,0	222,0	4,5	0,2	9,0	440,3	74,9	95,3	690,0	507,1	491,0	529,3	#######	0,18	79,61	77,95	87,39	0,16	79,60	77,93	88,44
137,0	223,0	4,5	0,2	8,4	429,9	74,9	94,2	678,0	509,8	492,3	530,0	#######	0,18	79,57	77,98	87,06	0,16	79,60	77,94	88,11
138,0	224,0	4,4	0,2	8,0	424,4	74,5	94,0	668,3	512,4	493,5	530,4	#######	0,18	79,59	78,02	86,69	0,16	79,64	78,00	87,76
139,0	225,0	4,4	0,3	7,9	421,7	74,7	93,7	656,7	514,9	494,2	530,8	#######	0,18	79,64	78,06	86,34	0,16	79,65	78,02	87,40
140,0	226,0	4,3	0,3	7,8	419,5	74,1	93,5	649,5	517,3	495,5	532,0	#######	0,18	79,62	78,06	86,04	0,16	79,64	78,03	87,01
141,0	227,0	4,3	0,3	7,7	415,7	74,4	93,3	639,9	519,7	495,5	532,0	#######	0,18	79,62	78,09	85,67	0,16	79,61	78,06	86,71
142,0	228,0	4,2	0,3	7,6	410,7	74,5	92,9	629,5	522,0	496,6	532,1	#######	0,18	79,59	78,12	85,36	0,16	79,62	78,06	86,40

SFBA EPA EMISSION RESULTS

Test Duration: **142** min

PRESSURE FACTOR:	DGM 1	0,97770	
	DGM 2	0,97843	
	DGM 3	1,00177	
TEMPERATURE FACTORS	DGM 1	0,98579	
	DGM 2	0,98562	
	DGM 3	0,99157	
VOLUMES SAMPLED	DGM 1	24,690	SCft
	DGM 2	22,956	Scft
	DGM 3	32,213	SCft

TOTAL TUNNEL VOLUME : 50055

SAMPLE RATIOS

Sample Train 1:	2027,348
Sample Train 2:	2180,502

Paticulate concentration

Sample Train 1	**0,000166**	g/dscf
Sample Train 2	**0,000170**	g/dscf
Room	**0,000003**	g/dscf

TOTAL EMISSIONS

Sample Train 1	**8,16**	g
Sample Train 2	**8,35**	g

EMISSION RATES

Sample Train 1	**3,45**	g/hr
Sample Train 2	**3,53**	g/hr

1st hour emission rate **7,50** g/hr

	Train 1	Train 2
Cs	0,0001661	0,00016989

RESULTS

Average emission rate: 3,5 g/hr

Burn Rate : 3,058 Dry kg/hr

BAROMETRIC PRESSURE

Average:	29,97293872	in Hg
Start:	29,97293872	in Hg
End:	29,97293872	in Hg

DGM CONTROLLER VALUES

DGM 1	Final:	4093,782	Cuft
	Initial:	4068,043	Cuft
DGM 2	Final:	2115,283	Cuft
	Initial:	2091,245	Cuft
DGM #3	Final:	991,600	Cuft
	Initial:	959,080	Cuft

TEMPERATURES

DGM 1	535,613	°R
DGM 2	535,701	°R

CALIBRATION FACTORS

DGM 1	0,9953
DGM 2	0,9903
DGM #3	0,9972

TUNNEL FLOW RATE: 352,500 Dscfm

PARTICULATE CATCH

Total Sample Train 1:	4,10	mg
Total Sample Train 2:	3,90	mg
Total Sample Train 1 1st hour:	3,70	mg

DEVIATION: 1,16%

*		*	*	*	*1	*2	*3	*4	*5	*6	*7	*8	Mass flow 1	DGM 1	DGM 1	Filter 1	Mass flow 2	DGM 2	DGM 2	Filter 2
Elapsed		Weight			Flue	Room	Tunnel	Unit	Unit	Unit	Unit	Unit	Reading	Inlet T	Outlet T	Temp	Reading	Inlet T	Outlet T	Temp
Time	Raw data row	Remaining	CO	CO_2	Gas	Temp	Dry Bulb	Top	Back	R.Side	L.Side	Bottom								
min		lbs	%	%	°F	°F	°F	°F	°F	°F	°F	°F	cuft/min	oF	oF	oF	cuft/min	oF	oF	oF
0,00	257,00	17,9	0,8	4,8	271,3	74,4	109,7	509,6	534,4	509,8	498,2	247,3	0,18	79,00	78,79	83,09	0,16	79,31	78,60	87,41
1,0	258,0	17,5	0,3	6,0	353,6	74,2	100,6	495,6	534,4	509,8	497,8	248,7	0,18	78,99	78,74	82,90	0,16	79,31	78,56	87,29
2,0	259,0	17,4	0,4	3,4	432,9	74,2	105,2	504,8	533,6	509,7	496,8	248,9	0,18	78,97	78,73	82,68	0,16	79,28	78,51	87,06
3,0	260,0	17,3	0,5	4,9	502,9	74,3	111,3	542,6	532,1	508,5	495,7	248,9	0,18	78,98	78,70	82,52	0,16	79,25	78,50	86,84
4,0	261,0	17,2	0,4	5,8	455,7	74,0	99,0	579,1	530,1	507,0	494,2	248,5	0,18	79,04	78,69	82,38	0,16	79,29	78,49	86,63
5,0	262,0	17,1	0,6	6,1	436,1	74,3	97,2	592,3	527,4	505,1	491,7	248,1	0,18	79,09	78,70	82,19	0,16	79,34	78,50	86,36
6,0	263,0	16,9	0,6	7,7	476,8	74,3	98,3	644,8	523,8	502,9	488,7	247,7	0,18	79,13	78,72	82,05	0,16	79,39	78,54	86,15
7,0	264,0	16,7	0,6	9,9	509,1	74,6	101,5	691,2	519,4	499,7	484,9	246,8	0,18	79,22	78,74	81,90	0,16	79,43	78,54	85,97
8,0	265,0	16,6	0,5	10,6	529,0	74,7	103,1	725,6	514,6	497,8	481,4	246,4	0,18	79,28	78,72	82,01	0,16	79,51	78,56	85,76
9,0	266,0	16,4	0,3	10,7	546,5	75,0	103,3	750,2	509,5	494,6	477,6	245,6	0,18	79,43	78,77	84,88	0,16	79,61	78,60	85,59
10,0	267,0	16,2	0,2	11,5	557,7	74,9	103,9	774,7	504,3	491,2	473,6	245,1	0,18	79,50	78,79	87,57	0,16	79,71	78,64	85,42
11,0	268,0	16,1	0,1	11,9	564,4	75,0	105,6	794,4	498,8	489,0	469,5	244,9	0,18	79,54	78,84	88,18	0,16	79,78	78,71	85,26
12,0	269,0	15,9	0,1	12,0	572,4	75,0	106,0	811,1	493,4	486,5	465,3	244,8	0,18	79,67	78,88	88,04	0,16	79,88	78,72	85,08
13,0	270,0	15,7	0,1	13,3	535,4	74,9	103,1	828,9	488,0	483,9	461,8	246,1	0,18	79,81	78,92	87,68	0,16	79,98	78,76	84,96
14,0	271,0	15,6	0,2	12,1	515,0	74,8	102,6	823,1	483,4	481,5	458,3	247,0	0,18	79,92	78,93	87,32	0,16	80,08	78,82	84,82
15,0	272,0	15,5	0,3	11,6	474,6	75,2	98,4	824,0	478,9	479,2	455,3	249,4	0,18	80,04	78,99	86,97	0,16	80,17	78,83	84,65
16,0	273,0	15,4	0,5	11,8	438,2	75,2	94,8	803,5	474,8	477,0	452,3	251,6	0,18	80,12	79,03	86,61	0,16	80,22	78,87	84,48
17,0	274,0	15,2	0,7	9,3	409,5	75,3	94,3	776,0	471,1	474,7	449,7	254,2	0,18	80,14	79,06	86,24	0,16	80,25	78,89	84,32
18,0	275,0	15,2	0,9	8,1	392,2	74,7	92,8	759,6	467,7	473,1	447,5	256,5	0,18	80,19	79,09	85,85	0,16	80,28	78,92	84,18
19,0	276,0	15,1	0,8	8,1	382,4	74,9	92,9	763,2	464,4	471,3	445,2	258,2	0,18	80,24	79,11	85,50	0,16	80,31	78,93	84,02
20,0	277,0	15,0	1,0	7,3	378,0	75,0	92,5	770,4	461,3	469,6	443,0	260,1	0,18	80,21	79,12	85,21	0,16	80,29	78,94	83,87
21,0	278,0	14,9	0,9	7,7	380,5	75,2	91,9	786,7	458,2	467,6	441,0	261,3	0,18	80,20	79,15	84,91	0,16	80,29	78,94	83,72
22,0	279,0	14,8	0,8	8,9	385,4	75,3	92,4	801,6	455,0	465,4	439,0	262,7	0,18	80,17	79,15	84,63	0,16	80,31	78,99	83,53
23,0	280,0	14,7	0,7	9,2	384,7	75,2	93,1	794,5	451,8	463,0	436,8	263,7	0,18	80,26	79,19	84,37	0,16	80,39	79,01	83,41
24,0	281,0	14,6	0,7	9,0	379,7	75,4	92,7	775,0	448,7	461,1	434,7	264,5	0,18	80,34	79,24	84,15	0,16	80,44	79,03	83,23
25,0	282,0	14,5	0,7	8,8	371,5	75,3	92,5	752,1	445,7	458,4	432,3	265,3	0,18	80,40	79,26	83,88	0,16	80,52	79,08	83,06
26,0	283,0	14,4	0,8	8,2	362,0	75,1	91,7	725,4	442,8	456,4	429,9	266,1	0,18	80,41	79,30	83,68	0,16	80,54	79,12	82,91
27,0	284,0	14,3	0,8	7,6	352,6	75,0	91,5	702,4	440,0	454,2	427,6	266,5	0,18	80,47	79,33	83,47	0,16	80,57	79,12	82,77
28,0	285,0	14,2	0,9	7,3	345,0	74,5	91,6	683,2	437,3	451,7	425,5	267,1	0,18	80,49	79,36	83,24	0,16	80,59	79,14	82,61
29,0	286,0	14,1	0,9	7,1	338,8	74,7	91,4	668,0	434,7	449,7	423,0	267,5	0,18	80,41	79,38	83,05	0,16	80,57	79,17	82,88
30,0	287,0	14,1	0,9	6,9	332,4	74,8	90,7	652,8	432,2	447,4	420,8	268,0	0,18	80,42	79,39	82,81	0,16	80,60	79,20	84,79
31,0	288,0	14,0	1,0	6,8	326,8	74,9	90,7	639,8	429,8	445,3	418,1	268,3	0,18	80,42	79,40	82,59	0,16	80,61	79,23	86,92
32,0	289,0	13,9	1,0	6,9	323,1	74,9	89,8	630,3	427,5	443,5	415,6	268,7	0,18	80,40	79,44	82,41	0,16	80,60	79,25	87,63
33,0	290,0	13,8	1,1	7,0	321,0	74,7	89,4	624,4	425,2	441,5	413,2	268,8	0,18	80,36	79,45	82,19	0,16	80,59	79,30	87,66
34,0	291,0	13,7	1,0	7,1	320,5	74,6	89,6	622,8	422,8	439,8	411,2	269,0	0,18	80,37	79,47	82,03	0,16	80,58	79,31	87,47
35,0	292,0	13,6	1,0	7,3	321,5	74,2	89,4	625,2	420,4	437,7	408,8	269,1	0,18	80,40	79,49	81,83	0,16	80,59	79,32	87,27
36,0	293,0	13,5	1,0	7,5	324,4	74,6	89,4	631,6	418,1	436,1	406,5	268,8	0,18	80,37	79,52	83,55	0,16	80,57	79,30	87,05
37,0	294,0	13,4	0,9	7,7	329,6	74,9	89,8	642,7	415,8	434,6	404,2	268,8	0,18	80,39	79,52	86,82	0,16	80,55	79,33	86,80
38,0	295,0	13,4	0,9	8,4	340,1	74,7	90,2	669,4	413,4	433,1	402,3	268,4	0,18	80,34	79,54	88,02	0,16	80,55	79,36	86,58
39,0	296,0	13,3	0,8	9,1	354,0	74,7	90,9	701,9	411,1	431,2	400,2	267,8	0,18	80,31	79,55	88,05	0,16	80,55	79,37	86,33
40,0	297,0	13,2	0,7	10,1	368,8	74,5	91,5	730,7	408,7	429,8	398,1	267,5	0,18	80,28	79,56	87,69	0,16	80,52	79,37	86,07
41,0	298,0	13,0	0,5	11,3	379,3	74,7	91,7	749,4	406,3	428,2	395,8	266,7	0,18	80,23	79,57	87,25	0,16	80,51	79,38	85,82
42,0	299,0	12,9	0,4	12,0	389,3	75,0	92,3	769,2	404,0	427,1	393,3	266,0	0,18	80,23	79,60	86,83	0,16	80,49	79,37	85,59
43,0	300,0	12,8	0,4	12,6	403,3	75,0	91,9	799,5	401,6	426,0	390,9	265,6	0,18	80,25	79,62	86,39	0,16	80,47	79,37	85,33
44,0	301,0	12,7	0,2	13,7	417,5	75,0	92,5	835,8	399,3	425,0	388,5	264,9	0,18	80,28	79,62	85,99	0,16	80,48	79,38	85,14
45,0	302,0	12,5	0,2	14,7	426,7	74,9	92,0	847,1	397,1	424,8	389,0	263,3	0,18	80,24	79,61	85,57	0,16	80,44	79,37	84,89
46,0	303,0	12,4	0,3	15,1	429,8	75,1	92,6	854,2	395,6	423,9	388,7	263,0	0,18	80,31	79,63	85,19	0,16	80,48	79,40	84,67
47,0	304,0	12,3	0,3	15,2	430,4	75,1	93,0	858,2	394,5	423,1	388,4	262,2	0,18	80,36	79,67	84,85	0,16	80,51	79,43	84,45
48,0	305,0	12,2	0,3	15,0	427,5	75,3	93,2	856,8	393,4	422,8	387,9	261,6	0,18	80,43	79,71	84,55	0,16	80,57	79,47	84,24
49,0	306,0	12,1	0,3	14,6	423,3	75,5	92,8	852,8	392,3	422,6	386,9	261,1	0,18	80,48	79,75	84,27	0,16	80,62	79,46	84,05
50,0	307,0	11,9	0,3	14,4	419,3	75,4	92,5	846,2	391,4	422,7	386,3	260,6	0,18	80,48	79,78	83,98	0,16	80,66	79,51	83,88
51,0	308,0	11,8	0,4	14,0	412,6	74,8	92,5	837,8	390,4	422,0	385,5	260,2	0,18	80,52	79,81	83,70	0,16	80,70	79,52	83,70
52,0	309,0	11,7	0,3	13,7	408,4	75,3	92,4	832,2	389,4	421,8	385,3	259,8	0,18	80,53	79,84	83,46	0,16	80,76	79,56	83,50
53,0	310,0	11,6	0,4	13,6	403,0	75,2	92,5	823,1	388,4	421,1	384,8	259,4	0,18	80,48	79,86	83,24	0,16	80,76	79,60	83,33
54,0	311,0	11,5	0,4	13,4	398,6	75,2	92,0	813,5	387,4	420,8	384,5	259,0	0,18	80,44	79,88	83,02	0,16	80,78	79,65	83,16
55,0	312,0	11,4	0,4	13,3	394,8	75,1	91,7	805,5	386,5	420,0	384,2	258,5	0,18	80,44	79,92	82,81	0,16	80,80	79,65	83,00
56,0	313,0	11,2	0,4	13,2	391,0	75,2	91,6	799,7	385,7	419,9	384,2	258,2	0,18	80,43	79,92	82,57	0,16	80,76	79,66	82,82
57,0	314,0	11,2	0,4	13,2	389,6	75,2	91,6	793,1	384,9	420,2	384,2	258,0	0,18	80,46	79,94	82,29	0,16	80,77	79,70	82,64
58,0	315,0	11,1	0,4	13,2	387,0	75,1	90,5	782,1	384,0	419,4	384,3	257,5	0,18	80,47	79,96	82,02	0,16	80,75	79,69	83,00
59,0	316,0	10,9	0,4	13,0	383,6	75,1	90,8	772,9	383,4	419,2	384,0	257,4	0,18	80,44	79,97	88,41	0,16	80,74	79,70	85,32
60,0	317,0	10,9	0,4	12,8	380,3	75,3	90,3	762,4	382,7	418,6	384,2	257,2	0,18	80,50	79,98	87,37	0,16	80,75	79,72	87,65
61,0	318,0	10,7	0,4	12,6	378,0	75,1	90,9	751,1	382,1	417,6	384,0	257,2	0,18	80,45	79,98	86,49	0,16	80,73	79,72	88,23
62,0	319,0	10,7	0,5	12,6	374,2	75,5	90,9	741,7	381,6	417,7	383,7	256,8	0,18	80,45	79,99	85,69	0,16	80,71	79,71	88,22
63,0	320,0	10,6	0,5	12,5	372,4	75,5	91,0	736,1	381,1	416,6	384,2	256,7	0,18	80,53	80,00	85,05	0,16	80,72	79,71	88,03
64,0	321,0	10,5	0,5	12,6	371,3	75,7	90,6	733,6	380,6	415,9	384,2	256,3	0,18	80,52	80,01	84,54	0,16	80,72	79,71	87,82
65,0	322,0	10,4	0,5	12,7	371,2	75,5	90,5	729,6	380,1	415,1	384,4	256,0	0,18	80,49	80,03	84,07	0,16	80,72	79,75	87,56
66,0	323,0	10,2	0,4	12,9	372,3	75,7	90,6	729,0	379,7	414,6	384,4	255,8	0,18	80,42	80,05	83,68	0,16	80,70	79,77	87,35
67,0	324,0	10,1	0,5	12,9	373,0	75,7	90,8	733,0	379,3	414,5	385,2	255,7	0,18	80,36	80,06	83,38	0,16	80,69	79,79	87,11
68,0	325,0	10,1	0,4	13,4	376,1	75,8	90,8	740,4	378,8	413,8	385,4	255,5	0,18	80,35	80,07	83,06	0,16	80,70	79,78	86,82
69,0	326,0	10,0	0,4	13,5	380,3	75,8	91,0	749,9	378,4	413,3	385,6	255,1	0,18	80,35	80,07	82,84	0,16	80,71	79,81	86,58
70,0	327,0	9,8	0,4	13,6	382,6	75,7	91,0	755,4	378,0	413,2	386,1	254,8	0,18	80,37	80,08	82,60	0,16	80,71	79,82	86,33
71,0	328,0	9,7	0,5	13,8	384,9	75,9	91,3	761,7	377,7	413,6	386,5	254,4	0,18	80,39	80,11	82,45	0,16	80,71	79,81	86,09
72,0	329,0	9,6	0,5	13,8	387,4	74,9	90,5	768,3	377,3	413,4	387,3	253,9	0,18	80,36	80,12	82,26	0,16	80,70	79,84	85,81
73,0	330,0	9,6	0,5	14,0	390,1	75,7	90,9	772,0	377,1	413,7	387,4	253,4	0,18	80,32	80,13	82,15	0,16	80,67	79,86	85,59
74,0	331,0	9,4	0,6	14,0	392,0	75,9	91,1	774,9	376,9	413,5	387,6	253,2	0,18	80,28	80,12	82,04	0,16	80,66	79,82	85,38
75,0	332,0	9,3	0,6	14,2	393,7	75,7	91,2	777,0	376,7	413,3	387,9	252,8	0,18	80,28	80,12	82,21	0,16	80,61	79,82	85,14
76,0	333,0	9,2	0,5	14,2	394,7	76,0	91,3	781,8	376,5	413,5	388,2	252,5	0,18	80,30	80,14	83,83	0,16	80,63	79,82	84,88
77,0	334,0	9,1	0,5	14,3	395,8	76,0	91,0	786,7	376,3	413,8	389,1	252,0	0,18	80,31	80,14	85,52	0,16	80,66	79,84	84,63
78,0	335,0	9,0	0,5	14,5	397,9	76,0	91,4	792,0	376,3	413,6	389,5	251,7	0,18	80,32	80,18	86,42	0,16	80,71	79,88	84,38
79,0	336,0	8,9	0,6	14,5	400,0	76,0	91,4	797,6	376,3	413,6	389,6	251,6	0,18	80,27	80,18	86,52	0,16	80,70	79,91	84,19
80,0	337,0	8,8	0,8	14,6	401,6	76,2	91,7	810,5	376,3	414,4	390,4	251,1	0,18	80,33	80,19	86,49	0,16	80,75	79,94	84,00
81,0	338,0	8,7	0,8	14,6	401,6	76,3	91,8	817,6	376,3	414,6	390,8	251,0	0,18	80,37	80,23	86,42	0,16	80,77	79,95	83,81

82,0	339,0	8,6	0,8	14,6	399,9	76,2	91,6	819,5	376,5	415,5	391,4	250,7	0,18	80,37	80,24	86,28	0,16	80,78	79,97	83,63
83,0	340,0	8,4	0,7	14,1	396,1	76,0	91,0	811,7	376,7	415,4	391,5	250,2	0,18	80,43	80,25	86,15	0,16	80,78	80,00	83,45
84,0	341,0	8,4	0,7	13,5	392,5	76,2	91,2	802,3	377,0	416,0	392,7	250,0	0,18	80,44	80,24	85,95	0,16	80,80	80,00	83,28
85,0	342,0	8,2	0,6	13,3	386,6	76,2	91,0	788,3	377,3	416,4	393,2	250,1	0,18	80,47	80,26	85,80	0,16	80,82	80,00	83,12
86,0	343,0	8,2	0,6	12,9	380,8	76,0	90,3	769,5	377,8	417,0	394,2	249,6	0,18	80,46	80,26	85,60	0,16	80,81	80,03	82,95
87,0	344,0	8,1	0,6	12,4	373,3	75,8	90,2	748,0	378,3	417,5	395,4	249,6	0,18	80,43	80,27	85,37	0,16	80,79	80,04	82,80
88,0	345,0	8,0	0,6	12,0	366,5	75,9	90,2	729,5	378,8	418,2	396,1	249,4	0,18	80,39	80,26	85,19	0,16	80,77	80,04	82,66
89,0	346,0	7,9	0,5	12,0	360,8	75,9	90,2	715,1	379,4	418,0	397,3	249,3	0,18	80,36	80,29	85,02	0,16	80,79	80,04	83,43
90,0	347,0	7,9	0,4	11,8	357,3	76,1	89,8	708,8	380,0	418,5	398,4	249,1	0,18	80,32	80,29	84,79	0,16	80,75	80,05	86,06
91,0	348,0	7,8	0,4	11,9	354,9	76,1	89,7	704,9	380,6	418,6	399,7	249,2	0,18	80,32	80,31	84,58	0,16	80,79	80,09	87,90
92,0	349,0	7,7	0,4	11,9	354,9	76,3	89,4	703,5	381,2	418,6	400,8	249,1	0,18	80,29	80,31	84,38	0,16	80,78	80,10	88,25
93,0	350,0	7,6	0,4	12,0	353,9	76,1	89,7	704,2	381,7	418,9	402,0	248,9	0,18	80,28	80,33	84,21	0,16	80,77	80,11	88,17
94,0	351,0	7,5	0,4	12,1	353,9	76,1	89,7	706,4	382,3	419,0	403,4	248,6	0,18	80,25	80,32	83,99	0,16	80,73	80,08	87,94
95,0	352,0	7,4	0,4	12,3	356,2	76,0	89,4	712,4	382,8	418,7	404,4	248,3	0,18	80,23	80,30	83,83	0,16	80,69	80,08	87,76
96,0	353,0	7,3	0,4	12,4	357,5	76,0	89,3	717,7	383,3	418,9	405,6	248,2	0,18	80,25	80,31	83,66	0,16	80,67	80,09	87,55
97,0	354,0	7,3	0,4	12,6	359,7	75,9	89,3	724,4	383,8	418,7	406,2	247,8	0,18	80,27	80,32	83,53	0,16	80,68	80,07	87,33
98,0	355,0	7,2	0,4	12,7	361,5	75,7	89,7	731,6	384,3	418,7	406,6	247,7	0,18	80,24	80,32	83,42	0,16	80,66	80,07	87,10
99,0	356,0	7,1	0,4	12,9	364,6	76,2	90,2	738,8	384,8	418,9	407,4	247,6	0,18	80,25	80,31	83,30	0,16	80,65	80,05	86,86
100,0	357,0	7,0	0,4	13,0	367,7	76,1	89,9	745,8	385,2	418,9	408,4	247,2	0,18	80,25	80,30	83,16	0,16	80,63	80,04	86,62
101,0	358,0	6,9	0,5	13,1	369,9	75,8	89,8	749,2	385,7	418,1	408,5	246,8	0,18	80,26	80,31	83,06	0,16	80,65	80,06	86,43
102,0	359,0	6,8	0,6	13,2	372,5	76,1	90,1	755,7	386,1	418,3	409,0	246,7	0,18	80,30	80,32	82,99	0,16	80,68	80,08	86,18
103,0	360,0	6,7	0,5	13,6	377,5	75,9	90,5	768,3	386,5	417,8	409,9	246,3	0,18	80,31	80,31	82,85	0,16	80,68	80,08	85,97
104,0	361,0	6,6	0,5	14,0	383,8	76,7	90,6	784,4	386,9	418,0	410,5	246,2	0,18	80,32	80,32	82,76	0,16	80,68	80,06	85,74
105,0	362,0	6,5	0,4	14,4	388,3	76,6	90,8	800,9	387,3	418,0	411,3	245,9	0,18	80,35	80,34	82,68	0,16	80,71	80,08	85,50
106,0	363,0	6,4	0,5	14,8	395,1	76,8	91,1	819,5	387,6	418,1	411,6	245,6	0,18	80,41	80,38	82,64	0,16	80,77	80,10	85,28
107,0	364,0	6,3	0,5	15,2	401,9	76,5	91,2	839,1	387,9	417,8	412,2	245,4	0,18	80,45	80,39	82,64	0,16	80,80	80,12	85,09
108,0	365,0	6,2	0,6	15,6	407,0	76,6	91,7	857,8	388,3	418,0	413,1	245,1	0,18	80,48	80,40	82,60	0,16	80,85	80,17	84,89
109,0	366,0	6,1	0,7	16,0	412,9	76,5	92,0	869,5	388,7	417,9	414,0	244,7	0,18	80,55	80,43	82,58	0,16	80,90	80,18	84,71
110,0	367,0	6,0	0,7	16,0	414,6	76,5	91,9	882,0	389,2	418,2	414,9	244,2	0,18	80,55	80,42	82,54	0,16	80,91	80,21	84,51
111,0	368,0	5,8	0,7	16,1	416,6	76,8	92,6	890,4	389,7	418,1	415,1	244,2	0,18	80,59	80,44	82,50	0,16	80,95	80,23	84,32
112,0	369,0	5,7	0,8	16,1	418,2	76,7	92,5	898,9	390,3	417,8	415,8	244,3	0,18	80,69	80,45	82,51	0,16	80,99	80,24	84,15
113,0	370,0	5,6	0,8	16,0	418,4	76,3	92,3	902,5	391,0	418,0	416,0	244,0	0,18	80,72	80,49	82,49	0,16	81,02	80,28	84,00
114,0	371,0	5,5	0,9	15,9	417,7	75,6	92,6	902,1	391,7	418,4	416,7	243,8	0,18	80,79	80,50	82,41	0,16	81,08	80,28	83,80
115,0	372,0	5,4	0,9	15,7	415,8	75,4	92,0	903,2	392,5	418,7	417,4	243,6	0,18	80,82	80,54	82,30	0,16	81,14	80,32	83,56
116,0	373,0	5,3	0,7	15,4	409,2	75,2	92,0	894,0	393,5	418,9	417,9	243,2	0,18	80,80	80,55	82,94	0,16	81,18	80,37	83,34
117,0	374,0	5,2	0,5	14,8	400,7	75,6	91,5	869,5	394,7	419,8	418,5	243,2	0,18	80,89	80,60	86,63	0,16	81,24	80,39	83,15
118,0	375,0	5,2	0,4	13,7	386,6	75,2	91,2	828,7	396,0	420,8	419,4	243,2	0,18	80,93	80,62	87,74	0,16	81,28	80,40	82,99
119,0	376,0	5,1	0,3	12,5	373,1	74,4	90,6	792,4	397,5	422,0	420,0	243,2	0,18	80,93	80,64	87,55	0,16	81,31	80,44	82,81
120,0	377,0	5,1	0,2	11,8	361,1	74,7	90,3	763,9	399,3	423,2	420,3	243,4	0,18	80,90	80,66	87,20	0,16	81,33	80,47	82,64
121,0	378,0	5,0	0,2	11,5	352,1	74,9	89,9	743,4	401,0	423,9	420,8	243,7	0,18	80,90	80,66	86,82	0,16	81,37	80,50	83,80
122,0	379,0	5,0	0,2	11,2	345,4	74,7	89,8	727,1	402,6	425,2	421,2	243,8	0,18	80,90	80,69	86,41	0,16	81,38	80,52	86,49
123,0	380,0	4,9	0,2	11,1	340,5	74,7	89,5	716,5	404,1	426,7	422,1	243,8	0,18	80,85	80,69	86,06	0,16	81,34	80,56	88,03
124,0	381,0	4,8	0,2	11,2	336,3	74,4	89,5	707,0	405,6	428,1	421,9	243,7	0,18	80,82	80,70	85,69	0,16	81,35	80,58	88,23
125,0	382,0	4,8	0,2	11,1	335,0	74,8	89,1	699,4	407,1	429,0	422,5	243,8	0,18	80,78	80,71	85,34	0,16	81,35	80,58	88,07
126,0	383,0	4,7	0,1	11,2	331,5	74,6	89,3	693,9	408,4	430,0	422,9	243,9	0,18	80,72	80,70	85,00	0,16	81,30	80,57	87,81
127,0	384,0	4,7	0,2	11,0	327,7	74,4	89,1	689,5	409,7	431,2	423,7	243,8	0,18	80,65	80,70	84,68	0,16	81,26	80,61	87,48
128,0	385,0	4,6	0,1	10,9	322,8	74,4	88,7	679,2	411,1	431,7	424,3	243,6	0,18	80,66	80,71	84,37	0,16	81,27	80,61	87,21
129,0	386,0	4,6	0,1	10,3	316,6	74,6	88,6	663,1	412,4	432,7	424,3	243,4	0,18	80,67	80,70	84,12	0,16	81,26	80,62	86,95
130,0	387,0	4,5	0,2	9,9	312,4	74,6	88,5	650,1	413,7	433,1	424,3	243,8	0,18	80,64	80,71	83,86	0,16	81,25	80,62	86,67
131,0	388,0	4,5	0,2	9,6	308,3	74,7	88,3	640,7	415,0	433,5	424,2	244,0	0,18	80,54	80,68	83,58	0,16	81,18	80,61	86,36
132,0	389,0	4,4	0,2	9,6	305,5	74,7	88,2	635,1	416,3	434,2	424,6	244,1	0,18	80,45	80,68	83,31	0,16	81,12	80,62	86,02
133,0	390,0	4,4	0,2	9,5	303,3	74,9	88,1	627,3	417,5	434,5	425,2	243,9	0,18	80,39	80,68	83,04	0,16	81,08	80,63	85,68
134,0	391,0	4,4	0,3	9,5	301,6	75,0	88,3	620,1	418,7	435,4	425,7	243,8	0,18	80,37	80,68	82,89	0,16	81,07	80,64	85,39
135,0	392,0	4,3	0,3	9,5	300,1	74,6	88,0	614,0	419,8	435,4	425,1	243,7	0,18	80,33	80,67	82,67	0,16	81,04	80,64	85,13
136,0	393,0	4,3	0,3	9,5	298,5	74,2	87,9	608,2	420,9	435,2	425,1	243,7	0,18	80,28	80,66	82,47	0,16	80,99	80,64	84,84
137,0	394,0	4,2	0,3	9,7	297,5	73,8	87,6	603,6	421,8	435,8	425,2	243,6	0,18	80,21	80,67	82,28	0,16	80,94	80,64	84,51
138,0	395,0	4,2	0,3	9,8	297,1	73,9	87,6	601,6	422,9	436,1	425,4	243,5	0,18	80,20	80,64	82,44	0,16	80,92	80,63	84,24
139,0	396,0	4,2	0,3	9,7	295,0	73,7	87,1	597,6	423,9	435,8	425,8	243,0	0,18	80,22	80,65	85,59	0,16	80,89	80,60	83,98
140,0	397,0	4,1	0,3	9,5	291,6	73,9	86,9	590,7	424,7	436,2	426,3	242,8	0,18	80,18	80,62	87,18	0,16	80,81	80,59	83,68
141,0	398,0	4,1	0,3	8,9	285,5	73,8	86,7	579,2	425,6	436,7	426,0	242,6	0,18	80,04	80,59	87,01	0,16	80,74	80,57	83,42
142,0	399,0	4,1	0,5	8,0	278,2	74,1	86,5	561,3	426,5	437,0	426,2	242,6	0,18	80,03	80,58	86,56	0,16	80,69	80,58	83,14
143,0	400,0	4,1	0,9	6,7	268,3	73,9	86,4	542,1	427,4	436,8	426,5	243,0	0,18	80,00	80,55	86,11	0,16	80,66	80,54	82,86
144,0	401,0	4,1	1,1	6,6	261,1	73,9	86,5	526,5	428,2	437,5	426,6	243,3	0,18	80,00	80,53	85,67	0,16	80,61	80,55	82,58
145,0	402,0	4,1	1,1	6,4	255,6	74,0	86,3	512,5	429,1	436,7	427,4	243,4	0,18	80,00	80,52	85,30	0,16	80,58	80,56	82,72
146,0	403,0	4,0	1,0	6,6	252,1	73,6	86,1	503,7	429,9	437,0	427,6	243,6	0,18	80,04	80,54	84,91	0,16	80,63	80,57	84,95
147,0	404,0	4,0	1,0	6,6	247,6	74,2	86,0	494,7	430,7	436,8	428,2	243,6	0,18	80,09	80,56	84,54	0,16	80,64	80,57	87,35
148,0	405,0	4,0	1,1	6,5	243,7	73,8	86,0	487,6	431,4	436,0	428,3	243,6	0,18	80,04	80,53	84,20	0,16	80,64	80,58	87,99
149,0	406,0	3,9	1,1	6,6	240,6	74,0	85,9	480,4	432,2	436,1	428,9	244,0	0,18	80,06	80,56	83,90	0,16	80,65	80,58	87,90
150,0	407,0	3,9	1,2	6,6	239,1	74,0	85,8	476,3	432,9	436,0	429,4	244,0	0,18	80,03	80,54	83,55	0,16	80,63	80,56	87,61
151,0	408,0	3,8	1,1	6,6	236,5	74,0	85,9	472,6	433,6	435,8	429,9	244,0	0,18	80,01	80,54	83,25	0,16	80,60	80,58	87,30
152,0	409,0	3,8	1,1	6,6	234,7	73,8	85,8	468,9	434,4	435,9	430,6	244,1	0,18	80,00	80,54	82,96	0,16	80,61	80,60	86,94
153,0	410,0	3,8	1,1	6,6	233,3	74,0	85,8	464,4	435,1	435,5	430,9	244,3	0,18	79,92	80,55	82,68	0,16	80,57	80,61	86,59
154,0	411,0	3,8	1,1	6,6	231,2	74,2	85,6	460,8	435,9	435,4	431,5	244,1	0,18	79,88	80,56	82,44	0,16	80,56	80,59	86,24
155,0	412,0	3,8	1,1	6,7	230,1	74,0	85,7	457,8	436,8	435,5	432,1	244,1	0,18	79,87	80,56	82,24	0,16	80,56	80,60	85,91
156,0	413,0	3,7	1,1	6,7	228,6	74,4	85,7	455,3	437,6	434,9	432,3	244,1	0,18	79,87	80,56	82,26	0,16	80,56	80,61	85,60
157,0	414,0	3,7	1,1	6,8	228,2	74,1	85,5	452,5	438,5	434,8	432,8	244,1	0,18	79,92	80,59	85,70	0,16	80,56	80,62	85,28
158,0	415,0	3,7	1,1	6,8	227,4	74,0	85,6	450,2	439,5	435,0	433,4	244,2	0,18	79,93	80,60	87,50	0,16	80,55	80,62	84,97
159,0	416,0	3,7	1,1	6,9	226,2	74,0	85,5	448,6	440,5	434,5	433,8	244,2	0,18	79,97	80,57	87,33	0,16	80,59	80,62	84,67
160,0	417,0	3,7	1,1	6,9	225,7	74,3	85,5	447,3	441,5	434,5	434,7	244,2	0,18	79,99	80,60	86,96	0,16	80,58	80,65	84,41
161,0	418,0	3,7	1,1	7,0	225,0	74,3	85,5	445,9	442,7	434,3	435,1	244,3	0,18	80,01	80,62	86,56	0,16	80,63	80,65	84,15
162,0	419,0	3,7	1,1	7,0	224,2	74,4	85,4	444,0	443,9	434,0	435,5	244,3	0,18	80,02	80,60	86,15	0,16	80,65	80,66	83,87
163,0	420,0	3,6	1,0	7,0	224,2	74,3	85,5	442,6	445,1	433,9	436,1	244,1	0,18	80,03	80,61	85,79	0,16	80,66	80,68	83,66
164,0	421,0	3,6	1,0	7,0	223,2	74,0	85,5	441,2	446,4	433,3	436,4	244,1	0,18	80,05	80,63	85,43	0,16	80,67	80,67	83,41
165,0	422,0	3,6	1,0	7,0	222,6	74,3	85,6	440,1	447,7	432,7	436,5	244,1	0,18	80,06	80,63	85,05	0,16	80,71	80,69	83,20
166,0	423,0	3,6	1,1	6,9	222,1	74,1	85,6	439,1	449,1	432,1	436,7	244,1	0,18	80,05	80,67	84,68	0,16	80,71	80,72	82,94
167,0	424,0	3,5	1,1	7,0	221,5	74,3	85,6	438,3	450,5	432,2	437,5	244,0	0,18	80,03	80,65	84,36	0,16	80,71	80,70	82,70

168,0	425,0	3,5	1,0	6,9	220,3	74,3	85,7	437,7	452,0	432,5	438,0	244,5	0,18	80,06	80,69	84,04	0,16	80,72	80,72	83,15
169,0	426,0	3,5	1,0	6,9	220,1	74,3	85,7	436,2	453,4	431,5	438,3	244,3	0,18	80,05	80,69	83,78	0,16	80,72	80,72	85,93
170,0	427,0	3,5	1,0	7,0	220,0	74,5	85,6	435,3	454,9	431,3	438,8	244,2	0,18	80,06	80,70	83,51	0,16	80,72	80,74	88,01
171,0	428,0	3,5	1,0	7,0	219,3	74,1	85,7	433,2	456,5	430,5	438,9	244,6	0,18	80,09	80,74	83,28	0,16	80,75	80,76	88,42
172,0	429,0	3,4	1,0	7,0	218,8	74,2	85,7	432,0	458,1	430,3	439,0	244,5	0,18	80,11	80,72	83,02	0,16	80,77	80,77	88,31
173,0	430,0	3,4	1,0	7,0	218,3	74,7	85,7	431,0	459,7	429,9	438,9	244,6	0,18	80,12	80,73	82,77	0,16	80,78	80,79	88,08
174,0	431,0	3,4	1,0	7,0	218,2	74,5	85,6	430,6	461,3	429,8	439,2	245,0	0,18	80,15	80,75	82,54	0,16	80,79	80,80	87,74
175,0	432,0	3,4	0,9	7,1	217,9	74,5	85,7	428,9	463,0	429,5	439,3	245,1	0,18	80,17	80,77	82,33	0,16	80,82	80,82	87,49
176,0	433,0	3,4	0,9	7,1	217,4	74,3	85,7	428,4	464,7	429,3	439,3	245,3	0,18	80,15	80,76	82,13	0,16	80,80	80,80	87,17
177,0	434,0	3,3	0,9	7,1	217,4	74,1	85,6	428,1	466,4	428,7	439,2	245,6	0,18	80,15	80,79	82,32	0,16	80,83	80,84	86,90
178,0	435,0	3,3	0,9	7,1	216,6	74,5	85,6	426,4	468,2	427,8	438,9	245,5	0,18	80,17	80,77	85,89	0,16	80,83	80,82	86,57
179,0	436,0	3,3	0,9	7,1	215,8	74,7	85,6	425,9	469,9	427,6	438,9	245,8	0,18	80,19	80,81	87,66	0,16	80,84	80,85	86,27
180,0	437,0	3,3	0,9	7,1	215,4	74,4	85,6	425,5	471,7	427,8	438,7	246,1	0,18	80,23	80,80	87,48	0,16	80,87	80,86	85,94
181,0	438,0	3,3	0,9	7,1	215,4	74,4	85,5	424,8	473,6	427,2	438,7	246,1	0,18	80,21	80,82	87,10	0,16	80,88	80,88	85,66
182,0	439,0	3,3	0,9	7,2	215,6	74,3	85,6	423,5	475,5	426,7	438,5	246,2	0,18	80,20	80,83	86,69	0,16	80,87	80,88	85,40
183,0	440,0	3,2	0,9	7,2	214,6	74,5	85,5	423,3	477,3	425,8	438,0	246,5	0,18	80,21	80,81	86,23	0,16	80,89	80,87	85,10
184,0	441,0	3,2	0,9	7,2	213,9	74,3	85,4	421,3	479,2	425,7	438,0	246,5	0,18	80,21	80,83	85,79	0,16	80,87	80,89	84,78
185,0	442,0	3,2	0,9	7,2	213,7	74,0	85,4	419,5	481,2	424,6	437,4	247,0	0,18	80,17	80,84	85,44	0,16	80,88	80,90	84,52
186,0	443,0	3,2	0,9	7,2	213,4	74,0	85,4	418,1	483,1	424,2	437,1	247,4	0,18	80,14	80,83	85,05	0,16	80,87	80,90	84,22
187,0	444,0	3,2	0,9	7,2	212,3	74,1	85,4	417,4	485,1	423,7	437,0	247,6	0,18	80,13	80,85	84,70	0,16	80,87	80,93	83,92
188,0	445,0	3,1	0,9	7,2	212,2	74,1	85,5	416,2	487,1	423,8	436,9	248,0	0,18	80,13	80,84	84,38	0,16	80,84	80,91	83,62
189,0	446,0	3,1	0,9	7,2	211,9	74,1	85,3	415,2	489,2	423,6	436,7	248,2	0,18	80,14	80,86	84,08	0,16	80,84	80,92	83,38
190,0	447,0	3,1	0,9	7,3	210,9	74,4	85,4	415,0	491,2	423,4	436,7	248,4	0,18	80,12	80,87	83,80	0,16	80,86	80,93	83,11
191,0	448,0	3,1	0,9	7,3	210,5	74,3	85,4	414,1	493,3	422,8	436,2	248,8	0,18	80,14	80,88	83,52	0,16	80,87	80,93	82,89
192,0	449,0	3,1	0,9	7,3	210,2	74,5	85,4	412,4	495,3	422,2	435,9	249,1	0,18	80,12	80,88	83,31	0,16	80,87	80,94	82,63
193,0	450,0	3,1	0,9	7,3	209,9	74,5	85,4	413,6	497,4	421,7	435,3	249,5	0,18	80,14	80,88	83,07	0,16	80,88	80,95	83,25
194,0	451,0	3,1	0,9	7,4	209,4	74,4	85,3	413,3	499,4	421,7	435,3	249,7	0,18	80,16	80,88	82,84	0,16	80,89	80,94	85,92
195,0	452,0	3,0	0,9	7,4	209,7	73,9	85,3	413,1	501,3	420,5	434,8	249,8	0,18	80,16	80,87	82,61	0,16	80,89	80,93	88,00
196,0	453,0	3,0	0,9	7,4	209,3	74,4	85,2	412,4	503,2	419,9	434,9	250,0	0,18	80,18	80,89	82,42	0,16	80,88	80,97	88,41
197,0	454,0	3,0	0,9	7,4	209,1	73,8	85,2	411,5	505,1	419,9	434,5	250,2	0,18	80,15	80,89	82,16	0,16	80,85	80,96	88,24
198,0	455,0	3,0	0,9	7,4	208,4	74,3	85,2	410,7	507,0	419,7	434,0	250,4	0,18	80,12	80,89	83,43	0,16	80,85	80,94	87,98
199,0	456,0	2,9	0,9	7,4	208,4	74,2	85,2	409,3	508,9	419,6	433,7	251,0	0,18	80,13	80,89	87,02	0,16	80,84	80,95	87,71
200,0	457,0	3,0	0,9	7,4	207,8	74,1	85,2	409,1	510,7	418,2	433,6	251,5	0,18	80,15	80,91	87,51	0,16	80,84	80,97	87,39
201,0	458,0	2,9	0,9	7,4	207,7	74,3	85,1	408,5	512,6	417,7	433,1	251,9	0,18	80,15	80,90	87,14	0,16	80,83	80,99	87,07
202,0	459,0	2,9	1,0	7,4	208,0	74,3	85,1	409,0	514,5	417,3	432,9	252,4	0,18	80,16	80,91	86,69	0,16	80,86	80,97	86,71
203,0	460,0	2,9	1,0	7,3	207,4	74,1	85,1	409,1	516,3	416,9	433,0	252,8	0,18	80,15	80,90	86,27	0,16	80,84	80,98	86,37
204,0	461,0	2,9	1,0	7,3	206,3	74,2	85,0	409,1	518,1	417,0	433,0	253,0	0,18	80,15	80,91	85,80	0,16	80,85	80,99	86,03
205,0	462,0	2,8	1,0	7,3	206,3	74,0	85,0	408,2	519,9	416,3	432,7	253,3	0,18	80,12	80,91	85,43	0,16	80,83	80,98	85,70
206,0	463,0	2,8	1,0	7,3	206,4	74,2	84,9	406,8	521,7	415,6	432,7	253,4	0,18	80,10	80,91	85,06	0,16	80,84	81,00	85,39
207,0	464,0	2,8	1,0	7,4	206,0	74,3	84,9	405,6	523,4	415,5	432,0	253,9	0,18	80,11	80,91	84,68	0,16	80,86	81,02	85,11
208,0	465,0	2,8	1,0	7,4	205,4	74,2	84,8	404,8	525,1	414,2	431,6	254,4	0,18	80,09	80,90	84,31	0,16	80,83	80,99	84,77
209,0	466,0	2,8	1,0	7,4	205,1	73,8	84,9	404,3	526,7	414,2	431,1	254,4	0,18	80,05	80,91	83,95	0,16	80,80	80,98	84,45
210,0	467,0	2,7	1,0	7,4	205,1	73,9	84,9	403,3	528,3	414,1	431,0	254,9	0,18	80,02	80,92	83,63	0,16	80,78	81,00	84,19
211,0	468,0	2,8	1,0	7,4	205,3	74,2	84,9	402,8	529,7	413,7	430,7	255,0	0,18	79,97	80,90	83,34	0,16	80,77	81,00	83,90
212,0	469,0	2,8	1,0	7,4	204,8	74,1	84,8	402,8	531,1	413,1	430,4	255,6	0,18	79,97	80,91	83,06	0,16	80,75	80,97	83,64
213,0	470,0	2,7	1,0	7,4	204,9	74,2	84,8	401,9	532,5	412,7	430,1	256,0	0,18	79,96	80,91	82,80	0,16	80,74	80,98	83,39
214,0	471,0	2,7	1,0	7,5	204,4	74,1	84,8	401,5	533,8	413,0	430,0	256,2	0,18	79,92	80,90	82,55	0,16	80,72	80,97	83,15
215,0	472,0	2,7	1,0	7,5	204,5	74,1	84,7	401,0	535,1	412,1	430,0	256,6	0,18	79,93	80,88	82,27	0,16	80,72	80,96	82,89
216,0	473,0	2,7	1,0	7,5	204,4	74,3	84,7	401,3	536,4	412,0	429,9	257,2	0,18	79,93	80,88	82,08	0,16	80,70	80,97	82,61
217,0	474,0	2,6	1,0	7,5	203,7	74,1	84,9	400,2	537,6	411,6	429,2	257,2	0,18	79,95	80,88	84,13	0,16	80,71	80,97	82,82
218,0	475,0	2,6	0,9	7,5	203,4	74,4	84,8	399,0	538,8	411,2	428,9	258,0	0,18	80,00	80,90	86,97	0,16	80,72	80,99	85,36
219,0	476,0	2,6	0,9	7,5	203,0	74,0	84,8	398,8	539,9	411,3	428,9	258,3	0,18	80,04	80,91	87,12	0,16	80,74	80,98	87,73
220,0	477,0	2,6	0,9	7,5	203,3	74,4	84,8	399,2	541,1	410,7	429,0	258,8	0,18	80,05	80,91	86,75	0,16	80,76	80,98	88,27
221,0	478,0	2,6	0,9	7,5	203,7	74,3	84,7	398,7	542,2	410,7	428,9	259,3	0,18	80,03	80,89	86,34	0,16	80,76	80,96	88,14
222,0	479,0	2,6	0,9	7,6	203,0	74,1	84,7	398,8	543,3	410,5	428,5	259,5	0,18	80,06	80,89	85,94	0,16	80,77	80,99	87,85
223,0	480,0	2,6	0,9	7,6	203,5	74,4	84,7	398,6	544,4	411,0	428,2	259,8	0,18	80,07	80,91	85,54	0,16	80,77	80,99	87,56
224,0	481,0	2,5	0,9	7,6	203,3	74,3	84,8	397,8	545,7	410,0	427,8	260,2	0,18	80,09	80,91	85,20	0,16	80,80	80,98	87,30
225,0	482,0	2,5	0,9	7,6	203,1	74,1	84,8	397,4	546,9	409,6	427,4	260,4	0,18	80,12	80,92	84,84	0,16	80,80	81,00	87,04
226,0	483,0	2,5	0,9	7,7	202,9	74,2	84,8	397,5	548,1	409,9	427,3	260,9	0,18	80,11	80,92	84,50	0,16	80,81	81,00	86,72
227,0	484,0	2,5	1,0	7,6	202,6	74,5	84,8	397,7	549,3	408,8	426,9	261,4	0,18	80,14	80,92	84,14	0,16	80,81	81,00	86,41
228,0	485,0	2,5	1,0	7,5	202,1	74,5	84,8	397,8	550,4	408,2	427,0	261,9	0,18	80,15	80,92	83,83	0,16	80,83	81,01	86,04
229,0	486,0	2,5	1,0	7,6	202,2	74,4	84,8	397,5	551,5	409,0	427,0	262,3	0,18	80,15	80,91	83,53	0,16	80,83	81,01	85,71
230,0	487,0	2,5	1,0	7,6	201,9	74,5	84,7	396,5	552,4	409,4	426,9	262,6	0,18	80,14	80,94	83,28	0,16	80,83	81,04	85,39
231,0	488,0	2,4	1,0	7,5	202,3	74,4	84,7	396,3	553,3	409,7	426,9	263,0	0,18	80,12	80,94	83,02	0,16	80,82	81,02	85,10
232,0	489,0	2,4	1,0	7,5	202,4	74,2	84,7	395,8	554,0	408,6	426,5	263,3	0,18	80,09	80,93	82,79	0,16	80,81	81,02	84,79
233,0	490,0	2,4	1,0	7,5	203,0	74,1	84,7	395,6	554,7	407,8	425,7	263,6	0,18	80,08	80,93	82,52	0,16	80,81	81,03	84,48
234,0	491,0	2,4	1,0	7,5	202,6	74,3	84,7	396,5	555,4	407,0	425,5	264,0	0,18	80,04	80,92	82,24	0,16	80,78	81,02	84,13
235,0	492,0	2,4	1,0	7,6	202,9	74,5	84,7	394,8	556,0	406,8	425,0	264,4	0,18	80,02	80,93	82,09	0,16	80,76	81,02	83,85
236,0	493,0	2,3	1,0	7,5	202,1	74,1	84,7	393,2	556,7	407,8	425,2	264,4	0,18	79,98	80,93	84,97	0,16	80,74	81,02	83,51
237,0	494,0	2,3	0,9	7,5	201,9	74,4	84,7	392,7	557,3	408,1	425,2	264,8	0,18	79,99	80,92	87,41	0,16	80,74	81,00	83,24
238,0	495,0	2,3	1,0	7,5	201,0	74,6	84,6	392,5	558,0	407,9	424,9	265,0	0,18	80,01	80,93	87,42	0,16	80,76	81,00	83,03
239,0	496,0	2,3	1,0	7,5	201,1	74,5	84,6	391,5	558,7	407,7	424,7	265,4	0,18	80,02	80,92	87,01	0,16	80,76	80,99	82,76
240,0	497,0	2,3	1,0	7,5	201,4	74,6	84,5	391,1	559,5	407,0	424,1	265,7	0,18	80,02	80,92	86,63	0,16	80,75	81,01	82,52
241,0	498,0	2,3	1,0	7,5	201,1	74,5	84,5	390,3	560,2	407,6	424,1	265,9	0,18	80,02	80,89	86,20	0,16	80,72	81,00	83,94
242,0	499,0	2,2	1,0	7,5	201,0	74,4	84,6	389,8	561,0	406,5	424,0	266,2	0,18	80,01	80,89	85,81	0,16	80,73	81,00	86,90
243,0	500,0	2,2	1,0	7,5	200,7	74,4	84,5	389,9	561,8	406,8	423,9	266,3	0,18	80,03	80,90	85,45	0,16	80,73	80,99	88,18
244,0	501,0	2,2	1,0	7,5	200,8	74,2	84,5	389,3	562,6	406,4	423,5	266,6	0,18	80,02	80,88	85,02	0,16	80,71	80,99	88,24
245,0	502,0	2,2	1,0	7,5	200,4	74,4	84,4	389,1	563,4	406,0	423,4	266,9	0,18	79,96	80,88	84,63	0,16	80,69	80,96	88,00
246,0	503,0	2,2	1,0	7,5	200,6	74,5	84,4	388,5	564,2	405,0	422,8	267,2	0,18	79,94	80,88	84,28	0,16	80,68	80,98	87,70
247,0	504,0	2,2	1,0	7,5	200,0	74,4	84,4	388,8	565,0	404,4	422,4	267,4	0,18	79,96	80,86	83,94	0,16	80,68	80,98	87,34
248,0	505,0	2,2	1,0	7,5	200,4	74,5	84,4	388,9	565,9	405,3	422,4	267,7	0,18	79,94	80,86	83,60	0,16	80,65	80,96	86,96
249,0	506,0	2,1	1,0	7,5	200,5	74,4	84,3	388,7	566,7	404,9	422,1	267,9	0,18	79,93	80,86	83,32	0,16	80,66	80,98	86,65
250,0	507,0	2,1	1,0	7,5	200,5	74,6	84,3	388,8	567,5	404,2	422,0	268,2	0,18	79,94	80,86	83,06	0,16	80,67	80,95	86,35
251,0	508,0	2,1	1,0	7,5	200,4	74,0	84,3	389,4	568,3	403,6	421,4	268,4	0,18	79,95	80,83	82,78	0,16	80,67	80,94	86,00
252,0	509,0	2,1	1,0	7,5	200,7	74,5	84,2	389,6	569,2	404,4	421,6	268,4	0,18	79,96	80,85	82,53	0,16	80,64	80,93	85,65
253,0	510,0	2,1	1,0	7,5	200,3	74,5	84,2	389,4	570,1	403,9	421,4	268,8	0,18	79,98	80,84	82,31	0,16	80,66	80,93	85,39

254,0	511,0	2,1	1,0	7,5	199,9	74,5	84,2	388,6	571,1	403,7	421,3	269,1	0,18	79,95	80,83	82,07	0,16	80,64	80,92	85,06
255,0	512,0	2,0	1,0	7,5	199,7	73,8	84,2	388,7	572,1	403,2	420,9	268,9	0,18	79,93	80,82	83,55	0,16	80,62	80,92	84,77
256,0	513,0	2,0	1,0	7,5	199,6	74,2	84,1	388,3	573,1	403,1	420,4	269,2	0,18	79,98	80,83	87,04	0,16	80,66	80,93	84,52
257,0	514,0	2,0	1,0	7,5	199,7	74,2	84,2	388,3	574,1	402,2	420,3	269,4	0,18	79,98	80,82	87,54	0,16	80,65	80,93	84,19
258,0	515,0	2,0	1,0	7,5	199,6	74,3	84,2	387,5	575,2	402,1	420,3	269,7	0,18	79,96	80,82	87,22	0,16	80,64	80,91	83,90
259,0	516,0	2,0	1,0	7,5	199,2	74,3	84,2	387,6	576,3	401,5	419,9	269,8	0,18	79,99	80,79	86,78	0,16	80,62	80,90	83,61
260,0	517,0	2,0	1,0	7,4	199,6	74,1	84,1	387,0	577,4	401,6	419,9	270,0	0,18	79,97	80,82	86,32	0,16	80,63	80,90	83,34
261,0	518,0	2,0	1,0	7,4	198,9	74,9	84,1	388,9	578,5	402,1	420,1	270,0	0,18	79,99	80,79	85,95	0,16	80,64	80,88	83,09
262,0	519,0	1,9	1,0	7,0	198,9	75,4	84,1	389,9	579,7	401,6	420,0	269,9	0,18	80,03	80,81	85,58	0,16	80,66	80,92	82,90
263,0	520,0	1,9	1,0	6,6	199,2	75,4	84,2	390,4	580,7	401,4	420,0	270,0	0,18	80,02	80,83	85,21	0,16	80,67	80,90	82,66
264,0	521,0	1,9	1,0	6,5	199,1	75,7	84,3	390,4	581,6	401,3	420,0	270,1	0,18	80,04	80,81	84,89	0,16	80,66	80,91	82,55
265,0	522,0	1,9	1,0	6,5	198,9	75,8	84,2	389,1	582,4	401,8	420,2	270,2	0,18	80,07	80,83	84,60	0,16	80,70	80,93	84,80
266,0	523,0	1,9	1,0	6,4	198,2	75,4	84,1	387,8	583,0	401,0	420,1	270,3	0,18	80,10	80,82	84,31	0,16	80,70	80,93	87,86
267,0	524,0	1,8	1,0	6,4	198,0	76,0	84,0	386,7	583,3	400,5	419,5	270,8	0,18	80,13	80,81	84,01	0,16	80,74	80,92	88,70
268,0	525,0	1,9	1,0	6,4	197,4	75,9	83,9	385,5	583,4	401,0	419,2	270,9	0,18	80,18	80,84	83,75	0,16	80,75	80,95	88,74
269,0	526,0	1,8	1,0	6,5	197,2	76,3	84,1	384,1	583,3	400,5	419,2	270,9	0,18	80,15	80,83	83,51	0,16	80,77	80,96	88,53
270,0	527,0	1,9	1,0	6,5	196,8	76,3	84,1	383,8	583,1	399,7	418,6	271,1	0,18	80,21	80,85	83,28	0,16	80,79	80,98	88,30
271,0	528,0	1,8	1,0	6,5	196,3	76,4	84,1	383,4	582,6	400,5	418,3	271,3	0,18	80,25	80,85	83,06	0,16	80,83	80,98	88,04
272,0	529,0	1,8	1,0	6,5	196,1	76,4	84,2	382,4	582,1	400,8	417,9	271,3	0,18	80,30	80,88	82,87	0,16	80,85	81,00	87,81
273,0	530,0	1,8	1,0	6,5	196,2	76,4	84,2	382,1	581,5	399,7	417,2	271,4	0,18	80,32	80,88	82,73	0,16	80,89	81,02	87,54
274,0	531,0	1,8	1,0	6,5	196,4	76,6	84,1	380,5	580,9	399,8	416,5	271,4	0,18	80,34	80,89	82,58	0,16	80,91	81,03	87,29
275,0	532,0	1,8	1,0	6,4	196,2	76,8	84,2	379,5	580,2	399,7	415,7	271,5	0,18	80,36	80,91	82,38	0,16	80,93	81,05	87,05
276,0	533,0	1,8	1,1	6,2	196,2	76,8	84,1	378,3	579,5	399,0	415,2	271,7	0,18	80,38	80,88	82,23	0,16	80,92	81,03	86,78
277,0	534,0	1,7	1,1	6,2	196,3	76,5	84,2	378,3	578,8	399,1	414,6	271,6	0,18	80,41	80,90	83,26	0,16	80,95	81,03	86,50
278,0	535,0	1,7	1,1	6,1	195,9	76,8	84,1	376,8	578,0	398,6	413,9	271,8	0,18	80,44	80,91	87,13	0,16	80,99	81,06	86,19
279,0	536,0	1,7	1,0	6,1	195,4	76,7	84,0	376,3	577,2	398,2	413,2	271,7	0,18	80,45	80,91	87,78	0,16	81,00	81,04	85,89
280,0	537,0	1,7	1,0	6,1	195,3	76,6	83,9	375,7	576,3	398,6	412,5	271,8	0,18	80,48	80,93	87,49	0,16	81,03	81,07	85,63
281,0	538,0	1,7	1,0	6,1	194,7	76,7	84,0	374,3	575,3	397,4	411,6	271,7	0,18	80,49	80,92	87,10	0,16	81,04	81,07	85,38
282,0	539,0	1,7	1,0	6,1	194,3	76,3	84,0	373,3	574,2	398,1	411,3	271,8	0,18	80,50	80,94	86,68	0,16	81,07	81,09	85,09
283,0	540,0	1,7	1,0	6,1	194,0	76,5	84,0	373,1	573,1	398,9	411,1	271,8	0,18	80,46	80,93	86,31	0,16	81,03	81,07	84,85
284,0	541,0	1,7	1,0	6,1	193,8	76,8	84,0	371,7	571,9	398,6	410,3	271,6	0,18	80,44	80,93	85,97	0,16	81,03	81,09	84,59
285,0	542,0	1,6	1,0	6,1	193,5	76,5	84,1	371,2	570,7	398,5	409,8	271,7	0,18	80,41	80,91	85,62	0,16	81,03	81,08	84,36
286,0	543,0	1,6	1,0	6,1	193,0	76,6	84,0	370,2	569,5	398,3	408,9	271,7	0,18	80,41	80,91	85,27	0,16	81,01	81,08	84,12
287,0	544,0	1,6	1,0	6,1	193,2	76,7	84,0	370,2	568,2	397,7	408,0	271,4	0,18	80,39	80,91	84,95	0,16	80,99	81,09	83,91
288,0	545,0	1,6	1,0	6,1	193,2	76,5	84,0	369,5	566,9	397,4	407,7	271,6	0,18	80,39	80,90	84,64	0,16	80,99	81,08	83,67
289,0	546,0	1,6	1,0	5,8	192,9	76,5	84,0	368,6	565,6	397,1	407,2	271,3	0,18	80,38	80,91	84,33	0,16	80,99	81,08	83,48
290,0	547,0	1,6	1,0	5,7	192,4	76,2	83,7	366,9	564,4	397,5	406,2	271,3	0,18	80,41	80,90	84,03	0,16	80,99	81,08	83,25
291,0	548,0	1,6	1,0	5,7	192,3	76,1	83,8	366,8	563,1	397,9	405,9	271,2	0,18	80,42	80,91	83,73	0,16	81,01	81,07	83,04
292,0	549,0	1,6	1,0	5,7	191,8	76,3	83,8	365,5	561,7	397,4	405,5	271,2	0,18	80,42	80,89	83,48	0,16	80,98	81,05	82,83
293,0	550,0	1,5	1,0	5,7	191,6	76,4	83,8	364,1	560,4	396,8	404,7	271,3	0,18	80,40	80,90	83,26	0,16	81,00	81,07	82,65
294,0	551,0	1,5	1,0	5,6	190,6	76,2	83,7	362,3	558,9	395,9	403,6	271,5	0,18	80,42	80,91	83,04	0,16	81,01	81,07	82,46
295,0	552,0	1,5	1,0	5,6	189,7	75,8	83,7	361,2	557,4	395,3	403,2	271,6	0,18	80,42	80,90	82,84	0,16	80,99	81,07	83,79
296,0	553,0	1,5	1,0	5,6	189,5	76,1	83,6	360,0	555,9	394,9	402,5	271,7	0,18	80,42	80,91	82,59	0,16	81,01	81,08	86,81
297,0	554,0	1,5	1,0	5,6	189,1	76,0	83,6	359,3	554,4	394,5	402,0	271,7	0,18	80,47	80,91	82,42	0,16	81,05	81,09	88,34
298,0	555,0	1,5	0,9	5,6	188,8	76,1	83,5	358,4	552,8	394,5	401,4	271,5	0,18	80,50	80,92	82,26	0,16	81,07	81,08	88,48
299,0	556,0	1,5	0,9	5,6	187,9	76,1	83,6	357,4	551,3	394,8	401,2	271,3	0,18	80,50	80,93	82,37	0,16	81,07	81,08	88,34
300,0	557,0	1,5	0,9	5,6	188,0	76,2	83,5	356,9	549,8	394,2	400,9	271,0	0,18	80,50	80,91	86,14	0,16	81,06	81,06	88,11
301,0	558,0	1,5	0,9	5,6	187,8	76,1	83,5	355,5	548,3	394,5	400,3	270,8	0,18	80,50	80,93	87,85	0,16	81,07	81,07	87,83
302,0	559,0	1,4	0,9	5,6	187,4	76,0	83,6	354,8	546,7	394,0	400,0	270,7	0,18	80,49	80,94	87,64	0,16	81,08	81,06	87,55
303,0	560,0	1,4	0,9	5,6	186,8	76,1	83,6	353,9	545,2	393,8	399,4	270,4	0,18	80,47	80,91	87,25	0,16	81,07	81,07	87,28
304,0	561,0	1,4	0,9	5,6	187,0	76,4	83,6	352,9	543,7	393,0	398,8	270,5	0,18	80,45	80,91	86,87	0,16	81,07	81,06	87,07
305,0	562,0	1,4	0,9	5,6	186,7	76,3	83,5	352,0	542,3	392,8	398,3	270,5	0,18	80,43	80,92	86,47	0,16	81,07	81,05	86,78
306,0	563,0	1,4	0,9	5,6	186,3	76,7	83,5	351,1	540,8	392,1	397,8	270,5	0,18	80,41	80,92	86,08	0,16	81,04	81,04	86,54
307,0	564,0	1,4	0,9	5,7	185,7	76,6	83,5	350,9	539,4	392,2	397,3	270,2	0,18	80,41	80,92	85,75	0,16	81,06	81,06	86,29
308,0	565,0	1,4	0,9	5,7	185,4	76,5	83,5	350,2	538,1	392,6	397,2	269,9	0,18	80,40	80,93	85,38	0,16	81,04	81,03	86,00
309,0	566,0	1,3	0,9	5,7	185,5	76,6	83,5	349,5	536,7	391,3	396,4	270,0	0,18	80,39	80,90	85,03	0,16	81,01	81,06	85,76
310,0	567,0	1,3	0,9	5,7	185,1	76,4	83,5	348,7	535,4	390,6	396,2	269,9	0,18	80,39	80,90	84,74	0,16	81,00	81,06	85,52
311,0	568,0	1,3	0,9	5,7	185,2	76,4	83,5	348,3	534,2	390,2	395,4	269,7	0,18	80,35	80,87	84,41	0,16	80,97	81,04	85,24
312,0	569,0	1,3	0,9	5,7	184,7	76,5	83,4	347,5	533,0	389,6	394,4	269,6	0,18	80,31	80,88	84,14	0,16	80,94	81,03	84,98
313,0	570,0	1,3	0,9	5,7	185,1	76,5	83,3	347,5	531,9	389,4	394,0	269,4	0,18	80,29	80,85	83,87	0,16	80,95	81,03	84,72
314,0	571,0	1,3	0,9	5,7	184,6	76,5	83,2	346,2	530,8	389,1	393,6	269,0	0,18	80,30	80,86	83,60	0,16	80,96	81,03	84,46
315,0	572,0	1,3	1,0	5,6	184,2	76,2	83,2	344,9	529,8	389,1	393,0	269,1	0,18	80,32	80,85	83,37	0,16	80,95	81,03	84,17
316,0	573,0	1,3	1,0	5,6	183,7	76,4	83,2	344,4	528,9	388,0	392,3	269,1	0,18	80,32	80,85	83,08	0,16	80,96	81,01	83,95
317,0	574,0	1,2	1,0	5,6	182,9	76,3	83,2	343,3	527,9	387,5	391,9	269,1	0,18	80,32	80,84	82,84	0,16	80,95	81,00	83,70
318,0	575,0	1,3	1,0	5,6	183,2	76,1	83,4	343,2	527,0	387,3	391,1	269,1	0,18	80,30	80,85	82,61	0,16	80,95	81,01	83,44
319,0	576,0	1,2	1,0	5,6	182,8	76,0	83,3	342,9	526,2	387,3	390,8	269,0	0,18	80,30	80,82	82,40	0,16	80,93	81,00	83,21
320,0	577,0	1,2	1,0	5,6	182,7	76,2	83,3	342,5	525,5	387,0	390,2	268,7	0,18	80,33	80,82	82,22	0,16	80,92	81,00	83,02
321,0	578,0	1,3	0,9	5,6	183,0	76,0	83,2	341,4	524,6	386,8	389,5	268,8	0,18	80,29	80,81	82,69	0,16	80,94	80,97	82,79
322,0	579,0	1,2	0,9	5,6	183,0	76,1	83,2	342,1	523,9	386,1	388,9	268,4	0,18	80,32	80,83	86,47	0,16	80,95	81,00	82,67
323,0	580,0	1,2	0,9	5,6	182,8	76,1	83,1	340,9	523,2	385,6	388,3	268,3	0,18	80,38	80,82	87,71	0,16	80,96	80,98	84,72
324,0	581,0	1,2	0,9	5,6	182,6	76,1	83,1	340,5	522,6	386,1	387,8	267,9	0,18	80,41	80,82	87,55	0,16	80,96	80,96	87,61
325,0	582,0	1,2	0,9	5,6	181,8	75,8	83,1	339,4	522,0	385,5	387,3	267,9	0,18	80,42	80,81	87,18	0,16	80,95	80,95	88,48
326,0	583,0	1,2	0,9	5,6	182,0	76,0	83,1	339,1	521,3	385,4	386,8	267,7	0,18	80,40	80,82	86,72	0,16	80,96	80,94	88,48
327,0	584,0	1,2	0,9	5,6	182,2	75,9	83,1	338,5	520,6	384,8	386,1	267,5	0,18	80,40	80,82	86,33	0,16	80,96	80,93	88,31
328,0	585,0	1,1	0,9	5,6	182,0	75,9	83,1	337,9	519,9	384,7	385,4	267,3	0,18	80,40	80,81	85,89	0,16	80,95	80,92	88,06
329,0	586,0	1,2	0,9	5,6	181,5	75,8	83,2	337,5	519,2	384,6	384,8	267,2	0,18	80,35	80,80	85,54	0,16	80,92	80,92	87,78
330,0	587,0	1,1	0,9	5,6	181,5	75,8	83,1	337,1	518,5	383,9	384,2	267,0	0,18	80,33	80,78	85,21	0,16	80,88	80,93	87,52
331,0	588,0	1,1	0,9	5,6	181,4	76,1	83,1	336,7	517,8	383,3	383,8	267,2	0,18	80,30	80,80	84,87	0,16	80,88	80,92	87,25
332,0	589,0	1,1	0,9	5,6	181,2	76,1	83,0	336,3	517,0	383,0	383,0	267,2	0,18	80,29	80,78	84,52	0,16	80,86	80,94	86,98
333,0	590,0	1,1	0,9	5,6	181,2	75,9	83,1	336,0	516,3	382,3	382,3	267,0	0,18	80,26	80,77	84,23	0,16	80,85	80,92	86,72
334,0	591,0	1,1	0,9	5,6	181,4	75,9	83,0	335,7	515,6	382,4	381,7	266,5	0,18	80,26	80,77	83,95	0,16	80,84	80,91	86,44
335,0	592,0	1,1	0,9	5,6	181,2	76,4	83,1	335,0	514,9	382,1	381,5	266,7	0,18	80,26	80,77	83,66	0,16	80,84	80,90	86,14
336,0	593,0	1,0	0,9	5,6	181,4	76,3	83,2	335,6	514,3	381,3	381,0	266,7	0,18	80,19	80,76	83,44	0,16	80,84	80,91	85,90
337,0	594,0	1,0	0,9	5,6	181,4	76,5	83,2	334,7	513,7	381,0	380,4	266,6	0,18	80,19	80,75	83,17	0,16	80,81	80,88	85,60
338,0	595,0	1,0	0,9	5,6	181,5	76,3	83,2	334,5	513,1	381,6	380,2	266,4	0,18	80,18	80,73	82,94	0,16	80,78	80,89	85,32
339,0	596,0	1,0	0,9	5,6	181,3	76,5	83,1	333,8	512,5	380,2	379,6	266,1	0,18	80,18	80,74	82,74	0,16	80,80	80,90	85,05

340,0	597,0	1,0	0,9	5,6	181,5	76,7	83,0	333,4	512,0	379,6	379,1	266,1	0,18	80,19	80,74	82,51	0,16	80,80	80,89	84,78
341,0	598,0	1,0	0,9	5,6	181,2	76,0	83,0	333,3	511,5	380,2	378,5	265,9	0,18	80,20	80,74	82,32	0,16	80,80	80,89	84,53
342,0	599,0	1,0	0,9	5,6	181,1	76,0	83,1	332,4	511,1	380,0	378,1	265,8	0,18	80,24	80,74	82,13	0,16	80,83	80,89	84,27
343,0	600,0	1,0	0,9	5,6	181,3	76,2	83,0	332,1	510,6	379,5	377,8	265,6	0,18	80,20	80,71	83,36	0,16	80,81	80,88	83,98
344,0	601,0	0,9	0,9	5,6	181,7	76,4	83,0	331,8	510,2	379,2	377,1	265,6	0,18	80,24	80,73	87,09	0,16	80,80	80,88	83,73
345,0	602,0	0,9	0,9	5,6	181,4	75,9	83,1	331,8	509,7	378,5	376,9	265,3	0,18	80,26	80,73	87,83	0,16	80,82	80,87	83,52
346,0	603,0	1,0	0,9	5,6	181,3	76,1	83,2	331,8	509,4	378,4	376,6	265,3	0,18	80,28	80,74	87,54	0,16	80,85	80,87	83,29
347,0	604,0	0,9	0,9	5,6	180,9	76,1	83,1	331,4	509,0	378,2	376,2	265,2	0,18	80,25	80,71	87,11	0,16	80,84	80,87	83,07
348,0	605,0	0,9	0,9	5,7	180,9	76,3	83,1	331,1	508,6	377,8	376,0	265,4	0,18	80,23	80,75	86,70	0,16	80,83	80,88	82,86
349,0	606,0	0,9	0,9	5,7	181,0	76,6	83,1	330,5	508,3	377,5	375,6	265,3	0,18	80,21	80,70	86,29	0,16	80,80	80,84	82,63
350,0	607,0	0,9	0,9	5,6	180,6	76,4	83,1	330,3	507,9	377,1	375,2	265,0	0,18	80,19	80,72	85,91	0,16	80,78	80,84	82,48
351,0	608,0	0,9	0,9	5,6	180,3	76,5	83,0	329,7	507,5	377,2	375,0	265,0	0,18	80,16	80,70	85,53	0,16	80,78	80,84	84,57
352,0	609,0	0,9	0,9	5,6	180,4	76,3	83,0	330,1	507,1	376,9	374,6	264,8	0,18	80,18	80,72	85,17	0,16	80,80	80,85	87,55
353,0	610,0	0,9	0,9	5,6	179,9	76,2	83,0	328,9	506,8	376,4	374,1	264,9	0,18	80,24	80,72	84,82	0,16	80,80	80,85	88,49
354,0	611,0	0,9	0,9	5,6	180,0	76,5	83,0	328,4	506,4	376,5	373,9	264,7	0,18	80,25	80,70	84,46	0,16	80,80	80,82	88,49
355,0	612,0	0,9	0,9	5,6	179,4	76,7	83,1	328,1	506,1	375,8	373,7	264,8	0,18	80,24	80,69	84,18	0,16	80,79	80,82	88,30
356,0	613,0	0,8	0,9	5,6	179,6	76,5	83,0	328,1	505,7	375,5	373,4	264,6	0,18	80,24	80,70	83,90	0,16	80,78	80,84	88,04
357,0	614,0	0,8	0,9	5,6	179,7	76,4	82,9	328,2	505,4	375,7	373,3	264,6	0,18	80,23	80,69	83,63	0,16	80,80	80,84	87,80
358,0	615,0	0,8	0,9	5,6	180,0	76,2	83,0	328,4	505,0	375,3	373,2	264,5	0,18	80,22	80,68	83,36	0,16	80,81	80,84	87,53
359,0	616,0	0,8	0,9	5,7	180,1	76,2	83,0	329,0	504,6	375,3	372,7	264,3	0,18	80,24	80,68	83,10	0,16	80,80	80,82	87,25
360,0	617,0	0,8	0,9	5,6	180,2	76,4	82,9	328,9	504,3	375,6	372,5	264,3	0,18	80,26	80,66	82,86	0,16	80,81	80,83	86,95
361,0	618,0	0,8	0,9	5,6	180,2	76,6	82,9	329,0	504,0	375,0	372,4	264,3	0,18	80,29	80,66	82,63	0,16	80,81	80,84	86,66
362,0	619,0	0,8	0,9	5,6	180,1	76,1	82,9	328,7	503,6	375,3	372,1	264,1	0,18	80,32	80,66	82,42	0,16	80,80	80,81	86,40
363,0	620,0	0,7	0,9	5,6	180,6	76,2	83,1	329,1	503,4	375,2	371,7	264,0	0,18	80,33	80,66	82,21	0,16	80,83	80,81	86,13
364,0	621,0	0,7	0,9	5,6	180,7	76,1	83,0	328,9	503,2	374,6	371,4	264,0	0,18	80,32	80,67	83,30	0,16	80,85	80,82	85,83
365,0	622,0	0,7	0,9	5,6	180,6	76,1	83,0	329,0	503,0	374,6	371,2	263,9	0,18	80,30	80,68	87,03	0,16	80,83	80,82	85,55
366,0	623,0	0,7	0,9	5,6	180,4	76,2	83,1	328,9	502,9	374,7	371,1	263,7	0,18	80,29	80,67	87,73	0,16	80,83	80,84	85,29
367,0	624,0	0,7	0,9	5,6	180,9	76,2	83,1	328,5	502,8	374,2	370,7	263,7	0,18	80,26	80,67	87,41	0,16	80,82	80,82	85,01
368,0	625,0	0,7	0,9	5,6	181,0	76,6	82,9	328,2	502,8	374,0	370,6	263,7	0,18	80,23	80,68	87,04	0,16	80,80	80,83	84,77
369,0	626,0	0,7	0,9	5,6	180,8	76,3	83,0	328,1	502,7	374,4	370,4	263,7	0,18	80,19	80,66	86,64	0,16	80,80	80,83	84,51
370,0	627,0	0,7	0,9	5,5	180,6	76,5	83,0	327,6	502,7	373,7	369,9	263,6	0,18	80,19	80,66	86,21	0,16	80,80	80,81	84,25
371,0	628,0	0,7	0,9	5,5	180,4	76,5	82,9	326,9	502,7	373,5	369,8	263,6	0,18	80,18	80,65	85,85	0,16	80,80	80,81	84,00
372,0	629,0	0,6	0,9	5,5	180,0	76,7	82,9	326,8	502,6	373,0	369,6	263,6	0,18	80,18	80,65	85,47	0,16	80,78	80,79	83,75
373,0	630,0	0,6	0,9	5,4	180,3	76,7	82,9	326,9	502,5	373,1	369,5	263,6	0,18	80,15	80,65	85,09	0,16	80,78	80,80	83,53
374,0	631,0	0,6	0,9	5,4	180,0	76,9	82,9	325,8	502,4	372,7	369,3	263,7	0,18	80,15	80,64	84,78	0,16	80,76	80,78	83,29
375,0	632,0	0,6	0,9	5,4	179,4	76,5	82,9	325,3	502,2	372,6	369,0	263,5	0,18	80,14	80,63	84,45	0,16	80,76	80,80	83,08
376,0	633,0	0,6	0,9	5,4	179,4	76,8	82,9	325,1	502,0	372,5	369,0	263,3	0,18	80,13	80,63	84,17	0,16	80,76	80,80	82,87
377,0	634,0	0,6	0,9	5,4	179,1	76,8	82,9	324,7	501,7	372,2	368,8	263,4	0,18	80,14	80,64	83,90	0,16	80,76	80,79	82,70
378,0	635,0	0,6	0,9	5,4	179,3	76,8	83,0	324,9	501,4	372,1	368,3	263,2	0,18	80,15	80,63	83,65	0,16	80,78	80,78	82,86
379,0	636,0	0,6	0,9	5,4	179,0	76,7	82,9	324,5	501,0	371,9	368,1	263,1	0,18	80,15	80,63	83,38	0,16	80,77	80,79	85,35
380,0	637,0	0,6	0,9	5,4	179,3	76,6	82,9	324,3	500,6	371,9	368,0	263,0	0,18	80,16	80,65	83,12	0,16	80,77	80,79	87,86
381,0	638,0	0,6	0,9	5,4	179,3	76,5	82,9	323,2	500,2	371,8	367,8	262,9	0,18	80,16	80,64	82,91	0,16	80,77	80,80	88,45
382,0	639,0	0,5	0,9	5,3	179,3	76,7	82,9	323,2	499,8	371,9	367,8	262,8	0,18	80,15	80,62	82,70	0,16	80,77	80,78	88,39
383,0	640,0	0,5	0,9	5,3	178,8	76,8	82,9	322,7	499,3	372,0	367,3	262,8	0,18	80,15	80,62	82,49	0,16	80,76	80,79	88,17
384,0	641,0	0,5	0,9	5,3	178,8	76,9	82,9	322,3	498,8	372,2	367,1	262,7	0,18	80,18	80,63	82,31	0,16	80,76	80,76	87,96
385,0	642,0	0,5	0,9	5,3	179,1	76,7	82,8	321,7	498,2	371,5	366,8	262,7	0,18	80,15	80,62	82,67	0,16	80,78	80,76	87,70
386,0	643,0	0,5	0,9	5,3	178,9	76,5	82,8	321,5	497,6	371,7	366,3	262,5	0,18	80,13	80,63	86,39	0,16	80,76	80,74	87,41
387,0	644,0	0,5	0,9	5,3	178,9	76,4	82,8	320,6	497,0	371,4	366,0	262,3	0,18	80,13	80,61	87,88	0,16	80,74	80,73	87,12
388,0	645,0	0,5	0,9	5,2	178,6	76,7	82,8	320,0	496,4	371,2	365,7	262,2	0,18	80,12	80,59	87,66	0,16	80,73	80,72	86,85
389,0	646,0	0,5	0,9	5,2	177,9	76,5	82,8	319,7	495,8	370,9	365,5	262,1	0,18	80,14	80,59	87,24	0,16	80,74	80,71	86,57
390,0	647,0	0,5	0,9	5,2	178,0	76,6	82,7	318,7	495,1	370,7	365,2	262,1	0,18	80,16	80,61	86,88	0,16	80,74	80,72	86,34
391,0	648,0	0,5	0,9	5,2	178,0	76,5	82,8	318,5	494,4	370,1	364,9	262,0	0,18	80,13	80,60	86,47	0,16	80,71	80,71	86,04
392,0	649,0	0,4	0,9	5,2	178,0	76,5	82,8	318,5	493,7	369,5	364,5	261,8	0,18	80,11	80,59	86,08	0,16	80,72	80,71	85,77
393,0	650,0	0,4	0,9	5,2	177,5	76,6	82,7	317,7	493,0	369,6	364,1	261,8	0,18	80,07	80,59	85,69	0,16	80,68	80,69	85,50
394,0	651,0	0,4	0,9	5,2	177,1	76,6	82,7	317,5	492,2	369,9	364,0	261,5	0,18	80,07	80,56	85,31	0,16	80,69	80,69	85,24
395,0	652,0	0,4	0,9	5,2	177,1	76,5	82,7	317,1	491,5	369,6	363,6	261,5	0,18	80,07	80,56	84,97	0,16	80,68	80,67	84,94
396,0	653,0	0,4	0,9	5,2	176,9	76,7	82,6	316,4	490,8	369,4	363,4	261,4	0,18	80,07	80,57	84,62	0,16	80,67	80,67	84,70
397,0	654,0	0,4	0,9	5,2	176,9	76,4	82,6	316,4	490,1	368,6	363,0	261,3	0,18	80,08	80,55	84,29	0,16	80,67	80,68	84,43
398,0	655,0	0,4	0,9	5,2	177,1	76,4	82,6	316,0	489,4	368,5	363,0	261,2	0,18	80,09	80,55	83,97	0,16	80,68	80,68	84,19
399,0	656,0	0,4	0,9	5,1	177,2	76,3	82,7	315,5	488,7	368,7	362,8	261,2	0,18	80,09	80,57	83,70	0,16	80,68	80,68	83,92
400,0	657,0	0,3	0,9	5,1	177,0	76,5	82,7	315,2	488,0	368,0	362,7	261,0	0,18	80,08	80,54	83,42	0,16	80,66	80,66	83,68
401,0	658,0	0,4	0,9	5,1	177,1	76,6	82,7	314,7	487,4	367,8	362,5	261,0	0,18	80,07	80,55	83,17	0,16	80,66	80,66	83,45
402,0	659,0	0,3	0,9	5,1	177,0	76,7	82,7	314,4	486,7	367,6	362,3	260,8	0,18	80,07	80,55	82,94	0,16	80,66	80,66	83,22
403,0	660,0	0,3	0,9	5,1	176,7	76,5	82,7	314,0	486,0	367,2	362,4	260,6	0,18	80,03	80,53	82,73	0,16	80,65	80,66	82,98
404,0	661,0	0,3	0,9	4,9	176,0	76,6	82,8	313,6	485,4	367,1	362,0	260,5	0,18	80,04	80,53	82,50	0,16	80,63	80,64	82,83
405,0	662,0	0,3	1,0	4,7	175,4	76,4	82,7	312,3	484,8	367,2	362,0	260,3	0,18	80,04	80,53	82,28	0,16	80,64	80,63	82,59
406,0	663,0	0,3	1,0	4,6	175,4	76,3	82,8	311,8	484,2	367,0	361,9	260,1	0,18	80,00	80,50	82,12	0,16	80,63	80,65	82,42
407,0	664,0	0,3	1,0	4,6	174,9	76,2	82,8	311,1	483,5	367,3	361,2	259,8	0,18	80,00	80,50	82,74	0,16	80,62	80,63	83,90
408,0	665,0	0,3	1,0	4,6	174,6	76,5	82,6	310,4	482,7	366,5	361,1	259,8	0,18	80,02	80,51	86,45	0,16	80,62	80,63	87,25
409,0	666,0	0,3	1,0	4,5	174,3	76,6	82,7	309,0	482,0	365,7	361,0	259,7	0,18	80,01	80,50	87,61	0,16	80,61	80,63	88,66
410,0	667,0	0,3	1,0	4,5	173,5	76,4	82,7	307,7	481,1	365,7	360,9	259,7	0,18	80,00	80,50	87,40	0,16	80,60	80,64	88,82
411,0	668,0	0,2	1,0	4,5	173,0	76,2	82,7	306,8	480,2	365,1	360,9	259,6	0,18	80,01	80,50	87,02	0,16	80,61	80,63	88,69
412,0	669,0	0,2	0,9	4,5	172,8	76,3	82,7	305,5	479,3	365,1	360,7	259,4	0,18	80,07	80,49	86,62	0,16	80,62	80,62	88,44
413,0	670,0	0,2	0,9	4,5	172,1	76,4	82,6	304,5	478,3	364,6	360,4	259,4	0,18	80,06	80,48	86,25	0,16	80,62	80,60	88,17
414,0	671,0	0,2	0,9	4,5	172,2	76,5	82,6	304,0	477,3	364,3	360,2	259,3	0,18	80,06	80,48	85,87	0,16	80,63	80,59	87,93
415,0	672,0	0,2	0,9	4,5	171,3	76,1	82,6	303,2	476,3	363,6	360,0	259,3	0,18	80,08	80,47	85,55	0,16	80,61	80,57	87,68
416,0	673,0	0,2	0,9	4,5	170,9	76,3	82,6	302,0	475,2	363,5	359,8	259,2	0,18	80,08	80,47	85,18	0,16	80,61	80,57	87,37
417,0	674,0	0,2	0,9	4,5	170,2	76,2	82,5	301,1	474,2	362,9	359,7	259,0	0,18	80,10	80,46	84,83	0,16	80,62	80,56	87,09
418,0	675,0	0,2	0,9	4,5	169,8	76,2	82,5	299,9	473,1	362,7	359,5	258,9	0,18	80,10	80,47	84,53	0,16	80,61	80,55	86,82
419,0	676,0	0,2	0,9	4,5	169,3	76,1	82,5	299,1	472,0	362,2	359,4	258,8	0,18	80,07	80,46	84,26	0,16	80,59	80,54	86,52
420,0	677,0	0,2	0,9	4,4	169,3	76,2	82,4	298,6	470,9	361,7	359,3	258,7	0,18	80,09	80,46	83,94	0,16	80,62	80,55	86,25
421,0	678,0	0,2	0,9	4,4	169,0	76,3	82,4	297,9	469,8	360,6	359,0	258,5	0,18	80,07	80,44	83,67	0,16	80,59	80,53	85,94
422,0	679,0	0,2	0,9	4,4	168,6	76,3	82,4	296,7	468,7	360,3	358,9	258,4	0,18	80,07	80,43	83,39	0,16	80,58	80,53	85,67
423,0	680,0	0,1	0,9	4,4	168,6	76,3	82,4	296,0	467,6	360,3	358,6	258,2	0,18	80,06	80,41	83,17	0,16	80,58	80,51	85,40
424,0	681,0	0,1	0,9	4,4	168,5	76,2	82,3	295,4	466,5	360,0	358,7	258,0	0,18	80,05	80,41	82,92	0,16	80,56	80,48	85,14
425,0	682,0	0,1	0,9	4,4	167,8	76,1	82,3	294,5	465,5	359,8	358,4	257,9	0,18	80,06	80,39	82,68	0,16	80,58	80,49	84,85

426,0	683,0	0,1	0,9	4,4	167,5	76,0	82,3	293,7	464,4	359,4	358,0	257,7	0,18	80,05	80,41	82,45	0,16	80,57	80,47	84,58
427,0	684,0	0,1	0,9	4,4	167,2	76,0	82,2	292,8	463,3	358,9	357,8	257,5	0,18	80,01	80,39	82,22	0,16	80,53	80,47	84,27
428,0	685,0	0,1	0,9	4,4	167,2	76,1	82,3	292,8	462,3	357,9	357,8	257,4	0,18	79,98	80,39	84,05	0,16	80,52	80,46	84,03
429,0	686,0	0,1	0,9	4,4	167,0	76,2	82,3	292,0	461,3	357,6	357,6	257,2	0,18	79,97	80,37	87,31	0,16	80,52	80,46	83,72
430,0	687,0	0,1	0,9	4,4	166,6	76,3	82,2	291,7	460,3	357,0	357,4	257,0	0,18	79,96	80,39	87,65	0,16	80,50	80,44	83,51
431,0	688,0	0,1	0,9	4,4	166,4	76,4	82,2	290,7	459,3	355,4	357,2	256,8	0,18	79,96	80,38	87,31	0,16	80,51	80,44	83,28
432,0	689,0	0,1	0,9	4,4	166,2	76,2	82,1	290,3	458,3	354,5	356,8	256,7	0,18	79,94	80,36	86,90	0,16	80,50	80,41	83,05
433,0	690,0	0,1	0,9	4,3	165,9	76,4	82,1	289,6	457,4	354,3	356,6	256,6	0,18	80,03	80,39	86,60	0,16	80,51	80,42	82,87
434,0	691,0	0,1	0,9	4,3	165,8	76,1	82,1	288,7	456,4	353,6	356,5	256,6	0,18	80,09	80,43	86,25	0,16	80,51	80,41	82,66
435,0	692,0	0,1	0,9	4,3	165,7	76,1	82,0	288,3	455,4	352,3	356,4	256,3	0,18	80,10	80,42	85,87	0,16	80,49	80,38	82,43
436,0	693,0	0,1	0,9	4,3	165,2	76,3	82,0	287,4	454,6	351,9	356,0	256,2	0,18	80,10	80,39	85,52	0,16	80,47	80,36	83,30
437,0	694,0	0,0	0,9	4,3	165,1	76,4	82,0	287,0	453,7	351,7	356,0	256,1	0,18	80,08	80,41	85,19	0,16	80,48	80,36	86,27

SFBA EPA EMISSION RESULTS

Test Duration: **437** min

PRESSURE FACTOR:	DGM 1	0,97770	
	DGM 2	0,97843	
	DGM 3	1,00177	
TEMPERATURE FACTORS	DGM 1	0,97716	
	DGM 2	0,97668	
	DGM 3	0,98616	
VOLUMES SAMPLED	DGM 1	74,461	SCft
	DGM 2	68,172	Scft
	DGM 3	98,593	SCft

TOTAL TUNNEL VOLUME : 158334

SAMPLE RATIOS

Sample Train 1:	2126,412
Sample Train 2:	2322,580

Paticulate concentration

Sample Train 1	**0,000074**	g/dscf
Sample Train 2	**0,000072**	g/dscf
Room	**0,000002**	g/dscf

TOTAL EMISSIONS

Sample Train 1	**11,37**	g
Sample Train 2	**11,06**	g

EMISSION RATES

Sample Train 1	**1,56**	g/hr
Sample Train 2	**1,52**	g/hr

1st hour emission rate **10,63** g/hr

	Train 1	Train 2
Cs	7,386E-05	7,1878E-05

RESULTS

Average emission rate: 1,54 g/hr

Burn Rate : 0,912 Dry kg/hr

BAROMETRIC PRESSURE

Average:	29,97293872	in Hg
Start:	29,97293872	in Hg
End:	29,97293872	in Hg

DGM CONTROLLER VALUES

DGM 1	Final:	4172,205	Cuft
	Initial:	4093,896	Cuft
DGM 2	Final:	2187,461	Cuft
	Initial:	2115,421	Cuft
DGM #3	Final:	1091,680	Cuft
	Initial:	991,600	Cuft

TEMPERATURES

DGM 1	540,341	°R
DGM 2	540,609	°R

CALIBRATION FACTORS

DGM 1	0,9953
DGM 2	0,9903
DGM #3	0,9972

TUNNEL FLOW RATE: 362,320 Dscfm

PARTICULATE CATCH

Total Sample Train 1:	5,50	mg
Total Sample Train 2:	4,90	mg
Total Sample Train 1 1st hour:	5,00	mg

DEVIATION: 1,40%

POLYTESTS
TESTING THROUGH YOUR REALITY

Date: 2020-01-16 Manufacturer: ICC Model: FFJ-16 047

Project #: pI 20219 Run: 2 Tech: MM Reviewer: DP

- Initial 7.46 lbs start fire (1 min torch)
- At 2 min close door
- At 23 lbs insert load
- At 5 min close door
- ~~At 20 min~~ After 20 min At 30 open fan High 20 min after insert load
- At 37 lbs close fan
- At 36 lbs insert load
- At 7 min close air inlet 1/2
- At 5 min close door
- At 6 min close air inlet (setting intermediate)
- At 10 min open fan High

TEST LOAD CONFIGURATION

POLYTESTS
TESTING THROUGH YOUR REALITY

PRE / POST CHECKS

Date: 2020-01-16 Manufacturer: ICC Model: FF-J126 047

Project #: pI 20219 Run: 2 Tech: MM Reviewer: DL

Equipment #	Time	12%	22%
EM-191	7:50	ok	ok

Moisture Meter Calibration Check:

	Pre-Test	Post-Test
Facility Conditions:		
Air Velocity from less than 2 feet	0 (max50 Fpm)	0 (max50 Fpm)
Smoke Capture Check (Tunnel velocity)	0	NA
Picture (4 sides)	ok	ok
Wood Heater Conditions:		
Date Wood Heater Stack Cleaned	2020-01-15	
Date Dilution Tunnel Cleaned	2020-01-15	
Induced Draft Check (max 0.005 H2O)	ok	
Traverse before ignition	ok	
Temperature System:		
Ambient (65°-90°F)	0 °F	
Proportional Checks:		
Thermocouple check	ok	
Pitot Clean	ok	
Pitot verification	ok	

Sampling Train ID Numbers:

	High fire test			Medium low fire test		
	1st hour	Train 1	Train 2	1st hour	Train 1	Train 2
Probe				005	06	11
Filter Front				506	508	510
Filter Back				507	509	511
Filter Thermocouple				11	11	12
Filter (80°F ≥ <90°F)				ok	ok	ok

POLYTESTS
TESTING THROUGH YOUR REALITY

SAMPLING EQUIPMENT CHECK OUT

Date: 2020-01-16 Manufacturer: ICC Model: FF-J1a6 047

Project #: pT 4219 Run: 2 Tech: MM Reviewer: NP

Leakage Checks Tunnel Samplers

~~High~~ medium fire test	System 1st hour		System 1		System 2	
Unplugged Flow Rate = .25cfm	Pre-Test ASTM (-15) CSA B415 (-5)	Post-Test (max test)	Pre-Test ASTM (-15) CSA B415 (-5)	Post-Test (Max test)	Pre-Test ASTM (-15) CSA B415 (-5)	Post-Test (Max test)
Vacuum (inches Hg.)	-15	-15	-15	-15	-15	-15
Final 1minute DGM (Liter)	118146.40	119930	118146.46	119993.20	061945.30	063654.36
Initial 1minute DGM (Liter)	118146.35	119930	118146.40	119993.15	061945.10	063654.21
Change © (Liter)	005	003	006	005	0.20	0.15
Allowable leakage .04 x Sample rate or 0.28Lpm CSA B415 (0.56)						
Check OK	Ok	Ok	Ok	Ok	Ok	Ok

Low medium fire test	System 1st hour		System 1		System 2	
Unplugged Flow Rate = .25cfm	Pre-Test ASTM (-15) CSA B415 (-5)	Post-Test (max test)	Pre-Test ASTM (-15) CSA B415 (-5)	Post-Test (Max test)	Pre-Test ASTM (-15) CSA B415 (-5)	Post-Test (Max test)
Vacuum (inches Hg.)						
Final 1minute DGM (Liter)						
Initial 1minute DGM (Liter)		NA				
Change © (Liter)						
Allowable leakage .04 x Sample rate or 0.28Lpm CSA B415 (0.56)						
Check OK						

POLYTESTS
TESTING THROUGH YOUR REALITY

SAMPLING EQUIPMENT CHECK OUT

Date: 2020-02-16 Manufacturer: ICE Model: FF-J16 042

Project #: PJ 2.219 Run: 2 Tech: MM Reviewer: DP

Leakage Checks Flue Gas Sampler

Plugged Probe	Pre-Test	Post Test
Vacuum (inches Hg.)	-5	-5
Rotameter Reading (mml/min.)	0	0
Flow Rate (lpm)	1.5	1.5
Allowable (.02 x Sample Rate)	30	30
Check OK	ok	ok

Leakage Checks Pitot

Plugged Probe	Pre Test 3 H2o static	Pre Test 0.4-0.5 H2o velocity	Post Test 3 H2o Static	Post Test 0.4-0.5 H2o velocity
Vacuum (inches Hg.)	3	.5	3	.4
Check OK (no change after 15 sec.)	ok	ok	ok	ok

POLYTESTS
TESTING THROUGH YOUR REALITY

PRE-TEST SCALE AUDIT

Date: 2020-01-16 Manufacturer: Ice Model: FF-J/a6 047

Project #: pJ 20216 Run: 2 Tech: MM Reviewer: DP

Scale Type	Audit		Measured Weight
	Equipment #	Weight	
Platform	Em. 090	44 lbs, Class F	44 lbs
Wood	Em. 090	44 lbs, Class F	44 lbs
Analytical	Em. 128	100 mg, Class S	100 mg
Analytical	Em. 120	200 g, Class S	200 g

LIMITS OF WEIGHT RANGES

ANALYTICAL SCALE: ..... 50%-150% of dry filter weight, ± 0.1 mg
PLATFORM SCALE..... 20%-80% of ideal test load weight, ± 0.1 lbs or 1%
WOOD SCALE ..... 20%-80% of ideal test load weight, ± 0.01 lbs or 1%

POLYTESTS
TESTING THROUGH YOUR REALITY

CONTINUOUS ANALYZERS

Date: 2020-01-16 Manufacturer: ICC Model: FF-J16 047

Project #: ~~pj 2019 No~~ pj 20219 Run: 2 Tech: MM Reviewer: DP

FOR TUNNELS < 12 in

Barometric pressure (P_{bar}) 1006 (KPa.) Static pressure (P_q) 0,20 (inches w.c.)
Inside diameter: Port A _____ Port B ____.
Tunnel cross sectional area: .1963Ft^2
Pitot tube type: Standard

Traverse Point	Position (inches)			Velocity Head Δ_p (inches H_2O)	Tunnel Temperature (°F)
	6 po	7 po	8 po		
A- Centroid	3.00	3.50	4	0,077	70,30
B - Centroid	3.00	3.50	4	0,076	70,19
A-1	0.40	0.50	0.50	0,064	70,11
A-2	1.50	1.75	2	0,066	70,16
A-3	4.50	5.25	6	0,083	70,22
A-4	5.60	6.5	7.5	0,068	70,21
B-1	0.40	0.50	0.50	0,065	70,16
B-2	1.50	1.75	2	0,080	70,25
B-3	4.50	5.25	6	0,068	70,22
B-4	5.60	6.5	7.5	0,066	70,22
				AVERAGE	

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

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

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

POLYTESTS
TESTING THROUGH YOUR REALITY

CONTINUOUS ANALYZERS

Date: 2020-01-16 Manufacturer: ICC Model: FF-J/ab 047

Project #: PT 20219 Run: 2 Tech: MM Reviewer: DP

Pre-Test (Adjust and Record)

	ZERO		SPAN		CAL. (Record Only)	
CO	0	0	2.984	3.000	0.990	1.000
Tolerance CO		+/- 0.02		+/- 0.15		+/- 0.05
CO_2	0	0	17.85	18.00	9.92	10.00
Tolerance CO2		+/- 0.02		+/- 0.5		+/- 0.5
O_2 informative CSA B415 calculated value	na	na	na	na	na	na
	Actual	Should Be	Actual	Should Be	Actual	Should Be

Post Test (Record Only)

	Zero	Span	Cal.	Zero Drift	Limit	Span Drift	Limit	Cal. Drift	Limit	OK?	Not OK*
CO	0	2.996	0.999	0	0.02	0.012	0.15	0.009	0.05	✓	
CO_2	0	17.80	9.98	0	0.02	0.07	0.5	0.06	0.5	✓	

POLYTESTS
TESTING THROUGH YOUR REALITY

TEST DATA LOG

Date: 2020-01-16 Manufacturer: Lec Model: FF-J126047

Project #: PJ 2019 Run: 2 Tech: M M Reviewer: SP

RAW DRY GAS METER READINGS

		System 1	System 2	Blank
High fire test	Final (Liter)			
	Initial (Liter)			
Low medium fire test	Final (Liter)	119 992,24	063 653,74	175,69
	Initial (Liter)	118146,75	061945,62	09,68

AMBIENT CONDITIONS

	Before	After
Barometer (kPa):	100.6	100.8
Dry Bulb (F):	73.8	75.2
Humidity (%):	25.3	28.1

POLYTESTS
TESTING THROUGH YOUR REALITY

FUEL DATA

Date: 2020-01-16 Manufacturer: Ice Model: ~~20~~ FF-Jldo 047

Project #: pI 20219 Run: 2 Tech: MM Reviewer: DP

FUEL DESCRIPTION:

Type of wood:

KINDLING AND START-UP LOAD

Piece Size	Weight		Meter Moisture Content (% dry)			
x x 16 in.	4,464	lbs.	20		20	20
x x 12 in.	2,976	lbs.	9		9	9
x x in.		lbs.				
x x in.		lbs.				
x x in.		lbs.				
x x in.		lbs.				
x x in.		lbs.				
x x in.		lbs.				
x x in.		lbs.				

HIGHFIRE TEST LOAD

Piece Size	Weight		Meter Moisture Content (% dry)			
2.5 x 3,00 x 12 in.	2,668	lbs.	18,3		18,1	18,6
3 x 2,00 x 12 in.	2,456	lbs.	25,9		18,2	26,4
2,5 x 2,50 x 16 in.	3,108	lbs.	19,6		18,7	19,1
x x in.		lbs.				
2,50 x 2,50 x 12 in.	1,900	lbs.	21,9		18,1	25,4
3,00 x 2,50 x 12 in.	2,164	lbs.	18,8		18,7	20,2
3,50 x 3,00 x 16 in.	3,548	lbs.	22,4		18,3	26
x x in.		lbs.				
x x in.		lbs.				

POLYTESTS
TESTING THROUGH YOUR REALITY

FUEL DATA

Date: 2020-01-16 Manufacturer: JLC Model: FF-J1606047

Project #: pJ 2019 Run: 2 Tech: MM Reviewer: DP

FUEL DESCRIPTION:

Type of wood:

LOW OR MEDIUM TEST LOAD

Piece Size	Weight		Meter Moisture Content (% dry)			
3,00 x 2,50 x 12 in.	2,988	lbs.	18,3	18,8		25°
3,50 x 3,50 x 12 in.	3 020	lbs.	2.5,9	18,6		27,4
3,50 x 3,00 x 16 in.	4,050	lbs.	18,2	18,3		22,4
x x in.		lbs.				
3,00 x 2,50 x 12 in.	2, 146	lbs.	23,1	18,4		23,8
3,00 x 2,00 x 12 in.	1, 960	lbs.	23,1	18,5		22,8
3,00 x 3,00 x 16 in.	4112	lbs.	25,1	18,8		26,5
x x in.		lbs.				
x x in.		lbs.				
x x in.		lbs.				
x x in.		lbs.				
x x in.		lbs.				
x x in.		lbs.				
x x in.		lbs.				

POLYTESTS
TESTING THROUGH YOUR REALITY

DILUTION TUNNEL PARTICULATE SAMPLER DATA

Date: 2020-01-15 Manufacturer: ICC Model: FF-J1A6 047

Project #: pI 2019 Run: 2 Tech: MM Reviewer: TP

MM MEDIUM ~~HIGHFIRE~~ TEST FILTERS

Pre-test Weight Record		SYSTEM 1 – 1st hour				SYSTEM 1				
		Probe & Housing Number	Front Filter Number	Back Filter Number	gaskets	Probe & Housing Number	Front Filter Number	Back Filter Number	gaskets	Blanck
Date	Time	005	506	507	06	006	508	509	30	512
2020-01-15	17:00	61.5025	0.1772		35.7163	61.3739	0.1755		33.9596	0.0842
2020-01-16	9:00	61.5026	0.1773		35.7164	61.3740	0.1756		33.9595	0.0843

Post-test Weight Record		SYSTEM 1 – 1st hour				SYSTEM 1				
		Probe & Housing Number	Front Filter Number	Back Filter Number	gaskets	Probe & Housing Number	Front Filter Number	Back Filter Number	gaskets	Blanck
Date	Time	005	506	507	06	006	508	509	30	512
2020-01-16	19:00	61.5038	0.1782		35.7173	61.3748	0.1759		33.9604	0.0843
2020-01-20	8:00	61.5028	0.1780		35.7164	61.3743	0.1759		33.9595	0.0843
2020-01-20	17:00	61.5027	0.1780		35.7164	61.3742	0.1759		33.9595	0.0843

POLYTESTS
TESTING THROUGH YOUR REALITY

DILUTION TUNNEL PARTICULATE SAMPLER DATA

Date: 2020-01-15 Manufacturer: ICC Model: FF-J/ab 047

Project #: pJ 20219 Run: 2 Tech: MM Reviewer: NP

Medium ~~HIGH~~ FIRE TEST FILTERS MM

Pre-test Weight Record		SYSTEM 2 Probe & Housing Number	Front Filter Number	Back Filter Number	gaskets
Date	Time	11	510	511	37
2020-01-15	17:10	93,7199	0,1761		34,3223
2020-01-16	8:18	93,7198	0,1762		34,3224

Post-test Weight Record		SYSTEM 2 Probe & Housing Number	Front Filter Number	Back Filter Number	gaskets
Date	Time	11	510	511	37
2020-01-16	19:00	93,7211	0,1771		34,3232
2020-01-20	8:00	93,7200	0,1770		34,3224
2020-01-20	17:00	93,7201	0,1771		34,3224

POLYTESTS
TESTING THROUGH YOUR REALITY

DILUTION TUNNEL PARTICULATE SAMPLER DATA

Date:_____ Manufacturer:_____ Model:_____

Project #:_____ Run:_____ Tech:_____ Reviewer:_____

		MEDIUM / LOW FIRE TEST FILTERS								
		SYSTEM 1 – 1st hour				SYSTEM 1				
Pre-test Weight Record		Probe & Housing Number	Front Filter Number	Back Filter Number	gaskets	Probe & Housing Number	Front Filter Number	Back Filter Number	gaskets	Blanck
Date	Time									

		SYSTEM 1 – 1st hour				SYSTEM 1				
Post-test Weight Record		Probe & Housing Number	Front Filter Number	Back Filter Number	gaskets	Probe & Housing Number	Front Filter Number	Back Filter Number	gaskets	Blanck
Date	Time				N/A					

POLYTESTS
TESTING THROUGH YOUR REALITY

DILUTION TUNNEL PARTICULATE SAMPLER DATA

Date:_____ Manufacturer:_____ Model:_____

Project #: _____ Run:_____ Tech:_____ Reviewer:_____

		MEDIUM / LOW FIRE TEST FILTERS			
		SYSTEM 2			
Pre-test Weight Record		Probe & Housing Number	Front Filter Number	Back Filter Number	gaskets
Date	Time				

		SYSTEM 2			
Post-test Weight Record		Probe & Housing Number	Front Filter Number	Back Filter Number	gaskets
Date	Time				

Paramètres

Tous les facteurs de corrections et autres paramètres qui peuvent être modifiés par l'utilisateur du fichier sont regroupés ici.

Code verrouillage:	ICC

Description du test

Test standard	EPA	
Run #	2	
Date	16-01-2020	
Technicien	M.M	
Project #	PI 20219	

Description de l'unité

Manufacturier	ICC	
Modèle	FF-JLAB 047	
Combustion system	Non-Cat	
Appliance type	FIREPLACE	
Firebox volume	1,57	cu ft.
Appliance weight empty	n.a	lbs
Fan (no, Standard, Option)	OPTION	

Paramètres du test

Logging time	1	min
Manufacturer's rated heat output	n.a	BTU/h Donnée fournie par le manfacturier
Targeted category	1	
Targeted output	n.a	BTU/h
Cp steel	n.a	BTU/lb-°F

Échantillonnage

Blank sampling rate	0,20	cuft/min
Internal probe diameter	0,18	in.
Calibration Factor (DGM #1):	0,995	Dimensionless
Equipment number (DGM #1):	EM 178	
Calibration Factor (DGM #2):	0,990	Dimensionless
Equipment number (DGM #2):	EM 179	
Calibration Factor (DGM #3):	0,997	
Equipment number (DGM #3):	EM 070	Dimensionless

Tunnel

Targeted tunnel flow rate	300	scfm
Tunnel diameter	8	in.
Molecular weight	28,78	May be assumed to be 28,78 (EPA) Si B-415 = 29
Pitot tube type	Standard	
Pitot tube coefficient	0,99	Dimensionless

Project nu.	PI 20219
Date	16-01-2020
Technicien	m.m

Fuel data

Fuel type	Cord	
Fuel specie	Oak	
HHV	20207,0	kJ/kg
%C	49,5	
%H	6,6	
%O	43,7	
%Ash	0,2	
HHV	8689,9	Btu/lb
LHV	7600,4	Btu/lb

Default Fuel Values

	D. Fir	Oak/Maple
HHV	19 810	20 207
%C	48,73	49,5
%H	6,87	6,62
%O	43,9	43,7
%Ash	0,5	0,2
HHV (Btu/lb)	8519	8690
LHV (Btu/lb)	7451	7600

Adjunct to ASTM E XXXX Wood Heater Cordwood Test Method - May 10, 2017 Version

Cordwood Fuel Load Calculators - 12 lb/ft^3 Nominal Load Density

Core 45-65% of Total Load Weight, Remainder 35-55% of Total Load Weight

Values to be input manually

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

Nominal Required Load Density (wet basis)	12	lb/ft^3				
Usable Firebox Volume	1,57	ft^3				
Total Nom. Load Wt. Target	18,84	lb				
Total Load Wt. Allowable Range	17,90	to	19,78	lb		
Core Target Wt. Allowable Range	8,478	to	12,25	lb		
Remainder Load Wt. Allowable Range	6,59	to	10,36	lb		
						Mid-Point
Core Load Fuel Pc. Wt. Allowable Range	2,83	to	4,71	lb		3,77
Remainder Load Pc. Wt. Allowable Range	1,88	to	5,65	lb		3,77
	Pc. #					
Core Load Piece Wt. Actual	1	2,99	lb		In Range	
	2	3,02	lb		In Range	
	3	4,05	lb		In Range	
Core Load Total. Wt. Actual		10,06	lb		In Range	
	Pc. #					
Remainder Load Piece Wt.	1	2,15	lb		In Range	
(2 or 3 Pcs.)	2	1,96	lb		In Range	
	3	4,11	lb		In Range	
Remainder Load Piece Weight Ratio - Small/Large		48%			In Range	≤ 67%
Remainder Load Tot. Wt. Act		8,22	lb		In Range	
Total Load Wt. Actual		18,28	lb		In Range	
Core % of Total Wt.		55%			In Range	45-65%
Remainder % of Total Wt.		45%			In Range	35-55%
Actual Load % of Nominal Target		97%			In Range	95-105%
Actual Fuel Load Density		11,6	lb/ft^3			
Allowable Charcoal Bed Wt. Range (lb)	1,9	to	3,6			Mid-Point
Actual Charcoal Bed Wt.		3,6	lb		In Range	2,7
Actual Fuel Load Ending Wt.		0,0	lb		Valid Test	≥ 90%
Total Wt. of Fuel Burned During Test Run lb.		18,3	lb			
Load pieces Length in.		12 & 16	in.			

Fuel Piece Moisture Reading (%-dry basis)

1	2	3	Ave.		Pc. Wt. Dry Basis			
18,3	18	25	20,4	In Range	2,48	lb	1,13	kg
25,9	18,6	27,4	24,0	In Range	2,44	lb	1,11	kg
18,2	18,3	22,4	19,6	In Range	3,39	lb	1,54	kg
23,1	18,4	23,8	21,8	In Range	1,76	lb	0,80	kg
23,1	18,5	22,8	21,5	In Range	1,61	lb	0,73	kg
25,1	18,8	26,5	23,5	In Range	3,33	lb	1,51	kg

Total Load Ave. MC % (dry basis)	21,8	In Range			
Total Load Ave. MC % (wet basis)	17,9				
Total Test Load Weight (dry basis) →			15,01	lb	6,81 kg
Total Fuel Weight Burned During Test Run (dry basis)			15,0	lb	6,81 kg

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

Nominal Required Load Density (wet basis)	12	lb/ft^3				
Usable Firebox Volume		ft^3				
Total Nom. Load Wt. Target	0	lb				
Total Load Wt. Allowable Range	0,00	to	0,00	lb		
Core Target Wt. Allowable Range	0,00	to	0,00	lb		
Remainder Load Wt. Allowable Range	0,00	to	0,00	lb		
						Mid-Point
Core Load Fuel Pc. Wt. Allowable Range	0,00	to	0,00	lb		0,00
Remainder Load Pc. Wt. Allowable Range	0,00	to	0,00	lb		0,00
	Pc. #					
Core Load Piece Wt. Actual	1			lb	In Range	
	2			lb	In Range	
	3			lb	In Range	
Core Load Total. Wt. Actual		0,00	lb		In Range	
	Pc. #					
Remainder Load Piece Wt.	1			lb	In Range	
(3 or 4 Pcs.)	2			lb	In Range	
	3			lb	In Range	
	4			lb	NA	
Remainder Load Piece Weight Ratio - Small/Large		#NOMBRE!			#NOMBRE!	≤ 67%
Remainder Load Tot. Wt. Act		0,00	lb		In Range	
Total Load Wt. Actual		0,00	lb		In Range	
Core % of Total Wt.		#DIV/0!			#DIV/0!	45-65%
Remainder % of Total Wt.		#DIV/0!			#DIV/0!	35-55%
Actual Load % of Nominal Target		#DIV/0!			#DIV/0!	95-105%
Actual Fuel Load Density		#DIV/0!	lb/ft^3			
Allowable Charcoal Bed Wt. Range (lb)	0,1	to	-0,1			Mid-Point
Actual Charcoal Bed Wt.			lb		Out of Range	0,0
Actual Fuel Load Ending Wt.			lb		Valid Test	≥ 90%
Total Wt. of Fuel Burned During Test Run lb.		0,0	lb			

Fuel Piece Moisture Reading (%-dry basis)

1	2	3	Ave.		Pc. Wt. Dry Basis			
			#DIV/0!	#DIV/0!	#DIV/0!	lb	#DIV/0!	kg
			#DIV/0!	#DIV/0!	#DIV/0!	lb	#DIV/0!	kg
			#DIV/0!	#DIV/0!	#DIV/0!	lb	#DIV/0!	kg
			#DIV/0!	#DIV/0!	#DIV/0!	lb	#DIV/0!	kg
			#DIV/0!	#DIV/0!	#DIV/0!	lb	#DIV/0!	kg
			#DIV/0!	#DIV/0!	#DIV/0!	lb	#DIV/0!	kg
			NA	NA	NA	lb	NA	kg

Total Load Ave. MC % (dry basis)	#DIV/0!	#DIV/0!			
Total Load Ave. MC % (wet basis)	#DIV/0!				
Total Test Load Weight (dry basis) →			#DIV/0!	lb	#DIV/0! kg
Total Fuel Weight Burned During Test Run (dry basis)			#DIV/0!	lb	#DIV/0! kg

	Start	End
Barometer (kPa):	100,6	100,8
Barometer (in.Hg):	29,707169	29,7662288
Dry Bulb (F):	73,8	75,2
Humidity (%):	25,3	28,1
Air velocity (ft/min)	0	0

High fire test						
DGM #1	Final:	#VALEUR!	cuft	Final:	na	Liter
	Initial:	0,000	cuft	Initial:		Liter
DGM #2	Final:	#VALEUR!	cuft	Final:	na	Liter
	Initial:	0,000	cuft	Initial:		Liter
DGM room				Final:	na	cuft
				Initial:		cuft

min or med burnrate						
DGM #1	Final:	4237,486	cuft	Final:	119992,240	Liter
	Initial:	4172,313	cuft	Initial:	118146,750	Liter
DGM #2	Final:	2247,911	cuft	Final:	63653,740	Liter
	Initial:	2187,589	cuft	Initial:	61945,620	Liter
DGM room				Final:	175,690	cuft
				Initial:	91,680	cuft

Numéro de la ligne dans "Raw data" à partir duquel les données du test commence	75
Numéro de la ligne dans "Raw data" à partir duquel les données du highfire test commence	117
Numéro de la ligne dans "Raw data" à partir duquel les données du min ou medium fire test commence	235

Autres données à rentrer: dans preload data, load data, traverse et filter set weight

Project nu.	PI 20219
Date	16-01-2020
Technicien	M.M

Filter set weight Low/ medium fire

	System 1 (g) 1st hour				System 1 (g)				System 2 (g)				Ambient blank (g)	Date	Heure
	probe	front / Back		gasket	probe	front / Back		gasket	probe	front / Back		gasket	Filter		
Number	5	506	507	6	6	508	509	30	11	510	511	37	512		
Before (1)															
Before (2)															
Before (3)															
Before (4)															
Before (5)	61,5025	0,1772		35,7163	61,3739	0,1755		33,9596	93,7199	0,1761		34,3223	0,0842	2020-01-15	17:00
Before (6)	61,5026	0,1773		35,7164	61,3740	0,1756		33,9595	93,7198	0,1762		34,3224	0,0843	2020-01-16	09:00
After (1)	61,5038	0,1782		35,7173	61,3748	0,1759		33,9604	93,7211	0,1771		34,3232	0,0843	2020-01-16	19:00
After (2)	61,5028	0,1780		35,7164	61,3743	0,1759		33,9595	93,7200	0,1770		34,3224	0,0843	2020-01-20	08:00
After (3)	61,5027	0,1780		35,7164	61,3742	0,1759		33,9595	93,7201	0,1771		34,3224	0,0843	2020-01-20	17:00
After (4)															
After (5)															
After (6)	61,5027	0,1780		35,7164	61,3742	0,1759		33,9595	93,7201	0,1771		34,3224	0,0843	2020-01-20	17:00
Difference	0,0001	0,0007	0,0000	0,0000	0,0002	0,0003	0,0000	0,0000	0,0003	0,0009	0,0000	0,0000	0,0000		
Total (mg)		0,8				1,3				1,2			0		
Total ajusté (mg)		**0,80**				**1,30**				**1,20**					

Project nu.	PI 20219
Date	16-01-2020
Technicien	M.M

*		*	*	*	*1	*2	*3	*4	*5	*6	*7	*8	Mass flow 1	DGM 1	DGM 1	Filter 1	Mass flow 2	DGM 2	DGM 2	Filter 2
Elapsed		Weight			Flue	Room	Tunnel	Unit	Unit	Unit	Unit	Unit	Reading	Inlet T	Outlet T	Temp	Reading	Inlet T	Outlet T	Temp
Time	Raw data row	Remaining	CO	CO_2	Gas	Temp	Dry Bulb	Top	Back	R.Side	L.Side	Bottom								
min		lbs	%	%	°F	°F	°F	°F	°F	°F	°F	°F	cuft/min	oF	oF	oF	cuft/min	oF	oF	oF
0,00	235,00	18,3	0,8	4,9	273,5	72,5	103,1	457,9	548,0	483,3	509,7	238,2	0,18	75,13	74,84	86,36	0,16	75,21	74,53	86,19
1,0	236,0	18,2	0,4	2,7	366,7	72,4	95,5	476,0	547,8	482,7	507,8	239,0	0,18	75,18	74,76	86,43	0,16	75,27	74,48	85,69
2,0	237,0	18,0	0,6	5,9	420,4	72,0	96,2	537,7	546,9	482,0	506,2	239,2	0,18	75,22	74,73	86,23	0,16	75,31	74,51	85,28
3,0	238,0	17,7	0,9	8,6	531,5	72,5	99,9	654,4	545,2	481,0	503,6	238,6	0,18	75,26	74,73	86,05	0,16	75,36	74,51	84,87
4,0	239,0	17,4	0,8	12,0	574,8	72,4	102,9	753,0	542,9	479,0	501,3	237,9	0,18	75,33	74,73	85,84	0,16	75,42	74,53	84,47
5,0	240,0	17,1	0,6	14,2	634,8	72,5	105,7	837,5	539,4	476,6	498,0	236,9	0,18	75,42	74,74	85,66	0,16	75,56	74,56	84,11
6,0	241,0	16,9	0,2	16,9	634,8	72,6	105,0	895,4	534,9	473,6	493,9	236,7	0,18	75,50	74,76	85,47	0,16	75,65	74,60	83,78
7,0	242,0	16,6	0,5	17,7	620,7	72,7	104,9	914,6	529,9	470,3	489,4	237,2	0,18	75,65	74,83	85,28	0,16	75,77	74,64	83,48
8,0	243,0	16,4	0,6	17,2	616,5	72,3	104,6	926,2	524,6	467,5	484,3	238,0	0,18	75,78	74,85	85,07	0,16	75,88	74,67	83,17
9,0	244,0	16,2	0,5	17,3	614,5	72,4	104,4	944,6	519,4	464,0	480,0	238,6	0,18	75,90	74,88	84,89	0,16	76,00	74,71	82,91
10,0	245,0	16,0	0,8	17,9	588,5	72,6	100,5	962,5	514,3	461,1	478,1	239,2	0,18	75,98	74,93	84,67	0,16	76,10	74,79	82,69
11,0	246,0	15,8	0,8	17,3	571,5	73,2	99,7	955,1	510,3	458,3	477,0	240,3	0,18	76,03	74,95	84,43	0,16	76,15	74,80	82,46
12,0	247,0	15,6	0,9	17,3	562,6	73,0	99,1	948,4	507,0	455,9	475,2	241,3	0,18	76,10	74,96	84,25	0,16	76,23	74,85	82,27
13,0	248,0	15,4	0,9	17,5	556,7	72,9	98,7	949,4	503,7	453,2	472,6	242,3	0,18	76,18	75,01	84,06	0,16	76,34	74,91	84,88
14,0	249,0	15,1	0,8	17,7	552,7	72,9	98,5	947,0	500,3	450,7	470,7	243,8	0,18	76,24	75,03	83,84	0,16	76,40	74,93	87,74
15,0	250,0	15,0	0,7	17,7	550,6	73,1	98,4	943,5	496,9	448,4	468,6	244,6	0,18	76,29	75,07	83,67	0,16	76,46	75,00	87,86
16,0	251,0	14,8	0,6	17,8	548,3	73,5	98,6	941,8	493,4	445,8	466,4	245,4	0,18	76,30	75,10	83,50	0,16	76,51	75,04	87,64
17,0	252,0	14,6	0,7	17,7	546,7	73,3	98,9	940,4	489,7	443,9	464,1	246,2	0,18	76,32	75,14	83,36	0,16	76,55	75,09	87,32
18,0	253,0	14,4	0,7	18,0	547,6	73,3	99,2	944,9	485,9	441,7	462,2	247,0	0,18	76,40	75,17	83,18	0,16	76,61	75,13	86,92
19,0	254,0	14,2	0,7	18,1	548,0	73,5	99,1	948,9	482,3	439,4	460,3	247,5	0,18	76,45	75,20	83,06	0,16	76,68	75,17	86,53
20,0	255,0	14,0	0,8	18,2	549,3	73,6	98,9	953,8	478,8	437,1	458,7	247,9	0,18	76,49	75,22	82,90	0,16	76,74	75,22	86,13
21,0	256,0	13,8	0,9	18,3	550,8	73,7	99,0	958,7	475,6	435,1	457,3	248,4	0,18	76,54	75,26	82,78	0,16	76,79	75,28	85,76
22,0	257,0	13,6	1,0	18,3	548,8	73,8	99,3	963,1	472,7	433,2	455,6	248,7	0,18	76,57	75,30	82,66	0,16	76,85	75,32	85,43
23,0	258,0	13,3	1,0	18,3	546,1	73,9	99,1	966,0	469,8	431,3	454,3	249,1	0,18	76,65	75,33	82,55	0,16	76,90	75,37	85,09
24,0	259,0	13,2	1,1	18,2	545,3	73,9	99,3	967,8	467,2	429,8	453,1	249,4	0,18	76,69	75,37	82,42	0,16	76,95	75,41	84,80
25,0	260,0	12,9	1,1	18,2	545,0	74,0	99,2	967,8	464,8	428,0	451,9	249,7	0,18	76,76	75,41	82,32	0,16	77,01	75,46	84,50
26,0	261,0	12,8	1,0	18,3	544,7	74,1	99,2	968,0	462,6	426,6	450,6	250,0	0,18	76,79	75,44	82,23	0,16	77,07	75,50	84,22
27,0	262,0	12,5	1,1	18,3	544,5	74,1	99,4	970,2	460,5	425,0	449,5	250,2	0,18	76,83	75,46	82,14	0,16	77,13	75,55	83,97
28,0	263,0	12,4	1,2	18,4	543,8	74,2	99,5	974,0	458,5	423,8	449,0	250,4	0,18	76,90	75,52	82,03	0,16	77,18	75,60	83,71
29,0	264,0	12,2	1,2	18,4	542,5	74,2	99,6	975,7	456,7	422,9	448,0	250,5	0,18	76,96	75,56	81,95	0,16	77,23	75,66	83,52
30,0	265,0	12,0	1,2	18,4	541,9	74,3	99,6	976,7	455,0	421,7	446,7	250,7	0,18	77,05	75,60	82,02	0,16	77,30	75,71	83,31
31,0	266,0	11,8	1,1	18,5	541,3	74,4	99,4	976,3	453,4	421,0	445,6	250,9	0,18	77,09	75,65	84,18	0,16	77,37	75,76	83,04
32,0	267,0	11,6	1,2	18,3	539,4	74,4	99,4	976,9	452,1	420,2	445,3	251,0	0,18	77,15	75,67	86,29	0,16	77,40	75,80	82,81
33,0	268,0	11,4	1,2	18,2	537,7	74,3	99,6	976,0	450,8	419,6	444,1	251,1	0,18	77,20	75,72	86,59	0,16	77,46	75,85	82,63
34,0	269,0	11,2	1,2	18,3	537,5	74,0	98,5	975,6	449,7	419,2	443,8	251,1	0,18	77,26	75,78	86,50	0,16	77,51	75,90	82,50
35,0	270,0	11,0	1,2	18,3	536,7	74,5	98,8	971,7	448,7	418,6	443,4	251,3	0,18	77,32	75,81	86,33	0,16	77,56	75,94	82,33
36,0	271,0	10,8	1,1	18,3	535,7	74,5	99,3	969,9	447,9	418,4	443,4	251,4	0,18	77,38	75,85	86,20	0,16	77,63	75,99	82,36
37,0	272,0	10,6	1,0	18,3	532,6	74,5	99,1	968,0	447,1	417,9	442,5	251,3	0,18	77,44	75,90	86,00	0,16	77,69	76,05	86,56
38,0	273,0	10,5	1,0	18,3	531,2	74,3	99,2	966,3	446,5	417,8	442,0	251,6	0,18	77,52	75,95	85,81	0,16	77,74	76,09	88,26
39,0	274,0	10,3	0,9	18,3	529,7	74,6	98,3	967,1	446,1	417,7	441,9	251,4	0,18	77,59	75,98	85,62	0,16	77,78	76,13	88,23
40,0	275,0	10,1	1,0	18,2	527,1	74,6	99,2	967,0	445,7	417,9	442,2	251,6	0,18	77,63	76,04	85,42	0,16	77,86	76,18	87,98
41,0	276,0	9,9	0,9	18,1	527,0	74,6	98,6	968,5	445,4	418,1	442,2	251,6	0,18	77,72	76,08	85,24	0,16	77,92	76,23	87,66
42,0	277,0	9,7	0,9	18,1	525,8	74,8	98,6	969,4	445,3	418,0	442,3	251,6	0,18	77,77	76,14	85,09	0,16	77,97	76,27	87,31
43,0	278,0	9,6	0,8	18,2	523,0	74,8	98,6	970,8	445,2	418,2	442,3	251,8	0,18	77,80	76,18	84,92	0,16	78,03	76,33	86,94
44,0	279,0	9,4	0,8	18,2	522,5	75,0	98,3	972,8	445,3	418,6	442,4	251,7	0,18	77,84	76,23	84,76	0,16	78,06	76,39	86,57
45,0	280,0	9,2	0,9	18,1	520,8	74,8	98,2	971,6	445,5	419,1	442,6	251,9	0,18	77,87	76,27	84,61	0,16	78,10	76,40	86,25
46,0	281,0	9,1	0,9	18,2	520,7	74,8	98,4	972,5	445,8	419,5	442,5	251,8	0,18	77,88	76,27	84,43	0,16	78,12	76,44	85,90
47,0	282,0	8,9	0,9	18,3	519,5	74,8	98,2	971,3	446,1	419,8	442,5	251,6	0,18	77,92	76,32	84,27	0,16	78,16	76,50	85,58
48,0	283,0	8,7	0,9	18,2	519,2	74,8	98,1	969,4	446,6	420,4	442,7	251,7	0,18	77,95	76,37	84,16	0,16	78,19	76,54	85,29
49,0	284,0	8,6	1,0	18,1	516,6	74,7	98,3	967,9	447,1	420,9	443,3	251,7	0,18	77,98	76,40	84,03	0,16	78,22	76,57	85,02
50,0	285,0	8,4	1,0	18,2	517,7	75,0	97,6	968,5	447,8	421,6	442,9	251,5	0,18	78,00	76,44	83,86	0,16	78,25	76,61	84,77
51,0	286,0	8,2	1,0	18,2	515,0	75,0	97,2	962,0	448,5	422,4	443,5	251,6	0,18	78,03	76,48	83,73	0,16	78,26	76,65	84,53
52,0	287,0	8,1	1,2	17,9	511,7	75,1	97,8	958,3	449,4	423,3	443,8	251,6	0,18	78,08	76,52	83,59	0,16	78,32	76,70	84,28
53,0	288,0	7,9	1,2	17,9	509,1	75,4	98,1	957,4	450,4	424,0	444,2	251,7	0,18	78,13	76,56	83,47	0,16	78,38	76,75	84,08
54,0	289,0	7,7	1,2	17,9	506,6	75,2	97,7	952,3	451,5	424,7	444,3	251,5	0,18	78,19	76,60	83,37	0,16	78,44	76,78	83,85
55,0	290,0	7,6	1,1	17,9	505,4	75,1	97,6	950,6	452,6	425,6	444,9	251,7	0,18	78,21	76,66	83,26	0,16	78,47	76,83	83,64
56,0	291,0	7,5	1,0	17,9	502,3	75,3	97,8	946,7	453,9	426,4	445,0	251,8	0,18	78,26	76,71	83,16	0,16	78,51	76,87	83,50
57,0	292,0	7,3	1,0	17,8	501,1	75,4	97,7	945,5	455,1	427,7	445,1	251,8	0,18	78,30	76,74	83,06	0,16	78,55	76,92	83,31
58,0	293,0	7,1	1,0	17,8	501,8	75,3	97,6	947,2	456,3	428,6	445,0	252,0	0,18	78,36	76,79	82,95	0,16	78,61	76,96	83,15
59,0	294,0	7,0	1,0	17,9	502,1	75,1	96,5	958,2	457,6	429,9	445,9	251,9	0,18	78,39	76,80	82,82	0,16	78,64	77,01	82,98
60,0	295,0	6,8	1,0	18,3	506,5	75,3	97,4	977,6	458,8	431,0	446,9	251,9	0,18	78,45	76,85	82,71	0,16	78,66	77,01	82,83
61,0	296,0	6,7	1,0	18,6	511,0	75,1	97,6	987,1	460,1	432,3	447,4	251,9	0,18	78,51	76,91	82,55	0,16	78,74	77,08	82,68
62,0	297,0	6,6	0,9	18,3	510,4	75,5	97,9	992,1	461,5	433,5	447,5	251,9	0,18	78,52	76,94	89,54	0,16	78,76	77,10	82,55
63,0	298,0	6,3	1,1	18,4	515,1	75,5	97,6	998,1	462,9	434,8	448,1	252,0	0,18	78,57	76,98	89,59	0,16	78,81	77,14	82,46
64,0	299,0	6,2	1,3	18,7	516,2	75,8	98,2	1002,7	464,2	436,1	448,7	252,0	0,18	78,64	77,02	89,24	0,16	78,86	77,19	82,31
65,0	300,0	6,1	1,2	18,7	514,9	75,8	97,9	1010,3	465,6	437,4	449,4	251,7	0,18	78,76	77,06	89,62	0,16	78,92	77,22	84,35
66,0	301,0	5,9	1,2	18,5	511,7	75,7	97,4	1008,8	466,9	439,0	450,3	251,9	0,18	78,83	77,11	89,96	0,16	79,00	77,27	88,09
67,0	302,0	5,8	0,9	18,0	506,1	75,9	97,1	1004,9	468,2	440,7	451,0	252,1	0,18	78,82	77,15	89,36	0,16	79,03	77,31	88,44
68,0	303,0	5,7	0,6	17,3	494,2	75,9	97,0	980,5	469,8	442,4	452,0	252,0	0,18	78,85	77,21	88,84	0,16	79,08	77,36	88,28
69,0	304,0	5,6	0,4	16,3	484,6	76,0	96,3	955,3	471,3	444,0	452,8	252,3	0,18	78,86	77,27	88,33	0,16	79,11	77,41	88,00
70,0	305,0	5,5	0,2	15,9	474,9	75,9	96,0	935,3	472,9	446,0	454,3	252,3	0,18	78,84	77,30	87,85	0,16	79,15	77,45	87,65
71,0	306,0	5,4	0,2	15,4	462,9	76,1	95,4	914,3	474,5	447,9	455,5	252,4	0,18	78,84	77,32	87,40	0,16	79,15	77,49	87,29
72,0	307,0	5,3	0,1	14,6	451,0	75,9	94,0	894,7	476,1	449,5	457,3	252,5	0,18	78,81	77,38	87,00	0,16	79,14	77,54	86,95
73,0	308,0	5,2	0,1	13,9	437,7	75,8	93,5	873,9	477,8	451,3	458,6	252,6	0,18	78,80	77,39	86,61	0,16	79,11	77,57	86,57
74,0	309,0	5,1	0,1	13,0	424,9	75,8	92,9	854,5	479,4	453,0	459,6	252,8	0,18	78,76	77,41	86,21	0,16	79,10	77,58	86,23
75,0	310,0	5,1	0,1	12,4	416,3	75,5	91,8	840,6	480,9	454,6	459,8	252,6	0,18	78,68	77,44	85,84	0,16	79,08	77,59	85,86
76,0	311,0	5,0	0,1	12,2	411,0	75,6	91,5	828,3	482,4	456,0	460,3	252,8	0,18	78,64	77,43	85,50	0,16	79,05	77,63	85,56
77,0	312,0	4,9	0,1	12,1	405,8	75,4	91,8	817,3	483,8	456,9	459,3	252,9	0,18	78,58	77,45	85,20	0,16	79,00	77,63	85,24
78,0	313,0	4,8	0,1	12,0	402,5	75,5	91,6	809,6	485,2	458,8	460,0	253,2	0,18	78,54	77,45	84,92	0,16	78,96	77,64	84,94
79,0	314,0	4,8	0,1	12,0	398,6	75,5	91,4	803,2	486,7	459,5	460,1	253,2	0,18	78,54	77,48	84,60	0,16	78,99	77,64	84,65
80,0	315,0	4,7	0,1	12,1	398,5	75,3	90,3	800,6	488,1	460,4	460,7	253,1	0,18	78,47	77,50	84,30	0,16	78,93	77,66	84,38
81,0	316,0	4,6	0,1	12,2	397,1	74,8	90,1	796,6	489,5	460,7	461,2	252,9	0,18	78,46	77,52	84,02	0,16	78,91	77,67	84,07

82,0	317,0	4,5	0,1	12,3	398,1	75,3	90,5	789,1	491,1	460,6	461,3	253,0	0,18	78,47	77,52	83,77	0,16	78,92	77,68	83,81
83,0	318,0	4,5	0,1	12,6	397,9	75,5	89,7	782,1	492,4	461,7	461,7	253,0	0,18	78,48	77,55	83,54	0,16	78,93	77,70	83,57
84,0	319,0	4,4	0,1	12,6	396,1	75,7	90,0	789,6	493,7	462,1	461,8	253,0	0,18	78,37	77,54	83,30	0,16	78,84	77,70	83,33
85,0	320,0	4,3	0,1	12,3	390,5	75,4	89,9	774,3	495,0	462,3	462,1	252,9	0,18	78,35	77,54	83,09	0,16	78,81	77,71	83,11
86,0	321,0	4,3	0,1	11,3	380,8	75,5	90,0	747,4	496,4	462,5	462,2	253,0	0,18	78,37	77,56	82,89	0,16	78,82	77,72	82,88
87,0	322,0	4,2	0,1	10,9	372,0	75,5	89,5	724,7	497,7	462,8	461,5	253,3	0,18	78,38	77,57	82,70	0,16	78,80	77,71	82,70
88,0	323,0	4,2	0,2	10,1	363,5	75,3	88,3	706,8	499,0	462,9	462,5	253,0	0,18	78,39	77,56	82,49	0,16	78,78	77,72	82,48
89,0	324,0	4,1	0,2	9,8	355,4	75,3	88,4	690,7	500,2	463,1	463,6	252,9	0,18	78,38	77,58	82,31	0,16	78,77	77,71	82,29
90,0	325,0	4,1	0,2	9,3	348,7	75,5	88,0	676,9	501,4	463,5	463,7	253,0	0,18	78,35	77,58	82,12	0,16	78,76	77,73	86,28
91,0	326,0	4,1	0,2	9,1	343,8	75,0	87,8	666,4	502,5	463,1	464,0	252,9	0,18	78,33	77,59	81,93	0,16	78,76	77,73	88,37
92,0	327,0	4,0	0,3	9,0	337,3	75,2	87,5	652,6	503,6	463,2	463,7	253,0	0,18	78,35	77,62	81,78	0,16	78,77	77,75	88,33
93,0	328,0	4,0	0,4	8,1	330,0	75,2	87,5	635,8	504,6	463,5	464,1	253,1	0,18	78,37	77,63	82,44	0,16	78,74	77,74	87,97
94,0	329,0	4,0	0,6	7,5	324,3	75,1	86,9	618,3	505,6	464,6	464,3	253,2	0,18	78,38	77,65	84,93	0,16	78,74	77,73	87,39
95,0	330,0	3,9	0,7	7,1	316,0	75,1	86,6	601,8	506,5	464,7	465,1	253,2	0,18	78,37	77,65	86,77	0,16	78,76	77,75	86,85
96,0	331,0	3,9	0,9	6,8	307,7	75,2	86,1	583,4	507,3	464,8	465,6	253,1	0,18	78,37	77,66	86,99	0,16	78,72	77,77	86,48
97,0	332,0	3,9	1,1	6,4	300,2	74,8	85,9	566,3	508,1	464,9	465,7	253,3	0,18	78,35	77,65	86,78	0,16	78,69	77,74	86,06
98,0	333,0	3,9	1,1	6,5	293,6	74,6	85,5	553,1	508,7	465,4	466,3	253,5	0,18	78,34	77,64	86,45	0,16	78,66	77,74	85,68
99,0	334,0	3,9	1,1	6,4	288,6	74,5	85,4	542,3	509,3	465,6	466,7	253,3	0,18	78,34	77,64	86,13	0,16	78,62	77,72	85,24
100,0	335,0	3,8	1,0	6,5	285,1	74,5	85,0	533,1	509,9	465,1	466,6	253,3	0,18	78,31	77,66	85,81	0,16	78,60	77,73	84,87
101,0	336,0	3,8	1,0	6,5	282,2	74,8	84,8	524,7	510,5	465,1	467,3	253,4	0,18	78,25	77,65	85,50	0,16	78,56	77,72	84,48
102,0	337,0	3,8	1,0	6,5	279,2	74,8	84,7	517,4	510,9	464,9	467,2	253,6	0,18	78,23	77,64	85,15	0,16	78,56	77,72	84,12
103,0	338,0	3,8	1,0	6,4	275,4	74,6	84,4	510,8	511,3	463,8	467,5	253,3	0,18	78,20	77,65	84,84	0,16	78,51	77,71	83,77
104,0	339,0	3,7	1,1	6,4	272,3	74,7	84,3	504,1	511,8	463,7	467,6	253,5	0,18	78,17	77,64	84,54	0,16	78,50	77,70	83,49
105,0	340,0	3,7	1,1	6,3	269,9	74,5	83,8	498,1	512,1	462,6	467,8	253,4	0,18	78,09	77,66	84,25	0,16	78,46	77,70	83,17
106,0	341,0	3,7	1,1	6,3	267,4	74,7	83,7	492,1	512,5	462,6	468,3	253,5	0,18	78,05	77,64	83,97	0,16	78,41	77,69	82,86
107,0	342,0	3,7	1,1	6,3	265,9	74,5	83,9	488,0	512,7	461,7	468,5	253,4	0,18	78,04	77,64	83,68	0,16	78,41	77,71	82,56
108,0	343,0	3,7	1,1	6,3	263,8	74,4	83,7	483,7	512,9	461,1	469,0	253,4	0,18	78,05	77,64	83,39	0,16	78,37	77,67	82,30
109,0	344,0	3,6	1,1	6,3	262,2	74,3	83,5	480,2	513,0	460,5	468,6	253,4	0,18	78,04	77,64	83,13	0,16	78,37	77,69	84,55
110,0	345,0	3,6	1,1	6,3	261,1	74,5	83,4	476,4	513,1	459,6	468,8	253,5	0,18	78,03	77,65	82,87	0,16	78,39	77,71	88,00
111,0	346,0	3,6	1,1	6,3	259,2	74,7	83,5	472,9	513,2	459,0	469,2	253,5	0,18	78,01	77,64	82,62	0,16	78,38	77,71	88,17
112,0	347,0	3,6	1,1	6,3	258,3	74,8	83,3	469,6	513,1	458,4	469,4	253,2	0,18	77,99	77,63	82,38	0,16	78,35	77,70	87,88
113,0	348,0	3,5	1,1	6,2	257,1	74,3	83,0	465,5	513,1	457,9	470,1	253,1	0,18	77,97	77,61	82,13	0,16	78,30	77,70	87,45
114,0	349,0	3,5	1,2	6,2	255,6	74,5	83,0	461,5	513,0	456,8	469,5	252,9	0,18	77,91	77,64	81,95	0,16	78,28	77,70	86,99
115,0	350,0	3,5	1,2	6,2	254,1	74,5	82,9	458,1	512,9	455,8	469,0	252,9	0,18	77,92	77,61	83,63	0,16	78,27	77,68	86,40
116,0	351,0	3,5	1,2	6,2	252,9	74,4	83,0	455,6	512,7	455,4	469,4	253,0	0,18	77,91	77,63	86,08	0,16	78,28	77,68	85,84
117,0	352,0	3,5	1,2	6,2	251,8	74,4	82,8	452,4	512,5	454,9	469,4	252,7	0,18	77,93	77,64	87,09	0,16	78,27	77,68	85,33
118,0	353,0	3,5	1,2	6,2	250,8	74,7	82,7	449,4	512,3	454,2	469,5	252,7	0,18	77,92	77,60	87,06	0,16	78,23	77,65	84,92
119,0	354,0	3,5	1,2	6,1	249,0	74,6	82,7	447,6	512,1	453,6	469,3	252,7	0,18	77,92	77,61	86,74	0,16	78,22	77,66	84,53
120,0	355,0	3,4	1,3	6,2	248,7	74,8	82,7	445,8	511,9	453,4	469,2	252,5	0,18	77,92	77,61	86,38	0,16	78,23	77,66	84,14
121,0	356,0	3,4	1,3	6,2	248,1	74,7	82,6	443,7	511,6	452,9	468,9	252,5	0,18	77,89	77,63	86,03	0,16	78,22	77,68	83,78
122,0	357,0	3,4	1,3	6,2	247,2	74,9	82,7	441,9	511,3	452,7	468,5	252,2	0,18	77,90	77,63	85,69	0,16	78,23	77,68	83,41
123,0	358,0	3,4	1,3	6,2	246,5	75,0	82,5	440,2	511,0	451,9	468,2	252,1	0,18	77,86	77,63	85,38	0,16	78,23	77,68	83,07
124,0	359,0	3,3	1,3	6,2	245,8	74,7	82,8	438,5	510,7	451,8	468,4	252,0	0,18	77,86	77,65	85,07	0,16	78,24	77,69	82,73
125,0	360,0	3,3	1,3	6,2	245,5	74,8	82,7	437,1	510,3	451,2	467,7	252,0	0,18	77,87	77,64	84,74	0,16	78,25	77,69	82,44
126,0	361,0	3,3	1,3	6,2	244,2	74,6	82,6	435,4	509,9	451,1	467,6	251,7	0,18	77,90	77,67	84,45	0,16	78,28	77,69	82,64
127,0	362,0	3,3	1,3	6,2	243,8	75,0	82,5	433,9	509,5	450,9	467,4	251,4	0,18	77,89	77,67	84,18	0,16	78,26	77,71	87,22
128,0	363,0	3,3	1,3	6,2	243,7	74,8	82,6	432,1	509,2	450,3	467,2	251,3	0,18	77,87	77,66	83,85	0,16	78,26	77,71	88,25
129,0	364,0	3,3	1,3	6,2	242,6	75,0	82,7	431,2	508,9	449,8	466,8	251,0	0,18	77,86	77,68	83,58	0,16	78,26	77,72	88,09
130,0	365,0	3,2	1,3	6,2	242,7	74,8	82,6	429,7	508,5	449,2	466,6	251,1	0,18	77,87	77,70	83,32	0,16	78,28	77,73	87,69
131,0	366,0	3,2	1,3	6,2	242,2	74,8	82,4	428,6	508,2	449,5	466,7	251,0	0,18	77,85	77,71	83,03	0,16	78,26	77,72	87,23
132,0	367,0	3,2	1,3	6,2	241,4	74,8	82,5	427,4	507,9	448,6	466,2	250,9	0,18	77,87	77,73	82,78	0,16	78,27	77,75	86,75
133,0	368,0	3,2	1,3	6,2	240,9	74,6	82,3	426,2	507,5	447,9	465,8	250,7	0,18	77,86	77,72	82,53	0,16	78,26	77,73	86,24
134,0	369,0	3,2	1,3	6,2	240,8	74,9	82,3	425,1	507,3	448,0	465,8	250,7	0,18	77,83	77,72	82,25	0,16	78,24	77,75	85,74
135,0	370,0	3,2	1,3	6,2	240,1	74,7	82,3	424,2	507,0	447,7	465,8	250,6	0,18	77,86	77,72	82,00	0,16	78,24	77,73	85,27
136,0	371,0	3,1	1,3	6,2	239,5	74,8	82,2	423,6	506,8	447,8	465,3	250,4	0,18	77,83	77,72	83,17	0,16	78,20	77,72	84,74
137,0	372,0	3,1	1,3	6,2	239,8	74,8	82,2	422,9	506,6	447,0	465,1	250,4	0,18	77,81	77,72	85,75	0,16	78,22	77,75	84,20
138,0	373,0	3,1	1,3	6,1	238,9	74,4	82,2	422,1	506,3	446,4	464,7	250,2	0,18	77,80	77,71	87,11	0,16	78,21	77,74	83,78
139,0	374,0	3,0	1,3	6,1	238,8	74,5	81,9	420,7	506,1	445,0	464,4	250,0	0,18	77,78	77,69	87,19	0,16	78,19	77,73	83,42
140,0	375,0	3,1	1,3	6,1	238,3	74,5	81,8	418,9	506,0	444,5	464,5	250,3	0,18	77,80	77,69	86,84	0,16	78,20	77,72	83,09
141,0	376,0	3,0	1,3	6,1	237,7	74,9	82,1	418,6	505,8	443,8	464,2	250,2	0,18	77,80	77,68	86,46	0,16	78,19	77,72	82,74
142,0	377,0	3,0	1,3	6,2	237,6	74,7	81,9	415,6	505,7	443,9	463,9	250,2	0,18	77,82	77,71	86,03	0,16	78,18	77,71	82,42
143,0	378,0	3,0	1,4	5,9	236,2	74,7	81,9	414,5	505,5	443,6	463,6	250,0	0,18	77,80	77,71	85,70	0,16	78,17	77,71	84,63
144,0	379,0	2,9	1,4	5,8	234,9	74,9	82,0	414,0	505,4	443,8	463,6	249,7	0,18	77,77	77,69	85,37	0,16	78,14	77,70	88,16
145,0	380,0	3,0	1,3	5,8	234,0	74,7	82,0	412,8	505,4	443,3	463,3	249,7	0,18	77,76	77,69	85,06	0,16	78,14	77,70	88,33
146,0	381,0	3,0	1,4	5,8	233,7	74,7	81,8	411,2	505,3	441,5	463,0	249,6	0,18	77,77	77,68	84,74	0,16	78,14	77,71	88,03
147,0	382,0	2,9	1,3	5,8	232,8	74,5	81,9	409,5	505,2	440,9	462,2	249,5	0,18	77,79	77,69	84,37	0,16	78,15	77,71	87,57
148,0	383,0	2,9	1,4	5,6	232,0	74,6	81,9	409,1	505,1	440,7	461,8	249,5	0,18	77,83	77,72	84,07	0,16	78,18	77,72	87,13
149,0	384,0	2,9	1,4	5,6	231,3	74,8	81,7	409,0	505,1	440,7	461,4	249,6	0,18	77,79	77,70	83,80	0,16	78,18	77,72	86,59
150,0	385,0	2,9	1,3	5,6	230,4	74,7	81,8	407,6	505,0	439,4	460,7	249,6	0,18	77,78	77,71	83,49	0,16	78,16	77,73	86,11
151,0	386,0	2,9	1,3	5,3	229,9	74,5	81,7	405,9	505,0	438,5	459,7	249,6	0,18	77,75	77,69	83,20	0,16	78,13	77,73	85,65
152,0	387,0	2,8	1,3	5,2	229,8	74,6	81,7	404,6	504,9	438,5	459,3	249,4	0,18	77,72	77,71	82,94	0,16	78,14	77,73	85,20
153,0	388,0	2,8	1,3	5,2	229,3	74,7	81,6	402,1	504,8	437,1	458,6	249,5	0,18	77,71	77,71	82,63	0,16	78,14	77,72	84,73
154,0	389,0	2,8	1,3	5,2	228,2	74,5	81,6	400,0	504,7	435,5	457,7	249,8	0,18	77,68	77,71	82,40	0,16	78,15	77,72	84,29
155,0	390,0	2,8	1,3	5,2	227,0	74,6	81,6	398,4	504,5	434,5	457,0	249,8	0,18	77,66	77,71	82,14	0,16	78,13	77,73	83,90
156,0	391,0	2,8	1,3	5,3	225,8	74,6	81,5	396,6	504,3	433,6	456,4	249,9	0,18	77,65	77,71	82,05	0,16	78,11	77,72	83,52
157,0	392,0	2,7	1,3	5,3	225,8	74,6	81,5	395,1	504,1	432,9	455,5	249,9	0,18	77,64	77,71	83,90	0,16	78,10	77,73	83,03
158,0	393,0	2,8	1,3	5,2	225,2	74,6	81,4	393,3	503,9	432,8	454,6	249,9	0,18	77,64	77,70	86,26	0,16	78,10	77,74	82,60
159,0	394,0	2,7	1,3	5,3	224,6	74,7	81,5	392,3	503,7	431,6	454,1	250,1	0,18	77,63	77,70	87,02	0,16	78,10	77,74	82,28
160,0	395,0	2,7	1,3	5,3	223,8	74,7	81,3	390,5	503,4	430,5	453,3	250,2	0,18	77,63	77,68	86,90	0,16	78,10	77,73	85,62
161,0	396,0	2,7	1,3	5,3	223,5	74,3	81,4	389,4	503,1	429,3	452,2	250,3	0,18	77,58	77,70	86,59	0,16	78,08	77,71	88,12
162,0	397,0	2,7	1,3	5,3	222,5	74,2	81,3	388,1	502,9	429,8	452,4	250,0	0,18	77,57	77,69	86,23	0,16	78,08	77,73	88,09
163,0	398,0	2,7	1,3	5,3	222,5	74,4	81,2	387,1	502,5	428,8	451,6	249,9	0,18	77,55	77,68	85,83	0,16	78,03	77,70	87,72
164,0	399,0	2,7	1,3	5,3	221,8	74,4	81,2	385,7	502,3	427,7	450,1	249,8	0,18	77,51	77,68	85,46	0,16	77,96	77,70	87,31
165,0	400,0	2,7	1,3	5,3	221,9	74,3	81,2	385,2	502,0	427,7	449,7	250,0	0,18	77,50	77,66	85,14	0,16	77,96	77,67	86,83
166,0	401,0	2,6	1,3	5,3	221,7	74,3	81,1	383,8	501,7	427,0	449,1	249,9	0,18	77,48	77,64	84,80	0,16	77,91	77,65	86,30
167,0	402,0	2,6	1,3	5,3	221,4	74,0	81,2	383,2	501,4	425,5	448,7	249,9	0,18	77,44	77,63	84,46	0,16	77,91	77,64	85,83

168,0	403,0	2,6	1,3	5,3	221,2	74,2	80,9	382,4	501,1	425,0	448,3	250,0	0,18	77,42	77,62	84,13	0,16	77,90	77,64	85,34
169,0	404,0	2,6	1,3	5,3	221,0	74,2	81,1	381,9	500,8	424,3	447,7	250,1	0,18	77,44	77,60	83,77	0,16	77,87	77,62	84,83
170,0	405,0	2,5	1,3	5,3	220,1	74,1	81,0	381,1	500,6	423,8	446,7	249,6	0,18	77,44	77,59	83,45	0,16	77,85	77,59	84,35
171,0	406,0	2,6	1,3	5,3	220,0	74,1	80,9	380,2	500,3	423,4	446,3	249,6	0,18	77,44	77,56	83,13	0,16	77,82	77,60	83,94
172,0	407,0	2,5	1,3	5,3	220,2	73,9	80,8	378,6	500,1	422,7	445,5	249,8	0,18	77,43	77,57	82,81	0,16	77,80	77,57	83,50
173,0	408,0	2,5	1,3	5,2	219,1	74,1	80,7	377,6	499,9	422,9	445,7	249,7	0,18	77,37	77,55	82,51	0,16	77,77	77,55	83,10
174,0	409,0	2,5	1,3	5,2	219,2	74,1	80,8	376,6	499,7	421,2	445,1	249,6	0,18	77,37	77,54	82,20	0,16	77,76	77,55	82,74
175,0	410,0	2,5	1,3	5,2	218,6	74,0	80,8	375,6	499,5	420,4	444,7	249,5	0,18	77,37	77,54	81,93	0,16	77,74	77,52	82,38
176,0	411,0	2,5	1,3	5,2	218,3	74,0	80,7	374,4	499,2	419,0	444,3	249,4	0,18	77,37	77,53	82,92	0,16	77,74	77,50	83,58
177,0	412,0	2,5	1,3	5,2	218,0	73,9	80,6	373,5	499,0	419,1	443,5	249,3	0,18	77,38	77,53	85,16	0,16	77,73	77,50	87,53
178,0	413,0	2,5	1,3	5,2	218,4	73,9	80,7	372,3	498,8	418,6	443,1	249,3	0,18	77,36	77,51	86,74	0,16	77,75	77,51	87,91
179,0	414,0	2,4	1,3	5,2	218,2	74,1	80,7	372,0	498,6	418,8	442,8	249,3	0,18	77,35	77,51	86,85	0,16	77,70	77,47	87,58
180,0	415,0	2,4	1,3	5,2	217,9	74,0	80,5	371,3	498,4	418,1	442,5	249,0	0,18	77,34	77,49	86,56	0,16	77,67	77,46	87,17
181,0	416,0	2,4	1,3	5,2	217,7	73,9	80,7	370,9	498,1	417,4	442,4	248,8	0,18	77,33	77,47	86,19	0,16	77,70	77,46	86,66
182,0	417,0	2,4	1,3	5,2	217,6	73,7	80,6	370,3	498,0	416,9	442,0	248,6	0,18	77,32	77,48	85,80	0,16	77,68	77,45	86,18
183,0	418,0	2,4	1,3	5,2	217,1	73,7	80,6	370,0	497,8	416,2	441,8	248,3	0,18	77,30	77,49	85,43	0,16	77,67	77,43	85,69
184,0	419,0	2,3	1,3	5,2	217,1	73,7	80,6	369,0	497,6	415,6	441,5	248,3	0,18	77,30	77,46	85,10	0,16	77,66	77,44	85,23
185,0	420,0	2,4	1,3	5,2	216,7	73,8	80,4	368,3	497,5	415,0	441,3	248,3	0,18	77,25	77,44	84,74	0,16	77,62	77,42	84,78
186,0	421,0	2,3	1,3	5,2	216,7	73,7	80,6	367,7	497,3	415,0	441,0	248,2	0,18	77,24	77,44	84,39	0,16	77,64	77,43	84,29
187,0	422,0	2,3	1,3	5,2	215,9	74,0	80,5	366,6	497,1	414,1	440,6	248,2	0,18	77,24	77,41	84,03	0,16	77,60	77,41	83,85
188,0	423,0	2,3	1,3	5,2	216,4	73,9	80,5	366,7	497,0	413,4	440,5	248,2	0,18	77,24	77,42	83,69	0,16	77,60	77,40	83,45
189,0	424,0	2,3	1,4	5,2	215,9	74,0	80,5	366,1	496,9	413,0	440,4	248,0	0,18	77,24	77,42	83,35	0,16	77,59	77,40	83,05
190,0	425,0	2,3	1,4	5,2	215,7	73,9	80,5	366,2	496,7	413,1	440,5	248,0	0,18	77,27	77,40	83,05	0,16	77,60	77,40	82,65
191,0	426,0	2,2	1,3	5,2	216,1	74,0	80,5	366,1	496,6	412,6	440,3	247,9	0,18	77,27	77,38	82,73	0,16	77,61	77,38	82,28
192,0	427,0	2,2	1,3	5,2	216,0	73,9	80,5	365,9	496,4	412,3	440,8	247,7	0,18	77,27	77,37	82,41	0,16	77,60	77,38	84,47
193,0	428,0	2,2	1,3	5,2	215,1	74,0	80,5	365,3	496,3	411,3	441,0	247,5	0,18	77,27	77,39	82,20	0,16	77,60	77,38	87,67
194,0	429,0	2,2	1,3	5,2	215,0	73,9	80,5	365,5	496,2	411,0	440,9	247,5	0,18	77,28	77,37	83,84	0,16	77,63	77,37	87,60
195,0	430,0	2,2	1,3	5,2	215,4	74,0	80,4	365,1	496,0	411,5	441,0	247,2	0,18	77,29	77,37	86,11	0,16	77,63	77,37	87,06
196,0	431,0	2,2	1,3	5,2	214,7	73,8	80,5	364,3	495,9	410,4	441,0	247,1	0,18	77,31	77,37	87,01	0,16	77,62	77,38	86,61
197,0	432,0	2,2	1,3	5,2	215,1	73,8	80,3	363,8	495,7	410,3	440,8	246,9	0,18	77,31	77,38	86,90	0,16	77,63	77,36	86,17
198,0	433,0	2,1	1,3	5,2	214,7	73,6	80,5	363,6	495,6	410,3	440,6	246,6	0,18	77,26	77,37	86,56	0,16	77,59	77,38	85,69
199,0	434,0	2,1	1,3	5,2	214,8	73,8	80,5	363,3	495,5	409,6	440,6	246,1	0,18	77,23	77,36	86,20	0,16	77,58	77,36	85,26
200,0	435,0	2,2	1,3	5,2	214,5	73,5	80,5	362,4	495,4	409,3	440,6	246,1	0,18	77,23	77,36	85,84	0,16	77,59	77,35	84,78
201,0	436,0	2,1	1,3	5,2	214,7	73,7	80,5	362,5	495,3	408,8	440,5	246,1	0,18	77,22	77,35	85,46	0,16	77,59	77,34	84,33
202,0	437,0	2,1	1,4	5,2	215,1	73,6	80,4	361,9	495,2	408,7	440,7	245,9	0,18	77,19	77,32	85,10	0,16	77,57	77,36	83,88
203,0	438,0	2,1	1,4	5,1	214,9	74,0	80,5	362,0	495,1	409,1	440,3	245,2	0,18	77,19	77,33	84,72	0,16	77,57	77,34	83,47
204,0	439,0	2,1	1,4	5,1	214,7	73,8	80,5	361,4	495,1	407,8	440,8	245,3	0,18	77,16	77,33	84,40	0,16	77,57	77,37	83,05
205,0	440,0	2,0	1,4	5,1	214,6	73,8	80,6	360,9	495,0	407,0	440,8	245,2	0,18	77,15	77,33	84,05	0,16	77,55	77,35	82,70
206,0	441,0	2,0	1,4	5,1	214,5	73,8	80,5	360,5	494,9	406,7	440,7	245,2	0,18	77,16	77,34	83,70	0,16	77,55	77,34	82,37
207,0	442,0	2,0	1,4	5,1	214,5	73,8	80,5	360,1	494,9	406,7	440,4	245,3	0,18	77,19	77,33	83,40	0,16	77,55	77,33	85,01
208,0	443,0	2,0	1,4	5,1	214,3	73,9	80,5	359,9	494,8	405,3	440,9	245,1	0,18	77,21	77,33	83,05	0,16	77,55	77,33	87,94
209,0	444,0	2,0	1,4	5,1	214,1	74,0	80,5	360,1	494,8	404,5	440,7	245,0	0,18	77,21	77,31	82,76	0,16	77,54	77,33	87,99
210,0	445,0	2,0	1,4	5,1	214,0	73,9	80,5	359,8	494,7	404,8	441,0	244,8	0,18	77,23	77,34	82,47	0,16	77,59	77,35	87,67
211,0	446,0	2,0	1,4	5,1	213,9	73,8	80,4	359,5	494,6	404,7	440,6	244,5	0,18	77,21	77,32	82,14	0,16	77,58	77,34	87,21
212,0	447,0	1,9	1,4	5,1	214,0	73,9	80,6	359,1	494,6	403,1	440,4	244,5	0,18	77,21	77,34	82,64	0,16	77,60	77,35	86,65
213,0	448,0	1,9	1,4	5,1	214,3	74,0	80,5	359,1	494,5	403,0	440,3	244,2	0,18	77,21	77,33	84,86	0,16	77,60	77,36	85,97
214,0	449,0	1,9	1,4	5,1	213,6	74,0	80,6	358,8	494,4	403,0	440,3	244,0	0,18	77,22	77,34	86,74	0,16	77,62	77,37	85,38
215,0	450,0	1,9	1,4	5,1	213,6	73,8	80,6	358,3	494,3	402,5	439,9	244,0	0,18	77,26	77,34	87,07	0,16	77,64	77,34	84,90
216,0	451,0	1,9	1,4	5,1	213,2	74,0	80,6	358,3	494,2	401,7	439,7	243,6	0,18	77,24	77,33	86,80	0,16	77,63	77,34	84,45
217,0	452,0	1,9	1,4	5,1	213,4	74,0	80,5	357,9	494,2	401,7	439,5	243,3	0,18	77,23	77,32	86,49	0,16	77,62	77,34	84,03
218,0	453,0	1,8	1,4	5,1	213,1	73,7	80,6	357,5	494,2	401,0	439,5	243,4	0,18	77,25	77,31	86,09	0,16	77,62	77,34	83,61
219,0	454,0	1,8	1,4	5,1	212,8	73,7	80,4	356,5	494,1	400,8	439,1	243,1	0,18	77,26	77,32	85,68	0,16	77,63	77,36	83,20
220,0	455,0	1,8	1,4	5,1	212,5	73,7	80,5	356,7	494,1	400,2	439,2	242,9	0,18	77,25	77,31	85,31	0,16	77,64	77,35	82,82
221,0	456,0	1,8	1,4	5,1	212,6	73,8	80,6	356,6	494,1	400,7	438,6	242,8	0,18	77,25	77,32	84,95	0,16	77,65	77,36	82,47
222,0	457,0	1,8	1,4	5,1	212,3	74,0	80,5	356,9	494,1	400,6	438,7	242,7	0,18	77,26	77,30	84,59	0,16	77,62	77,35	82,69
223,0	458,0	1,8	1,4	5,1	212,3	73,9	80,4	357,0	494,1	399,9	438,6	242,6	0,18	77,27	77,30	84,22	0,16	77,62	77,33	87,04
224,0	459,0	1,8	1,4	5,1	212,4	74,0	80,6	356,6	494,1	399,0	438,4	242,4	0,18	77,29	77,28	83,88	0,16	77,61	77,30	88,13
225,0	460,0	1,8	1,4	5,1	212,8	73,9	80,5	356,5	494,1	398,6	438,0	242,5	0,18	77,31	77,28	83,54	0,16	77,63	77,34	87,90
226,0	461,0	1,7	1,4	5,1	212,6	73,9	80,5	356,7	494,1	398,7	437,9	242,5	0,18	77,30	77,28	83,20	0,16	77,61	77,29	87,49
227,0	462,0	1,7	1,4	5,1	211,9	73,9	80,4	355,8	494,1	398,4	437,6	242,2	0,18	77,31	77,28	82,87	0,16	77,60	77,30	87,00
228,0	463,0	1,7	1,3	5,0	211,8	73,8	80,5	354,7	494,2	398,0	437,4	242,1	0,18	77,32	77,29	82,55	0,16	77,61	77,30	86,48
229,0	464,0	1,7	1,3	5,1	211,6	73,8	80,4	354,0	494,2	397,9	437,1	242,1	0,18	77,32	77,28	82,22	0,16	77,61	77,30	85,97
230,0	465,0	1,7	1,3	5,1	211,4	73,8	80,2	353,5	494,3	397,3	436,9	242,0	0,18	77,31	77,27	82,34	0,16	77,62	77,31	85,40
231,0	466,0	1,6	1,3	5,1	210,9	73,7	80,3	352,9	494,3	396,7	436,5	241,8	0,18	77,34	77,26	84,47	0,16	77,63	77,30	84,78
232,0	467,0	1,7	1,3	5,0	210,9	73,6	80,5	352,1	494,3	396,8	436,2	241,8	0,18	77,34	77,28	86,64	0,16	77,65	77,32	84,20
233,0	468,0	1,6	1,3	5,0	210,7	73,7	80,3	351,1	494,3	396,1	435,8	241,7	0,18	77,32	77,28	87,22	0,16	77,64	77,32	83,76
234,0	469,0	1,6	1,3	5,0	210,3	73,8	80,4	350,9	494,3	396,0	435,5	241,7	0,18	77,29	77,26	87,02	0,16	77,63	77,31	83,34
235,0	470,0	1,6	1,3	5,0	210,3	73,8	80,4	350,3	494,3	395,1	435,4	241,7	0,18	77,30	77,27	86,67	0,16	77,62	77,33	82,98
236,0	471,0	1,6	1,3	4,9	210,6	73,8	80,3	349,8	494,2	395,1	435,0	241,6	0,18	77,29	77,27	86,26	0,16	77,61	77,31	82,59
237,0	472,0	1,6	1,3	4,9	210,5	73,9	80,4	349,5	494,1	394,6	434,8	241,4	0,18	77,26	77,26	85,89	0,16	77,61	77,32	82,25
238,0	473,0	1,6	1,3	4,8	210,3	73,8	80,3	348,8	494,0	394,0	434,6	241,3	0,18	77,26	77,24	85,52	0,16	77,61	77,30	85,40
239,0	474,0	1,5	1,3	4,8	210,1	73,9	80,1	348,0	493,9	393,9	434,4	241,1	0,18	77,24	77,24	85,12	0,16	77,60	77,28	87,81
240,0	475,0	1,5	1,3	4,8	209,8	74,0	80,2	347,6	493,8	392,8	434,4	241,0	0,18	77,23	77,23	84,73	0,16	77,59	77,28	87,78
241,0	476,0	1,5	1,3	4,8	209,3	74,0	80,3	346,8	493,7	393,0	434,2	240,9	0,18	77,23	77,22	84,38	0,16	77,56	77,26	87,38
242,0	477,0	1,5	1,3	4,8	209,2	74,0	80,2	346,5	493,5	393,0	434,2	240,6	0,18	77,24	77,22	84,03	0,16	77,56	77,28	86,91
243,0	478,0	1,5	1,3	4,8	209,2	73,8	80,1	345,3	493,4	392,6	434,2	240,5	0,18	77,19	77,22	83,69	0,16	77,55	77,28	86,40
244,0	479,0	1,4	1,3	4,8	208,8	73,7	80,1	343,9	493,2	392,1	434,2	240,4	0,18	77,16	77,22	83,36	0,16	77,54	77,25	85,87
245,0	480,0	1,4	1,3	4,8	208,7	73,7	80,0	343,3	493,0	391,4	433,7	240,4	0,18	77,15	77,20	83,01	0,16	77,48	77,26	85,34
246,0	481,0	1,5	1,3	4,7	208,4	73,5	80,0	342,3	492,9	391,2	433,5	240,3	0,18	77,11	77,21	82,71	0,16	77,48	77,25	84,85
247,0	482,0	1,4	1,3	4,7	208,2	73,6	80,1	341,9	492,7	391,0	433,4	240,3	0,18	77,14	77,22	82,38	0,16	77,47	77,24	84,36
248,0	483,0	1,4	1,2	4,7	208,0	73,6	80,0	341,0	492,5	390,8	433,3	240,4	0,18	77,15	77,21	82,07	0,16	77,47	77,22	83,93
249,0	484,0	1,4	1,2	4,7	207,3	73,7	80,0	340,5	492,3	390,0	433,3	240,3	0,18	77,16	77,21	82,60	0,16	77,47	77,22	83,43
250,0	485,0	1,4	1,2	4,7	206,7	73,8	80,1	339,9	492,0	389,5	433,3	240,1	0,18	77,14	77,18	84,87	0,16	77,45	77,23	82,91
251,0	486,0	1,4	1,2	4,7	206,9	73,7	80,0	338,8	491,6	389,3	433,3	240,1	0,18	77,16	77,18	86,77	0,16	77,46	77,22	82,46
252,0	487,0	1,4	1,2	4,7	206,6	73,8	80,1	337,7	491,3	389,4	433,1	240,0	0,18	77,16	77,18	87,02	0,16	77,47	77,22	83,13
253,0	488,0	1,4	1,2	4,7	205,7	73,8	80,1	337,2	490,9	389,1	432,9	240,0	0,18	77,19	77,17	86,74	0,16	77,46	77,21	87,22

254,0	489,0	1,3	1,2	4,7	205,5	73,9	80,0	336,6	490,4	389,0	432,7	240,0	0,18	77,22	77,17	86,36	0,16	77,46	77,19	87,93
255,0	490,0	1,3	1,2	4,7	205,4	73,9	80,0	336,2	489,9	388,7	432,5	239,9	0,18	77,25	77,17	85,92	0,16	77,49	77,20	87,67
256,0	491,0	1,3	1,2	4,7	205,4	74,0	79,8	335,6	489,4	388,2	432,5	239,9	0,18	77,26	77,17	85,56	0,16	77,49	77,21	87,23
257,0	492,0	1,3	1,2	4,7	205,2	74,0	80,0	334,8	488,9	388,0	432,4	239,9	0,18	77,24	77,16	85,17	0,16	77,50	77,19	86,70
258,0	493,0	1,3	1,2	4,7	204,8	73,8	79,8	334,5	488,4	387,9	432,6	239,7	0,18	77,24	77,13	84,78	0,16	77,48	77,18	86,20
259,0	494,0	1,3	1,2	4,7	204,6	73,6	79,9	334,0	487,9	387,7	432,8	239,7	0,18	77,20	77,13	84,42	0,16	77,45	77,17	85,66
260,0	495,0	1,3	1,2	4,7	204,7	73,7	79,9	333,2	487,3	387,2	432,6	239,7	0,18	77,18	77,13	84,04	0,16	77,45	77,18	85,11
261,0	496,0	1,2	1,2	4,7	203,9	73,8	79,8	333,1	486,8	387,3	432,8	239,7	0,18	77,16	77,12	83,70	0,16	77,42	77,15	84,60
262,0	497,0	1,3	1,2	4,7	204,0	73,8	79,8	332,3	486,3	387,2	432,7	239,4	0,18	77,15	77,09	83,34	0,16	77,42	77,14	84,10
263,0	498,0	1,2	1,2	4,6	204,4	73,5	79,8	332,0	485,7	386,7	432,7	239,4	0,18	77,17	77,08	82,99	0,16	77,40	77,13	83,63
264,0	499,0	1,2	1,2	4,6	204,6	73,8	79,8	331,5	485,3	385,9	432,6	239,3	0,18	77,13	77,05	82,67	0,16	77,39	77,12	83,20
265,0	500,0	1,2	1,2	4,6	204,1	73,9	79,8	331,1	484,9	385,2	432,8	239,1	0,18	77,14	77,06	82,31	0,16	77,40	77,12	82,77
266,0	501,0	1,2	1,2	4,6	203,7	73,4	79,6	330,9	484,4	385,4	432,5	239,1	0,18	77,13	77,06	82,00	0,16	77,38	77,10	82,39
267,0	502,0	1,2	1,2	4,6	203,4	74,1	79,6	330,2	484,0	384,4	432,3	238,7	0,18	77,13	77,05	82,87	0,16	77,37	77,08	85,04
268,0	503,0	1,2	1,2	4,7	203,3	73,7	79,8	330,1	483,5	384,4	432,8	238,8	0,18	77,10	77,05	85,10	0,16	77,37	77,09	87,70
269,0	504,0	1,2	1,2	4,7	203,1	73,6	79,8	330,1	483,1	384,0	433,1	238,6	0,18	77,09	77,05	86,98	0,16	77,35	77,09	87,60
270,0	505,0	1,1	1,2	4,7	203,4	73,5	79,7	329,9	482,7	383,7	433,0	238,6	0,18	77,07	77,03	87,28	0,16	77,35	77,09	87,24
271,0	506,0	1,1	1,2	4,7	203,1	73,6	79,7	329,7	482,3	383,6	432,9	238,5	0,18	77,05	77,03	87,01	0,16	77,31	77,08	86,78
272,0	507,0	1,1	1,2	4,7	203,2	73,6	79,8	329,6	481,9	383,2	433,1	238,2	0,18	77,04	77,02	86,63	0,16	77,31	77,07	86,28
273,0	508,0	1,1	1,2	4,7	203,1	73,5	79,7	329,2	481,6	382,4	433,1	238,2	0,18	77,04	77,02	86,15	0,16	77,29	77,07	85,78
274,0	509,0	1,1	1,2	4,7	203,2	73,8	79,6	329,0	481,3	381,6	433,1	238,4	0,18	77,02	77,00	85,69	0,16	77,26	77,03	85,27
275,0	510,0	1,1	1,2	4,7	203,3	73,5	79,6	328,7	481,0	381,5	433,2	238,5	0,18	77,02	77,01	85,23	0,16	77,23	77,03	84,73
276,0	511,0	1,1	1,2	4,7	203,7	73,5	79,5	328,3	480,7	381,6	433,1	238,4	0,18	76,98	76,98	84,82	0,16	77,24	77,02	84,28
277,0	512,0	1,0	1,2	4,7	203,0	73,8	79,6	328,3	480,4	381,4	433,1	238,4	0,18	76,97	76,98	84,38	0,16	77,22	76,98	83,81
278,0	513,0	1,0	1,2	4,7	203,0	73,6	79,4	327,9	480,2	380,9	433,3	238,2	0,18	76,99	76,98	84,02	0,16	77,19	76,99	83,39
279,0	514,0	1,0	1,1	4,7	202,9	73,4	79,5	327,5	479,9	380,9	433,1	238,3	0,18	76,97	76,97	83,65	0,16	77,20	76,98	82,97
280,0	515,0	1,0	1,1	4,7	202,9	73,7	79,3	327,3	479,7	380,4	432,7	238,0	0,18	76,96	76,96	83,31	0,16	77,17	76,98	82,60
281,0	516,0	1,0	1,1	4,7	203,3	73,9	79,4	327,6	479,5	380,4	433,0	237,9	0,18	76,95	76,97	82,99	0,16	77,17	76,97	82,21
282,0	517,0	1,0	1,1	4,7	203,4	73,5	79,4	327,2	479,4	379,7	432,9	237,8	0,18	76,89	76,94	82,65	0,16	77,11	76,92	85,29
283,0	518,0	1,0	1,1	4,8	203,5	73,6	79,4	327,3	479,2	379,6	432,8	237,8	0,18	76,89	76,94	82,32	0,16	77,09	76,94	88,09
284,0	519,0	0,9	1,1	4,8	203,3	73,5	79,4	327,2	479,1	379,1	432,8	237,9	0,18	76,91	76,91	82,02	0,16	77,12	76,93	88,08
285,0	520,0	1,0	1,2	4,7	203,2	73,6	79,3	327,0	479,0	379,2	432,8	238,0	0,18	76,92	76,90	82,11	0,16	77,08	76,92	87,66
286,0	521,0	0,9	1,2	4,7	203,2	73,5	79,4	327,0	478,9	378,8	432,5	237,7	0,18	76,91	76,92	84,25	0,16	77,10	76,93	87,05
287,0	522,0	0,9	1,2	4,7	203,0	73,7	79,4	327,6	478,8	378,7	432,3	237,7	0,18	76,88	76,89	86,48	0,16	77,09	76,92	86,39
288,0	523,0	0,9	1,1	4,6	203,1	73,5	79,2	327,0	478,9	377,6	432,6	237,4	0,18	76,84	76,89	87,00	0,16	77,05	76,89	85,88
289,0	524,0	0,9	1,1	4,5	203,2	74,2	79,5	326,7	478,9	377,4	432,4	237,5	0,18	76,82	76,88	86,79	0,16	77,06	76,87	85,36
290,0	525,0	0,9	1,1	4,5	203,1	73,6	79,2	326,8	478,9	377,1	432,1	237,3	0,18	76,78	76,88	86,43	0,16	77,01	76,86	84,89
291,0	526,0	0,9	1,1	4,5	203,0	73,7	79,3	326,1	479,0	376,2	432,2	237,2	0,18	76,74	76,86	86,04	0,16	77,00	76,86	84,40
292,0	527,0	0,9	1,1	4,5	202,6	73,6	79,2	325,6	479,1	375,8	432,1	237,3	0,18	76,71	76,86	85,59	0,16	76,98	76,86	83,92
293,0	528,0	0,8	1,1	4,5	202,7	73,5	79,2	325,0	479,2	376,1	432,1	237,3	0,18	76,67	76,85	85,18	0,16	76,93	76,82	83,47
294,0	529,0	0,8	1,1	4,5	202,2	73,3	79,1	324,4	479,3	375,9	431,9	237,2	0,18	76,65	76,82	84,76	0,16	76,91	76,80	83,02
295,0	530,0	0,8	1,1	4,5	202,4	73,4	79,1	324,1	479,3	375,1	431,9	237,6	0,18	76,65	76,81	84,40	0,16	76,90	76,80	82,60
296,0	531,0	0,8	1,1	4,5	201,9	73,3	79,0	323,6	479,4	375,3	431,5	237,6	0,18	76,63	76,79	84,02	0,16	76,87	76,76	82,23
297,0	532,0	0,8	1,1	4,5	201,7	73,4	79,0	322,9	479,3	375,0	431,4	237,6	0,18	76,62	76,77	83,61	0,16	76,85	76,76	85,62
298,0	533,0	0,8	1,1	4,5	201,3	73,2	79,1	322,5	479,4	374,5	431,4	237,6	0,18	76,64	76,76	83,21	0,16	76,85	76,74	87,80
299,0	534,0	0,8	1,1	4,5	201,3	73,2	79,1	322,3	479,4	373,9	430,9	237,6	0,18	76,62	76,76	82,88	0,16	76,83	76,73	87,71
300,0	535,0	0,7	1,1	4,5	200,7	73,2	79,0	321,7	479,4	373,2	430,9	237,5	0,18	76,59	76,75	82,54	0,16	76,83	76,72	87,30
301,0	536,0	0,8	1,1	4,5	201,1	73,1	78,9	321,3	479,4	372,3	430,9	237,8	0,18	76,57	76,75	82,17	0,16	76,79	76,70	86,79
302,0	537,0	0,7	1,1	4,5	200,7	73,1	79,0	320,9	479,4	372,2	430,4	237,5	0,18	76,58	76,76	83,00	0,16	76,79	76,70	86,16
303,0	538,0	0,7	1,1	4,5	200,8	73,1	78,9	320,6	479,4	372,2	430,3	237,4	0,18	76,53	76,73	85,22	0,16	76,77	76,70	85,44
304,0	539,0	0,7	1,1	4,5	200,9	73,2	78,7	320,1	479,4	372,4	430,0	237,5	0,18	76,52	76,70	86,81	0,16	76,75	76,68	84,83
305,0	540,0	0,7	1,1	4,5	200,9	73,2	78,6	319,7	479,4	372,3	429,6	237,6	0,18	76,51	76,70	86,93	0,16	76,73	76,67	84,39
306,0	541,0	0,7	1,1	4,5	200,4	73,2	78,6	319,5	479,4	372,0	429,3	237,4	0,18	76,51	76,68	86,61	0,16	76,72	76,64	83,88
307,0	542,0	0,7	1,1	4,5	200,5	73,3	78,6	319,3	479,3	371,5	428,9	237,4	0,18	76,53	76,66	86,19	0,16	76,70	76,63	83,38
308,0	543,0	0,7	1,1	4,5	200,2	73,1	78,7	319,2	479,3	371,0	428,5	237,4	0,18	76,49	76,63	85,76	0,16	76,67	76,61	82,96
309,0	544,0	0,6	1,1	4,5	200,1	73,2	78,8	318,9	479,2	370,6	428,1	237,2	0,18	76,46	76,62	85,36	0,16	76,65	76,59	82,52
310,0	545,0	0,6	1,1	4,5	200,2	73,0	78,7	318,6	479,2	370,3	427,8	237,2	0,18	76,47	76,62	84,95	0,16	76,66	76,57	82,81
311,0	546,0	0,6	1,1	4,5	199,9	73,0	78,7	318,3	479,2	369,4	427,9	237,1	0,18	76,45	76,62	84,55	0,16	76,65	76,58	86,84
312,0	547,0	0,6	1,1	4,5	199,8	73,1	78,6	318,4	479,2	369,6	427,5	237,0	0,18	76,41	76,59	84,13	0,16	76,65	76,57	87,83
313,0	548,0	0,6	1,1	4,5	200,2	73,2	78,6	318,1	479,1	369,1	427,3	237,1	0,18	76,41	76,61	83,77	0,16	76,63	76,56	87,56
314,0	549,0	0,6	1,1	4,5	200,5	73,1	78,6	317,6	479,2	367,9	426,7	237,0	0,18	76,37	76,59	83,38	0,16	76,64	76,54	87,09
315,0	550,0	0,6	1,1	4,5	199,9	73,2	78,5	317,3	479,2	367,2	426,5	237,2	0,18	76,39	76,59	83,00	0,16	76,63	76,53	86,53
316,0	551,0	0,6	1,1	4,4	199,9	72,9	78,4	316,6	479,2	366,4	426,0	237,1	0,18	76,35	76,57	82,61	0,16	76,62	76,54	86,00
317,0	552,0	0,5	1,1	4,4	199,8	73,1	78,5	316,4	479,2	366,2	425,3	237,2	0,18	76,36	76,55	82,28	0,16	76,57	76,52	85,48
318,0	553,0	0,5	1,1	4,4	200,0	73,0	78,4	316,3	479,1	365,8	425,2	237,2	0,18	76,34	76,54	82,15	0,16	76,57	76,50	84,88
319,0	554,0	0,5	1,1	4,4	200,1	72,9	78,5	316,0	479,1	365,8	424,6	237,0	0,18	76,32	76,53	83,94	0,16	76,55	76,49	84,26
320,0	555,0	0,5	1,1	4,4	199,8	72,9	78,5	315,8	479,1	366,0	424,5	236,9	0,18	76,31	76,52	86,11	0,16	76,54	76,49	83,68
321,0	556,0	0,5	1,1	4,4	199,9	73,0	78,6	315,5	479,0	365,5	424,0	237,1	0,18	76,30	76,52	86,89	0,16	76,51	76,49	83,18
322,0	557,0	0,5	1,1	4,4	199,9	73,0	78,4	315,7	478,9	365,8	423,6	237,1	0,18	76,29	76,50	86,74	0,16	76,53	76,46	82,75
323,0	558,0	0,5	1,1	4,3	199,2	72,8	78,5	315,4	478,8	366,0	423,0	237,3	0,18	76,31	76,48	86,34	0,16	76,50	76,43	82,32
324,0	559,0	0,5	1,1	4,3	199,0	73,0	78,1	315,0	478,8	365,4	422,9	237,0	0,18	76,27	76,44	85,90	0,16	76,46	76,40	84,02
325,0	560,0	0,4	1,1	4,3	198,4	72,9	78,3	314,4	478,7	365,1	422,4	237,1	0,18	76,29	76,44	85,35	0,16	76,45	76,40	87,73
326,0	561,0	0,4	1,1	4,2	198,4	72,9	78,4	313,7	478,7	365,3	422,0	237,2	0,18	76,28	76,42	84,89	0,16	76,41	76,37	87,96
327,0	562,0	0,4	1,1	4,2	198,1	72,9	78,4	312,7	478,6	365,4	421,4	237,1	0,18	76,26	76,39	84,48	0,16	76,39	76,33	87,53
328,0	563,0	0,4	1,1	4,2	197,7	72,9	78,2	311,9	478,6	365,6	421,0	237,2	0,18	76,23	76,38	84,09	0,16	76,38	76,30	87,03
329,0	564,0	0,4	1,1	4,2	196,8	73,0	78,2	311,2	478,6	365,5	420,5	237,2	0,18	76,21	76,35	83,68	0,16	76,35	76,29	86,45
330,0	565,0	0,4	1,1	4,2	196,1	72,9	78,2	310,3	478,5	365,3	419,6	237,1	0,18	76,19	76,31	83,29	0,16	76,30	76,26	85,86
331,0	566,0	0,3	1,1	4,2	196,1	72,6	78,2	309,7	478,5	365,3	419,2	237,2	0,18	76,16	76,27	82,89	0,16	76,26	76,21	85,31
332,0	567,0	0,4	1,1	4,2	196,1	72,7	78,2	309,3	478,5	365,4	418,4	237,2	0,18	76,16	76,26	82,53	0,16	76,25	76,19	84,77
333,0	568,0	0,4	1,1	4,2	195,5	72,8	78,0	308,9	478,4	365,4	417,7	237,0	0,18	76,12	76,24	82,18	0,16	76,20	76,16	84,25
334,0	569,0	0,3	1,1	4,2	195,5	72,8	78,0	308,0	478,4	365,5	416,7	237,2	0,18	76,11	76,21	82,11	0,16	76,17	76,13	83,70
335,0	570,0	0,3	1,1	4,2	195,1	72,7	78,1	308,0	478,3	365,7	415,9	237,2	0,18	76,09	76,21	83,97	0,16	76,20	76,13	83,12
336,0	571,0	0,3	1,1	4,3	195,5	72,8	78,2	307,4	478,2	365,5	414,8	237,3	0,18	76,12	76,21	86,16	0,16	76,22	76,15	82,56
337,0	572,0	0,3	1,1	4,3	195,3	72,8	78,0	307,0	478,1	365,5	413,8	237,4	0,18	76,13	76,20	86,93	0,16	76,23	76,15	82,15
338,0	573,0	0,3	1,1	4,3	195,2	72,8	78,0	307,1	478,0	365,6	413,0	237,3	0,18	76,14	76,18	86,73	0,16	76,20	76,13	84,48
339,0	574,0	0,3	1,1	4,3	195,0	72,8	78,0	306,7	477,9	365,4	412,3	237,5	0,18	76,13	76,18	86,28	0,16	76,20	76,13	87,53

340,0	575,0	0,3	1,1	4,3	194,8	72,8	78,1	306,6	477,8	365,4	411,4	237,5	0,18	76,12	76,17	85,80	0,16	76,23	76,10	87,63
341,0	576,0	0,3	1,1	4,3	195,1	72,8	78,0	306,4	477,8	365,5	410,6	237,6	0,18	76,11	76,16	85,35	0,16	76,18	76,09	87,20
342,0	577,0	0,2	1,1	4,3	195,0	72,8	78,0	306,4	477,7	365,1	409,8	237,5	0,18	76,09	76,13	84,97	0,16	76,17	76,09	86,73
343,0	578,0	0,2	1,1	4,3	195,4	72,8	77,8	306,6	477,7	365,4	409,0	237,5	0,18	76,09	76,15	84,54	0,16	76,18	76,07	86,20
344,0	579,0	0,2	1,1	4,3	195,0	72,8	78,0	306,3	477,6	365,1	408,2	237,3	0,18	76,07	76,15	84,12	0,16	76,17	76,06	85,62
345,0	580,0	0,2	1,1	4,3	195,3	72,7	77,9	306,4	477,6	365,0	407,7	237,3	0,18	76,03	76,09	83,71	0,16	76,13	76,03	85,05
346,0	581,0	0,2	1,0	4,3	195,1	72,7	77,8	306,2	477,6	365,2	407,1	237,3	0,18	76,01	76,07	83,30	0,16	76,08	76,00	84,52
347,0	582,0	0,2	1,0	4,3	195,3	72,6	77,7	306,3	477,6	364,9	406,2	237,1	0,18	75,98	76,05	82,87	0,16	76,05	75,97	83,96
348,0	583,0	0,1	1,0	4,3	195,2	72,6	77,7	306,1	477,5	365,1	405,3	236,9	0,18	75,97	76,04	82,48	0,16	76,05	75,96	83,45
349,0	584,0	0,1	1,0	4,3	195,2	72,6	77,8	306,0	477,4	365,3	404,5	237,0	0,18	75,93	76,03	82,13	0,16	76,01	75,93	82,95
350,0	585,0	0,1	1,0	4,4	195,2	72,5	77,8	305,8	477,3	365,3	404,0	237,1	0,18	75,89	75,98	82,66	0,16	75,95	75,92	82,46
351,0	586,0	0,1	1,0	4,4	195,3	72,5	77,9	306,0	477,2	365,3	403,4	237,1	0,18	75,88	75,96	84,78	0,16	75,93	75,89	82,37
352,0	587,0	0,1	1,0	4,4	195,6	72,5	77,8	305,6	477,2	365,4	403,0	236,9	0,18	75,88	75,95	86,48	0,16	75,96	75,89	86,27
353,0	588,0	0,1	1,0	4,4	195,2	72,5	77,8	305,5	477,1	365,0	402,1	237,2	0,18	75,86	75,94	86,66	0,16	75,94	75,88	87,68
354,0	589,0	0,1	1,0	4,4	195,5	72,5	77,8	305,2	477,0	365,2	401,6	237,0	0,18	75,84	75,95	86,37	0,16	75,96	75,88	87,46
355,0	590,0	0,1	1,0	4,3	195,6	72,5	77,6	305,1	477,0	365,1	401,0	237,1	0,18	75,86	75,93	85,91	0,16	75,96	75,88	86,99
356,0	591,0	0,1	1,0	4,3	195,4	72,3	77,6	304,9	477,0	364,0	400,7	237,2	0,18	75,84	75,92	85,45	0,16	75,95	75,87	86,44
357,0	592,0	0,1	1,0	4,3	195,1	72,1	77,6	304,9	477,0	364,0	400,2	237,2	0,18	75,84	75,93	84,98	0,16	75,94	75,86	85,88
358,0	593,0	0,1	1,0	4,3	195,0	72,2	77,6	304,7	476,9	363,1	399,5	237,3	0,18	75,84	75,91	84,51	0,16	75,93	75,85	85,31
359,0	594,0	0,0	1,0	4,3	194,9	72,3	77,6	304,5	476,9	362,8	399,2	237,2	0,18	75,87	75,89	84,04	0,16	75,92	75,83	84,74

SFBA EPA EMISSION RESULTS

Test Duration: **359** min

PRESSURE FACTOR:	DGM 1	0,97884	
	DGM 2	0,98064	
	DGM 3	0,99387	
TEMPERATURE FACTORS	DGM 1	0,98309	
	DGM 2	0,98280	
	DGM 3	0,98877	
VOLUMES SAMPLED	DGM 1	62,419	SCft
	DGM 2	57,570	Scft
	DGM 3	82,326	SCft

TOTAL TUNNEL VOLUME : 127987

SAMPLE RATIOS

Sample Train 1:	2050,450
Sample Train 2:	2223,167

Paticulate concentration

Sample Train 1	**0,000021**	g/dscf
Sample Train 2	**0,000021**	g/dscf
Room	**0,000000**	g/dscf

TOTAL EMISSIONS

Sample Train 1	**2,67**	g
Sample Train 2	**2,67**	g

EMISSION RATES

Sample Train 1	**0,45**	g/hr
Sample Train 2	**0,45**	g/hr

1st hour emission rate **1,64** g/hr

	Train 1	Train 2
Cs	2,083E-05	2,0844E-05

RESULTS

Average emission rate: 0,45 g/hr

Burn Rate : 1,138 Dry kg/hr

BAROMETRIC PRESSURE

Average:	29,73669881	in Hg
Start:	29,70716882	in Hg
End:	29,7662288	in Hg

DGM CONTROLLER VALUES

DGM 1	Final:	4237,486	Cuft
	Initial:	4172,313	Cuft
DGM 2	Final:	2247,911	Cuft
	Initial:	2187,589	Cuft
DGM #3	Final:	175,690	Cuft
	Initial:	91,680	Cuft

TEMPERATURES

DGM 1	537,082	°R
DGM 2	537,239	°R

CALIBRATION FACTORS

DGM 1	0,9953
DGM 2	0,9903
DGM #3	0,9972

TUNNEL FLOW RATE: 356,511 Dscfm

PARTICULATE CATCH

Total Sample Train 1:	1,30	mg
Total Sample Train 2:	1,20	mg
Total Sample Train 1 1st hour:	0,80	mg

DEVIATION: 0,04%

APPENDIX 2: Proportionality results

Average	Average	Average	Proportional	Highfire				Average
18,16	Inlet +	Inlet +						0,279
	Outlet	Outlet	Average	Average	#1	#2		
Tunnel	Temp.	Temp.	101,52	101,36	System 1	System 2		SQRT
Velocity	Meter 1	Meter 2	**Proportional Rates**		Vol.Std.	Vol.Std.		Delta-P
			PR1	**PR2**			Time	
Ft/Sec	Deg. R	Deg. R	**%**	**%**	(ft3)	(ft3)	min	(in H2O)2
18,001	532,5	532,4			0,174	0,161	0	0,2819895
17,968	532,5	532,4	99,66	99,57	0,174	0,161	1	0,280529
18,033	532,5	532,4	100,53	100,36	0,174	0,161	2	0,2799188
17,822	532,5	532,4	103,03	102,97	0,174	0,161	3	0,2748144
17,912	532,6	532,5	103,91	103,69	0,174	0,161	4	0,2744723
17,919	532,7	532,6	104,96	104,85	0,174	0,161	5	0,2731132
17,816	532,8	532,7	105,80	105,55	0,174	0,161	6	0,2712287
17,890	532,9	532,9	104,95	104,90	0,174	0,161	7	0,2727373
17,819	533,0	533,0	105,04	104,88	0,174	0,161	8	0,2721726
17,935	533,1	533,1	103,97	103,83	0,174	0,161	9	0,2744259
18,038	533,2	533,2	103,26	103,02	0,174	0,161	10	0,2762901
17,662	533,2	533,2	105,10	104,96	0,174	0,161	11	0,2708503
17,990	533,2	533,3	103,04	102,97	0,174	0,161	12	0,2760763
17,977	533,3	533,4	102,83	102,64	0,174	0,161	13	0,2762891
18,117	533,3	533,4	101,68	101,52	0,174	0,161	14	0,2788778
17,998	533,3	533,4	102,47	102,23	0,174	0,161	15	0,2770315
18,106	533,3	533,4	101,61	101,57	0,174	0,161	16	0,2788786
18,112	533,3	533,5	101,49	101,30	0,174	0,161	17	0,2792459
18,007	533,3	533,5	101,83	101,66	0,174	0,161	18	0,2779721
18,100	533,3	533,5	101,02	100,91	0,174	0,161	19	0,2797961
18,079	533,4	533,5	100,92	100,73	0,174	0,161	20	0,2797973
17,983	533,4	533,6	101,43	101,26	0,174	0,161	21	0,278326
18,092	533,3	533,5	100,72	100,54	0,174	0,161	22	0,2801639
18,117	533,3	533,5	100,60	100,44	0,174	0,161	23	0,2805306
18,076	533,3	533,5	100,90	100,72	0,174	0,161	24	0,2797969
17,980	533,3	533,5	101,38	101,20	0,174	0,161	25	0,278383
18,098	533,3	533,6	100,77	100,70	0,174	0,161	26	0,2801305
18,037	533,3	533,6	101,33	101,15	0,174	0,161	27	0,27888
18,134	533,3	533,6	100,68	100,51	0,174	0,161	28	0,2805306
18,120	533,3	533,6	100,64	100,42	0,174	0,161	29	0,2805311
17,978	533,4	533,6	101,40	101,21	0,174	0,161	30	0,2783359
18,212	533,4	533,6	100,04	99,89	0,174	0,161	31	0,2819901
18,093	533,4	533,7	100,44	100,27	0,174	0,161	32	0,2805305
17,393	533,5	533,7	105,34	105,16	0,174	0,161	33	0,2685673
17,348	533,5	533,7	105,11	104,93	0,174	0,161	34	0,2685033
18,004	533,5	533,7	100,89	100,68	0,174	0,161	35	0,2792476
18,168	533,6	533,8	99,78	99,62	0,174	0,161	36	0,2819915
17,988	533,6	533,8	100,76	100,58	0,174	0,161	37	0,2792483
17,951	533,7	533,9	100,93	100,72	0,174	0,161	38	0,2787463
17,922	533,7	533,9	101,12	100,84	0,174	0,161	39	0,2783273
18,396	533,8	533,9	104,93	104,77	0,174	0,161	40	0,2766626
18,160	533,8	533,9	103,30	103,04	0,174	0,160	41	0,2770333
18,186	533,8	534,0	103,74	103,56	0,174	0,160	42	0,2766626
18,042	533,8	534,0	104,31	104,13	0,174	0,161	43	0,2748008
18,215	533,8	534,0	101,57	101,41	0,174	0,161	44	0,2797992
18,172	533,8	534,0	101,74	101,67	0,174	0,161	45	0,2792478
18,092	533,8	534,0	101,95	101,89	0,174	0,161	46	0,2783269
18,245	533,9	534,1	101,13	100,92	0,174	0,161	47	0,280687
18,185	533,9	534,1	101,39	101,22	0,174	0,161	48	0,2797986
17,430	534,0	534,2	105,76	105,64	0,174	0,161	49	0,2681865
17,311	534,0	534,2	106,55	106,38	0,174	0,161	50	0,2662656
18,189	534,1	534,3	101,49	101,29	0,174	0,161	51	0,2797921
18,285	534,2	534,3	100,98	100,89	0,174	0,161	52	0,2810763
18,151	534,2	534,4	101,89	101,68	0,174	0,161	53	0,2788806

18,140	534,3	534,5	102,14	101,98	0,174	0,160	54	0,2783266
18,204	534,3	534,5	101,99	101,82	0,174	0,160	55	0,279168
18,178	534,4	534,6	101,93	101,84	0,174	0,161	56	0,2788813
18,165	534,4	534,6	101,96	101,70	0,174	0,160	57	0,2788811
18,193	534,4	534,6	101,74	101,58	0,174	0,160	58	0,2792485
18,329	534,5	534,6	101,17	101,11	0,174	0,160	59	0,2810808
18,281	534,5	534,7	101,29	101,21	0,174	0,161	60	0,2805318
18,237	534,6	534,7	101,66	101,40	0,174	0,160	61	0,2797987
18,182	534,6	534,8	102,02	101,86	0,174	0,160	62	0,278881
18,160	534,7	534,8	102,17	102,00	0,174	0,160	63	0,2784931
18,297	534,8	534,9	101,36	101,16	0,174	0,160	64	0,2805316
18,281	534,9	535,0	101,47	101,35	0,174	0,160	65	0,2801665
18,225	535,0	535,1	101,81	101,66	0,173	0,160	66	0,2792477
18,218	535,1	535,2	101,96	101,74	0,174	0,160	67	0,2790589
18,288	535,3	535,3	101,53	101,40	0,174	0,160	68	0,2801646
18,335	535,3	535,4	101,14	101,00	0,174	0,160	69	0,2810811
18,219	535,4	535,4	101,81	101,56	0,174	0,160	70	0,2792495
18,188	535,5	535,5	101,90	101,74	0,174	0,160	71	0,2788816
18,216	535,5	535,6	101,74	101,60	0,173	0,160	72	0,2791428
18,197	535,6	535,6	101,80	101,74	0,173	0,160	73	0,2788833
18,195	535,6	535,7	101,90	101,66	0,173	0,160	74	0,2788823
18,264	535,7	535,7	101,47	101,30	0,173	0,160	75	0,2800033
18,259	535,7	535,8	101,58	101,42	0,173	0,160	76	0,2798009
18,200	535,7	535,8	101,91	101,68	0,173	0,160	77	0,2788806
18,336	535,8	535,9	100,94	100,81	0,173	0,160	78	0,2810824
18,213	535,9	536,0	101,95	101,74	0,173	0,160	79	0,2788831
18,153	536,0	536,1	102,41	102,26	0,173	0,160	80	0,2777564
18,231	536,1	536,2	102,01	101,86	0,173	0,160	81	0,2788843
18,241	536,2	536,3	102,05	101,71	0,173	0,160	82	0,2788831
18,298	536,3	536,4	101,67	101,53	0,173	0,160	83	0,2798023
18,203	536,4	536,5	102,20	101,96	0,173	0,160	84	0,2783303
18,295	536,5	536,5	101,60	101,38	0,173	0,160	85	0,279808
18,343	536,6	536,6	101,34	101,09	0,173	0,160	86	0,2805353
18,233	536,7	536,7	101,91	101,78	0,173	0,160	87	0,2788849
18,248	536,7	536,8	101,58	101,39	0,173	0,160	88	0,2794045
18,234	536,8	536,8	101,90	101,69	0,173	0,160	89	0,2788783
18,241	536,9	536,9	101,90	101,73	0,173	0,160	90	0,2788851
18,201	536,9	537,0	102,11	101,95	0,173	0,160	91	0,278332
18,259	537,0	537,0	101,74	101,49	0,173	0,160	92	0,279253
18,097	537,1	537,1	102,67	102,56	0,173	0,160	93	0,2766683
18,180	537,1	537,2	102,21	102,03	0,173	0,160	94	0,2779652
18,325	537,1	537,2	101,41	101,36	0,173	0,160	95	0,2801718
18,259	537,1	537,2	101,70	101,55	0,173	0,160	96	0,2792538
18,235	537,2	537,3	101,82	101,74	0,173	0,160	97	0,2788867
18,332	537,3	537,4	101,15	101,00	0,173	0,160	98	0,2805337
18,327	537,4	537,4	101,11	100,87	0,173	0,160	99	0,2805371
18,406	537,4	537,4	100,51	100,37	0,173	0,160	100	0,2819772
18,221	537,4	537,5	101,41	101,23	0,173	0,160	101	0,2792854
18,199	537,5	537,6	101,57	101,42	0,173	0,160	102	0,2788868
18,131	537,5	537,6	101,86	101,71	0,173	0,160	103	0,2779651
18,182	537,6	537,6	101,45	101,36	0,173	0,160	104	0,2788235
18,336	537,6	537,7	100,72	100,57	0,173	0,160	105	0,2810862
18,183	537,7	537,7	101,45	101,35	0,173	0,160	106	0,2788868
18,249	537,7	537,8	101,14	100,99	0,173	0,160	107	0,2798052
18,162	537,7	537,8	101,52	101,37	0,173	0,160	108	0,2786198
18,212	537,7	537,8	101,33	101,18	0,173	0,160	109	0,2792546
18,294	537,7	537,8	100,84	100,71	0,173	0,160	110	0,2805384
18,288	537,8	537,9	100,82	100,77	0,173	0,160	111	0,2805387
18,180	537,8	537,9	101,39	101,23	0,173	0,160	112	0,2789209
18,402	537,9	537,9	100,13	99,94	0,173	0,160	113	0,282363
18,201	537,9	538,0	101,34	101,09	0,173	0,160	114	0,2792557

18,289	538,0	538,0	100,68	100,53	0,173	0,160	115	0,2806919
18,255	538,0	538,1	100,87	100,69	0,173	0,160	116	0,2801829
18,303	538,1	538,1	100,45	100,32	0,173	0,160	117	0,2810883
18,167	538,1	538,1	101,02	100,87	0,173	0,160	118	0,2792562
18,230	538,1	538,2	100,70	100,55	0,173	0,159	119	0,2801738
18,267	538,1	538,2	100,41	100,26	0,173	0,159	120	0,280855
18,337	538,2	538,2	99,97	99,87	0,173	0,160	121	0,2820006
18,242	538,2	538,3	100,48	100,34	0,173	0,159	122	0,2805406
18,375	538,3	538,3	99,64	99,51	0,173	0,159	123	0,2827159
18,172	538,3	538,3	100,60	100,46	0,173	0,159	124	0,2798073
18,259	538,4	538,4	100,16	99,94	0,173	0,159	125	0,2810899
18,218	538,4	538,4	100,31	100,17	0,173	0,159	126	0,2805407
18,380	538,4	538,4	99,37	99,26	0,173	0,159	127	0,2831014
18,234	538,5	538,5	99,99	99,86	0,173	0,159	128	0,2810897
18,169	538,5	538,5	100,34	100,10	0,173	0,159	129	0,2801753
18,337	538,6	538,6	99,36	99,30	0,173	0,159	130	0,2827689
18,418	538,6	538,6	98,98	98,78	0,173	0,159	131	0,2839974
18,167	538,7	538,7	100,25	100,11	0,173	0,159	132	0,2801768
18,299	538,7	538,7	99,45	99,32	0,172	0,159	133	0,2823075
18,328	538,7	538,7	99,31	99,17	0,172	0,159	134	0,2827299
18,271	538,8	538,7	99,50	99,35	0,172	0,159	135	0,282002
18,300	538,8	538,8	99,46	99,27	0,173	0,159	136	0,2823665
18,446	538,8	538,8	98,43	98,30	0,173	0,159	137	0,2848801
18,338	538,8	538,8	98,96	98,83	0,172	0,159	138	0,2832747
18,251	538,8	538,8	99,37	99,13	0,172	0,159	139	0,2820024
18,397	538,8	538,8	98,65	98,34	0,173	0,159	140	0,2843134
18,268	538,9	538,8	99,21	99,08	0,173	0,159	141	0,2823674
18,119	538,9	538,8	99,95	99,81	0,172	0,159	142	0,2801781

Average	Average	Average	Proportional Rates Medium/low fire					Average
18,23	Inlet +	Inlet +						0,283
	Outlet	Outlet	Average	Average	#1	#2		
Tunnel	Temp.	Temp.	103,68	105,13	System 1	System 2		SQRT
Velocity	Meter 1	Meter 2	**Proportional Rates**		Vol.Std.	Vol.Std.		Delta-P
			PR1	**PR2**			Time	
Ft/Sec	Deg. R	Deg. R	**%**	**%**	(ft3)	(ft3)	min	(in H2O)2
18,308	538,9	539,0			0,172	0,159	0	0,2788925
18,306	538,9	538,9	105,98	107,53	0,172	0,159	1	0,2811095
18,296	538,9	538,9	106,93	108,40	0,172	0,159	2	0,2798057
18,334	538,8	538,9	107,87	109,36	0,172	0,159	3	0,2788813
18,386	538,9	538,9	105,15	106,77	0,172	0,159	4	0,2827311
18,176	538,9	538,9	106,12	107,66	0,172	0,159	5	0,2799505
18,209	538,9	539,0	106,13	107,67	0,172	0,159	6	0,2801785
18,177	539,0	539,0	106,91	108,48	0,172	0,159	7	0,2788936
18,202	539,0	539,0	107,09	108,63	0,172	0,159	8	0,2788925
18,236	539,1	539,1	106,90	108,43	0,172	0,159	9	0,2793601
18,466	539,1	539,2	105,65	107,18	0,172	0,159	10	0,2827312
18,447	539,2	539,2	106,20	107,62	0,172	0,159	11	0,2820035
18,454	539,3	539,3	106,11	107,61	0,172	0,159	12	0,2820072
18,345	539,4	539,4	106,15	107,81	0,172	0,159	13	0,2810927
18,302	539,4	539,4	106,42	107,92	0,172	0,159	14	0,2805437
18,248	539,5	539,5	105,91	107,45	0,172	0,159	15	0,2807819
18,200	539,6	539,5	105,50	107,01	0,172	0,159	16	0,2809424
18,167	539,6	539,6	105,53	107,03	0,172	0,159	17	0,2805449
18,366	539,6	539,6	104,06	105,59	0,172	0,159	18	0,2839998
18,371	539,7	539,6	104,15	105,64	0,172	0,159	19	0,2840534
18,279	539,7	539,6	104,58	106,13	0,172	0,159	20	0,2827323
18,304	539,7	539,6	104,32	105,75	0,172	0,159	21	0,2832766
18,312	539,7	539,7	104,16	105,79	0,172	0,159	22	0,2832763
18,289	539,7	539,7	104,63	106,11	0,172	0,159	23	0,2827329
18,363	539,8	539,7	104,12	105,54	0,172	0,159	24	0,2840004
18,255	539,8	539,8	104,70	106,23	0,172	0,159	25	0,2823692
18,242	539,9	539,8	104,63	106,15	0,172	0,159	26	0,282368
18,289	539,9	539,8	104,40	105,84	0,172	0,159	27	0,2831398
18,380	539,9	539,9	103,80	105,35	0,172	0,159	28	0,2845423
18,261	539,9	539,9	104,44	105,98	0,172	0,159	29	0,2827327
18,226	539,9	539,9	104,52	106,15	0,172	0,159	30	0,2823697
18,388	539,9	539,9	103,58	105,10	0,172	0,159	31	0,2849033
18,093	539,9	539,9	105,11	106,58	0,172	0,159	32	0,2805461
18,309	539,9	539,9	103,69	105,29	0,172	0,159	33	0,2840023
18,266	539,9	539,9	104,08	105,59	0,172	0,159	34	0,2832781
18,204	539,9	540,0	104,39	105,91	0,172	0,159	35	0,2823703
18,285	539,9	539,9	103,91	105,41	0,172	0,159	36	0,28364
17,388	540,0	539,9	109,36	110,96	0,172	0,159	37	0,2696153
17,499	539,9	540,0	108,82	110,25	0,172	0,159	38	0,2712447
17,608	539,9	540,0	108,22	109,86	0,172	0,159	39	0,2727536
17,348	539,9	539,9	110,02	111,66	0,172	0,159	40	0,2685813
17,668	539,9	539,9	108,01	109,57	0,172	0,159	41	0,2734928
17,360	539,9	539,9	110,04	111,64	0,172	0,159	42	0,2685818
18,303	539,9	539,9	104,32	105,81	0,172	0,159	43	0,2832775
18,259	539,9	539,9	104,67	106,15	0,172	0,159	44	0,2824146
18,224	539,9	539,9	104,86	106,30	0,172	0,159	45	0,2820069
18,063	540,0	539,9	105,81	107,36	0,172	0,159	46	0,2793676
18,146	540,0	540,0	105,40	106,94	0,172	0,159	47	0,2805455
17,546	540,1	540,0	109,01	110,61	0,172	0,159	48	0,2712481
18,260	540,1	540,0	104,67	106,21	0,172	0,159	49	0,2823706
18,232	540,1	540,1	104,78	106,30	0,172	0,159	50	0,282006
17,743	540,2	540,1	107,67	109,24	0,172	0,159	51	0,2744421
17,571	540,2	540,2	108,69	110,27	0,172	0,159	52	0,2718102
17,536	540,2	540,2	108,93	110,51	0,172	0,159	53	0,2712436
17,590	540,2	540,2	108,49	109,92	0,172	0,159	54	0,2722102

17,491	540,2	540,2	109,04	110,61	0,172	0,159	55	0,2707608
17,435	540,2	540,2	109,39	110,96	0,172	0,159	56	0,2699131
18,217	540,2	540,2	104,80	106,20	0,172	0,159	57	0,2820064
18,222	540,2	540,2	104,44	105,95	0,172	0,159	58	0,2823711
18,285	540,2	540,2	104,13	105,64	0,172	0,159	59	0,2832834
18,382	540,2	540,2	103,49	104,99	0,172	0,159	60	0,2849041
18,305	540,2	540,2	104,08	105,55	0,172	0,159	61	0,2835531
18,063	540,2	540,2	105,43	107,04	0,172	0,159	62	0,2798141
18,429	540,3	540,2	103,35	104,86	0,172	0,159	63	0,2854445
18,306	540,3	540,2	104,00	105,49	0,172	0,159	64	0,2836407
18,444	540,3	540,2	103,18	104,66	0,172	0,159	65	0,285804
18,353	540,2	540,2	103,71	105,21	0,172	0,159	66	0,2843808
18,390	540,2	540,2	103,54	105,07	0,172	0,159	67	0,2849051
18,251	540,2	540,2	104,34	105,89	0,172	0,159	68	0,2827346
18,231	540,2	540,3	104,49	106,00	0,172	0,159	69	0,2823709
18,288	540,2	540,3	104,20	105,74	0,172	0,159	70	0,2832789
18,294	540,3	540,3	104,18	105,69	0,172	0,159	71	0,2832785
18,326	540,2	540,3	103,96	105,38	0,172	0,159	72	0,2839878
18,370	540,2	540,3	103,68	105,06	0,172	0,159	73	0,2845446
18,313	540,2	540,2	104,03	105,53	0,172	0,159	74	0,2836405
18,397	540,2	540,2	103,58	105,08	0,172	0,159	75	0,2849044
18,399	540,2	540,2	103,59	105,03	0,172	0,159	76	0,2849053
18,394	540,2	540,3	103,56	105,11	0,172	0,159	77	0,2849048
18,376	540,2	540,3	103,75	105,18	0,172	0,159	78	0,2845407
18,319	540,2	540,3	104,04	105,56	0,172	0,159	79	0,2836412
18,265	540,3	540,3	104,42	105,91	0,172	0,159	80	0,282736
18,301	540,3	540,4	104,21	105,71	0,172	0,159	81	0,2832787
18,355	540,3	540,4	103,91	105,37	0,172	0,159	82	0,2841395
18,429	540,3	540,4	103,38	104,93	0,172	0,159	83	0,285445
18,432	540,3	540,4	103,45	104,90	0,172	0,159	84	0,2854449
18,289	540,4	540,4	104,13	105,63	0,172	0,159	85	0,2832751
18,325	540,4	540,4	103,80	105,29	0,172	0,159	86	0,2840027
18,285	540,3	540,4	104,04	105,49	0,172	0,159	87	0,2834119
18,415	540,3	540,4	103,33	104,75	0,172	0,159	88	0,285445
18,357	540,3	540,4	103,57	105,13	0,172	0,159	89	0,284545
18,351	540,3	540,4	103,56	105,05	0,172	0,159	90	0,2845447
18,355	540,3	540,4	103,53	104,93	0,172	0,159	91	0,2846337
18,403	540,3	540,4	103,22	104,67	0,172	0,159	92	0,2854461
18,404	540,3	540,4	103,24	104,71	0,172	0,159	93	0,2854087
18,373	540,3	540,4	103,43	104,88	0,172	0,159	94	0,2849084
18,262	540,3	540,4	103,99	105,59	0,172	0,159	95	0,2832787
18,365	540,3	540,4	103,39	104,87	0,172	0,159	96	0,2849042
18,400	540,3	540,4	103,24	104,76	0,172	0,159	97	0,2854458
18,431	540,3	540,4	103,10	104,58	0,172	0,159	98	0,2858046
18,462	540,3	540,3	103,02	104,50	0,172	0,159	99	0,2861639
18,410	540,3	540,3	103,27	104,78	0,172	0,159	100	0,2854454
18,456	540,3	540,4	103,09	104,46	0,172	0,159	101	0,2861641
18,297	540,3	540,4	103,93	105,52	0,172	0,159	102	0,28364
18,382	540,3	540,4	103,63	105,00	0,172	0,159	103	0,2848535
18,364	540,3	540,4	103,69	105,13	0,172	0,159	104	0,2845499
18,367	540,3	540,4	103,76	105,14	0,172	0,159	105	0,2845451
18,453	540,4	540,4	103,20	104,70	0,172	0,159	106	0,2858075
18,258	540,4	540,5	104,42	105,85	0,172	0,159	107	0,2827351
18,300	540,4	540,5	104,22	105,72	0,172	0,159	108	0,2832801
18,411	540,5	540,5	103,69	105,18	0,172	0,159	109	0,2849038
18,444	540,5	540,6	103,45	104,89	0,172	0,159	110	0,2854457
18,397	540,5	540,6	103,83	105,39	0,172	0,159	111	0,2845457
18,361	540,6	540,6	104,01	105,41	0,172	0,159	112	0,2840012
18,497	540,6	540,6	103,15	104,72	0,172	0,159	113	0,2861647
18,456	540,6	540,7	103,43	104,93	0,172	0,159	114	0,2854457
18,469	540,7	540,7	103,33	104,83	0,172	0,159	115	0,2858013
18,434	540,7	540,8	103,46	104,96	0,172	0,159	116	0,2852708

18,519	540,7	540,8	102,94	104,44	0,172	0,159	117	0,2867006
18,369	540,8	540,8	103,75	105,13	0,172	0,159	118	0,2844628
18,330	540,8	540,9	103,86	105,31	0,172	0,159	119	0,2840042
18,441	540,8	540,9	103,18	104,54	0,172	0,159	120	0,2858055
18,410	540,8	540,9	103,16	104,62	0,172	0,159	121	0,2854469
18,353	540,8	541,0	103,46	104,93	0,172	0,159	122	0,2845781
18,369	540,8	541,0	103,34	104,90	0,172	0,159	123	0,2849054
18,403	540,8	541,0	103,21	104,68	0,172	0,159	124	0,2854459
18,315	540,7	541,0	103,67	105,02	0,172	0,159	125	0,284172
18,365	540,7	540,9	103,31	104,76	0,172	0,159	126	0,2849058
18,339	540,7	540,9	103,43	104,99	0,172	0,159	127	0,2845458
18,216	540,7	540,9	104,05	105,51	0,172	0,159	128	0,2827358
18,273	540,7	540,9	103,71	105,16	0,172	0,159	129	0,283642
18,497	540,7	540,9	102,49	103,96	0,172	0,159	130	0,2871485
18,210	540,6	540,9	104,05	105,55	0,172	0,159	131	0,2827419
18,348	540,6	540,9	103,35	104,79	0,172	0,159	132	0,2849067
18,423	540,5	540,9	102,80	104,24	0,172	0,159	133	0,2861214
18,464	540,5	540,9	102,65	104,08	0,172	0,159	134	0,2867032
18,285	540,5	540,8	103,56	105,10	0,172	0,159	135	0,2839968
18,378	540,5	540,8	103,09	104,53	0,172	0,159	136	0,2854424
18,452	540,4	540,8	102,61	104,00	0,172	0,159	137	0,2867032
18,314	540,4	540,8	103,45	104,77	0,172	0,159	138	0,2845459
18,362	540,4	540,7	103,07	104,51	0,172	0,159	139	0,2854296
18,406	540,4	540,7	102,69	104,23	0,172	0,159	140	0,2861654
18,299	540,3	540,7	103,28	104,73	0,172	0,159	141	0,2845486
18,376	540,3	540,6	102,91	104,32	0,172	0,159	142	0,2858062
18,398	540,3	540,6	102,78	104,21	0,172	0,159	143	0,2861656
18,376	540,3	540,6	102,80	104,38	0,172	0,159	144	0,2858097
18,176	540,3	540,6	103,90	105,35	0,172	0,159	145	0,2827361
18,150	540,3	540,6	104,13	105,54	0,172	0,159	146	0,2823727
18,287	540,3	540,6	103,22	104,76	0,172	0,159	147	0,2845463
18,124	540,3	540,6	104,20	105,59	0,172	0,159	148	0,2820084
18,145	540,3	540,6	104,10	105,44	0,172	0,159	149	0,2823728
18,307	540,3	540,6	103,17	104,51	0,172	0,159	150	0,2849064
18,205	540,3	540,6	103,78	105,22	0,172	0,159	151	0,2832813
18,027	540,3	540,6	104,68	106,14	0,172	0,159	152	0,2805489
18,225	540,2	540,6	103,57	105,07	0,172	0,159	153	0,2836424
18,199	540,2	540,6	103,71	105,20	0,172	0,159	154	0,2832809
18,341	540,2	540,6	102,98	104,41	0,172	0,159	155	0,2854464
18,201	540,2	540,6	103,67	105,15	0,172	0,159	156	0,2832791
18,302	540,3	540,6	103,15	104,50	0,172	0,159	157	0,284906
18,245	540,3	540,6	103,38	104,87	0,172	0,159	158	0,2840025
18,336	540,3	540,6	102,93	104,26	0,172	0,159	159	0,2854465
18,221	540,3	540,6	103,49	105,04	0,172	0,159	160	0,2836418
18,221	540,3	540,6	103,52	104,97	0,172	0,159	161	0,283646
18,138	540,3	540,7	104,06	105,39	0,172	0,159	162	0,282373
18,302	540,3	540,7	103,14	104,56	0,172	0,159	163	0,2848987
18,279	540,3	540,7	103,27	104,70	0,172	0,159	164	0,2845458
18,246	540,3	540,7	103,36	104,98	0,172	0,159	165	0,2840039
18,347	540,4	540,7	102,90	104,32	0,172	0,159	166	0,2855801
18,199	540,3	540,7	103,80	105,13	0,172	0,159	167	0,2832801
18,119	540,4	540,7	104,16	105,65	0,172	0,159	168	0,2820086
18,282	540,4	540,7	103,28	104,71	0,172	0,159	169	0,2845464
18,281	540,4	540,7	103,27	104,63	0,172	0,159	170	0,2845459
18,239	540,4	540,8	103,51	104,91	0,172	0,159	171	0,283876
18,225	540,4	540,8	103,60	104,98	0,172	0,159	172	0,2836457
18,224	540,4	540,8	103,60	104,93	0,172	0,159	173	0,2836418
18,166	540,5	540,8	103,80	105,35	0,172	0,159	174	0,2827557
18,340	540,5	540,8	102,82	104,32	0,172	0,159	175	0,2854465
18,166	540,5	540,8	103,85	105,25	0,172	0,159	176	0,2827361
18,118	540,5	540,8	104,06	105,50	0,172	0,159	177	0,2820153
18,118	540,5	540,8	104,08	105,50	0,172	0,159	178	0,2820123

18,246	540,5	540,8	103,43	104,78	0,172	0,159	179	0,2840046
18,282	540,5	540,9	103,24	104,67	0,172	0,159	180	0,2845695
18,280	540,5	540,9	103,23	104,66	0,172	0,159	181	0,2845463
18,303	540,5	540,9	102,99	104,44	0,172	0,159	182	0,2849066
18,139	540,5	540,9	103,91	105,35	0,172	0,159	183	0,2823736
18,220	540,5	540,9	103,44	104,98	0,172	0,159	184	0,2836426
18,278	540,5	540,9	103,13	104,54	0,172	0,159	185	0,2845465
18,138	540,5	540,9	103,93	105,35	0,172	0,159	186	0,2823735
18,243	540,5	540,9	103,40	104,80	0,172	0,159	187	0,2840052
18,278	540,5	540,9	103,12	104,55	0,172	0,159	188	0,2845472
18,253	540,5	540,9	103,35	104,78	0,172	0,159	189	0,2841871
18,196	540,5	540,9	103,69	105,11	0,172	0,159	190	0,2832804
18,340	540,5	540,9	102,78	104,22	0,172	0,159	191	0,2855106
18,196	540,5	540,9	103,58	105,05	0,172	0,159	192	0,2832888
18,161	540,5	540,9	103,77	105,31	0,172	0,159	193	0,282736
18,276	540,5	540,9	103,22	104,64	0,172	0,159	194	0,2845472
18,218	540,5	540,9	103,50	104,95	0,172	0,159	195	0,2836454
18,193	540,5	540,9	103,67	105,09	0,172	0,159	196	0,2832809
18,295	540,5	540,9	103,07	104,51	0,172	0,159	197	0,2848714
18,216	540,5	540,9	103,54	104,93	0,172	0,159	198	0,283643
18,216	540,5	540,9	103,54	104,96	0,172	0,159	199	0,2836432
18,238	540,5	540,9	103,40	104,73	0,172	0,159	200	0,2840038
18,214	540,5	540,9	103,52	104,95	0,172	0,159	201	0,2836432
18,296	540,5	540,9	103,04	104,46	0,172	0,159	202	0,2849067
18,272	540,5	540,9	103,20	104,53	0,172	0,159	203	0,2845364
18,190	540,5	540,9	103,65	105,08	0,172	0,159	204	0,2832808
18,213	540,5	540,9	103,52	104,94	0,172	0,159	205	0,2836427
18,292	540,5	540,9	103,05	104,47	0,172	0,159	206	0,2849073
18,235	540,5	540,9	103,38	104,68	0,172	0,159	207	0,2840056
18,076	540,5	540,9	104,18	105,58	0,172	0,159	208	0,2815604
18,350	540,5	540,9	102,69	104,14	0,172	0,159	209	0,2858043
18,269	540,5	540,9	103,18	104,60	0,172	0,159	210	0,2845477
18,292	540,4	540,9	103,06	104,45	0,172	0,159	211	0,2849074
18,186	540,4	540,9	103,61	104,97	0,172	0,159	212	0,2832818
18,104	540,4	540,9	104,11	105,51	0,172	0,159	213	0,2820097
18,325	540,4	540,8	102,86	104,27	0,172	0,159	214	0,2854475
18,208	540,4	540,8	103,51	104,83	0,172	0,159	215	0,2836438
18,045	540,4	540,8	104,42	105,76	0,172	0,159	216	0,2810985
18,152	540,4	540,8	103,75	105,27	0,172	0,159	217	0,282737
18,151	540,4	540,9	103,84	105,24	0,172	0,159	218	0,282737
18,267	540,5	540,9	103,18	104,56	0,172	0,159	219	0,2845473
18,128	540,5	540,9	103,93	105,28	0,172	0,159	220	0,2823748
18,185	540,5	540,9	103,58	104,94	0,172	0,159	221	0,2832817
18,103	540,5	540,9	103,98	105,41	0,172	0,159	222	0,2820098
18,266	540,5	540,9	103,05	104,47	0,172	0,159	223	0,2845478
18,186	540,5	540,9	103,52	104,94	0,172	0,159	224	0,2832816
18,349	540,5	540,9	102,65	104,05	0,172	0,159	225	0,285823
18,349	540,5	540,9	102,68	104,10	0,172	0,159	226	0,2858071
18,267	540,5	540,9	103,16	104,59	0,172	0,159	227	0,2845472
18,210	540,5	540,9	103,38	104,92	0,172	0,159	228	0,2836472
18,232	540,5	540,9	103,36	104,68	0,172	0,159	229	0,2840063
18,266	540,5	540,9	103,16	104,51	0,172	0,159	230	0,2845472
18,231	540,5	540,9	103,27	104,78	0,172	0,159	231	0,2840053
18,150	540,5	540,9	103,71	105,13	0,172	0,159	232	0,2827391
18,150	540,5	540,9	103,82	105,13	0,172	0,159	233	0,2827377
18,267	540,5	540,9	103,05	104,46	0,172	0,159	234	0,2845693
18,231	540,5	540,9	103,22	104,67	0,172	0,159	235	0,2840056
18,231	540,5	540,9	103,37	104,68	0,172	0,159	236	0,2840053
18,369	540,5	540,9	102,47	103,93	0,172	0,159	237	0,2861666
18,206	540,5	540,9	103,37	104,79	0,172	0,159	238	0,2836435
18,229	540,5	540,9	103,35	104,66	0,172	0,159	239	0,2840052
18,286	540,5	540,9	102,98	104,32	0,172	0,159	240	0,2849022

18,263	540,5	540,9	103,07	104,57	0,172	0,159	241	0,2845472
18,263	540,5	540,9	103,16	104,57	0,172	0,159	242	0,2845474
18,145	540,5	540,9	103,79	105,17	0,172	0,159	243	0,2827368
18,262	540,5	540,8	103,15	104,53	0,172	0,159	244	0,2845473
18,226	540,4	540,8	103,35	104,75	0,172	0,159	245	0,2840061
18,226	540,4	540,8	103,28	104,77	0,172	0,159	246	0,2840064
18,225	540,4	540,8	103,34	104,65	0,172	0,159	247	0,2840058
18,340	540,4	540,8	102,69	104,10	0,172	0,159	248	0,2858072
18,201	540,4	540,8	103,45	104,78	0,172	0,159	249	0,2836441
18,202	540,4	540,8	103,37	104,88	0,172	0,159	250	0,2836679
18,281	540,4	540,8	102,91	104,32	0,172	0,159	251	0,2848932
18,200	540,4	540,8	103,46	104,89	0,172	0,159	252	0,2836436
18,193	540,4	540,8	103,42	104,93	0,172	0,159	253	0,2835443
18,256	540,4	540,8	103,13	104,55	0,172	0,159	254	0,2845466
18,175	540,4	540,8	103,50	104,90	0,172	0,159	255	0,2832818
18,144	540,4	540,8	103,64	105,07	0,172	0,159	256	0,282817
18,142	540,4	540,8	103,68	105,22	0,172	0,159	257	0,28274
18,362	540,4	540,8	102,55	103,92	0,172	0,159	258	0,2861662
18,094	540,4	540,8	103,97	105,50	0,172	0,159	259	0,2820099
18,337	540,4	540,8	102,67	104,09	0,172	0,159	260	0,2858066
18,221	540,4	540,8	103,33	104,76	0,172	0,159	261	0,2840062
18,176	540,4	540,8	103,58	104,89	0,172	0,159	262	0,283302
18,223	540,4	540,8	103,33	104,64	0,172	0,159	263	0,2840055
18,282	540,4	540,8	103,01	104,32	0,172	0,159	264	0,2849079
18,176	540,5	540,8	103,57	105,00	0,172	0,159	265	0,2833008
18,198	540,5	540,8	103,44	104,87	0,172	0,159	266	0,2836439
18,276	540,5	540,8	102,97	104,31	0,172	0,159	267	0,2849075
18,194	540,5	540,8	103,42	104,80	0,172	0,159	268	0,2836337
18,116	540,5	540,9	103,83	105,28	0,172	0,159	269	0,2823737
18,222	540,5	540,9	103,17	104,70	0,172	0,159	270	0,2840367
18,175	540,6	540,9	103,44	104,99	0,172	0,159	271	0,2832818
18,152	540,6	540,9	103,66	105,09	0,172	0,159	272	0,2829157
18,257	540,6	541,0	102,98	104,52	0,172	0,159	273	0,2845471
18,278	540,6	541,0	102,92	104,36	0,172	0,159	274	0,2849077
18,199	540,6	541,0	103,33	104,73	0,172	0,159	275	0,2836437
18,227	540,6	541,0	103,24	104,65	0,172	0,159	276	0,2840982
18,281	540,7	541,0	102,85	104,27	0,172	0,159	277	0,2849078
18,139	540,7	541,0	103,70	105,16	0,172	0,159	278	0,2827374
18,275	540,7	541,0	102,90	104,35	0,172	0,159	279	0,2848774
18,217	540,7	541,1	103,24	104,65	0,172	0,159	280	0,2840055
18,114	540,7	541,1	103,73	105,28	0,172	0,159	281	0,2823745
18,326	540,7	541,1	102,53	103,96	0,172	0,159	282	0,2856871
18,115	540,7	541,0	103,75	105,27	0,172	0,159	283	0,282375
18,276	540,7	541,1	102,88	104,26	0,172	0,159	284	0,2848999
18,326	540,7	541,1	102,56	104,03	0,172	0,159	285	0,2856461
18,335	540,7	541,0	102,60	103,91	0,172	0,159	286	0,2858071
18,203	540,6	541,0	103,25	104,68	0,172	0,159	287	0,2837482
18,172	540,6	541,0	103,49	104,83	0,172	0,159	288	0,2832823
18,277	540,6	541,0	102,94	104,35	0,172	0,159	289	0,2849087
18,132	540,7	541,0	103,65	105,12	0,172	0,159	290	0,2827376
17,995	540,7	541,0	104,51	105,90	0,172	0,159	291	0,2805634
18,163	540,7	541,0	103,44	104,94	0,172	0,159	292	0,2831722
18,388	540,7	541,0	102,16	103,56	0,172	0,159	293	0,2867053
18,167	540,7	541,0	103,47	104,89	0,172	0,159	294	0,2832832
18,272	540,7	541,0	102,91	104,32	0,172	0,159	295	0,284908
18,166	540,7	541,0	103,45	104,81	0,172	0,159	296	0,2832829
18,247	540,7	541,1	103,02	104,32	0,172	0,159	297	0,2845484
18,269	540,7	541,1	102,88	104,19	0,172	0,159	298	0,2849087
18,250	540,7	541,1	103,00	104,30	0,172	0,159	299	0,2846008
18,165	540,7	541,1	103,47	104,88	0,172	0,159	300	0,2832826
18,130	540,7	541,1	103,56	105,01	0,172	0,159	301	0,2827378
18,108	540,7	541,1	103,81	105,22	0,172	0,159	302	0,2823773

18,131	540,7	541,1	103,57	105,00	0,172	0,159	303	0,2827382
18,256	540,7	541,1	102,95	104,33	0,172	0,159	304	0,2846976
18,211	540,7	541,1	103,21	104,56	0,172	0,159	305	0,2840064
18,211	540,7	541,0	103,21	104,64	0,172	0,159	306	0,2840067
18,169	540,7	541,1	103,39	104,75	0,172	0,159	307	0,2833654
18,303	540,7	541,0	102,58	104,00	0,172	0,159	308	0,2854466
18,332	540,6	541,0	102,49	103,90	0,172	0,159	309	0,2858969
18,024	540,6	541,0	104,21	105,64	0,172	0,159	310	0,2810997
18,246	540,6	541,0	102,91	104,36	0,172	0,159	311	0,2845479
18,128	540,6	541,0	103,57	105,04	0,172	0,159	312	0,282738
18,080	540,6	541,0	103,90	105,37	0,172	0,159	313	0,2820018
18,183	540,6	541,0	103,22	104,75	0,172	0,159	314	0,283645
18,298	540,6	541,0	102,56	103,97	0,172	0,159	315	0,2854486
18,124	540,6	541,0	103,54	104,99	0,172	0,159	316	0,2827383
18,183	540,6	541,0	103,22	104,64	0,172	0,159	317	0,2836446
18,169	540,6	541,0	103,33	104,86	0,172	0,159	318	0,2833853
18,207	540,6	541,0	103,09	104,59	0,172	0,159	319	0,2840099
18,183	540,6	541,0	103,22	104,75	0,172	0,159	320	0,2836442
18,151	540,6	541,0	103,40	104,94	0,172	0,159	321	0,283154
18,124	540,6	541,0	103,62	104,97	0,172	0,159	322	0,2827379
18,100	540,6	541,0	103,74	105,10	0,172	0,159	323	0,2823747
18,122	540,6	541,0	103,53	105,08	0,172	0,159	324	0,2827377
18,181	540,6	541,0	103,31	104,69	0,172	0,159	325	0,2836442
18,262	540,6	541,0	102,81	104,20	0,172	0,159	326	0,2849084
18,076	540,6	540,9	103,80	105,17	0,172	0,159	327	0,2820108
18,239	540,6	540,9	102,91	104,30	0,172	0,159	328	0,2845479
18,159	540,6	540,9	103,46	104,79	0,172	0,159	329	0,2832827
18,204	540,6	540,9	103,08	104,57	0,172	0,159	330	0,2840064
18,157	540,5	540,9	103,41	104,82	0,172	0,159	331	0,2832825
18,148	540,5	540,9	103,46	104,81	0,172	0,159	332	0,2831647
18,206	540,5	540,9	103,19	104,58	0,172	0,159	333	0,2840304
18,317	540,5	540,9	102,47	103,85	0,172	0,159	334	0,2858006
18,305	540,5	540,9	102,57	104,03	0,172	0,159	335	0,2855765
18,124	540,5	540,9	103,62	104,99	0,172	0,159	336	0,2827382
18,124	540,5	540,8	103,68	105,00	0,172	0,159	337	0,2827382
17,999	540,5	540,8	104,32	105,77	0,172	0,159	338	0,2807914
18,342	540,5	540,9	102,43	103,84	0,172	0,159	339	0,2861674
18,157	540,5	540,8	103,47	104,78	0,172	0,159	340	0,2832823
18,375	540,5	540,8	102,11	103,52	0,172	0,159	341	0,2867049
18,076	540,5	540,9	103,85	105,25	0,172	0,159	342	0,2820165
18,342	540,5	540,8	102,36	103,72	0,172	0,159	343	0,2861675
18,318	540,5	540,8	102,44	103,85	0,172	0,159	344	0,2858079
18,261	540,5	540,8	102,82	104,26	0,172	0,159	345	0,2849084
18,240	540,5	540,9	103,00	104,35	0,172	0,159	346	0,2845479
18,100	540,5	540,9	103,68	105,21	0,172	0,159	347	0,2823864
18,100	540,5	540,9	103,80	105,24	0,172	0,159	348	0,2823751
18,294	540,5	540,8	102,66	104,11	0,172	0,159	349	0,2854193
18,262	540,5	540,8	102,81	104,19	0,172	0,159	350	0,2849076
18,218	540,4	540,8	103,01	104,42	0,172	0,159	351	0,284249
18,335	540,4	540,8	102,35	103,76	0,172	0,159	352	0,2860725
18,238	540,5	540,8	103,00	104,32	0,172	0,159	353	0,2845477
18,121	540,5	540,8	103,64	104,99	0,172	0,159	354	0,2827373
18,238	540,5	540,8	102,95	104,32	0,172	0,159	355	0,2845483
18,202	540,5	540,8	103,20	104,52	0,172	0,159	356	0,2840059
18,236	540,5	540,8	102,89	104,42	0,172	0,159	357	0,2845487
18,156	540,5	540,8	103,35	104,90	0,172	0,159	358	0,2832825
18,098	540,5	540,8	103,80	105,16	0,172	0,159	359	0,2823751
18,235	540,5	540,8	102,94	104,30	0,172	0,159	360	0,2845479
18,073	540,5	540,8	103,92	105,36	0,172	0,159	361	0,2820088
18,235	540,5	540,8	102,99	104,31	0,172	0,159	362	0,2845478
18,239	540,5	540,8	103,00	104,32	0,172	0,159	363	0,284548
18,237	540,5	540,8	103,00	104,42	0,172	0,159	364	0,2845476

18,288	540,5	540,8	102,61	104,03	0,172	0,159	365	0,2853269
18,181	540,5	540,8	103,34	104,65	0,172	0,159	366	0,2836438
18,122	540,5	540,8	103,67	105,08	0,172	0,159	367	0,2827388
18,229	540,5	540,8	103,02	104,45	0,172	0,159	368	0,2844351
18,237	540,4	540,8	102,90	104,35	0,172	0,159	369	0,2845475
18,260	540,4	540,8	102,84	104,20	0,172	0,159	370	0,2849078
18,259	540,4	540,8	102,82	104,18	0,172	0,159	371	0,2849076
18,201	540,4	540,8	103,09	104,53	0,172	0,159	372	0,2840054
18,155	540,4	540,8	103,36	104,78	0,172	0,159	373	0,2832813
18,293	540,4	540,8	102,57	103,99	0,172	0,159	374	0,2854478
18,178	540,4	540,8	103,23	104,65	0,172	0,159	375	0,2836428
18,315	540,4	540,8	102,55	103,85	0,172	0,159	376	0,2858075
18,258	540,4	540,8	102,87	104,29	0,172	0,159	377	0,284908
18,294	540,4	540,8	102,60	104,09	0,172	0,159	378	0,285448
18,201	540,4	540,8	103,11	104,51	0,172	0,159	379	0,2840057
18,202	540,4	540,8	103,14	104,60	0,172	0,159	380	0,2840182
18,235	540,4	540,8	102,89	104,31	0,172	0,159	381	0,2845476
18,293	540,4	540,8	102,57	103,98	0,172	0,159	382	0,2854479
18,235	540,4	540,8	103,01	104,43	0,172	0,159	383	0,2845473
18,293	540,4	540,8	102,63	103,98	0,172	0,159	384	0,2854488
18,234	540,4	540,8	103,00	104,30	0,172	0,159	385	0,2845473
18,257	540,4	540,7	102,76	104,20	0,172	0,159	386	0,2849066
18,234	540,4	540,7	102,99	104,43	0,172	0,159	387	0,2845477
18,371	540,4	540,7	102,14	103,52	0,172	0,159	388	0,286703
18,233	540,4	540,7	102,95	104,31	0,172	0,159	389	0,2845484
18,336	540,4	540,7	102,33	103,72	0,172	0,159	390	0,2861667
18,200	540,4	540,7	103,18	104,51	0,172	0,159	391	0,2840391
18,256	540,3	540,7	102,76	104,23	0,172	0,159	392	0,2849067
18,198	540,3	540,7	103,20	104,51	0,172	0,159	393	0,2840051
18,231	540,3	540,7	102,94	104,31	0,172	0,159	394	0,2845458
18,289	540,3	540,7	102,66	103,98	0,172	0,159	395	0,2854485
18,288	540,3	540,7	102,59	104,08	0,172	0,159	396	0,285448
18,288	540,3	540,7	102,57	104,09	0,172	0,159	397	0,2854476
18,114	540,3	540,7	103,54	104,97	0,172	0,159	398	0,2827372
18,290	540,3	540,7	102,67	103,98	0,172	0,159	399	0,2854484
18,290	540,3	540,7	102,62	104,09	0,172	0,159	400	0,2854475
18,173	540,3	540,7	103,28	104,64	0,172	0,159	401	0,2836438
18,224	540,3	540,7	102,96	104,47	0,172	0,159	402	0,2844176
18,151	540,3	540,7	103,43	104,81	0,172	0,159	403	0,2832829
18,233	540,3	540,6	102,92	104,33	0,172	0,159	404	0,2845433
18,025	540,3	540,6	104,18	105,51	0,172	0,159	405	0,2813341
18,117	540,3	540,6	103,57	105,08	0,172	0,159	406	0,2827362
18,198	540,3	540,6	103,22	104,54	0,172	0,159	407	0,2840051
18,196	540,3	540,6	103,20	104,51	0,172	0,159	408	0,2840049
18,197	540,3	540,6	103,17	104,63	0,172	0,159	409	0,2840053
18,290	540,2	540,6	102,64	104,09	0,172	0,159	410	0,2854481
18,069	540,3	540,6	103,94	105,38	0,172	0,159	411	0,2820097
18,092	540,3	540,6	103,80	105,22	0,172	0,159	412	0,2823746
18,198	540,3	540,6	103,18	104,57	0,172	0,159	413	0,2840467
18,253	540,3	540,6	102,77	104,30	0,172	0,159	414	0,2849074
18,231	540,3	540,6	102,99	104,44	0,172	0,159	415	0,2845468
18,288	540,3	540,6	102,68	104,05	0,172	0,159	416	0,285448
18,310	540,3	540,6	102,44	103,97	0,172	0,159	417	0,2858073
18,252	540,3	540,6	102,76	104,18	0,172	0,159	418	0,2849075
18,193	540,3	540,6	103,08	104,53	0,172	0,159	419	0,2840062
17,971	540,3	540,6	104,45	105,83	0,172	0,159	420	0,2805496
18,119	540,3	540,6	103,49	104,93	0,172	0,159	421	0,2828576
18,146	540,3	540,6	103,44	104,85	0,172	0,159	422	0,2832817
18,364	540,2	540,5	102,21	103,63	0,172	0,159	423	0,2867043
18,168	540,2	540,5	103,21	104,64	0,172	0,159	424	0,2836434
18,191	540,2	540,5	103,07	104,50	0,172	0,159	425	0,2840057
18,144	540,2	540,5	103,41	104,84	0,172	0,159	426	0,2832817

18,208	540,2	540,5	103,03	104,50	0,172	0,159	427	0,2842982
18,168	540,2	540,5	103,25	104,64	0,172	0,159	428	0,2836431
18,085	540,2	540,5	103,75	105,13	0,172	0,159	429	0,2823739
18,244	540,2	540,5	102,76	104,21	0,172	0,159	430	0,2848614
18,246	540,2	540,5	102,79	104,28	0,172	0,159	431	0,2849072
18,223	540,1	540,5	102,94	104,41	0,172	0,159	432	0,2845469
18,108	540,2	540,5	103,58	105,07	0,172	0,159	433	0,2827673
17,965	540,3	540,5	104,38	105,89	0,172	0,159	434	0,2805489
18,186	540,3	540,4	103,10	104,61	0,172	0,159	435	0,2840049
18,139	540,2	540,4	103,36	104,87	0,172	0,159	436	0,2832819
18,278	540,2	540,4	102,58	104,08	0,172	0,159	437	0,2854479

Average	Average	Average	Proportional Rates Medium/low fire					Average
18,02	Inlet +	Inlet +						0,279
	Outlet	Outlet	Average	Average	#1	#2		
Tunnel	Temp.	Temp.	102,58	100,09	System 1	System 2		SQRT
Velocity	Meter 1	Meter 2	**Proportional Rates**		Vol.Std.	Vol.Std.		Delta-P
			PR1	**PR2**			Time	
Ft/Sec	Deg. R	Deg. R	**%**	**%**	(ft3)	(ft3)	min	(in H2O)2
18,053	535,0	534,9			0,173	0,155	0	0,274741
18,033	535,0	534,9	104,60	102,12	0,173	0,155	1	0,2762945
17,899	535,0	534,9	105,63	103,12	0,174	0,155	2	0,2740568
18,152	535,0	534,9	104,78	102,28	0,174	0,155	3	0,277037
18,054	535,0	535,0	105,88	103,36	0,174	0,155	4	0,2748051
18,059	535,1	535,1	106,48	103,94	0,174	0,155	5	0,2741827
17,741	535,1	535,1	108,23	105,64	0,174	0,156	6	0,2695236
17,976	535,2	535,2	106,77	104,22	0,174	0,155	7	0,2731183
17,996	535,3	535,3	106,57	104,03	0,174	0,155	8	0,2734953
18,055	535,4	535,4	106,18	103,65	0,174	0,155	9	0,2744309
17,881	535,5	535,4	106,50	103,95	0,174	0,155	10	0,2727515
17,979	535,5	535,5	105,82	103,29	0,174	0,155	11	0,2744314
17,847	535,5	535,5	106,46	103,92	0,174	0,156	12	0,2725541
17,938	535,6	535,6	105,86	103,33	0,174	0,155	13	0,2740567
17,959	535,6	535,7	105,69	103,16	0,174	0,156	14	0,2744314
18,080	535,7	535,7	104,97	102,45	0,174	0,155	15	0,2762927
18,047	535,7	535,8	105,19	102,67	0,174	0,155	16	0,2757366
18,136	535,7	535,8	104,72	102,20	0,174	0,155	17	0,2770372
17,886	535,8	535,9	106,24	103,68	0,174	0,155	18	0,2731196
17,994	535,8	535,9	105,59	103,05	0,174	0,155	19	0,2747958
17,942	535,9	536,0	105,84	103,29	0,174	0,155	20	0,2740567
17,969	535,9	536,0	105,70	103,14	0,174	0,155	21	0,274432
18,095	535,9	536,1	105,00	102,46	0,174	0,155	22	0,2762952
17,995	536,0	536,1	105,47	102,92	0,174	0,155	23	0,274805
17,972	536,0	536,2	105,69	103,14	0,173	0,155	24	0,2744309
17,947	536,1	536,2	105,91	103,35	0,174	0,155	25	0,2740629
18,056	536,1	536,3	105,20	102,66	0,174	0,155	26	0,2757378
17,827	536,1	536,3	106,58	104,00	0,174	0,155	27	0,2721794
17,976	536,2	536,4	105,72	103,15	0,174	0,155	28	0,2744318
17,977	536,3	536,4	105,71	103,15	0,174	0,155	29	0,2744317
17,977	536,3	536,5	105,67	103,11	0,173	0,155	30	0,2744316
18,049	536,4	536,6	105,25	102,70	0,173	0,155	31	0,2755668
17,998	536,4	536,6	105,49	102,93	0,173	0,155	32	0,274805
18,124	536,5	536,7	104,79	102,25	0,173	0,155	33	0,2766671
18,082	536,5	536,7	104,85	102,30	0,173	0,155	34	0,276295
17,903	536,6	536,8	105,90	103,34	0,173	0,155	35	0,2734955
17,887	536,6	536,8	106,17	103,59	0,173	0,155	36	0,2731197
18,115	536,7	536,9	104,71	102,17	0,173	0,155	37	0,2766597
17,885	536,7	536,9	106,17	103,60	0,173	0,155	38	0,2731201
17,875	536,8	537,0	106,01	103,44	0,173	0,155	39	0,2731911
18,027	536,8	537,0	105,31	102,76	0,173	0,155	40	0,2752997
17,936	536,9	537,1	105,61	103,05	0,173	0,155	41	0,274057
18,108	537,0	537,1	104,63	102,10	0,173	0,155	42	0,2766671
17,968	537,0	537,2	105,52	102,97	0,173	0,155	43	0,2745298
17,956	537,0	537,2	105,44	102,89	0,173	0,155	44	0,2744324
17,889	537,1	537,2	105,80	103,23	0,173	0,155	45	0,2734399
17,873	537,1	537,3	105,92	103,35	0,173	0,155	46	0,2731216
18,077	537,1	537,3	104,73	102,19	0,173	0,155	47	0,2762958
17,868	537,2	537,4	105,98	103,41	0,173	0,155	48	0,2731356
17,932	537,2	537,4	105,64	103,07	0,173	0,155	49	0,2740582
18,176	537,2	537,4	104,04	101,51	0,173	0,155	50	0,2779641
18,145	537,3	537,5	104,18	101,65	0,173	0,155	51	0,277594
18,048	537,3	537,5	104,85	102,30	0,173	0,155	52	0,2759454
17,929	537,3	537,6	105,59	103,03	0,173	0,155	53	0,2740548
18,032	537,4	537,6	104,90	102,35	0,173	0,155	54	0,2757428

17,945	537,4	537,6	105,38	102,82	0,173	0,155	55	0,2744338
17,946	537,5	537,7	105,40	102,84	0,173	0,155	56	0,2744053
17,947	537,5	537,7	105,35	102,79	0,173	0,155	57	0,2744337
18,031	537,6	537,8	104,86	102,31	0,173	0,155	58	0,27574
18,159	537,6	537,8	103,91	101,39	0,173	0,155	59	0,2779643
17,881	537,6	537,8	105,68	103,12	0,173	0,155	60	0,2734987
17,952	537,7	537,9	105,40	102,84	0,173	0,155	61	0,2745173
18,038	537,7	537,9	104,84	102,30	0,173	0,155	62	0,2757768
18,152	537,8	538,0	104,17	101,64	0,173	0,155	63	0,2775949
18,101	537,8	538,0	104,44	101,91	0,173	0,155	64	0,2766696
17,887	537,9	538,1	105,80	103,24	0,173	0,155	65	0,2734791
17,919	538,0	538,1	105,41	102,85	0,173	0,155	66	0,2740673
18,023	538,0	538,2	104,73	102,19	0,173	0,155	67	0,2757409
17,850	538,0	538,2	105,71	103,15	0,173	0,155	68	0,2731227
17,925	538,1	538,3	105,14	102,59	0,173	0,155	69	0,2744349
18,041	538,1	538,3	104,40	101,86	0,173	0,155	70	0,2762981
17,884	538,1	538,3	105,20	102,64	0,173	0,155	71	0,274041
18,057	538,1	538,3	103,93	101,40	0,173	0,155	72	0,2770407
17,965	538,1	538,3	104,49	101,94	0,173	0,155	73	0,2757417
17,870	538,1	538,3	104,81	102,26	0,173	0,155	74	0,2744364
17,973	538,1	538,3	104,01	101,47	0,173	0,155	75	0,2762991
17,933	538,0	538,3	104,20	101,66	0,173	0,155	76	0,2757432
17,828	538,0	538,3	104,87	102,30	0,173	0,155	77	0,2740609
18,026	538,0	538,3	103,60	101,07	0,173	0,155	78	0,27716
18,050	538,0	538,3	103,50	100,97	0,173	0,155	79	0,2775787
17,974	538,0	538,3	103,74	101,20	0,173	0,155	80	0,2766711
18,054	538,0	538,3	103,23	100,71	0,173	0,155	81	0,2779672
17,976	538,0	538,3	103,76	101,22	0,173	0,155	82	0,2766715
18,054	538,0	538,3	103,27	100,75	0,173	0,155	83	0,2780633
18,028	538,0	538,3	103,37	100,84	0,173	0,155	84	0,2775974
17,798	537,9	538,3	104,70	102,14	0,173	0,155	85	0,2740634
18,028	538,0	538,3	103,35	100,82	0,173	0,155	86	0,277598
18,020	538,0	538,3	103,20	100,68	0,173	0,155	87	0,277608
18,001	538,0	538,2	103,21	100,69	0,173	0,155	88	0,2775988
17,821	538,0	538,2	104,26	101,72	0,173	0,155	89	0,2748107
18,020	538,0	538,2	103,08	100,56	0,173	0,155	90	0,277968
17,872	538,0	538,2	103,86	101,32	0,173	0,155	91	0,2757435
17,956	538,0	538,3	103,28	100,76	0,173	0,155	92	0,2771084
17,951	538,0	538,2	103,33	100,81	0,173	0,155	93	0,2770432
18,061	538,0	538,2	102,59	100,10	0,173	0,155	94	0,2788899
18,115	538,0	538,3	102,22	99,74	0,173	0,155	95	0,2798078
17,928	538,0	538,2	103,12	100,61	0,173	0,155	96	0,2770442
18,045	538,0	538,2	102,50	100,01	0,173	0,155	97	0,27889
17,954	538,0	538,2	102,94	100,44	0,173	0,155	98	0,2775981
18,036	538,0	538,2	102,45	99,97	0,173	0,155	99	0,2788903
18,117	538,0	538,2	102,03	99,56	0,173	0,155	100	0,2802408
18,027	537,9	538,1	102,42	99,93	0,173	0,155	101	0,2788903
17,989	537,9	538,1	102,61	100,12	0,173	0,155	102	0,278338
18,102	537,9	538,1	101,93	99,46	0,173	0,155	103	0,2801759
17,919	537,9	538,1	102,93	100,43	0,173	0,155	104	0,2773662
18,009	537,9	538,1	102,32	99,84	0,173	0,155	105	0,2788909
18,009	537,8	538,1	102,40	99,91	0,173	0,155	106	0,2788912
18,065	537,8	538,1	102,04	99,56	0,173	0,155	107	0,2797275
17,929	537,8	538,0	102,81	100,32	0,173	0,155	108	0,2776727
17,971	537,8	538,0	102,50	100,01	0,173	0,155	109	0,2783693
17,944	537,8	538,0	102,63	100,14	0,173	0,155	110	0,2779684
18,005	537,8	538,0	102,39	99,90	0,173	0,155	111	0,2788908
18,061	537,8	538,0	101,95	99,48	0,173	0,155	112	0,2798105
18,195	537,8	538,0	101,14	98,68	0,173	0,155	113	0,2819672
17,962	537,8	538,0	102,48	99,99	0,173	0,155	114	0,2783374
17,935	537,8	538,0	102,65	100,16	0,173	0,155	115	0,2779693
17,997	537,8	538,0	102,27	99,79	0,173	0,155	116	0,278895

17,993	537,8	538,0	102,24	99,76	0,173	0,155	117	0,2788938
18,016	537,8	537,9	102,14	99,66	0,173	0,155	118	0,279258
18,015	537,8	537,9	102,22	99,75	0,173	0,155	119	0,2792453
17,932	537,8	537,9	102,58	100,09	0,173	0,155	120	0,2779691
18,132	537,8	537,9	101,43	98,97	0,173	0,155	121	0,2810942
17,932	537,8	538,0	102,59	100,10	0,173	0,155	122	0,2779652
17,930	537,7	538,0	102,57	100,08	0,173	0,155	123	0,2779696
17,934	537,8	538,0	102,57	100,08	0,173	0,155	124	0,2779714
18,133	537,8	538,0	101,44	98,98	0,173	0,155	125	0,2810907
17,990	537,8	538,0	102,23	99,75	0,173	0,155	126	0,2788915
17,953	537,8	538,0	102,43	99,94	0,173	0,155	127	0,2783372
17,850	537,8	538,0	103,03	100,53	0,173	0,155	128	0,2767242
17,956	537,8	538,0	102,45	99,96	0,173	0,155	129	0,2783376
17,954	537,8	538,0	102,51	100,02	0,173	0,155	130	0,2783379
18,046	537,8	538,0	101,88	99,40	0,173	0,155	131	0,2798084
17,988	537,8	538,0	102,21	99,73	0,173	0,155	132	0,2788908
18,022	537,8	538,0	102,00	99,52	0,173	0,155	133	0,2794552
17,985	537,8	538,0	102,20	99,72	0,173	0,155	134	0,2788906
18,009	537,8	538,0	102,09	99,61	0,173	0,155	135	0,2792579
17,984	537,8	538,0	102,20	99,72	0,173	0,155	136	0,278891
18,042	537,8	538,0	101,86	99,38	0,173	0,155	137	0,279809
17,948	537,8	538,0	102,40	99,91	0,173	0,155	138	0,2783366
18,038	537,7	538,0	101,77	99,29	0,173	0,155	139	0,2798091
17,976	537,7	538,0	102,16	99,68	0,173	0,155	140	0,2788909
18,059	537,7	538,0	101,75	99,28	0,173	0,155	141	0,2800885
17,978	537,8	537,9	102,17	99,69	0,173	0,155	142	0,2788902
18,084	537,8	537,9	101,56	99,10	0,173	0,155	143	0,2805421
18,003	537,7	537,9	102,04	99,57	0,173	0,155	144	0,2792581
17,979	537,7	537,9	102,18	99,70	0,173	0,155	145	0,2788906
18,083	537,7	537,9	101,64	99,17	0,173	0,155	146	0,280542
18,119	537,7	537,9	101,37	98,91	0,173	0,155	147	0,2810903
18,062	537,8	537,9	101,70	99,24	0,173	0,155	148	0,2801762
17,999	537,7	537,9	102,02	99,54	0,173	0,155	149	0,2792576
17,941	537,7	537,9	102,36	99,88	0,173	0,155	150	0,2783374
18,034	537,7	537,9	101,82	99,35	0,173	0,155	151	0,2798093
17,975	537,7	537,9	102,15	99,67	0,173	0,155	152	0,2788913
18,033	537,7	537,9	101,83	99,35	0,173	0,155	153	0,2798099
17,997	537,7	537,9	102,02	99,53	0,173	0,155	154	0,2792586
18,033	537,7	537,9	101,82	99,34	0,173	0,155	155	0,2798097
17,996	537,7	537,9	102,01	99,53	0,173	0,155	156	0,2792586
17,972	537,7	537,9	102,15	99,66	0,173	0,155	157	0,2788909
17,970	537,7	537,9	102,20	99,71	0,173	0,155	158	0,2788912
18,077	537,7	537,9	101,54	99,07	0,173	0,155	159	0,2805418
18,028	537,7	537,9	101,80	99,32	0,173	0,155	160	0,2798095
17,970	537,6	537,9	102,14	99,65	0,173	0,155	161	0,2788907
18,051	537,6	537,9	101,77	99,29	0,173	0,155	162	0,2801764
17,907	537,6	537,9	102,46	99,97	0,173	0,155	163	0,2779697
17,990	537,6	537,8	102,00	99,52	0,173	0,155	164	0,2792513
18,025	537,6	537,8	101,80	99,32	0,173	0,155	165	0,2798054
18,072	537,6	537,8	101,53	99,06	0,173	0,155	166	0,2805419
17,931	537,5	537,8	102,34	99,85	0,173	0,155	167	0,2783372
18,044	537,5	537,8	101,65	99,17	0,173	0,155	168	0,2801758
18,108	537,5	537,7	101,33	98,86	0,173	0,155	169	0,2811143
18,046	537,5	537,7	101,64	99,17	0,173	0,155	170	0,2801769
17,967	537,5	537,7	102,11	99,63	0,173	0,155	171	0,2789812
17,983	537,5	537,7	101,90	99,43	0,173	0,155	172	0,2792576
18,062	537,5	537,7	101,53	99,06	0,173	0,155	173	0,2805004
18,042	537,5	537,7	101,65	99,18	0,173	0,155	174	0,2801762
18,019	537,5	537,6	101,79	99,32	0,173	0,155	175	0,279809
18,064	537,4	537,6	101,49	99,03	0,173	0,155	176	0,2805422
18,040	537,5	537,6	101,64	99,18	0,173	0,155	177	0,2801741
18,040	537,4	537,6	101,64	99,18	0,173	0,155	178	0,2801758

17,959	537,4	537,6	102,12	99,65	0,173	0,155	179	0,2788907
17,913	537,4	537,6	102,24	99,77	0,173	0,155	180	0,2782427
18,041	537,4	537,6	101,65	99,19	0,173	0,155	181	0,2801757
18,039	537,4	537,6	101,64	99,18	0,173	0,155	182	0,2801762
17,980	537,4	537,5	101,98	99,51	0,173	0,155	183	0,2792582
18,143	537,4	537,6	101,06	98,61	0,173	0,155	184	0,2817999
17,811	537,3	537,5	102,92	100,43	0,173	0,155	185	0,2766732
17,921	537,3	537,5	102,26	99,78	0,173	0,155	186	0,2783378
18,037	537,3	537,5	101,65	99,18	0,173	0,155	187	0,2801726
17,978	537,3	537,5	101,87	99,40	0,173	0,155	188	0,2792521
17,955	537,3	537,5	102,11	99,64	0,173	0,155	189	0,2788902
18,016	537,3	537,5	101,78	99,31	0,173	0,155	190	0,279828
18,061	537,3	537,5	101,51	99,06	0,173	0,155	191	0,2805407
18,156	537,3	537,5	101,00	98,55	0,173	0,155	192	0,2820016
17,955	537,3	537,5	102,11	99,64	0,173	0,155	193	0,2788903
18,014	537,3	537,5	101,78	99,31	0,173	0,155	194	0,2798084
18,177	537,3	537,5	100,85	98,41	0,173	0,155	195	0,2823612
17,978	537,3	537,5	101,98	99,51	0,173	0,155	196	0,2792597
17,952	537,3	537,5	102,10	99,63	0,173	0,155	197	0,2788905
18,013	537,3	537,5	101,78	99,32	0,173	0,155	198	0,2798088
17,955	537,3	537,5	102,12	99,65	0,173	0,155	199	0,2788901
17,979	537,3	537,5	101,99	99,52	0,173	0,155	200	0,2792574
18,179	537,3	537,5	100,76	98,32	0,173	0,155	201	0,2823651
18,060	537,3	537,5	101,52	99,06	0,173	0,155	202	0,280541
18,055	537,3	537,5	101,48	99,02	0,173	0,155	203	0,280454
18,014	537,2	537,5	101,80	99,32	0,173	0,155	204	0,2798075
18,015	537,2	537,4	101,80	99,33	0,173	0,155	205	0,2798083
17,910	537,2	537,4	102,39	99,91	0,173	0,155	206	0,2781911
17,978	537,3	537,4	101,99	99,52	0,173	0,155	207	0,279257
17,920	537,3	537,4	102,37	99,89	0,173	0,155	208	0,2783372
17,919	537,3	537,4	102,33	99,85	0,173	0,155	209	0,2783376
18,061	537,3	537,5	101,52	99,06	0,173	0,155	210	0,2805409
17,954	537,3	537,5	102,12	99,64	0,173	0,155	211	0,2788926
17,980	537,3	537,5	102,00	99,52	0,173	0,155	212	0,2792569
17,837	537,3	537,5	102,81	100,32	0,173	0,155	213	0,2770435
18,239	537,3	537,5	100,56	98,11	0,173	0,155	214	0,2832716
17,921	537,3	537,5	102,33	99,85	0,173	0,155	215	0,2783432
18,039	537,3	537,5	101,66	99,20	0,173	0,155	216	0,2801764
18,037	537,3	537,5	101,66	99,19	0,173	0,155	217	0,2801687
17,897	537,3	537,5	102,47	99,98	0,173	0,155	218	0,2779694
18,013	537,3	537,5	101,78	99,31	0,173	0,155	219	0,2798084
18,097	537,3	537,5	101,33	98,87	0,173	0,155	220	0,2810899
18,039	537,3	537,5	101,66	99,19	0,173	0,155	221	0,28018
18,037	537,3	537,5	101,65	99,19	0,173	0,155	222	0,2801759
18,059	537,3	537,5	101,51	99,05	0,173	0,155	223	0,2805405
17,980	537,3	537,5	101,99	99,53	0,173	0,155	224	0,2792576
18,097	537,3	537,5	101,32	98,87	0,173	0,155	225	0,2810899
17,955	537,3	537,5	102,12	99,65	0,173	0,155	226	0,2788991
18,153	537,3	537,5	100,89	98,45	0,173	0,155	227	0,2820012
18,039	537,3	537,5	101,66	99,20	0,173	0,155	228	0,2801759
17,976	537,3	537,5	101,97	99,51	0,173	0,155	229	0,2792578
17,975	537,3	537,5	101,97	99,50	0,173	0,155	230	0,2792576
18,094	537,3	537,5	101,31	98,86	0,173	0,155	231	0,2810897
17,920	537,3	537,5	102,30	99,82	0,173	0,155	232	0,2783371
18,058	537,3	537,5	101,44	98,98	0,173	0,155	233	0,2805416
17,917	537,3	537,5	102,31	99,83	0,173	0,155	234	0,2783377
17,953	537,3	537,5	102,11	99,63	0,173	0,155	235	0,2788905
18,035	537,3	537,5	101,64	99,18	0,173	0,155	236	0,2801756
18,032	537,3	537,5	101,59	99,12	0,173	0,155	237	0,2801128
18,010	537,3	537,5	101,77	99,30	0,173	0,155	238	0,2798085
18,008	537,2	537,4	101,75	99,28	0,173	0,155	239	0,2798086
18,033	537,2	537,4	101,59	99,12	0,173	0,155	240	0,2801758

18,058	537,2	537,4	101,51	99,05	0,173	0,155	241	0,2805439
17,974	537,2	537,4	101,98	99,50	0,173	0,155	242	0,2792574
18,183	537,2	537,4	100,78	98,33	0,173	0,155	243	0,2825393
17,948	537,2	537,4	102,01	99,54	0,173	0,155	244	0,2788957
18,029	537,2	537,4	101,58	99,12	0,173	0,155	245	0,2801764
17,946	537,2	537,4	102,10	99,62	0,173	0,155	246	0,2788906
18,106	537,2	537,4	101,22	98,77	0,173	0,155	247	0,2813402
18,032	537,2	537,3	101,62	99,16	0,173	0,155	248	0,2802078
18,183	537,2	537,3	100,77	98,34	0,173	0,155	249	0,2825582
18,031	537,2	537,3	101,68	99,22	0,173	0,155	250	0,2801758
18,040	537,2	537,3	101,57	99,11	0,173	0,155	251	0,2803373
18,007	537,2	537,3	101,77	99,31	0,173	0,155	252	0,2798086
18,230	537,2	537,3	100,53	98,09	0,173	0,155	253	0,2832731
18,003	537,2	537,3	101,77	99,31	0,173	0,155	254	0,2797759
17,970	537,2	537,3	101,95	99,49	0,173	0,155	255	0,279258
18,003	537,2	537,3	101,74	99,28	0,173	0,155	256	0,2798114
17,970	537,2	537,3	101,95	99,49	0,173	0,155	257	0,2792581
17,943	537,2	537,3	102,18	99,71	0,173	0,155	258	0,2788901
18,026	537,2	537,3	101,62	99,17	0,173	0,155	259	0,2801588
17,968	537,2	537,3	101,96	99,49	0,173	0,155	260	0,2792567
18,027	537,1	537,3	101,62	99,17	0,173	0,155	261	0,2801751
18,031	537,1	537,3	101,59	99,13	0,173	0,155	262	0,280258
17,943	537,1	537,3	102,09	99,62	0,173	0,155	263	0,2788905
18,025	537,1	537,3	101,68	99,21	0,173	0,155	264	0,2801755
18,167	537,1	537,3	100,84	98,40	0,173	0,155	265	0,2823653
18,023	537,1	537,2	101,61	99,15	0,173	0,155	266	0,2801751
18,081	537,1	537,2	101,16	98,72	0,173	0,155	267	0,2810893
18,002	537,1	537,2	101,76	99,30	0,173	0,155	268	0,2798083
18,026	537,1	537,2	101,63	99,17	0,173	0,155	269	0,2801757
17,942	537,1	537,2	102,10	99,62	0,173	0,155	270	0,2788902
18,000	537,0	537,2	101,76	99,29	0,173	0,155	271	0,27981
18,049	537,0	537,2	101,40	98,94	0,173	0,155	272	0,2805411
18,114	537,0	537,2	101,13	98,69	0,173	0,155	273	0,2815593
18,246	537,0	537,1	100,39	97,96	0,173	0,155	274	0,2836342
18,000	537,0	537,1	101,67	99,22	0,173	0,155	275	0,2798079
18,139	537,0	537,1	100,97	98,52	0,173	0,155	276	0,2820007
18,046	537,0	537,1	101,39	98,94	0,173	0,155	277	0,2805414
17,996	537,0	537,1	101,74	99,28	0,173	0,155	278	0,2798086
18,186	537,0	537,1	100,71	98,28	0,173	0,155	279	0,2827283
18,199	537,0	537,1	100,59	98,17	0,173	0,155	280	0,2829959
18,020	537,0	537,1	101,57	99,12	0,173	0,155	281	0,2801755
17,996	536,9	537,0	101,76	99,31	0,173	0,155	282	0,2798081
18,136	536,9	537,0	100,96	98,53	0,173	0,155	283	0,2820007
18,043	536,9	537,0	101,49	99,04	0,173	0,155	284	0,2805418
18,076	536,9	537,0	101,28	98,84	0,173	0,155	285	0,2810898
18,043	536,9	537,0	101,49	99,05	0,173	0,155	286	0,2805411
17,854	536,9	537,0	102,57	100,10	0,173	0,155	287	0,277598
18,040	536,9	537,0	101,52	99,07	0,174	0,155	288	0,2805454
18,138	536,8	537,0	100,98	98,54	0,174	0,155	289	0,2820009
18,016	536,8	536,9	101,63	99,18	0,174	0,155	290	0,2801752
18,122	536,8	536,9	101,06	98,62	0,174	0,155	291	0,281779
18,076	536,8	536,9	101,24	98,80	0,173	0,155	292	0,2810995
18,181	536,8	536,9	100,61	98,18	0,173	0,155	293	0,2827278
18,009	536,7	536,9	101,66	99,21	0,173	0,155	294	0,2800835
17,955	536,7	536,8	101,96	99,50	0,174	0,155	295	0,2792568
17,990	536,7	536,8	101,76	99,31	0,174	0,155	296	0,2798089
18,013	536,7	536,8	101,63	99,18	0,174	0,155	297	0,2801751
17,931	536,7	536,8	101,99	99,53	0,173	0,155	298	0,2788897
17,990	536,7	536,8	101,74	99,29	0,173	0,155	299	0,279807
18,072	536,7	536,8	101,25	98,81	0,173	0,155	300	0,2810888
17,988	536,7	536,7	101,65	99,20	0,173	0,155	301	0,2798077
18,153	536,7	536,7	100,81	98,38	0,173	0,155	302	0,2823643

18,209	536,6	536,7	100,51	98,09	0,174	0,155	303	0,2832723
17,984	536,6	536,7	101,74	99,29	0,174	0,155	304	0,279808
18,006	536,6	536,7	101,60	99,16	0,174	0,155	305	0,2801745
18,171	536,6	536,7	100,76	98,34	0,174	0,155	306	0,2827274
18,030	536,6	536,7	101,47	99,03	0,174	0,155	307	0,2805402
17,949	536,6	536,6	101,96	99,51	0,174	0,155	308	0,2792568
17,949	536,5	536,6	101,97	99,51	0,174	0,155	309	0,2792536
18,172	536,5	536,6	100,71	98,29	0,174	0,155	310	0,2827274
18,172	536,5	536,6	100,71	98,29	0,174	0,155	311	0,2827263
18,116	536,5	536,6	101,00	98,57	0,174	0,155	312	0,2818945
17,983	536,5	536,6	101,75	99,30	0,174	0,155	313	0,2798185
17,948	536,5	536,6	101,97	99,51	0,174	0,155	314	0,2792596
18,029	536,5	536,6	101,49	99,05	0,174	0,155	315	0,2805403
18,026	536,5	536,6	101,42	98,97	0,174	0,155	316	0,28054
18,169	536,5	536,5	100,71	98,28	0,174	0,155	317	0,2827279
17,959	536,4	536,5	101,80	99,35	0,174	0,155	318	0,2794802
17,980	536,4	536,5	101,76	99,31	0,174	0,155	319	0,2798071
17,980	536,4	536,5	101,76	99,31	0,174	0,155	320	0,2798066
18,064	536,4	536,5	101,31	98,87	0,174	0,155	321	0,2810892
18,027	536,4	536,5	101,50	99,05	0,174	0,155	322	0,2805394
18,144	536,4	536,5	100,85	98,43	0,174	0,155	323	0,282355
17,916	536,4	536,4	102,07	99,62	0,174	0,155	324	0,2788883
18,141	536,4	536,4	100,82	98,40	0,174	0,155	325	0,2823638
18,002	536,4	536,4	101,63	99,19	0,174	0,155	326	0,280174
18,024	536,3	536,4	101,51	99,08	0,174	0,155	327	0,280509
18,140	536,3	536,3	100,72	98,31	0,174	0,155	328	0,2823623
17,955	536,3	536,3	101,87	99,43	0,174	0,155	329	0,2794924
17,944	536,2	536,3	101,94	99,50	0,174	0,156	330	0,2793017
18,161	536,2	536,2	100,73	98,32	0,174	0,156	331	0,2826936
18,244	536,2	536,2	100,27	97,87	0,174	0,156	332	0,2839943
18,221	536,2	536,2	100,35	97,95	0,174	0,156	333	0,283666
18,090	536,2	536,1	101,10	98,69	0,174	0,156	334	0,281644
18,056	536,2	536,2	101,31	98,89	0,174	0,156	335	0,2810875
18,164	536,2	536,2	100,74	98,32	0,174	0,156	336	0,2827264
17,999	536,2	536,2	101,59	99,15	0,174	0,156	337	0,280226
18,113	536,2	536,2	100,97	98,56	0,174	0,156	338	0,281999
18,019	536,2	536,2	101,50	99,07	0,174	0,156	339	0,2805386
18,021	536,1	536,2	101,51	99,08	0,174	0,156	340	0,280539
18,054	536,1	536,1	101,19	98,77	0,174	0,155	341	0,2810873
18,159	536,1	536,1	100,72	98,31	0,174	0,155	342	0,2827264
18,134	536,1	536,1	100,84	98,42	0,174	0,156	343	0,2823633
18,213	536,1	536,1	100,42	98,02	0,174	0,156	344	0,2835691
18,111	536,1	536,1	100,98	98,56	0,174	0,156	345	0,2819991
17,993	536,0	536,0	101,64	99,21	0,174	0,156	346	0,2801722
18,199	536,0	536,0	100,38	97,98	0,174	0,156	347	0,2834042
17,933	536,0	536,0	101,97	99,53	0,174	0,156	348	0,2792549
18,015	536,0	536,0	101,41	98,99	0,174	0,156	349	0,2805398
18,016	535,9	535,9	101,50	99,07	0,174	0,156	350	0,2805384
17,914	535,9	535,9	102,01	99,58	0,174	0,156	351	0,2789206
18,110	535,9	535,9	101,00	98,59	0,174	0,156	352	0,2819994
18,191	535,9	535,9	100,54	98,13	0,174	0,156	353	0,2832699
18,156	535,9	535,9	100,66	98,25	0,174	0,156	354	0,2827259
17,966	535,9	535,9	101,71	99,27	0,174	0,155	355	0,2798059
18,105	535,9	535,9	101,00	98,58	0,174	0,156	356	0,281977
18,153	535,9	535,9	100,69	98,28	0,174	0,156	357	0,2827259
18,179	535,9	535,9	100,53	98,12	0,174	0,156	358	0,2831225
18,020	535,9	535,9	101,47	99,04	0,174	0,156	359	0,2806566

APPENDIX 3: Calibration data

APPENDIX 4: Unit pre burn

JLab047 Project - Test unit Aging - 50 hours

This document outlines technical data demonstrating a minimum of 50 hours of aging prior EPA testing for the unit, as per requirements of the ASTM E3053-17 Std, section 8.1.4.

The table below is a summary with cumulated hours. All details are on the following pages.

Date	Hours of Aging	Cumulated Hours
2019-12-19	5h55	5h55
2019-12-18	8h20	14h15
2019-12-17	7h58	22h13
2019-12-16	7h47	30h00
2019-12-13	5h11	35h11
2019-12-12	8h45	43h56
2019-12-11	8h05	52h01

	Date		HB3	Ambient	B1	B2	B3	B4	B5
	2019-12-19	Scale	Chimney 8.5'±.5' Flue	Amb EPA set up Ambient	Firebox Top Ext. Metal	Firebox Bottom Ext. Metal	Firebox Left Ext. Metal	Firebox Right Ext. Metal	Firebox Back Ext. Metal
Clock	Test Time	SCALE, lb	°C	°C	°C	°C	°C	°C	°C
10:44:30	00:00:02	645.90	200	23	323	103	275	288	270
10:54:30	00:10:02	662.60	260	23	450	109	266	276	268
11:04:30	00:20:02	661.00	247	23	476	113	247	256	247
11:14:30	00:30:02	659.55	225	23	428	115	235	246	231
11:24:30	00:40:02	658.15	228	22	425	114	223	240	220
11:34:30	00:50:02	656.70	242	22	453	111	217	238	214
11:44:30	01:00:02	655.20	253	23	488	111	217	240	212
11:54:30	01:10:02	653.70	249	22	506	110	222	244	215
12:04:30	01:20:02	652.35	240	23	504	110	230	250	222
12:14:30	01:30:02	651.05	247	24	522	111	238	257	231
12:24:30	01:40:02	649.90	211	23	473	112	247	265	243
12:34:30	01:50:02	649.45	159	23	332	114	254	270	257
12:44:30	02:00:02	649.15	139	22	277	115	256	270	271
12:54:30	02:10:02	649.00	125	22	243	117	253	267	281
13:04:30	02:20:02	648.80	119	22	231	117	248	261	290
13:14:30	02:30:02	648.60	111	22	217	118	240	254	293
13:24:30	02:40:02	648.45	106	22	204	121	231	247	290
13:34:30	02:50:02	648.30	103	21	195	122	222	239	285
13:44:30	03:00:02	648.20	100	21	187	122	215	232	280
13:54:30	03:10:02	648.00	98	20	181	122	209	226	277
14:04:30	03:20:02	647.90	96	22	178	121	203	222	275
14:14:30	03:30:02	647.75	95	22	173	121	199	218	274
14:24:30	03:40:02	647.65	94	22	169	120	196	215	275
14:34:30	03:50:02	647.50	93	20	166	119	193	212	277
14:44:30	04:00:02	647.35	92	21	164	118	190	210	278
14:54:30	04:10:02	647.20	92	21	163	117	188	208	277
15:04:30	04:20:02	647.05	92	21	163	116	187	208	275
15:14:30	04:30:02	646.95	92	21	162	115	187	208	274
15:24:30	04:40:02	646.80	91	21	160	115	186	207	272
15:34:30	04:50:02	646.70	90	21	158	115	186	206	271
15:44:30	05:00:02	646.55	89	20	156	115	185	206	271
15:54:30	05:10:02	646.45	89	20	153	114	184	204	271
16:04:30	05:20:02	646.35	88	20	153	115	182	203	270
16:14:30	05:30:02	646.20	87	20	151	114	180	200	269
16:24:30	05:40:02	646.10	87	20	150	114	179	196	268
16:34:30	05:50:02	646.00	86	20	146	114	178	192	268
16:39:30	05:55:02	645.90	85	20	144	114	177	191	267

Date: 2019-12-19

18.02 lb of red Oak
Average Moisture %dry: 23.6%
Aging time: 5h55m

"Core" et "Remainder"	Pièces	Long. (po)	Poids (wet) (lb)	ok?	Humidité %dry	%dry	%dry	Moyenne %dry	Ok ?	Poids (Dry) Teorique lb	kg
Charge "Core" Requis: 3 pièces	C1	12.0	2.85	Oui	25.1	23.4	18.5	22.3	Oui	2.33	1.06
	C2	12.0	2.86	Oui	20.0	25.3	18.5	21.3	Oui	2.36	1.07
	C3	15.75 max	4.17	Oui	25.0	26.3	26.3	25.9	Oui	3.31	1.50
Poids total du "Core"			9.88	Oui							
Charge "Remainder" Requis: 2-3 pièce(s)	R1	12.0	1.91	Oui	23.2	18.9	16.0	19.4	Oui	1.60	0.73
	R2	12.0	1.90	Oui	23.8	25.5	19.0	22.8	Oui	1.55	0.70
	R3	15.75 max	4.33	Oui	25.0	31.0	27.0	27.7	Oui	3.39	1.54
Ratio poids - Pièces petites/grosses			44%	Oui	≤67% à respecter (+léger/+lourd)						
Poids total du "Remainder"			8.14	Oui							

Conformité de la charge totale (C+R)			Nbre de bûches au total
Poids de la charge totale C+R	18.02	Oui	6
Poids "C" p/r à la charge tot. (45-65%)	55%	Oui	
Poids "R" p/r à la charge tot. (35-55%)	45%	Oui	
Poids Charge p/r à poids cible (95-105%	97%	Oui	
Densité actuelle de la charge	11.6	lb/ft³	

Détails de la Charge totale				
Charge totale Hum Moy (%Dry)	23.9	Oui		
Hum. Moy. (%Wet)	19.3	Informatif	lb	kg
Charge totale - Poids (Dry)			14.54	6.60

		(canal240)	#	101-A01	102-A02	103-A03	104-A04	105-A05	106-A06
	Date 2019-12-18	Scale	HB3 Chimney 8.5'±.5' Flue	Ambient Amb EPA set up Ambient	B1 Firebox Top Ext. Metal	B2 Firebox Bottom Ext. Metal	B3 Firebox Left Ext. Metal	B4 Firebox Right Ext. Metal	B5 Firebox Back Ext. Metal
Heure de Test	Test Time	SCALE, lb	°C	°C	°C	°C	°C	°C	°C
12:16:00	00:00:02	645.60	150	23	247	109	254	252	261
12:26:00	00:10:02	662.35	274	24	484	110	244	241	252
12:36:00	00:20:02	660.75	211	23	457	118	240	226	234
12:46:00	00:30:02	659.30	212	23	466	119	233	215	221
12:56:00	00:40:02	657.85	198	23	455	119	229	210	211
13:06:00	00:50:02	656.65	183	24	414	119	228	208	207
13:16:00	01:00:02	655.50	178	24	411	117	228	208	206
13:26:00	01:10:02	654.40	187	24	441	116	229	209	207
13:36:00	01:20:02	653.30	187	25	451	115	231	211	210
13:46:00	01:30:02	652.20	188	24	459	115	232	214	214
13:56:00	01:40:02	651.35	153	25	387	116	235	218	220
14:06:00	01:50:02	650.75	140	24	366	116	235	223	224
14:16:00	02:00:02	650.25	121	24	311	117	234	224	226
14:26:00	02:10:02	649.95	99	24	243	117	230	223	229
14:36:00	02:20:02	649.75	84	24	193	118	223	218	230
14:46:00	02:30:02	649.55	77	24	174	119	215	212	227
14:56:00	02:40:02	649.45	73	23	164	119	207	207	224
15:06:00	02:50:02	649.30	71	23	158	119	202	203	222
15:16:00	03:00:02	649.20	69	23	153	118	198	199	220
15:26:00	03:10:02	649.10	68	23	150	118	195	195	219
15:36:00	03:20:02	649.00	67	23	147	117	192	193	218
15:46:00	03:30:02	648.85	67	23	146	117	190	191	217
15:56:00	03:40:02	648.75	66	23	144	116	187	191	216
16:06:00	03:50:02	648.60	66	23	144	116	185	190	216
16:16:00	04:00:02	648.50	65	23	140	115	184	190	214
16:26:00	04:10:02	648.45	64	23	137	115	182	189	213
16:36:00	04:20:02	648.30	63	23	135	115	180	188	212
16:46:00	04:30:02	648.25	63	23	134	115	178	186	210
16:56:00	04:40:02	648.15	63	23	135	114	176	183	208
17:06:00	04:50:02	648.05	63	22	134	114	175	181	207
17:16:00	05:00:02	647.95	63	23	133	113	174	179	206
17:26:00	05:10:02	647.80	62	23	132	113	173	178	206
17:36:00	05:20:02	647.75	62	22	132	113	171	177	206
17:46:00	05:30:02	647.60	63	22	133	112	170	176	207
17:56:00	05:40:02	647.55	64	23	134	112	169	176	208
18:06:00	05:50:02	647.40	64	22	135	112	168	175	211
18:16:00	06:00:02	647.30	64	22	135	112	168	174	215
18:26:00	06:10:02	647.20	64	22	135	111	168	173	218
18:36:00	06:20:02	647.10	65	22	137	111	168	173	221
18:46:00	06:30:02	647.00	65	22	137	111	169	172	224
18:56:00	06:40:02	646.85	65	22	136	111	169	171	227
19:06:00	06:50:02	646.75	64	22	136	111	169	171	230
19:16:00	07:00:02	646.65	64	22	136	111	169	171	233
19:26:00	07:10:02	646.60	65	22	136	111	169	170	237
19:36:00	07:20:02	646.45	64	22	133	111	169	170	240
19:46:00	07:30:02	646.35	63	22	132	111	169	170	243
19:56:00	07:40:02	646.25	64	22	132	112	169	169	245
20:06:00	07:50:02	646.15	63	21	132	112	168	168	248
20:16:00	08:00:02	646.00	63	21	132	112	168	167	250
20:26:00	08:10:02	645.90	62	21	131	112	168	166	251
20:36:00	08:20:02	645.75	62	21	130	111	168	165	251

Date: 2019-12-18

18.03 lb of red Oak
Average Moisture %dry: 23.8%
Aging time: 8h20m

"Core" et "Remainder"	Pièces	Long. (po)	Poids (wet) (lb)	ok?	Humidité %dry	%dry	%dry	Moyenne %dry	Ok ?	Poids (Dry)-Teorr lb	kg
Charge "Core" Requis: 3 pièces	C1	12.0	2.86	Oui	26.5	25.3	26.0	25.9	Oui	2.27	1.03
	C2	12.0	2.86	Oui	27.0	26.1	17.2	23.4	Oui	2.32	1.05
	C3	15.75 max	4.16	Oui	26.7	31.0	21.5	26.4	Oui	3.29	1.49
Poids total du "Core"			9.88	Oui							
Charge "Remainder" Requis: 2-3 pièce(s)	R1	12.0	1.92	Oui	16.1	21.7	17.9	18.6	Oui	1.62	0.73
	R2	12.0	1.91	Oui	15.9	21.0	17.9	18.3	Oui	1.61	0.73
	R3	15.75 max	4.32	Oui	22.0	27.0	26.4	25.1	Oui	3.45	1.57
Ratio poids - Pièces petites/grosses			44%	Oui	≤67% à respecter (+léger/+lourd)						
Poids total du "Remainder"			8.15	Oui							

Conformité de la charge totale (C+R)			Nbre de bûches au total
Poids de la charge totale C+R	18.03	Oui	6
Poids "C" p/r à la charge tot. (45-65%)	55%	Oui	
Poids "R" p/r à la charge tot. (35-55%)	45%	Oui	
Poids Charge p/r à poids cible (95-105%	97%	Oui	
Densité actuelle de la charge	11.6	lb/ft³	

Détails de la Charge totale				
Charge totale Hum Moy (%Dry)	23.8	Oui		
Hum. Moy. (%Wet)	19.2	Informatif		
Charge totale - Poids (Dry)			lb 14.57	kg 6.61

		(canal240)	#	101-A01	102-A02	103-A03	104-A04	105-A05	106-A06
	Date 2019-12-17	Scale	HB3 Chimney 8.5'±.5' Flue	Ambient Amb EPA set up Ambient	B1 Firebox Top Ext. Metal	B2 Firebox Bottom Ext. Metal	B3 Firebox Left Ext. Metal	B4 Firebox Right Ext. Metal	B5 Firebox Back Ext. Metal
Heure de Test	Temps du Test	SCALE, lb	°C	°C	°C	°C	°C	°C	°C
12:04:00	00:00:02	649.75	194	24	300	109	280	249	269
12:14:00	00:10:02	666.40	287	24	480	119	276	246	268
12:24:00	00:20:02	664.65	254	24	507	128	268	241	245
12:34:00	00:30:02	663.00	240	24	487	129	258	237	228
12:44:00	00:40:02	661.45	225	23	438	128	252	235	218
12:54:00	00:50:02	659.95	221	24	449	127	249	236	212
13:04:00	01:00:02	658.60	222	23	479	125	249	238	210
13:14:00	01:10:02	657.15	220	24	463	123	250	240	211
13:24:00	01:20:02	655.95	218	24	500	122	250	243	216
13:34:00	01:30:02	655.00	188	24	429	122	250	245	223
13:44:00	01:40:02	654.40	154	24	334	122	250	246	229
13:54:00	01:50:02	654.00	141	24	314	122	247	245	233
14:04:00	02:00:02	653.70	114	24	243	123	242	241	236
14:14:00	02:10:02	653.55	99	24	205	123	234	232	236
14:24:00	02:20:02	653.45	93	24	192	124	227	224	233
14:34:00	02:30:02	653.30	89	24	184	125	220	218	230
14:44:00	02:40:02	653.20	87	24	177	125	214	213	227
14:54:00	02:50:02	653.05	85	24	173	125	211	208	225
15:04:00	03:00:02	652.95	84	24	170	125	207	205	223
15:14:00	03:10:02	652.80	83	24	167	124	203	203	222
15:24:00	03:20:02	652.70	81	24	163	123	199	201	221
15:34:00	03:30:02	652.60	80	24	161	122	196	201	220
15:44:00	03:40:02	652.45	78	25	157	122	192	200	220
15:54:00	03:50:02	652.35	78	24	154	122	189	198	218
16:04:00	04:00:02	652.25	77	23	152	121	186	196	217
16:14:00	04:10:02	652.10	77	23	151	121	182	194	215
16:24:00	04:20:02	652.00	76	24	151	120	179	191	215
16:34:00	04:30:02	651.75	77	24	152	119	178	189	214
16:44:00	04:40:02	651.75	77	23	152	119	177	188	214
16:54:00	04:50:02	651.65	77	22	152	118	177	187	215
17:04:00	05:00:02	651.55	77	22	152	118	178	186	215
17:14:00	05:10:02	651.45	76	24	150	118	178	185	215
17:24:00	05:20:02	651.30	75	23	147	117	180	182	215
17:34:00	05:30:02	651.20	74	22	142	117	180	180	215
17:44:00	05:40:02	651.10	72	24	140	117	178	179	215
17:54:00	05:50:02	651.05	72	23	139	115	177	176	215
18:04:00	06:00:02	650.95	72	22	137	114	176	175	214
18:14:00	06:10:02	650.80	72	24	136	114	174	174	212
18:24:00	06:20:02	650.75	72	24	137	114	173	174	211
18:34:00	06:30:02	650.65	73	23	139	112	174	172	211
18:44:00	06:40:02	650.55	72	23	138	112	174	172	212
18:54:00	06:50:02	650.45	72	23	136	112	175	171	211
19:04:00	07:00:02	650.35	71	24	133	111	175	168	210
19:14:00	07:10:02	650.25	70	22	131	110	175	166	209
19:24:00	07:20:02	650.20	70	24	129	111	174	165	207
19:34:00	07:30:02	650.10	68	24	126	110	174	163	206
19:44:00	07:40:02	650.00	68	23	124	108	173	159	205
19:54:00	07:50:02	649.90	66	23	121	109	171	158	204
20:02:00	07:58:02	649.85	66	24	120	109	170	157	203

Date: 2019-12-17

18.03 lb of red Oak
Average Moisture %dry: 22.8%
Aging time: 7h58m

"Core" et "Remainder"	Pièces	Long. (po)	Poids (wet) (lb)	ok?	Humidité %dry	%dry	%dry	Moyenne %dry	Ok ?	Poids (Dry) Teorr lb	kg
Charge "Core" Requis: 3 pièces	C1	12.0	2.85	Oui	13.5	24.3	24.7	20.8	Oui	2.36	1.07
	C2	12.0	2.86	Oui	14.5	23.9	15.7	18.0	Oui	2.42	1.10
	C3	15.75 max	4.21	Oui	24.9	30.0	27.2	27.4	Oui	3.31	1.50
Poids total du "Core"			9.92	Oui							
Charge "Remainder" Requis: 2-3 pièce(s)	R1	12.0	1.91	Oui	18.9	19.9	18.5	19.1	Oui	1.60	0.73
	R2	12.0	1.91	Oui	16.9	18.5	19.1	18.2	Oui	1.62	0.73
	R3	15.75 max	4.29	Oui	28.4	26.3	26.5	27.1	Oui	3.38	1.53
Ratio poids - Pièces petites/grosses			45%	Oui	≤67% à respecter (+léger/+lourd)						
Poids total du "Remainder"			8.11	Oui							

Conformité de la charge totale (C+R)			Nbre de bûches au total	Détails de la Charge totale				
Poids de la charge totale C+R	18.03	Oui	6	Charge totale	22.8	Oui		
Poids "C" p/r à la charge tot. (45-65%)	55%	Oui		Hum Moy (%Dry)				
Poids "R" p/r à la charge tot. (35-55%)	45%	Oui		Hum. Moy. (%Wet)	18.6	Informatif		
Poids Charge p/r à poids cible (95-105%	97%	Oui					lb	kg
Densité actuelle de la charge	11.6	lb/ft³		Charge totale - Poids (Dry)			14.68	6.66

		(canal240)	#	101-A01	102-A02	103-A03	104-A04	105-A05	106-A06
	Date 2019-12-16	Scale	HB3 Chimney 8.5'±.5' Flue	Ambient Amb EPA set up Ambient	B1 Firebox Top Ext. Metal	B2 Firebox Bottom Ext. Metal	B3 Firebox Left Ext. Metal	B4 Firebox Right Ext. Metal	B5 Firebox Back Ext. Metal
Heure de Test	Temps du Test	SCALE, lb	°C	°C	°C	°C	°C	°C	°C
11:30:30	00:00:02	649.70	203	24	312	96	278	277	299
11:40:30	00:10:02	666.65	267	23	360	103	267	270	299
11:50:30	00:20:02	665.00	224	23	446	111	241	247	270
12:00:30	00:30:02	663.80	218	23	470	118	231	233	243
12:10:30	00:40:02	662.55	204	22	426	119	222	224	229
12:20:30	00:50:02	661.30	212	22	436	118	217	219	219
12:30:30	01:00:02	660.00	224	22	476	116	214	216	211
12:40:30	01:10:02	658.65	231	22	505	114	213	216	207
12:50:30	01:20:02	657.40	223	24	478	113	214	219	208
13:00:30	01:30:02	656.30	208	24	452	113	217	223	211
13:10:30	01:40:02	655.40	184	23	417	113	221	228	217
13:20:30	01:50:02	654.65	167	23	358	113	223	229	222
13:30:30	02:00:02	654.05	154	24	319	114	224	231	227
13:40:30	02:10:02	653.80	116	23	238	114	223	228	232
13:50:30	02:20:02	653.65	97	24	193	115	217	225	235
14:00:30	02:30:02	653.50	90	23	177	115	210	220	233
14:10:30	02:40:02	653.40	85	23	169	116	203	215	229
14:20:30	02:50:02	653.20	83	23	165	116	198	210	226
14:30:30	03:00:02	653.15	82	23	162	115	194	206	224
14:40:30	03:10:02	653.00	80	24	158	116	191	202	223
14:50:30	03:20:02	652.90	79	23	155	115	188	199	222
15:00:30	03:30:02	652.80	78	24	151	115	186	197	221
15:10:30	03:40:02	652.70	77	23	149	114	185	195	220
15:20:30	03:50:02	652.55	77	22	148	114	184	193	218
15:30:30	04:00:02	652.50	76	23	147	114	183	192	218
16:10:30	04:40:02	652.00	77	23	148	112	185	189	220
16:20:30	04:50:02	651.80	77	23	149	112	184	188	223
16:30:30	05:00:02	651.70	79	22	150	112	184	188	226
16:40:30	05:10:02	651.60	80	23	151	113	182	190	230
16:50:30	05:20:02	651.45	80	22	152	113	180	193	234
17:00:30	05:30:02	651.35	80	23	152	113	179	196	236
17:10:30	05:40:02	651.20	81	23	153	113	177	199	238
17:20:30	05:50:02	651.05	81	23	152	113	176	200	241
17:30:30	06:00:02	650.95	82	23	153	113	175	201	244
17:40:30	06:10:02	650.85	82	23	153	114	174	202	247
17:50:30	06:20:02	650.75	82	23	151	114	173	203	249
18:00:30	06:30:02	650.60	81	22	149	114	173	202	247
18:10:30	06:40:02	650.50	81	23	147	114	172	201	245
18:20:30	06:50:02	650.35	81	22	146	114	172	201	244
18:30:30	07:00:02	650.30	80	23	145	114	171	201	243
18:40:30	07:10:02	650.15	79	23	142	115	169	200	241
18:50:30	07:20:02	650.05	76	23	137	115	168	196	240
19:00:30	07:30:02	649.95	75	23	133	115	168	190	237
19:10:30	07:40:02	649.80	74	23	131	116	169	185	235
19:17:30	07:47:02	649.80	73	23	130	115	169	180	233

Date: 2019-12-16

17.98 lb of red Oak
Average Moisture %dry: 23.8%
Aging time: 7h47m

"Core" et "Remainder"	Pièces	Long. (po)	Poids (wet) (lb)	ok?	Humidité %dry	%dry	%dry	Moyenne %dry	Ok ?	Poids (Dry) Teorr lb	kg
Charge "Core" Requis: 3 pièces	C1	12.0	2.85	Oui	24.9	24.3	17.9	22.4	Oui	2.33	1.06
	C2	12.0	2.85	Oui	26.9	19.9	15.5	20.8	Oui	2.36	1.07
	C3	15.75 max	4.16	Oui	23.8	29.0	25.1	26.0	Oui	3.30	1.50
Poids total du "Core"			9.86	Oui							
Charge "Remainder" Requis: 2-3 pièce(s)	R1	12.0	1.90	Oui	21.2	23.8	17.2	20.7	Oui	1.57	0.71
	R2	12.0	1.92	Oui	20.5	22.0	19.1	20.5	Oui	1.59	0.72
	R3	15.75 max	4.30	Oui	28.1	27.6	28.0	27.9	Oui	3.36	1.52
Ratio poids - Pièces petites/grosses			44%	Oui	≤67% à respecter (+léger/+lourd)						
Poids total du "Remainder"			8.12	Oui							

Conformité de la charge totale (C+R)			Nbre de bûches au total
Poids de la charge totale C+R	17.98	Oui	
Poids "C" p/r à la charge tot. (45-65%)	55%	Oui	
Poids "R" p/r à la charge tot. (35-55%)	45%	Oui	6
Poids Charge p/r à poids cible (95-105%)	97%	Oui	
Densité actuelle de la charge	11.6	lb/ft³	

Détails de la Charge totale				
Charge totale Hum Moy (%Dry)	23.8	Oui		
Hum. Moy. (%Wet)	19.2	Informatif		
Charge totale - Poids (Dry)			lb 14.52	kg 6.59

		(canal240)	#	101-A01	102-A02	103-A03	104-A04	105-A05	106-A06
	Date 2019-12-13	Scale	HB3 Chimney 8.5"x.5" Flue	Ambient Amb EPAsetup Ambient	B1 Firebox Top Ext. Metal	B2 Firebox Bottom Ext. Metal	B3 Firebox Left Ext. Metal	B4 Firebox Right Ext. Metal	B5 Firebox Back Ext. Metal
Heure de Test	Temps du Test	SCALE, lb	°C	°C	°C	°C	°C	°C	°C
11:44:30	00:00:02	649.80	195	23	304	98	274	262	268
11:54:30	00:10:02	666.35	297	24	529	105	264	253	260
12:04:30	00:20:02	664.50	262	24	560	113	250	242	236
12:14:30	00:30:02	662.85	243	23	519	117	241	236	226
12:24:30	00:40:02	661.35	237	23	509	118	235	234	217
12:34:30	00:50:02	659.85	235	23	509	117	232	235	213
12:44:30	01:00:02	658.35	235	24	523	117	231	238	213
12:54:30	01:10:02	656.95	224	24	521	117	232	240	217
13:04:30	01:20:02	655.75	227	24	526	117	235	243	223
13:14:30	01:30:02	654.60	220	24	526	116	239	246	231
13:24:30	01:40:02	653.95	153	24	359	118	243	247	242
13:34:30	01:50:02	653.75	119	23	263	120	241	245	247
13:44:30	02:00:02	653.60	107	23	233	121	234	242	250
13:54:30	02:10:02	653.45	101	23	218	121	228	239	251
14:04:30	02:20:02	653.30	98	23	212	122	222	236	251
14:14:30	02:30:02	653.10	95	23	206	122	217	234	250
14:24:30	02:40:02	653.00	94	23	200	123	213	232	250
14:34:30	02:50:02	652.85	92	23	196	122	209	228	250
14:44:30	03:00:02	652.70	90	23	192	123	206	224	251
14:54:30	03:10:02	652.60	89	23	188	123	203	220	252
15:04:30	03:20:02	652.45	88	22	186	123	200	216	252
15:14:30	03:30:02	652.40	87	22	182	123	199	213	252
15:24:30	03:40:02	652.25	86	22	180	123	198	210	252
15:34:30	03:50:02	652.10	85	22	176	123	196	208	252
15:44:30	04:00:02	652.00	84	22	173	122	194	205	251
15:54:30	04:10:02	651.90	83	22	172	123	192	201	250
16:04:30	04:20:02	651.75	83	22	170	122	189	199	250
16:14:30	04:30:02	651.65	83	22	171	122	188	196	250
16:24:30	04:40:02	651.55	83	22	171	122	186	195	251
16:34:30	04:50:02	651.40	83	22	170	122	185	193	251
16:44:30	05:00:02	650.85	83	22	166	122	185	191	251
16:54:30	05:10:02	651.15	83	22	166	122	185	191	252
16:55:30	05:11:02	651.10	83	22	166	121	184	191	252

Date: 2019-12-13

18.04 lb of red Oak
Average Moisture %dry: 21.6%
Aging time: 5h11m

"Core" et "Remainder"	Pièces	Long. (po)	Poids (wet) (lb)	ok?	Humidité %dry	%dry	%dry	Moyenne %dry	Ok ?	Poids (Dry) Total lb	kg
Charge "Core" Requis: 3 pièces	C1	12.0	2.85	Oui	22.3	19.0	18.5	19.9	Oui	2.38	1.08
	C2	12.0	2.85	Oui	22.0	25.1	15.7	20.9	Oui	2.36	1.07
	C3	15.75 max	4.22	Oui	25.3	22.1	19.5	22.3	Oui	3.45	1.57
Poids total du "Core"			9.92	Oui							
Charge "Remainder" Requis: 2-3 pièce(s)	R1	12.0	1.88	Non	27.0	25.7	26.3	26.3	Oui	1.49	0.68
	R2	12.0	1.93	Oui	21.5	15.0	23.8	20.1	Oui	1.61	0.73
	R3	15.75 max	4.31	Oui	19.3	25.0	19.1	21.1	Oui	3.56	1.61
Ratio poids - Pièces petites/grosses			44%	Oui	≤67% à respecter (+léger/+lourd)						
Poids total du "Remainder"			8.12	Oui							

Conformité de la charge totale (C+R)			Nbre de bûches au total	Détails de la Charge totale				
Poids de la charge totale C+R	18.04	Oui		Charge totale Hum Moy (%Dry)	21.6	Oui		
Poids "C" p/r à la charge tot. (45-65%)	55%	Oui		Hum. Moy. (%Wet)	17.8	Informatif	lb	kg
Poids "R" p/r à la charge tot. (35-55%)	45%	Oui	6	Charge totale - Poids (Dry)			14.84	6.73
Poids Charge p/r à poids cible (95-105%)	97%	Oui						
Densité actuelle de la charge	11.6	lb/ft³						

		(canal240)	#	101-A01	102-A02	103-A03	104-A04	105-A05	106-A06
	Date 2019-12-12	Scale	HB3 Chimney 8.5'±.5' Flue	Ambient Amb EPA set up Ambient	B1 Firebox Top Ext. Metal	B2 Firebox Bottom Ext. Metal	B3 Firebox Left Ext. Metal	B4 Firebox Right Ext. Metal	B5 Firebox Back Ext. Metal
Heure de Test	Temps du Test	SCALE, lb	°C	°C	°C	°C	°C	°C	°C
11:12:00	00:00:02	649.80	203	23	325	104	292	272	266
11:22:00	00:10:02	666.35	292	24	518	109	279	263	268
11:32:00	00:20:02	664.60	225	23	519	117	258	255	244
11:42:00	00:30:02	663.40	205	23	501	122	245	247	232
11:52:00	00:40:02	662.20	207	23	509	122	234	239	222
12:02:00	00:50:02	660.95	203	23	511	120	226	234	215
12:12:00	01:00:02	659.80	197	23	497	119	222	231	210
12:22:00	01:10:02	658.80	189	24	479	117	219	229	209
12:32:00	01:20:02	657.80	191	23	491	116	218	228	209
12:42:00	01:30:02	656.75	192	24	500	115	217	228	211
12:52:00	01:40:02	655.75	188	22	499	114	217	229	216
13:02:00	01:50:02	654.95	168	23	466	114	221	230	221
13:12:00	02:00:02	654.60	120	23	308	115	222	231	226
13:22:00	02:10:02	654.30	104	23	233	117	219	230	229
13:32:00	02:20:02	654.10	87	22	201	117	212	226	228
13:42:00	02:30:02	654.00	80	22	185	116	204	220	224
13:52:00	02:40:02	653.90	76	22	177	116	199	215	220
14:02:00	02:50:02	653.75	74	22	171	115	195	211	216
14:12:00	03:00:02	653.70	71	22	166	115	192	207	213
14:22:00	03:10:02	653.60	70	22	162	114	189	202	210
14:32:00	03:20:02	653.50	68	22	159	113	187	198	207
14:42:00	03:30:02	653.35	68	22	157	112	184	194	205
14:52:00	03:40:02	653.25	68	21	156	112	183	191	203
15:02:00	03:50:02	653.15	67	21	156	112	181	189	202
15:12:00	04:00:02	653.05	67	22	155	112	181	185	201
15:22:00	04:10:02	652.95	67	21	155	111	181	181	202
15:32:00	04:20:02	652.85	67	21	154	111	181	176	202
15:42:00	04:30:02	652.75	67	19	152	111	183	172	203
15:52:00	04:40:02	652.70	66	21	151	111	184	168	203
16:02:00	04:50:02	652.55	66	22	150	110	183	165	204
16:12:00	05:00:02	652.45	67	21	151	109	182	163	204
16:22:00	05:10:02	652.40	66	21	150	109	180	162	205
16:32:00	05:20:02	652.25	66	21	151	109	178	161	206
16:42:00	05:30:02	652.20	66	21	148	109	176	160	209
16:52:00	05:40:02	652.05	66	22	147	108	175	159	213
17:02:00	05:50:02	651.95	65	21	146	108	174	158	218
17:12:00	06:00:02	651.85	66	21	144	107	172	158	222
17:22:00	06:10:02	651.75	65	21	143	107	171	158	227
17:32:00	06:20:02	651.65	64	21	141	107	171	157	231
17:42:00	06:30:02	651.55	64	21	140	107	170	157	233
17:52:00	06:40:02	651.50	63	22	138	107	169	156	235
18:02:00	06:50:02	651.35	63	21	139	106	167	155	238
18:12:00	07:00:02	651.30	64	21	138	106	165	155	242
18:22:00	07:10:02	651.20	64	21	138	107	163	154	245
18:32:00	07:20:02	651.10	64	22	139	107	161	155	248
18:42:00	07:30:02	651.00	64	21	140	107	159	155	251
18:52:00	07:40:02	650.90	65	21	141	106	157	156	254
19:02:00	07:50:02	650.80	65	21	140	106	155	158	255
19:12:00	08:00:02	650.75	65	21	139	106	154	159	256
19:22:00	08:10:02	650.65	64	22	138	107	153	159	256
19:32:00	08:20:02	650.55	64	21	139	107	153	159	255
19:42:00	08:30:02	650.50	64	21	138	107	153	159	254
19:52:00	08:40:02	650.35	63	21	136	107	153	158	252
19:57:00	08:45:02	650.30	63	21	135	108	153	158	251

Date: 2019-12-12

17.97 lb of red Oak
Average Moisture %dry: 23.5%
Aging time: 8h45m

"Core" et "Remainder"	Pièces	Long. (po)	Poids (wet) (lb)	ok?	Humidité %dry	%dry	%dry	Moyenne %dry	Ok ?	Poids (Dry) Teorr lb	kg
Charge "Core" Requis: 3 pièces	C1	12.0	2.85	Oui	26.6	29.0	25.8	27.1	Oui	2.24	1.02
	C2	12.0	2.85	Oui	16.6	26.4	28.3	23.8	Oui	2.30	1.04
	C3	16.0	4.20	Oui	27.6	26.9	25.5	26.7	Oui	3.32	1.50
Poids total du "Core"			9.90	Oui							
Charge "Remainder" Requis: 2-3 pièce(s)	R1	12.0	1.90	Oui	23.3	23.8	14.0	20.4	Oui	1.58	0.72
	R2	12.0	1.87	Non	22.3	24.7	18.0	21.7	Oui	1.54	0.70
	R3	16.0	4.30	Oui	17.2	25.4	18.3	20.3	Oui	3.57	1.62
Ratio poids - Pièces petites/grosses			43%	Oui	≤67% à respecter (+léger/+lourd)						
Poids total du "Remainder"			8.07	Oui							

Conformité de la charge totale (C+R)			Nbre de bûches au total
Poids de la charge totale C+R	17.97	Oui	
Poids "C" p/r à la charge tot. (45-65%)	55%	Oui	
Poids "R" p/r à la charge tot. (35-55%)	45%	Oui	6
Poids Charge p/r à poids cible (95-105%	97%	Oui	
Densité actuelle de la charge	11.6	lb/ft³	

Détails de la Charge totale				
Charge totale Hum Moy (%Dry)	23.5	Oui		
Hum. Moy. (%Wet)	19.0	Informatif		
Charge totale - Poids (Dry)			lb 14.55	kg 6.60

		(canal240)	#	101-A01	102-A02	103-A03	104-A04	105-A05	106-A06
	Date	Scale	HB3	Ambient	B1	B2	B3	B4	B5
	2019-12-11		Chimney	Amb	Firebox	Firebox	Firebox	Firebox	Firebox
			8.5'±.5'	EPA set up	Top	Bottom	Left	Right	Back
			Flue	Ambient	Ext. Metal	Ext. Metal	Ext. Metal	Ext. Metal	Ext. Metal
Heure de Test	Temps du Test	SCALE, lb	°C	°C	°C	°C	°C	°C	°C
11:20:00	00:00:02	649.80	207.806	22.992	339.883	107.836	254.459	259.295	269.626
11:30:00	00:10:02	666.25	296.091	22.835	497.025	112.686	249.231	254.986	269.917
11:40:00	00:20:02	664.90	167.057	22.344	336.820	121.327	238.742	236.321	247.767
11:50:00	00:30:02	663.75	233.735	22.890	508.343	123.588	227.101	220.127	224.446
12:00:00	00:40:02	662.20	226.641	22.398	507.621	122.987	221.443	214.789	213.330
12:10:00	00:50:02	660.85	218.275	23.558	500.774	121.836	219.868	215.468	205.234
12:20:00	01:00:02	659.55	218.945	22.560	495.031	120.248	219.280	218.298	200.890
12:30:00	01:10:02	658.25	215.125	24.141	499.813	119.445	221.312	221.304	200.161
12:40:00	01:20:02	656.90	214.272	23.835	510.013	117.630	223.914	224.628	202.711
12:50:00	01:30:02	655.85	204.175	23.025	503.914	118.051	225.878	229.156	207.841
13:00:00	01:40:02	654.90	187.862	23.382	460.708	117.469	228.764	232.763	214.356
13:10:00	01:50:02	654.10	177.785	23.226	466.993	117.758	232.183	236.746	221.555
13:20:00	02:00:02	653.70	129.826	23.152	317.228	118.723	235.173	241.992	228.650
13:30:00	02:10:02	653.50	107.833	22.402	253.335	120.270	234.058	240.797	232.357
13:40:00	02:20:02	653.35	98.083	22.630	229.194	120.578	229.666	235.679	233.360
13:50:00	02:30:02	653.20	92.126	22.431	212.157	121.202	223.136	229.804	232.347
14:00:00	02:40:02	653.10	88.653	20.875	203.856	121.680	217.104	224.483	230.226
14:10:00	02:50:02	652.95	85.750	21.889	197.459	121.554	212.089	219.712	228.166
14:20:00	03:00:02	652.85	83.844	22.828	190.937	121.113	208.185	215.388	226.352
14:30:00	03:10:02	652.70	81.230	22.424	183.976	120.967	204.016	211.689	224.719
14:40:00	03:20:02	652.65	79.446	21.747	179.660	120.516	199.821	208.244	222.808
14:50:00	03:30:02	652.50	78.582	21.415	177.509	120.111	195.647	205.306	220.957
15:00:00	03:40:02	652.40	77.824	21.938	174.267	118.887	192.453	203.381	219.143
15:10:00	03:50:02	652.30	77.135	21.630	171.938	118.555	189.272	201.879	217.390
15:20:00	04:00:02	652.20	76.404	21.332	168.114	118.069	186.424	201.493	216.090
15:30:00	04:10:02	652.05	76.307	21.628	165.966	117.887	183.705	200.944	216.877
15:40:00	04:20:02	651.95	75.864	21.953	165.393	117.176	181.222	201.260	219.312
15:50:00	04:30:02	651.85	75.554	20.885	161.618	116.081	178.817	203.048	222.978
16:00:00	04:40:02	651.70	75.652	19.634	164.606	116.221	176.830	203.363	227.285
16:10:00	04:50:02	651.60	75.451	18.394	164.536	116.247	175.542	202.526	230.526
16:20:00	05:00:02	651.50	75.363	18.948	161.716	115.778	174.716	200.780	232.604
16:30:00	05:10:02	651.40	74.280	19.003	159.253	115.250	173.985	199.021	233.359
16:40:00	05:20:02	651.30	74.036	18.519	157.257	114.568	172.929	197.091	231.794
16:50:00	05:30:02	651.20	73.102	20.395	154.386	113.874	172.588	195.283	229.439
17:00:00	05:40:02	651.10	71.789	20.952	150.845	113.954	171.550	192.842	227.632
17:10:00	05:50:02	651.00	71.299	21.237	148.996	113.442	170.224	190.558	226.056
17:20:00	06:00:02	650.90	70.949	20.837	148.491	113.362	168.707	187.737	223.868
17:30:00	06:10:02	650.85	70.671	21.473	147.883	112.987	167.774	185.467	222.476
17:40:00	06:20:02	650.70	69.088	21.963	142.628	112.492	167.067	183.184	220.884
17:50:00	06:30:02	650.65	68.272	21.199	139.747	112.025	165.995	180.441	218.027
18:00:00	06:40:02	650.55	67.302	21.095	138.352	111.293	164.890	177.847	215.237
18:10:00	06:50:02	650.50	66.761	21.270	135.888	110.225	163.553	175.265	212.669
18:20:00	07:00:02	650.45	65.917	21.027	133.162	109.952	162.050	172.989	210.222
18:30:00	07:10:02	650.35	65.378	21.401	131.889	109.257	160.452	170.315	208.014
18:40:00	07:20:02	650.30	64.950	21.640	130.802	108.934	158.995	168.280	206.534
18:50:00	07:30:02	650.15	64.725	21.401	129.672	108.435	157.674	166.460	205.782
19:00:00	07:40:02	650.10	64.940	21.093	129.786	107.848	156.218	164.624	205.026
19:10:00	07:50:02	650.00	64.503	21.609	129.012	107.595	154.838	162.968	203.806
19:20:00	08:00:02	649.95	63.928	21.612	126.985	107.346	153.237	161.464	201.721
19:25:00	08:05:02	649.80	63.847	21.628	125.796	106.404	152.629	160.291	200.693

Date: 2019-12-11

17.83 lb of red Oak
Average Moisture %dry: 23.9%
Aging time: 8h05m

"Core" et "Remainder"	Pièces	Long. (po)	Poids (wet) (lb)	ok?	Humidité %dry	%dry	%dry	Moyenne %dry	Ok ?	Poids (Dry) Teorr lb	kg
Charge "Core" Requis: 3 pièces	C1	12.0	2.85	Oui	24.9	22.0	24.6	23.8	Oui	2.30	1.04
	C2	12.0	2.83	Oui	22.0	29.0	30.0	27.0	Oui	2.23	1.01
	C3	16.0	4.15	Oui	23.7	25.3	20.0	23.0	Oui	3.37	1.53
Poids total du "Core"			9.83	Oui							
Charge "Remainder" Requis: 2-3 pièce(s)	R1	12.0	1.89	Non	21.4	24.8	26.0	24.1	Oui	1.52	0.69
	R2	12.0	1.86	Non	26.0	24.9	19.0	23.3	Oui	1.51	0.68
	R3	16.0	4.25	Oui	18.0	25.4	26.0	23.1	Oui	3.45	1.57
Ratio poids - Pièces petites/grosses			44%	Oui	≤67% à respecter (+léger/+lourd)						
Poids total du "Remainder"			8.00	Oui							

Conformité de la charge totale (C+R)			Nbre de bûches au total	Détails de la Charge totale				
Poids de la charge totale C+R	17.83	Oui		Charge totale Hum Moy (%Dry)	23.9	Oui		
Poids "C" p/r à la charge tot. (45-65%)	55%	Oui						
Poids "R" p/r à la charge tot. (35-55%)	45%	Oui	6	Hum. Moy. (%Wet)	19.3	Informatif	lb	kg
Poids Charge p/r à poids cible (95-105%)	96%	Oui		Charge totale - Poids (Dry)			14.39	6.53
Densité actuelle de la charge	11.5	lb/ft³						

APPENDIX 5: Participants

Danick Power ing.
v-p operation
Services Polytests inc.
450.741.3636
www.polytests.com

Maxime Martin
Technicien
Services Polytests inc.
450.741.3636
www.polytests.com

Luc Gilbert
Technicien
ICC

APPENDIX 6: Drawings and specifications

APPENDIX 7: Operator's manual

Owner's Manual

Residential Factory Built Fireplace

Operation • Maintenance • Installation

PEARL 3600

Keep these instructions for future use.

WOODBURNING FIREPLACES

Industrial Chimney Company Inc.
400 J.-F. Kennedy, St-Jerome, QC, Canada, J7Y 4B7
Telephone: (450) 565-6336
www.icc-rsf.com

RSF-IIPRL3600 – 2020-01

Dear Customer,

The PEARL3600 incorporates technology with elegance to give you a beautiful view of the fire without compromising on heating efficiency or environmental quality.

We have designed your new PEARL3600 to be easy to install, operate and maintain. It is in your best interest to become familiar with it. Study your manual to be sure that the installation is correct, then follow the guidelines for operation and maintenance.

We at **RSF Woodburning Fireplaces** congratulate you on your choice of the PEARL3600, and are confident that you have purchased a fireplace that is *simply, the best*.

Sincerely,

RSF Woodburning Fireplaces Team

May 2020

TABLE OF CONTENT

SAFETY FIRST

DO'S AND DONT'S

If this fireplace is not properly installed, a house fire could result. For your safety, follow the installation directions. Contact your local authority having jurisdiction (such as municipal building department, fire department, fire prevention bureau, etc.) regarding restrictions and installation requirements, and the need to obtain a permit.

To ANYONE using this fireplace: these **DO's** and **DONT's** are for your safety.

1. **DO** read this instruction manual before lighting your first fire.
2. **DO** burn seasoned wood fuel or densified fuel logs or a combination of densified fuel logs and wood fuel.
3. **DO operate the fireplace with the door fully closed**. If the door is left partly open, gas and flame can be drawn out of the fireplace opening, creating both fire and smoke hazards.
4. **DO** keep all combustible materials (furniture, firewood, etc.) at least 4' away from the front of the fireplace.
5. This fireplace needs periodic inspection and repair for proper operation. **DO** learn to properly use it and maintain it.
6. **Do** have at least one smoke detector on each level of the house and at least one carbon monoxide detector.
7. To avoid glass breakage, **DO NOT** slam the fireplace door.
8. **DO NOT** ever use gasoline, gasoline-type lantern fuel, kerosene, charcoal lighter fluid or similar liquids to start or freshen up a fire in this fireplace. Keep all such liquids well away from the fireplace while it is in use.
9. DO NOT overfire the fireplace. If you are unable to slow down the burn rate of the fire or if the chimney connector behind the top louver glows red, you are overfiring the fireplace.
10. **DO NOT** use a fireplace grate or other products not specified for use with this fireplace.
11. The burn rates are set by the manual air control at the factory. **DO NOT** tamper with the air control. **DO NOT** install a flue damper that would allow you to reduce the chimney draft and thus slow the minimum burn rate.
12. To avoid damaging the fireplace, **DO NOT** operate it in a manner inconsistent with the operating instructions in this manual.
13. **DO NOT** install an insert in this fireplace.

◆ **NOTE:** We strongly recommend that our products be installed and serviced by professionals who are certified by the National Fireplace Institute in the U.S. or by Wood Energy Technology Transfer Inc. in Canada.

CREOSOTE: FORMATION AND REMOVAL

When wood is burned slowly, it produces tar and other organic vapors which combine with the expelled moisture from the wood to form creosote. The creosote vapors can condense in the relatively cool chimney of a slow burning fire. As a result, creosote residue accumulates on the flue lining. When ignited, this creosote makes an extremely hot fire.

The chimney should be inspected periodically during the heating season to see if a creosote build-up has occurred. The presence in a chimney of soot or creosote in excess of 1/8" (3mm) thick will indicate the need for immediate cleaning, possible modification of burning procedures, and more frequent inspections.

❖ **WARNING: BURN DRY WOOD ONLY.**
DO NOT BURN: DRIFTWOOD, TREATED WOOD, COAL, GARBAGE, OR PLASTIC.

Do not use construction scraps (e.g. 2x4 or plywood scraps) as your only supply of fuel as you can overheat and seriously damage the fireplace.

We do not recommend using wax fuel logs (e.g. Duraflame) in this fireplace because it will dirty the glass. If you choose to use them, do not use more than one at a time and do not poke or stir while it is burning. Use only firelogs that have been evaluated for fireplace use. In Canada, they must meet the requirements of ANSI/CAN/UL/ULC 2115, Processed Solid Fuel Firelogs and Firestarters. Refer to the firelog warnings and caution markings on packaging prior to use.

GENERAL SPECIFICATIONS

The PEARL3600 is environmentally friendly and meets the 2020 United States Environmental Protection Agency (EPA) particulate emission standard with cordwood at an average emission rate of 1.5 grams per hour.

It also has an optimal efficiency of 79%. This has been established using the high heating value of the wood, under the best burning conditions and using CSA B415.1-10 calculations.

Furthermore, the weighted average EPA efficiency is 74%. The later has been established using the higher heating value of the wood, while burning EPA cordwood and using CSA B415.1-10 calculations.

It has been shown to deliver heat ranging from 13 000 to 50 000 BTU/h with an average of 25 000BTU/h. Please refer to the "Improving efficiency", the "Importance of draft", the "Burn Time vs. Heat Output" and the "Fuel" sections to better understand the various factors that influence the efficiency and heat output of your fireplace.

THE COMBUSTION CONTROL SYSTEM

Since the door is sealed, all combustion air must come through the PEARL3600's primary air control.

For the first few days, it is best to operate the fireplace with the primary air control fully open (handle pushed to the far right). Just control the fire as you would any normal fireplace, using one or two logs at a time for a smaller fire, or more logs for more heat. Once you become familiar with operating the fireplace with the control open, you can start experimenting with lower settings.

OPTIONS

For increased air circulation and marginally more heat output, you can add an optional fan (FO-FDHB8, FO-FDHB5-N, new fan, FO-CIF).

If you have any rooms directly above or adjacent to the room with the fireplace that you would like to heat, you may want to consider the Gravity Vent Kits (FO-V2, FO-VGC or FO-V3). The gravity vent distributes hot air to these rooms without the need for a blower.

For a simple way to circulate a moderate amount of warm air from the fireplace to another room, we offer the Heat Dump Kit (FO-HD). It includes a 180 cfm blower and is most often used to provide supplemental heating to a basement room when the fireplace is on the main floor, but it can also be used to send the warm air to an adjacent room or upstairs.

◆ **NOTE**: Many options require wiring and/or electricity for their installation. If there is any chance that any of these options will be installed in the future then suitable wiring should be run during framing. Otherwise, it will be difficult to install these options later. You can refer to page 26 for a list of options that require electricity.

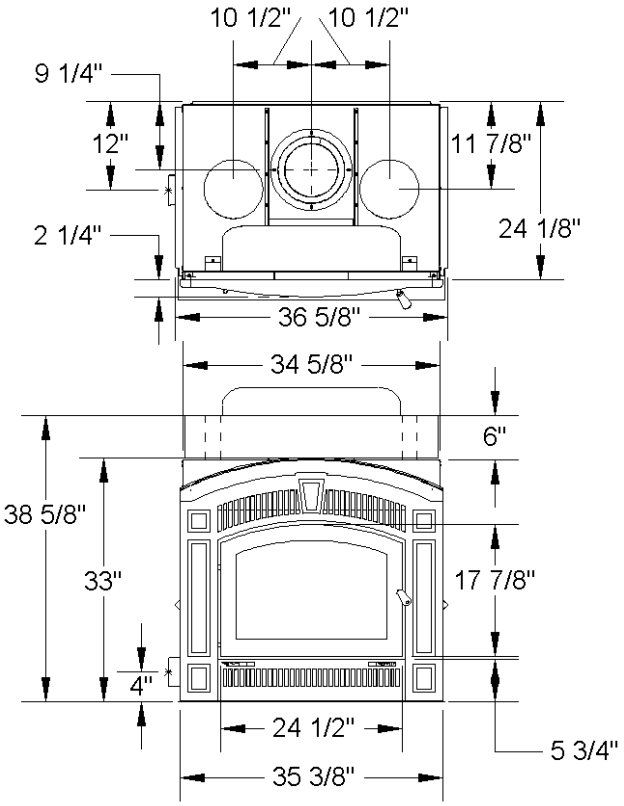
Detailed installation instructions are included in the box with each option. These can also be obtained from our Internet Web Site: www.icc-rsf.com.

❖**WARNING: THIS FIREPLACE HAS NOT BEEN TESTED WITH A GAS LOG SET (UNVENTED OR VENTED). TO REDUCE RISK OF FIRE OR INJURY, DO NOT INSTALL A GAS LOG SET (UNVENTED OR VENTED) INTO THIS FIREPLACE. DO NOT INSTALL A GAS LOG LIGHTER BECAUSE THE HEAT PRODUCED BY THE FIREPLACE WILL PERMANENTLY DAMAGE THE GAS LOG LIGHTER.**

UNIT DIMENSIONS AND CLEARANCES

For the side wall clearance

Distance from the fireplace side standoff to the side of the firebox opening:
$8^1/_8$"



For the mantel shelf clearance

Distance from the fireplace base to the top of the firebox opening:
22"

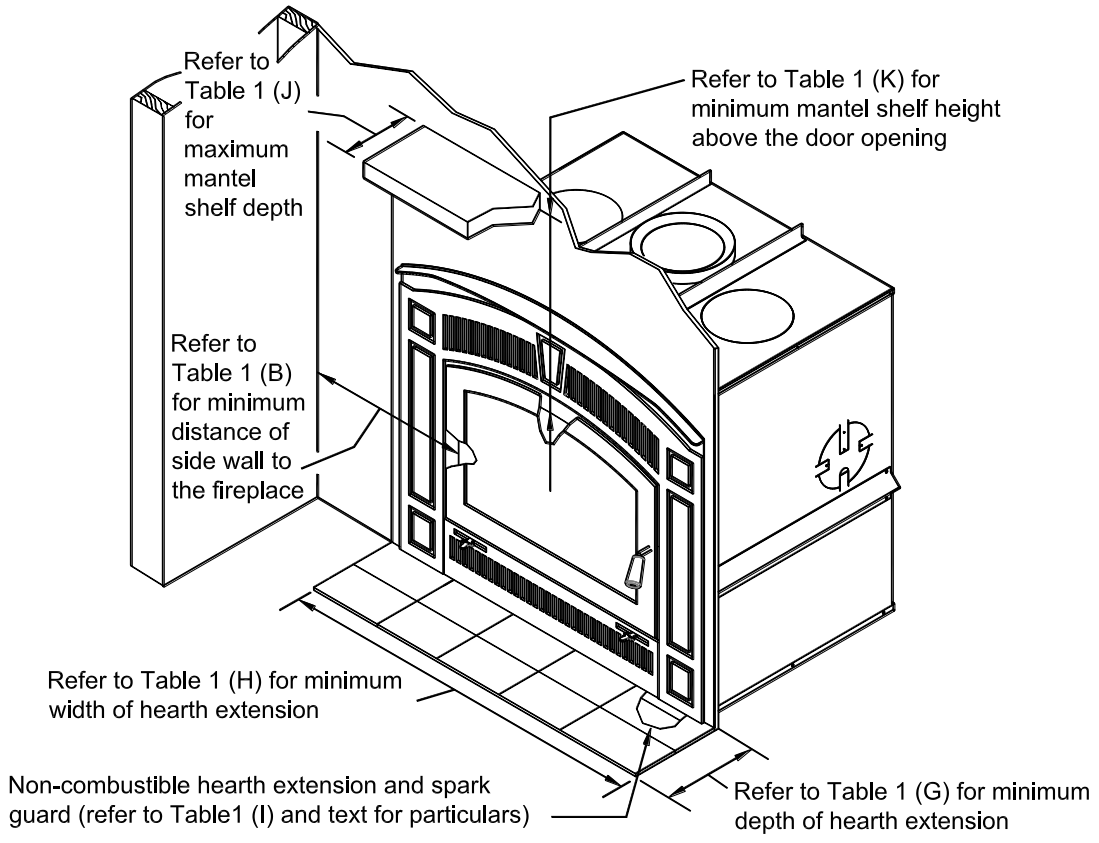


Figure 1 Unit Dimensions and Clearances

Table 1 Unit Dimensions and Clearances

A	Distance of combustible material from side, back and top standoffs	0" (0,0 mm)
B	Minimum distance from the side wall to the side of the firebox opening	12" (305 mm)
C	Minimum ceiling clearance: from the base of the fireplace to the ceiling • in the enclosure above the fireplace and • in the room in front of the fireplace	6' (1,83 m)
D	Minimum chimney height: minimum total chimney height from fireplace top to below the chimney rain cap – Refer to Table 3 on page 18 if elbows are present	12' (3,66 m)
E	Maximum chimney height: maximum total chimney height from fireplace top to below the chimney rain cap	45' (13,72 m)
F	Maximum chimney height supported by the fireplace	12' (3,66 m)
G	Minimum depth of non-combustible hearth extension: from the front of the fireplace	18" (457 mm)
H	Minimum width of non-combustible hearth extension: total width, must be centered on the firebox opening	40½" (1,03 m)
I	Minimum width of the spark guard	32½" (825 mm)
J	Maximum mantel shelf depth (see Table 2 for other mantel sizes)	12" (305 mm)
K	Minimum height of a combustible mantel shelf above the top of the firebox opening: to the bottom of the combustible mantel (refer to the "Installation: Mantel" section for particulars)	See Table 2

Table 2 Various Mantel Shelf Depths and Corresponding Installation Heights

Maximum Mantel Shelf Depth	Minimum Installation Height
0" to 4"	17"
12"	28½"

No combustible mantel shelf can be installed lower than 16½" above the top of the firebox opening. A combustible mantel shelf cannot be deeper than 12".

For any combustible mantel shelf depths between 4" and 12", you can calculate the minimum installation height. For example:

- Mantel shelf depth to be installed: 9½"
- So: ((**9.5"** – 4") x 1.4375) + 17" = 24.9 = 25"
- Thus minimum installation height of a **9½"** mantel: **25"** above the firebox opening.

If the combustible mantel shelf has a cross-section with variable depth, it has to be installed so that its widest part is not installed lower than the corresponding minimum installation height while making sure that the lowest point of the mantel is not installed lower the minimum installation height corresponding to it depth.

Refer to the "Installation: Mantel" section for particulars.

OPERATION

AIR CONTROLS

All the PEARL3600 air controls are located below the door (see Figure 2 and Figure 3).

Combustion Air Control

Unlike most open fireplaces, RSF fireplaces don't have flue dampers. Instead, the system is sealed by closing the door, and the amount of air entering the firebox is controlled by the combustion air control lever (see Figure 2). Setting the air control lever all the way open (towards the right) will allow the maximum amount of air into the firebox. Closing the air control (towards the left) will reduce the amount of air entering the firebox.

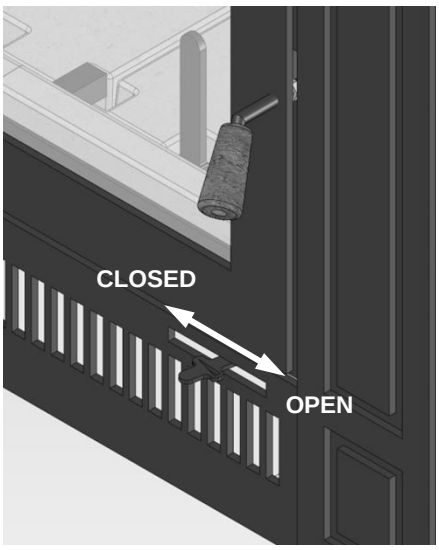


Figure 2 Combustion Air Control

Outside Air Control

The PEARL3600 is designed to use outside air for combustion (see Figure 3).

Setting the outside air control lever towards the left will completely open the outside air damper and allow fresh air into the base of the fireplace. Because outside air is generally colder and denser it will help to start the fire. In some cases, fresh air will help compensate for negative pressure problems within the house; however, it will not prevent the fireplace from smoking in a severely depressurized house.

We recommend always using outside air for combustion, but you may choose to use room air for combustion instead. To do so, move the outside air control lever towards the right to close the outside air damper. This control should be closed when the fireplace isn't burning to prevent cold air infiltration.

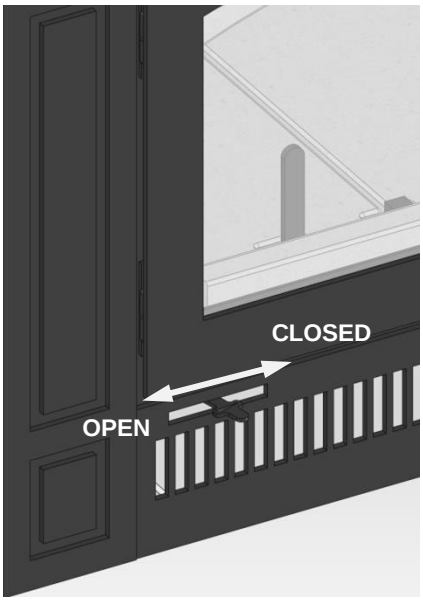


Figure 3 Outside Air Control

IMPROVING EFFICIENCY

The location of your fireplace will affect how efficiently it heats the home. Your fireplace should be located in part of the house you want to be the warmest. Trying to heat the main floor with a fireplace in the basement will generally overheat the basement and waste fuel. Certain RSF options offer the ability to move heat from the main floor to the basement. This allows you to efficiently heat your primary space while also heating the basement as a secondary space.

The efficiency will also be influenced by the draft in the chimney which will be influenced by various factors (refer to "Importance of draft" below) and by the amount of wood burning at any point (see "Burn Time vs. Heat Output" below). The efficiency will also be influenced by the quality of the wood (refer to "Fuel" below).

All of these factors must be taken into account and optimize so you can recover the maximum heat from your fireplace.

IMPORTANCE OF DRAFT

Draft is the natural force which pulls air from the fireplace up the chimney. The strength of draft in your chimney depends on a variety of factors, including chimney height, nearby obstructions, altitude, etc.

Excessive draft can result in a hotter fire than intended or reduced burn times as more air is pulled through the fireplace. It will also result in less heat recovery since the heat will not have as much time to irradiate into the room before being sucked into the chimney.

Weak draft can result in smoke entering the room and difficulty lighting or operating the fireplace. Weak draft is often incorrectly associated as a blockage in the air intake for the fireplace. Adding chimney height is the most common solution. See Table 3 for minimum chimney height recommendations.

BURN TIME VS. HEAT OUTPUT

The faster your fireplace burns the more heat it will create; however, faster fires result in much more hot air flow up the chimney which means you are sacrificing efficiency. Fast burning fires (lots of air) go through much more wood than slow burning fires. To get the most out of your PEARL3600 fireplace, adjust the combustion air control lever at the appropriate time. If the fire seems to be burning too quickly, turn the air down. If the fire is smoldering and there are no visible flames, turn the air up. This way you'll always be getting the most out of your fuel.

FUEL

All modern high efficiency fireplaces and woodstoves are designed to burn best with seasoned cordwood. Seasoned wood can be defined as wood that has been cut, split and let dry under cover for a minimum of 6 months, preferably a year or more. Dry seasoned wood generally contains less than 20% moisture content. Attempting to burn fuel with a high moisture content will be difficult and result in lower efficiency, increased creosote buildup and dark deposits on the glass. It's possible to burn a very large amount of wood and get very little heat if the wood is wet.

The type of wood you select is also important. All types of wood give off more or less the same number of BTU's per pound. Since softer woods are less dense than hardwoods it is possible to put more weight of hardwood in the firebox; in other words, all woodburning appliances will burn longer and more evenly with hardwoods. Never burn scrap, garbage, treated wood or driftwood as they produce much more pollution and can corrode the firebox and chimney as well. Burning large amounts of paper, cardboard, mill ends, or construction waste can easily over fire and damage the fireplace or even ignite a chimney fire if the flue is dirty.

FIRST FIRES

You will experience a slow start-up during the first few fires. The refractory bricks lining the firebox contain moisture from manufacturing and require a few hot fires to evaporate the moisture. While there is still moisture in the bricks, they will be black with smoke deposits. When the moisture has dissipated, the bricks will turn white. Unlike cast iron stoves, there is no need to cure the fireplace itself by starting with small fires and progressively larger ones. Feel free to light a large fire from the very start.

You will experience a slight odor during the first few fires. This odor comes from curing paint and oil burning off the metal. The odor may be strong enough to set off your smoke detector. Open the doors and windows to allow the room to properly ventilate.

LIGHTING

Ensure that the combustion air control lever is all the way in the open position. You will want as much air as possible for the lighting process.

We recommend that you prepare your fire in a top-down fashion. This will make for a faster start and a cleaning burn while starting.

Start by laying 2-3 layers of small wood pieces (about 10 pieces of 1" to 2" in diameter). Criss-cross the pieces so there is plenty of air circulation in between. Then continue by criss-crossing your kindling (about 20 pieces the size of your fingers) on top of the small wood. You can then add a few pieces of paper on top. **Never use any flammable liquid.** Light the fire at the top of the pile and close the door most of the way, but do not shut it completely. If the door is positioned correctly you will see air rushing into the fireplace, this will help the lighting process. Wait about 2 minutes and then close the door completely. The fire should continue to burn. If it looks like it wants to smolder, crack the door open for another minute or two before closing it again. The amount of time to keep the door slightly ajar at startup is dependant on the height of your chimney and the outside temperature: the higher and the colder, the longer the door needs to remains cracked but it should never be more than 5-6 minutes.

Once most of the startup fuel is down to a nice coal bed, add cordwood according to you needs, up to 6 logs at a time. The first layer of logs should be oriented front to back (i.e. North/South). The second layer should then be oriented left to right. Always put at least 2 layers of logs criss-crossed together, this will help them to light to burn cleanly. Again keep the door cracked for a couple of minutes while the bottom logs catch on fire, then you can close the door completely.

Keep the combustion air control on maximum until the next reload. This will help establish a strong draft in the chimney before you reduce the combustion air, ensuring a cleaner burn at the same time.

❖ **WARNING: DO NOT USE A GRATE OR ELEVATE THE FIRE.**

❖ **WARNING: MAKE SURE TO KEEP THE FIRE BEHIND THE FRONT STEP. REPLACE THE LOGS IF THEY FALL AGAINST THE GLASS.**

CONTROLLING YOUR FIRE

To get maximum efficiency out of your fireplace you will want to adjust the amount of air entering the firebox at the appropriate times. Gauge how much to close the combustion air by how the fire reacts once the combustion air control lever has been moved. If the fire goes out and begins to smolder, there's too little combustion air entering the firebox. If this happens, reopen the combustion air control and wait a little longer before attempting to restrict the air again. If there's no change to the burn pattern, you can continue to close the combustion air further. Always close the combustion air control gradually, never from maximum to minimum in an instant. Eventually you should be able to close the combustion air all or most of the way. There should always be visible fire inside the firebox at every step of the process. It is normal for some installations that the air control cannot be fully closed and maintain a fire. Every home, installiaton, and draft is unique. Ensure there is visible flame to keep the glass and chimney clean.

REFUELING

Have your next wood load ready when you open the door. The temperature in the firebox will decrease as the door is open, so decreasing the amount of time the door is open will allow the firebox to remain hot. Do not rush.

Turn off the fans, if installed. The fans may cause smoke to spill out of the fireplace if they are running.

The door should be opened slowly to keep smoke from spilling into your room. If you have a problem with smoke spillage, check to see that all kitchen and bathroom fans have been shut off. They can cause negative pressure in the house which pulls smoke out of the fireplace.

Take the time to poke and stir the unburnt wood that is left in the firebox. This will help revive the fire. Place the new logs in the firebox. Try to maintain a clear a path in front of the pilot, which is the metal tube centered between the two andiron posts. The pilot brings an influx of air close to the coals that will help to keep the fire going. Once the new wood has been loaded, keep the door slightly ajar for a couple of minutes to get the fire going depending on how well seasoned your cordwood is and how much coals were left in the firebox. Once the new wood it well lit, close the door.

You can now adjust the combustion air control according to your needs.

If you have a fan installed,

- wait about 45 minutes after reloading before you start the fan again if you have the combustion air control set to anything between half-way to minimum
- wait about 20 minutes after reloading before you start the fan again if you have the combustion air control set to anything between half-way to maximum.

TROUBLESHOOTING PROBLEMS

If smoke comes into the house when the door is opened:

- You may have opened the door too quickly and created a suction of air into the room, this can be avoided by opening the door more slowly.
- Ensure your chimney is clean and your chimney cap is not plugged. Chimney caps with screens are more likely to become clogged with creosote buildup.
- Make sure you have adequate chimney height for your system. Refer to the Chimney section of this booklet and make sure to take altitude, and number of elbows into consideration.
- If you have purchased the inline fan, make sure the blower is off before opening the door.
- Check to see if other fans in the home are running, particularly a kitchen range hood, or bathroom exhaust fan. This can affect the pressure in the home.

- Try opening a window near the fireplace a little, this will equalize the pressure in the home and should correct a draft problem. Once proper draft is established the window can be closed.
- Make sure you've used enough kindling to establish a hot fire quickly. The most likely time that smoke will enter the home is during the lighting process.

If your fireplace burns excessively fast, seemingly uncontrollably:

- Check all door seals and gaskets to ensure that air is not leaking into the firebox. See "Door Adjustment" for details of how to verify the tightness of the door.
- Inspect the secondary air tubes in the top of the fireplace to ensure they are in good condition. An unwanted hole in the secondary air tubes can bring additional unwanted air into the fireplace.

MAINTENANCE

CHIMNEY CLEANING

Check the chimney for creosote buildup every week or so until experience shows how often you need to clean it. A buildup of 1/8" (3 mm) or more should be cleaned before more creosote accumulates. Close the fireplace door prior to sweeping. Use an 6" round brush.

The baffle in the firebox can be pulled forward or completely removed to gain better access to the flue from below. Whether you decide to remove it or pull it forward, great care should be given not to damage the back secondary air tube with the sweeping brush or while moving, removing and/or reinstalling the baffle.

To pull the baffle forward, simply pull it over the front secondary air tube.

To remove the baffle, first remove the front secondary air tube. Simply unscrew the secondary air tube on the left side, slide the tube toward the right until the left end drops out of its hole. Slide the tube back towards the left to get the right end out of its hole. To remove the baffle, push up and slide it off the brackets.

Do not forget to replace both the baffle and the secondary air tube as you removed them and be sure to properly orient the secondary air tube.

DISPOSAL OF ASHES

Remove the ashes before they become too deep, i.e., before you have a spillage problem when you open the door. The ashes should be placed in a metal container with a tight-fitting lid. 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. If the ashes are disposed of by burial, or otherwise locally dispersed, they should be retained in the closed container until all cinders have thoroughly cooled.

GENERAL CLEANING

The high heat paint can be cleaned with a soft damp cloth. Use a mild detergent and water. Do not use abrasive cleaners.

GLASS CLEANING

In a controlled combustion firebox, temperatures are not always high enough to keep the glass perfectly clean. A good hot fire once a day usually cleans off most of the deposits that have accumulated. Remember: the drier the wood and the hotter the fire, the cleaner the glass. A word of caution: although heat will not break the glass, impact can. Be careful not to hit the glass.

❖ **WARNING: NEVER CLEAN THE GLASS WITH AN ABRASIVE CLEANER UNLESS SPECIFIED FOR THAT PARTICULAR USE. USE ONLY A CLEANER RECOMMENDED BY YOUR DEALER. NEVER CLEAN THE GLASS WHILE IT IS HOT, A SERIOUS BURN CAN RESULT. THERE ARE A NUMBER OF EXCELLENT WOOD STOVE GLASS CLEANERS AVAILABLE WHICH ARE FAR SUPERIOR TO REGULAR GLASS AND OVEN CLEANERS FOR WOOD STOVE APPLICATIONS.**

PAINT

❖ **WARNING: AVOID SPRAYING CERAMIC GLASS CLEANER OR OTHER CLEANERS ON THE PAINT OF THE FIREPLACE. THEY MAY REMOVE THE PAINT AND MAKE TOUCHUPS DIFFICULT.**

You can touch up the face of the PEARL3600 with *Stove Bright* Metallic Black high temperature paint which is available at most fireplaces dealers. Follow the directions outlined on the spray can. **DO NOT** attempt to paint the fireplace while it is still warm. Keep the spray can away from any source of heat or open flame. Ensure that there is adequate ventilation in the room from the time you start painting until the paint is dry. *Stove Bright* is available in a wide range of colors if you want to change the color of your PEARL3600.

We recommend that you take the time to protect or remove any item that you do not want to paint such as: the door glass, the plated door, the fireplace surroundings, etc. The glass can be removed from the door but you will have to replace the window gasket.

DOOR ADJUSTMENT

To check for a proper door seal, insert a sheet of paper between the door and the front of the fireplace and latch the door. Pull gently but firmly on the sheet of paper. If the paper either tears or is hard to retrieve, the adjustment is correct. Repeat this procedure along all sides of the door.

The most important factor for controlling the burn rate of the PEARL3600 is a good seal on the door gasket. If the door gasket is worn or damaged to the point where the seal is not adequate as described above, then remove and replace the gasket. Replacement kits are available from your RSF dealer.

If needed, the hinges can be adjusted to improve the alignment of the door latch with respect to the hole in the fireplace facing, and for easy installation/removal of the door.

◆ **NOTE:** An improperly adjusted door seal can have a significant effect on the performance and durability of the fireplace. A poorly adjusted door can result in reduced efficiency, over firing, excessive wood consumption and premature fireplace failure.

INSTALLATION

Check with your local authority having jurisdiction (such as municipal building department, fire department, fire prevention bureau, etc.) regarding restrictions and installation requirements, and the need to obtain a permit.

◆ **NOTE:** We recommend that you remove the door until after all finishing work is completed around the fireplace. This will reduce the possibility of scratches, vandalism, or damage to the finish caused by drywall dust, muriatic acid, plaster, cement, paint or any other harmful spray or liquid.

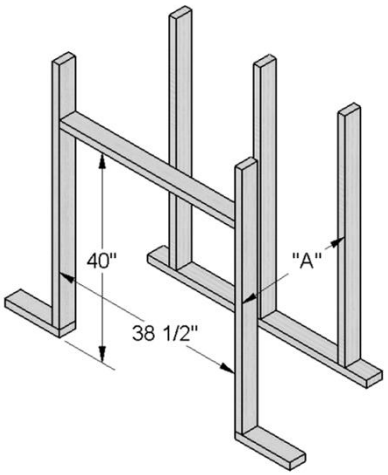
LOCATION

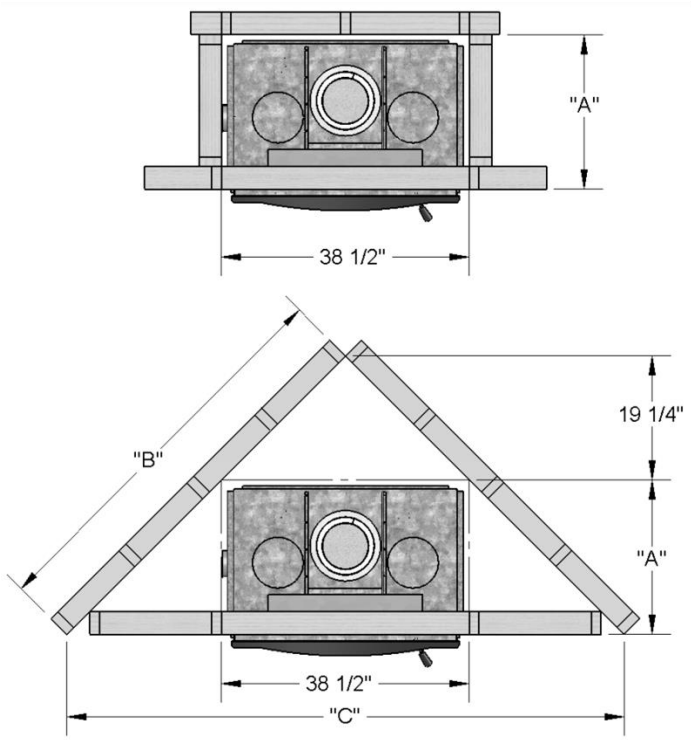
Your PEARL3600 fireplace may be installed in many different ways (see Figure 4) without any special floor reinforcement. We recommend that you take the time to plan your entire installation (fireplace, chimney, and options) before beginning the actual installation (refer to Figure 5).

Dimensions of the fireplace along with clearances are shown in Figure 1 and Table 1.

❖ **WARNING: IF THIS FIREPLACE IS NOT PROPERLY INSTALLED, A HOUSE FIRE CAN RESULT. FOR YOUR SAFETY, FOLLOW THE INSTALLATION INSTRUCTIONS AND CLEARANCES. DO NOT PACK REQUIRED AIR SPACES WITH INSULATION OR OTHER MATERIALS.**

1. Note the location of roof and floor joists. Try to choose a location that does not require cutting them.
2. Do not build shelves or cupboards in the area above the fireplace. This space must be kept empty.
3. If at all possible, run the chimney up through the inside of the house. If it must be run outside, it should be enclosed in an insulated enclosure (see Installation: Chase Enclosure). Remember, a cold chimney causes poor draft.





Please refer to the "Finishing " section starting on page 15 for description of each finishing scenario.	Depth of the Rectangular Enclosure "A"	Depth of the Corner Enclosure "B"	Width of the Corner Enclosure "C"
Flat Facing	24 ½"	62"	87 ½"
Thin Facing	24"	61 ¼"	86 ½"
Thick Facing	23 ½"	60 ½"	85 ½"

The framing dimensions are larger than required for ease of installation. The Heat Dump Option will require an extra 12" on the selected side.

Figure 4 PEARL3600 Framing Examples

FRAMING

The enclosure walls can be framed with any suitable materials (2x4 or 2x6 studs, plywood, gypsum board, etc.). Because of the high heat output potential of the PEARL3600, combustible materials must NOT go closer to the fireplace than the standoffs, top, back and sides.

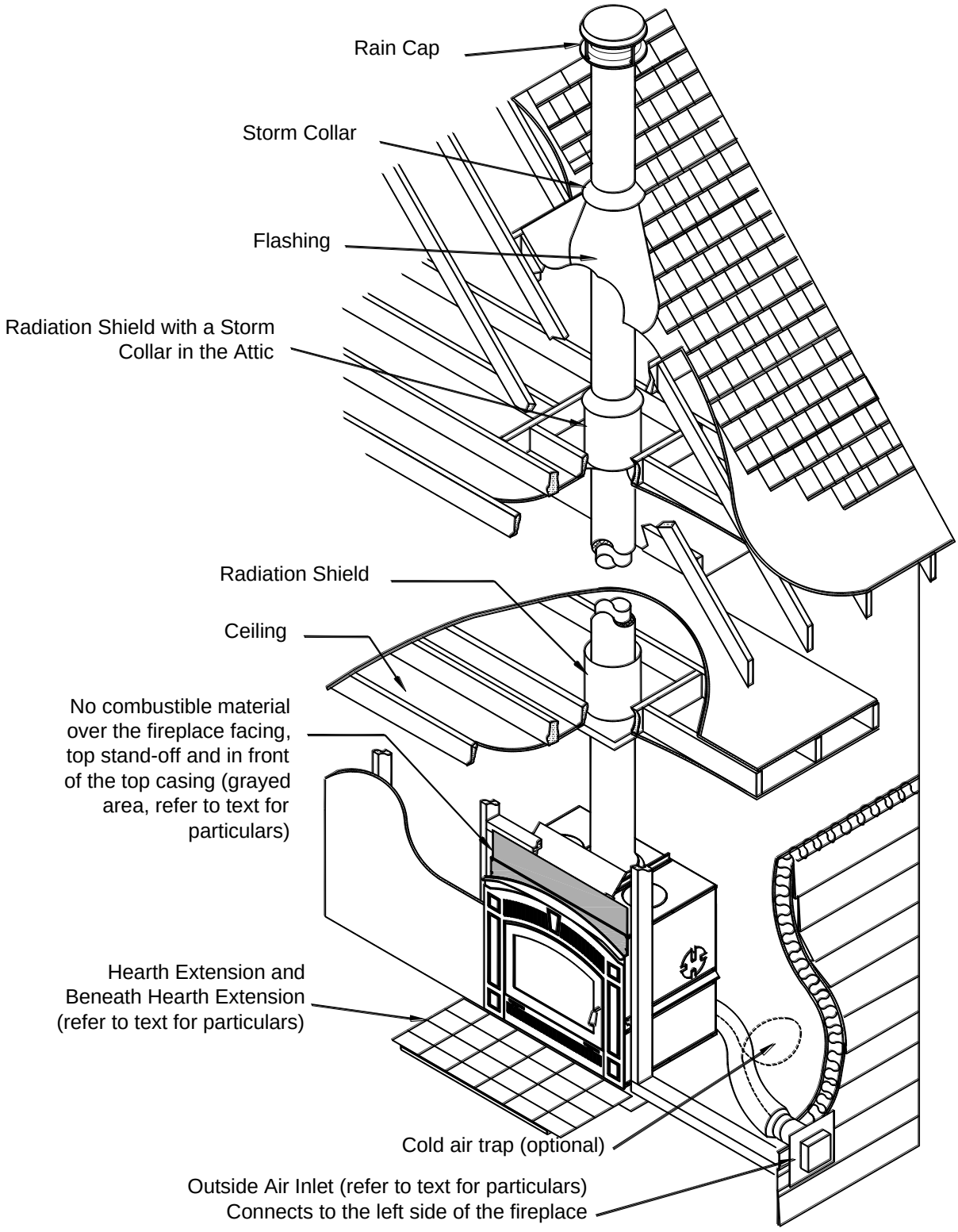


Figure 5 PEARL3600 General Installation

CEILING CLEARANCE

Ceiling clearance is the distance from the base of the fireplace to the ceiling. Under no circumstances should the distance between the ceiling firestop and the base fireplace be less than the dimension specified in Table 1 (C).

STANDOFF INSTALLATION

Before you begin installing your fireplace, you MUST install the standoff provided on the top of the fireplace.

The back shield MUST be open on the back side as shown at the top of Figure 6. You can then install the standoff on the fireplace as shown in Figure 6 with the screws provided in the manual bag.

DO NOT fill the gap between the fireplace and the standoff with insulation or any other material; it will be covered with the finishing material.

NOTHING CAN BE PLACED BELOW THE HEADER SUPPORTS OF THE TOP STANDOFF WHETHER COMBUSTIBLE OR NOT. THE SPACE MUST REMAIN EMPTY.

SECURING THE FIREPLACE IN PLACE

Once the fireplace is in its final location, take the time to attach it to the floor. Using at least two of the five small brackets that were securing the fireplace to the crate, attach the casing of the fireplace to the floor. If possible, try to have at least one, if not two, of the brackets screwed into the floor joists with 2" wood screws.

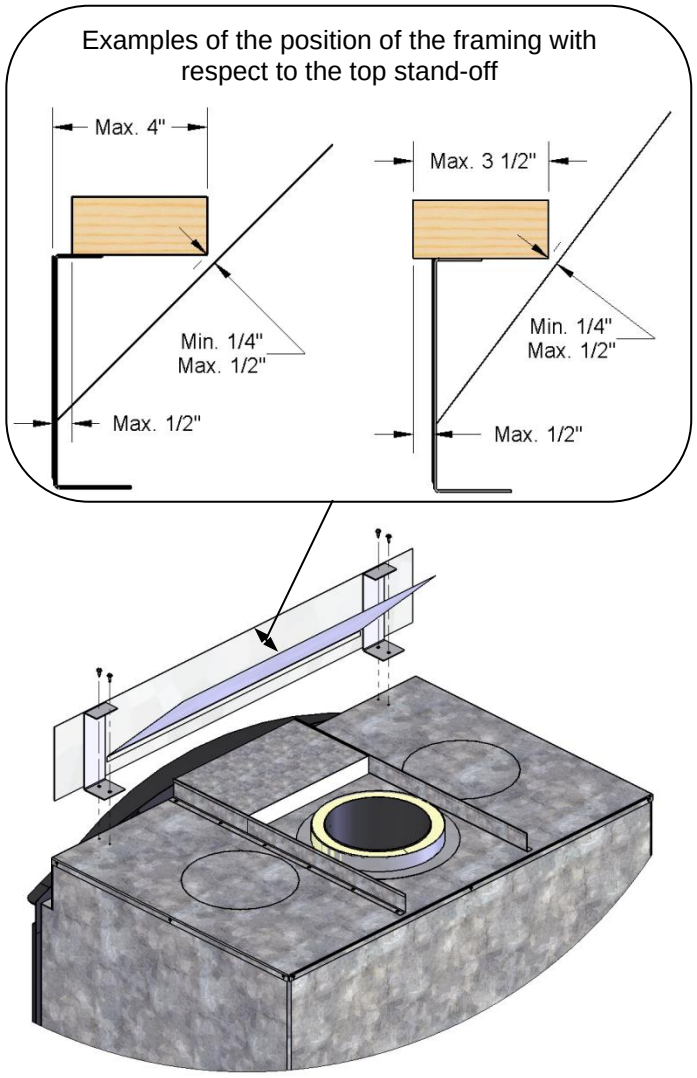


Figure 6 Standoff Installation

OUTSIDE AIR DUCT

After the fireplace is correctly positioned, connect the outside air inlet to the fireplace.

Use an insulated aluminium flexible duct rated at over 200° F. The duct should not exceed 12' vertical rise above the base of the unit. We suggest using the 4" RSF outside air kit (FO-INT).

The air inlet should always be at least 5' lower than the chimney rain cap and must never terminate in attic spaces.

A 4" diameter duct can be used if the total duct run is less than 25'. For longer runs, use 5" diameter duct. Both 4" and 5" connecting sleeves are provided with the fireplace.

1. Find a convenient location for the insulated flexible duct and outside air inlet. The outside air inlet can be above or below floor level (see Figure 7).

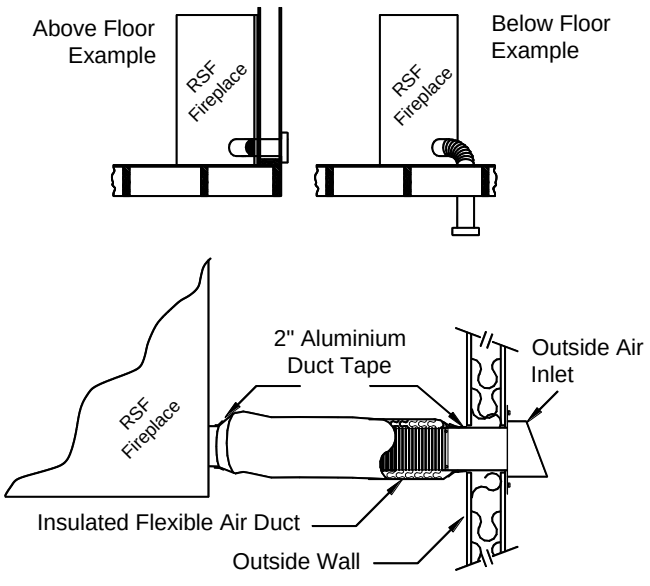


Figure 7 Outside Air Connection and Installation Example

2. Make a 4 ¼" (5 ¼" if using a 5" diameter duct) hole in the outside wall of the house. Push the outside air inlet in from the outside. Seal the joint between the air inlet and the outside wall with an appropriate sealant.

3. Place the insulated flexible duct over the round sleeve on the outside air inlet. At both ends, carefully pull back the insulation and plastic cover, exposing the flexible duct. Then at each end, attach the duct with metal screws to the air inlet and to the fireplace connecting sleeve. Carefully push the insulation and cover back over the duct. Tape the plastic cover in place with 2" aluminium duct tape.

❖ CAUTION: WHEN RUNNING THE DUCT AROUND CORNERS, BE SURE TO PREVENT CRIMPING THE DUCT IN A WAY THAT WOULD RESTRICT THE COMBUSTION AIRFLOW.

FINISHING AROUND THE FIREPLACE

The decorative faceplate of the PEARL3600 fireplace is not meant to be covered, it is meant to be admired. **DO NOT** cover the decorative faceplate of the fireplace or any of its louvers.

The decorative faceplate of the PEARL3600 extends ½" beyond the sides of the fireplace to be able to hide the edge of the finishing material behind it. There is also a 1" indentation in the top of the casing to allow for easy finishing behind the rounded top of the decorative faceplate.

Before you begin, remove the decorative faceplate and bottom louver to prevent damaging them while installing the finishing materials. To remove the faceplate, use a 5/32 allen key and remove the two screws located on either side of the faceplate's keystone centerpiece (see Figure 8). Once the bolts are removed, the faceplate will be loose, so with one hand holding the faceplate in place, close the door. Take a good grip on both side of the faceplate and lift it up. There are two brackets, one on each lower side, that need to be disengaged from the base of the fireplace. Do not lose the hardware that secures the faceplate to the fireplace.

To remove the bottom louver, simply open the door, grab the top of the louver close to each extremity and pull forward. There are two high temperature magnets, one on each side, close to the top of the louver keeping it in place along with two supports close to the bottom of the louver to support the weight of the louver.

If desired, you can also remove the glass door by lifting it off its hinges

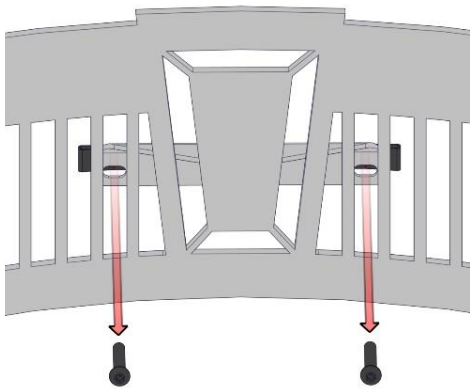


Figure 8 Location of the Screws Securing the Decorative Faceplate

Facing Requirements

Finishing materials that cover the facing of the fireplace MUST BE NON-COMBUSTIBLE (e.g. brick, slate, ceramic tile, etc.). Drywall cannot get closer to the fireplace than the side and top standoffs. The front face of the top standoff is considered part of the fireplace facing (see Figure 5). Framing shown in the Figure 9 and Figure 10 is based on the recommended framing shown in Figure 4.

Plan the finishing of the fireplace in advance and plan for the material thickness including the adhesive coat. You MUST be able to reinstall the decorative facing properly, or it may become a safety hazard.

Top View - Cross section of Fireplace, Framing and Facing (refer to Figure 10)

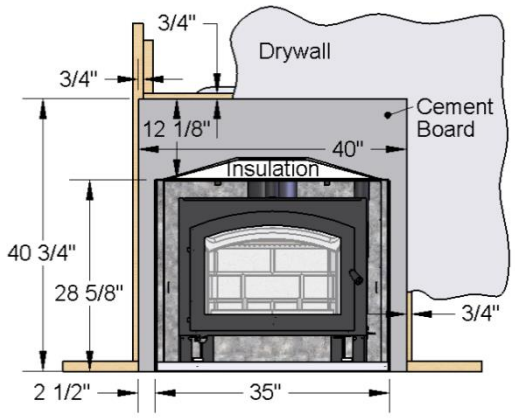
The non-combustible finishing materials may be installed so that they fit behind the decorative faceplate. Refer to Figure 10 and adjust the position of your framing to accommodate the thickness of the finishing material you have selected.

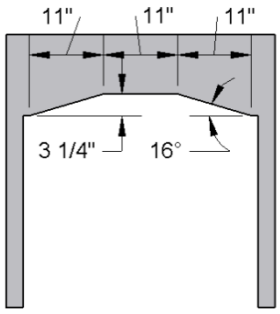
❖ WARNING GYPSUM BOARDS OR ANY OTHER COMBUSTIBLE MATERIAL CANNOT TOUCH THE CASING OF THE FIREPLACE. ONLY NON-COMBUSTIBLE MATERIAL SUCH AS CEMENT BOARD CAN TOUCH THE FIREPLACE CASING.

Framing cannot be recessed more than 1½" from the back of the decorative faceplate or more than ½" back from the front of the top standoff (see Figure 6). To accommodate thick non-combustible finishing materials (e.g. materials > 1"), use the decorative faceplate as a template and install them so that they protrude past the decorative faceplate.

Flat Facing Installations:

cement board contacting sides of fireplace with drywall

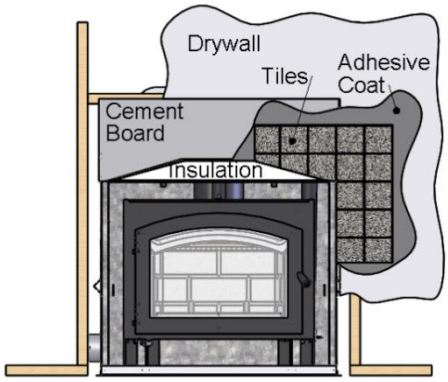


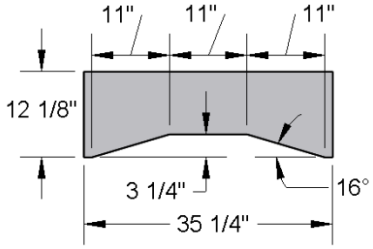


Cement board interior cut detail. A template was provided on the cardboard packaging of the fireplace

Other Installations:

cement board only on top with drywall no closer than side and top standoffs





Cement board cut detail. A template was provided on the cardboard packaging of the fireplace

Figure 9 Facing Examples – Front Views

Flat Facing (refer to Figure 9 and Figure 10)

The PEARL3600 can be finished by simply surrounding it with cement board and painting it to provide a flat facing look.

- Align the front of the framing so that it is recessed ½" back from the decorative faceplate (or ½" in front of the top standoff, see Figure 6). It should be in line with the front of the notched portion of the side standoff.
- Cover the sides and the top area of the fireplace with a non-combustible material such as a cement board. Use the template provided in the cardboard packaging of the fireplace to cut the cement board to the appropriate shape. The decorative faceplate will cover the edge of the cement board against the fireplace casing.

  Remember: **ONLY NON-COMBUSTIBLE MATERIAL SUCH AS CEMENT BOARD CAN TOUCH THE FIREPLACE CASING.**
- The rest of the wall (beyond the standoffs) can be covered with regular drywall.

Thin Facing (refer to Figure 9 and Figure 10)

The PEARL3600 can also be finished with thin facing materials such as ceramic tiles that are less than 1" thick including the adhesive coat.

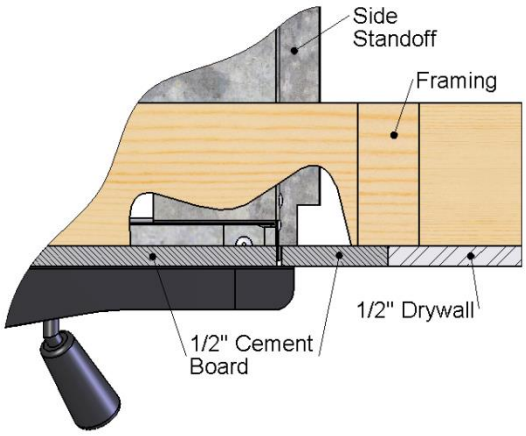
- Align the front of the framing so that it is recessed 1" – 1½" back from the decorative faceplate (flush - ½" back from the top standoff, see Figure 6). Adjust this distance based on the thickness of your facing material and add ½" for drywall.
- The area directly above the door must be covered with non-combustible material (see Figure 9). If using cement board, a template was provided in the cardboard packaging to achieve the appropriate shape.
- The rest of the wall (beyond the standoffs) can be covered with regular gypsum boards.

Remember: **GYPSUM BOARDS OR ANY OTHER COMBUSTIBLE MATERIAL CANNOT TOUCH THE CASING OF THE FIREPLACE.**

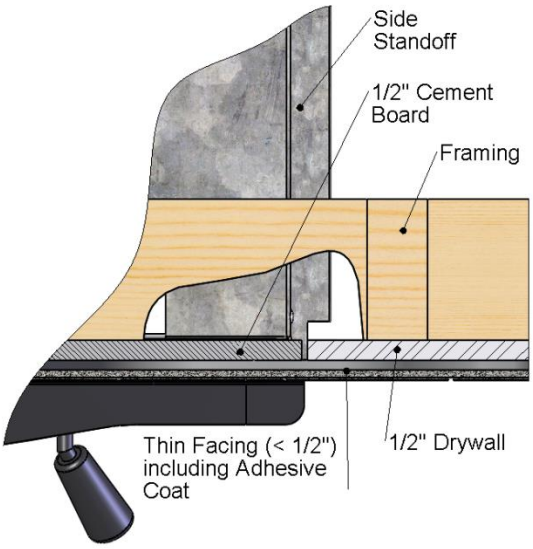
- Apply your adhesive coat and thin finishing material to the wall so it will fit behind the decorative faceplate.

Thick Facing (refer to Figure 9 and Figure 10)

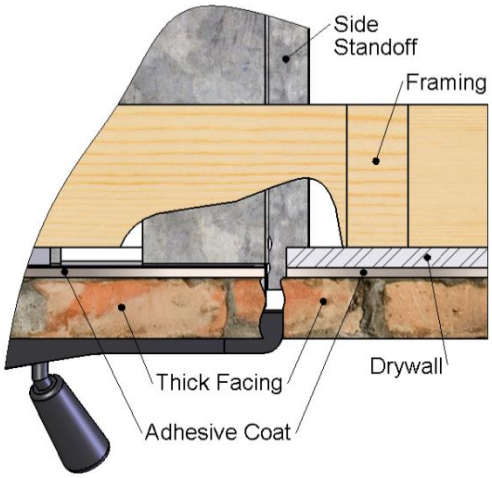
You can also finish your PEARL3600 with materials that will result in a combined thickness greater than 1" (e.g. brick, stone, etc.). These materials will not fit behind the decorative faceplate and will protrude past the faceplate once installed. **If you are using thick finishing materials, then the decorative faceplate of the PEARL3600 can be used as a template**.



Flat Facing: requires cement board due to the direct contact to the fireplace casing



Thin Facing (< 1", including the drywall)



Thick Facing (≥ 1")

Note: Framing shown is based on the recommended framing in Figure 4.

Figure 10 Framing Alignment Examples – Top Views

CHIMNEY

This fireplace is certified for use with 6" ICC Model EXCEL chimney only. Please refer to Table 1 (D-E) for the minimum and maximum chimney heights permitted with the PEARL3600 fireplace.

We recommend that the minimum height be increased by approximately 6" for every 1000' elevation above sea level. Every 15°, 30° or 45° offset (one pair of elbows) also increases the minimum height. See Table 3 for more precise recommended flue heights.

For example, if you are living 6015' above sea level, your chimney should terminate at least 15' from the top of the fireplace if it is a straight chimney or at least 18'6" if one 30° offset is used as shown in Table 3.

Table 3 Minimum Recommended Flue Heights

Elevation (ft)	Number of Offset						
	Straight Chimney	1 x 15°	2 x 15°	1 x 30°	2 x 30°	1 x 45°	2 x 45°
0 - 1000	Minimum 12’	13’	14’	15’	18’	16’	20’
1001 - 2000	12’6”	13’6”	14’6”	15’6”	19’	16’6”	20’
2001 - 3000	13’	14’	15’	16’	19’6”	17’	21’6”
3001 - 4000	13’6”	14’6”	15’6”	17’	20’	18’	22’6”
4001 - 5000	14’	15’	16’	17’6”	21’	18’6”	23’
5001 - 6000	14’6”	15’6”	17’	18’	21’6”	19’	24’
6001 - 7000	15’	16’	17’6”	18’6”	22’	20’	24’6”
7001 - 8000	15’6”	16’6”	18’	19’	23’	20’6”	25’6”
8001 - 9000	16’	17’	18’6”	20’	24’	21’	26’6”
9001 - 10000	16’6”	17’6”	19’	20’6”	24’6”	22’	27’

Flue height is measured from the top of the fireplace to the top of the chimney before installing the rain cap.

If you have two different offsets (two pairs of different elbows), simply use the column for two offsets of the biggest pair of elbows at your elevation to get your Minimum Flue Height.

CHIMNEY INSTALLATION

Make sure to read the EXCEL Chimney installation manual concerning requirements for supports, bracing, anchors, etc. Refer to Table 1 (F) for the maximum chimney height that can be supported by the top of the fireplace.

❖ **WARNING: THE CLEARANCE BETWEEN THE CHIMNEY AND COMBUSTIBLE MATERIAL MUST BE 2" OR MORE. DO NOT FILL THIS AREA WITH INSULATION.**

1. Cut and frame the required holes in the floor(s), ceiling(s) and roof where the chimney will pass through. The rough opening in the framing is 12" square (the opening can be slightly bigger, but NEVER smaller).
2. From below, install a radiation shield in each floor through which the chimney passes. At the attic level, install a radiation shield and a storm collar as shown in Figure 11.

   ❖ **WARNING: A RADIATION SHIELD MUST BE INSTALLED AT EACH FLOOR WHERE THE CHIMNEY PASSES THROUGH.**

3. Place the first length of chimney on the fireplace. Secure the chimney length to the fireplace with the three screws provided. Assemble the rest of the chimney.

The chimney must extend at least 3' above its point of contact with the roof and at least 2' higher than any wall, roof, or building within 10' of it. If the chimney is higher than 5' above the roof, it must be secured using a roof brace.

4. Put the roof flashing into place. Seal the joint between the roof and the flashing with roofing tar or an exterior sealant. For sloping roofs, place the flashing under the upper shingles and on top of the lower shingles. Secure the flashing to the roof using roofing nails or roofing screws.

   If the chimney is enclosed to the roof:

   - In **USA**: use a vented flashing;
   - In **Canada**: use a vented flashing, or a roof radiation shield with a regular flashing.

   ❖ WARNING: DO NOT BLOCK ANY OF THE OPENINGS IN THE VENTED FLASHING WITH SEALANT, CAULKING OR ANY OTHER MATERIALS.

5. Place the storm collar over the chimney and flashing. Place a bead of exterior sealant around the chimney below the storm collar, pull the storm collar through the sealant and seal it once again on the top with the exterior sealant (**DO NOT use roofing tar**).

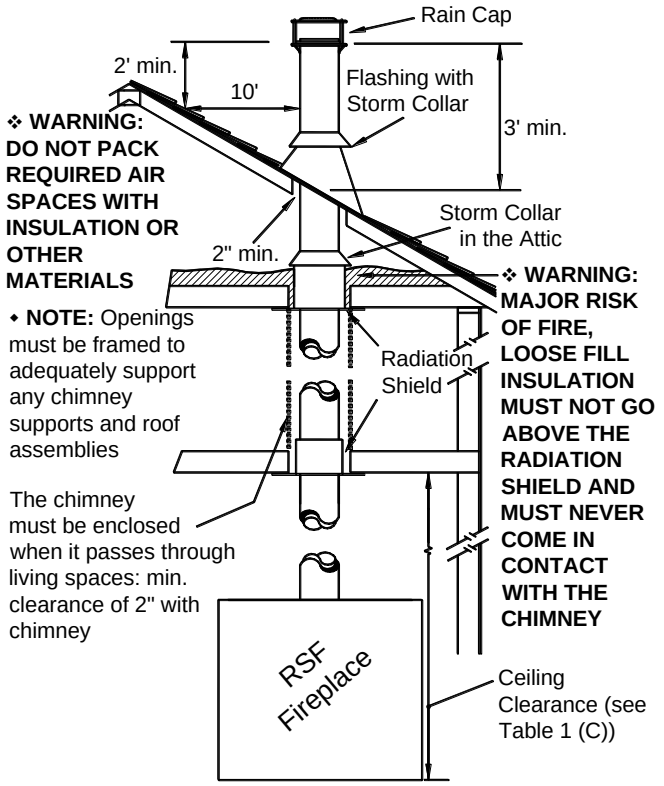


Figure 11 General Chimney Installation

6. Fit the rain cap on the chimney. Secure it tightly in place.

OFFSET CHIMNEY

An elbow may be installed directly on top of the fireplace if required. See the detailed offset charts in the EXCEL chimney installation manual. Use the offset option if you need to clear a joist or pass around a cupboard. See Figure 12 and Figure 13 for examples.

- Maximum offset angle:
  - In **USA**: 30°;
  - In **Canada**: 45°.
- Maximum number of elbows: four, resulting in two offsets and returns.

Install the fireplace and chimney as described earlier. When you require an elbow, proceed as follows:

1. Install the required elbow. Turn it in the desired direction, and fasten it to the chimney length with the three metal screws provided at the joints.
2. Install enough lengths to obtain the desired offset. Secure each joint with three metal screws. Refer to the offset charts provided with the EXCEL chimney installation manual for exact offset dimensions.

   If the chimney goes through an outside wall as shown in Figure 13 and is enclosed on the other side of the wall, then the outside plate of the angled wall rediation shield MUST NOT be installed.
3. Use another elbow to return the chimney to the vertical direction.
4. Install a roof support, a wall support, or an offset support above each offset to support the weight of the chimney (elbows are not designed to support the chimney above an offset).

Through the Wall Offset

You can also go through the wall at an angle starting directly at the fireplace as depicted in Figure 13. An angled wall insulated radiation shield (XM-6EWRSI30 or XM-6EWRSI45) must be used wherever the chimney passed through an exterior wall. Make sure you have enough ceiling height. If not, you might want to consider installing the fireplace in an outside chase.

If the chimney is enclosed once outside of the house, do not install the outside plate of the angled wall insulated radiation shield.

Refer to the angled wall insulated radiation shield installation sheets for more detailed installations instructions.

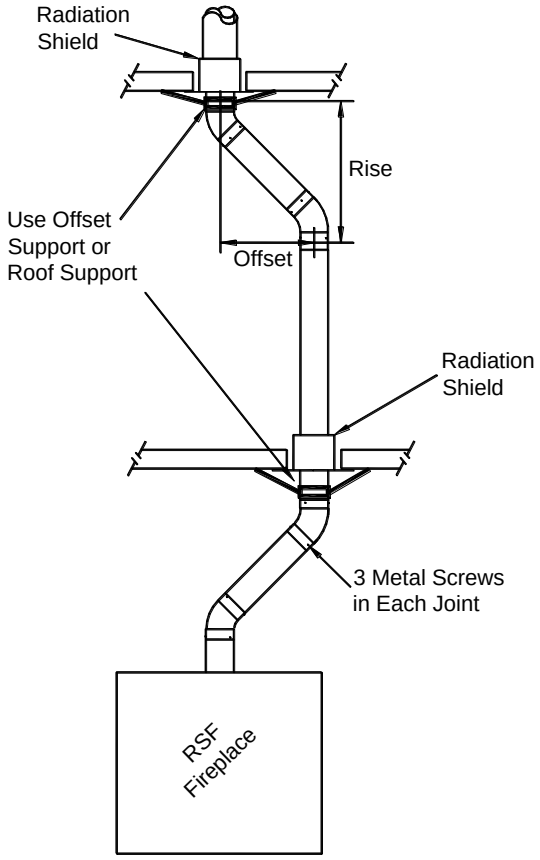


Figure 12 Offset Chimney Installation Example

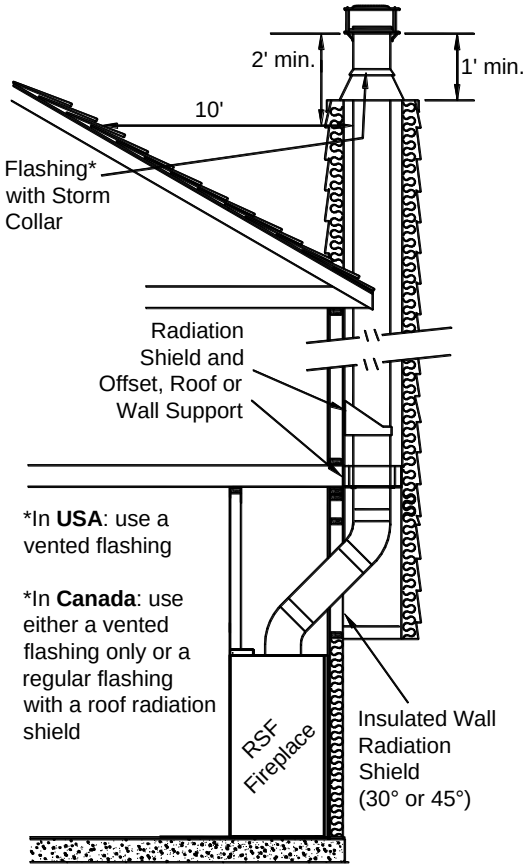


Figure 13 Offset Chimney Through a Wall Example

CHASE ENCLOSURE

If the chimney runs up the outside of the house, we recommend that it be enclosed in a chase structure. The chase should be constructed in such a way that it is an extension of the home (see Figure 14). It should be well insulated between the footings and the floor of the home to prevent heat loss. If the climate in your area is mild, insulate the chase at least to the first firestop. If the climate in your area is very cold, insulate the chase to the top to keep the chimney warmer, increase the draft, and reduce creosote buildup. We also recommend insulating the ceiling of the chase just as if it were in the attic space. This will prevent cold air from dropping down through the chase and into the room where the fireplace is installed (see Figure 14).

Some local codes require that the walls be insulated, vapor sealed and sheathed with a fire rated gypsum board (see Figure 14). We strongly recommend this procedure for all installations to prevent cold drafts from originating in the fireplace enclosure. If you follow this procedure, we recommend that you do not insulate the wall above the front of the fireplace.

◆ **REMEMBER:** Check local codes concerning installation requirements and restrictions in your area.

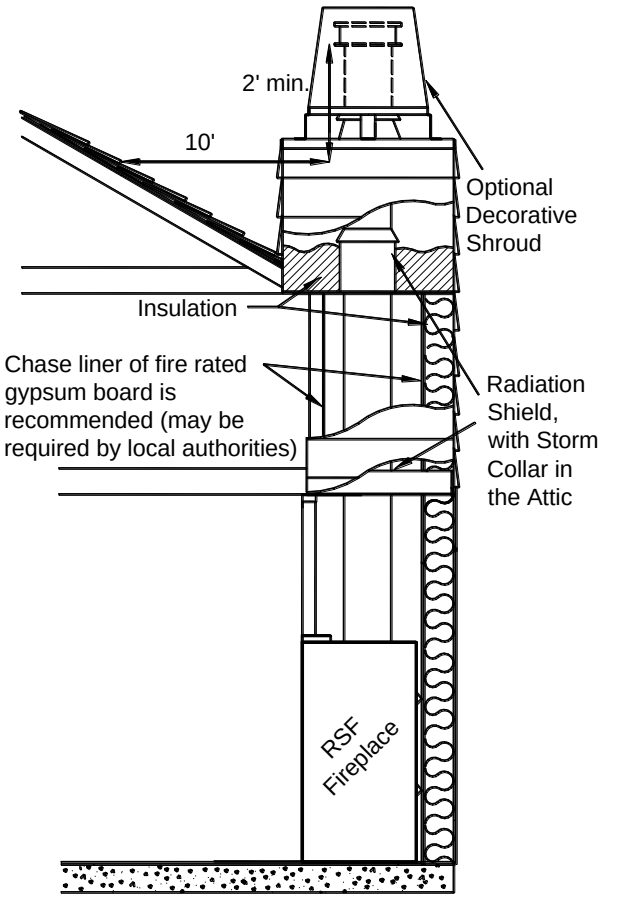


Figure 14 Chimney Installed with a Chase Enclosure Example

MASONRY CHIMNEY

Installing your PEARL3600 fireplace with a masonry chimney still requires using EXCEL chimney from the top of the fireplace to where it will connect to a listed liner that will run up inside the masonry chimney (see Figure 15).

The stainless-steel liner should be fitted inside the clay liner all the way to the top of the masonry chimney. It is not meant to replace the clay liner. You can use either the EXCEL liner or any other listed liner to ULC-S635, ULC-S640 or UL-1777.

Special care is to be taken to make sure that you have a good solid connection between the EXCEL chimney and the liner. A masonry adaptor (FO-FDM6) was designed specifically for that purpose and is available from your RSF dealer. It will attach to the liner with 3 stainless steel rivets (provided) and to the EXCEL chimney with 3 screws (provided).

After mortaring in place, the connection between the EXCEL chimney and the liner should not be visible in order to isolate the heat released through the liner from the fireplace enclosure.

As depicted in Figure 15, you must install at least one 18" length of EXCEL chimney after the EXCEL chimney elbow. The uppermost part of the EXCEL chimney - where it enters the masonry chimney - must be a minimum of 12" from the ceiling.

◆ **NOTE:** If the ceiling is high enough, you can install one or more EXCEL

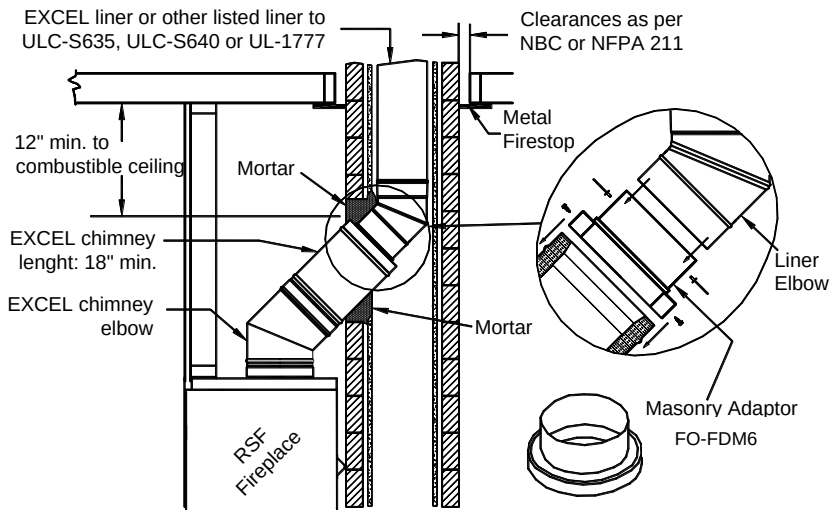


Figure 15 Connection to a Masonry Chimney

chimney lengths directly on the fireplace before the elbow.

If you use a flexible liner, make sure to be careful when cleaning to ensure that the stainless-steel flexible liner is not dislodged in any way.

Using an Existing Masonry Chimney

❖ **WARNING: IF YOU ARE CONSIDERING USING AN EXISTING CHIMNEY, IT MUST FIRST BE THOROUGHLY INSPECTED BY AN AUTHORITY HAVING JURISDICTION TO DETERMINE THE FOLLOWING:**

1. The masonry chimney is well constructed and fully lined, in accordance with Local Building Codes and the National Building Code of Canada (NBC) or National Fire Protection Association chimney standard (NFPA 211).
2. It has been thoroughly cleaned of any soot or creosote residue and inspected to determine that it is in good working condition.
3. There is no insulation of any type in contact with the masonry chimney and there is no insulation stuffed anywhere in the chimney.
4. All the necessary clearances around the masonry chimney, along the complete run of the chimney, are respected as per NBC or NFPA 211. If the masonry chimney is enclosed in drywall, openings will probably be required in order to verify clearances at all points.
5. The masonry chimney will only be used for the fireplace and no other appliance.

If major repairs are required to meet the above conditions, a new chimney should be constructed.

To make the hole through the masonry chimney and make the connection to the fireplace, we recommend that you follow these steps:

1. Sight-in and mark the outline of where the EXCEL chimney will penetrate the masonry chimney.
2. Using a large (¾" - 2") masonry drill bit, drill a hole exactly in the center of the oval outline. With a masonry hammer and drill, slowly enlarge the hole to the size required. Remember to work from the center out. Be especially careful with the clay liner behind the brick because three sides of it must stay in place.
3. Bring the stainless-steel liner down from the top of the chimney.

   If you are using a rigid liner you will need enough room to secure an elbow to it with at least two screws.

   If it is difficult to install rigid stainless steel liner in the existing masonry chimney or for a masonry chimney with less than 10"x10" inside, a listed stainless steel flexible liner can be used along with a flexible/rigid adaptor (LM-6LAF) available from your RSF dealer.
4. Install the liner elbow and masonry adaptor on the lower end of the liner.
5. Move the fireplace forward enough to install the EXCEL chimney on the fireplace (elbow and length) then move the fireplace back into position as you connect the masonry adaptor to the EXCEL chimney.

Using a New Masonry chimney

Since the masonry chimney is not build yet, we recommend that you position your fireplace, install the EXCEL chimney on it and connect to the first length of liner before building the chimney as explained above and shown in Figure 15 . The liner sections can easily be installed as the layers of brick are being placed. Since this is a new chimney, we recommend that you build it to the right size, so you do not have to ovalize the liner.

◆ **Remember:** The stainless-steel liner should be fitted inside the clay liner all the way to the top of the masonry chimney. It is not meant to replace the clay liner.

HEARTH EXTENSION

The area immediately in front of the fireplace must be protected by a non-combustible material such as brick, tile, stone, or slate. Refer to Table 1 (G-H) for the depth and width that the hearth protection should extend beyond the front and both sides of the door opening (see Figure 1). There is no minimum thickness required for the hearth extension.

BENEATH THE HEARTH EXTENSION

If the PEARL3600 is installed on a non-combustible floor, NONE of the cement board and the spark guard specified below is not required.

Install the spark guard provided (5" x 36" piece of sheet metal) halfway under the fireplace and halfway under the hearth extension and centered on the door opening. The spark guard will extend 2½" beneath the fireplace. This will make certain that sparks cannot lodge in this area and start a fire. If necessary, the provided spark guard can be cut to the minimum width specified in Table 1 (I).

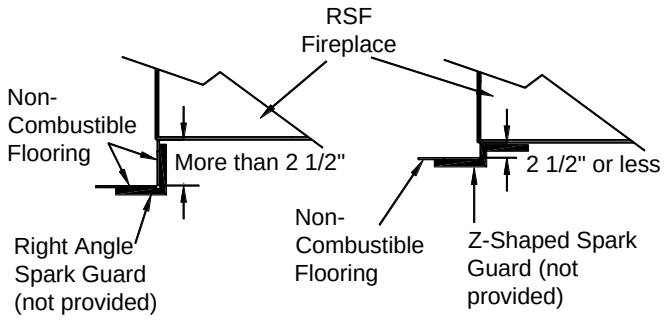


Figure 16 Special Custom-made Spark Guard

If you are preparing a raised installation, you will need a custom made spark guard, either a "Z" shaped spark guard or a right angle spark guard (see Figure 16). The Z-shaped spark guard must be used if the height between the bottom of the fireplace and the top of the non-combustible flooring of the hearth extension is less than or equal to 2 ½". The height of the Z-shaped spark guard must equal the distance between the floor and the base of the unit and go under the hearth extension and the fireplace by at least 2½". If the unit is installed higher than 2 ½" from the top of the flooring, a right-angle spark guard is necessary. The sides of the right-angle spark guard should be at least 2½" x 2½" and must be covered with non-combustible material. Any custom made spark guard must have the minimum width specified in Table 1(I), and be installed centered on the door opening.

◆ **NOTE**: Custom-made spark guards are site built.

In the USA only:

A ½" cement board, such as Durock®, HardieBacker ® or equivalent, MUST be installed beneath the hearth extension. The cement board must have the same minimum dimensions as the hearth extension (see Table 1 (G-H)). If the fireplace is raised by at least 4", the cement board is NOT required.

The spark guard must be installed under any of the layers of the hearth extension.

MANTEL

Masonry and other non-combustible mantels (shelf and posts) can be placed anywhere around the fireplace facing. If the non-combustible mantel is located between the top of the fireplace facing and the specified height for a combustible mantel, then the wall portion between the top of the fireplace facing and the mantel must be covered in non-combustible material. If the non-combustible mantel is located at the same height allowed for a combustible mantel, or higher, then no special wall covering is required below the mantel.

For combustible mantels shelves, please see Table 1 (J-K) for the maximum depth of the mantel shelf and their clearance requirements. See Figure 1 for an example.

Vertical mantel posts on the sides of the fireplace opening must be non-combustible. Combustible mantel posts are not permitted unless they meet the clearance required to a perpendicular sidewall (see Table 1 (B)).

REFRACTORY BRICK INSTALLATION

Before lighting your first fire, you must make sure the refractory bricks are properly installed inside the firebox. To remove any of the refractory bricks, just follow the installation procedure in the reverse sequence. Refer to Figure 17 to identify which refractory brick is the left and which is the right at each step of the installation.

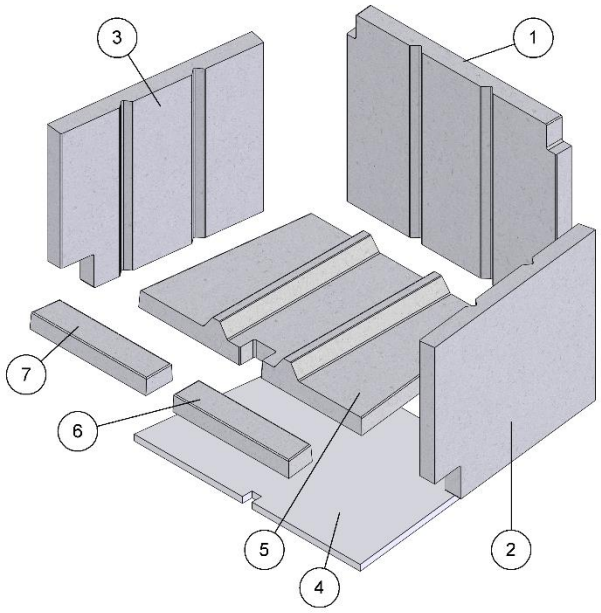


Figure 17 Refractory Bricks Installation

1. First, start by placing the rear refractory brick in the firebox (1), then the right side (2) and left side (3) refractory bricks (3).
2. Continue by installing the soft insulation (4) on the bottom of the firebox. It fits tight between the front and the back refractory brick and between both side refractory bricks.
3. Then install the bottom refractory brick (5).
4. Finally, install the two front refractory bricks (6 on the right and 7 on the left).

These refractory bricks have been designed specifically for the PEARL3600 and no modifications are required to ensure a proper fit.

LISTING LABEL

The listing label is glued to the bottom of the fireplace. Just remove the bottom louver; the listing label is below the floor shield.

Will be available soon.

COMPLETE OPTIONS LIST

		Electricity Required
FO-CID	Intake Duct (necessary for FO-CIF)	
FO-CIF	Inline Fan (needs also FO-CID)	✓
FO-DUCT5	Insulated Duct 5 feet	
FO-GRK9	Gasket Replacement Kit	
FO-FDHB5-N	Internal Blower Kit	✓
FO-FDHB8	Internal Blower Kit	✓
New	Internal Blower Kit	✓
FO-FDM6	Masonry Chimney Adapter 6"	
FO-HD	Heat Dump Kit	✓
FO-INT	Outside Air Kit 4" Diameter	
FO-V2	Gravity Vent Kit	
FO-V3	Rectangular Gravity Vent Kit	
FO-VGC	Contemporary Grill for for FO-V2	

REPLACEMENT PARTS

Use only genuine RSF parts. The use of any substitutes will void the warranty and may put your safety at risk.

Will be available soon.
Contact your RSF dealer.

LIMITED WARRANTY

30 Years Limited Warranty

All RSF Woodburning Fireplaces models are warranted against defects in material and workmanship for a period of 30 years, subject to the following conditions:

During the first year **RSF Woodburning Fireplaces** will repair or replace, at our option, any parts which upon examination by an authorized **RSF Woodburning Fireplaces** representative, are found to be defective, except the parts listed in the EXCLUSIONS portion of this warranty. **RSF Woodburning Fireplaces** will also pay reasonable labor costs for the repair work.

During the second through fifth years **RSF Woodburning Fireplaces** will repair or replace, at our option, any parts which upon examination by an authorized **RSF Woodburning Fireplaces** representative, are found to be defective, except the parts listed in the EXCLUSIONS portion of this warranty. **RSF Woodburning Fireplaces** shall not be responsible for any labor costs associated with this repair work.

During the sixth through thirtieth years **RSF Woodburning Fireplaces** will provide replacement parts, if available, at 50% of the published retail price, except for the parts listed in the EXCLUSIONS portion of this warranty. **RSF Woodburning Fireplaces** shall not be responsible for any labor costs associated with this repair work.

EXCLUSIONS:

- Electrical components are warranted for one year only.
- Glass and plating.
- Andirons (front and back parts).
- Damage due to normal wear and tear, such as paint discoloration, worn gaskets, eroded or cracked refractory components.
- Repairs or replacements necessitated by vandalism, neglect, abuse, over-firing, improper fuel or fuel loads, or failure to adequately service the unit, as stated in the owner's manual.
- Repairs or replacements (particularly charges for travel and labor) not authorized by **RSF Woodburning Fireplaces** in advance.

LIMITATIONS:

- All items found to be defective will be replaced or repaired upon return of the defective part to an authorized **RSF Woodburning Fireplaces** dealer. **RSF Woodburning Fireplaces** will not be responsible for freight costs related to shipping replacement parts.
- Any complete fireplace, or part thereof, that is replaced or serviced under this warranty, will be warranted for a period not exceeding the remaining term of the original warranty.
- This warranty is not transferable.
- This warranty does not apply to damage to the appliance while in transit.
- This warranty does not apply if the installation does not conform to the installation requirements in the owner's manual.

RSF Woodburning Fireplaces is free of liability for any damages caused by the appliance, as well as material and labor charges incurred in the removal or re-installation of any **RSF Woodburning Fireplaces** fireplace under this warranty. Incidental or consequential damages are not covered by this warranty.

The remedies set forth herein are exclusive, and the liability of the seller shall not exceed the price of the fireplace or part thereof upon which the liability is based.

This warranty is expressly in lieu of all other warranties expressed or implied, including the warranties of merchantability and fitness for use and all other obligations or liabilities on the part of **RSF Woodburning Fireplaces.**

Nom de l'étiquette / Label Name:	Perle 3600 / Pearl 3600, # série / serial #
Numéro de l'étiquette IDENCO / Printer (IDENCO) label reference number:	
Matériel de l'étiquette / Label Material:	Aluminium foil
Épaisseur de l'étiquette / Label Thickness:	0.002"
Couleur de l'étiquette / Label Color:	Noire mat avec lettrage blanc / Black mat with white letters
Dimension de l'étiquette / Label Dimension:	9.625" large/width x 4.625" haut/high (peut être changé si nécessaire)
Numéro de dessin / Drawing Number:	9303XX
Numéro Syteline / Syteline Number:	9303XX
Numéro sur l'étiquette / Reference Number on Label:	9303XX

LISTED FACTORY FIREPLACE AND SPACE HEATER

MODEL: PEARL 3600

TESTED TO: UL 127 / CAN/ULC-S610 / CAN/ULC-S627
EPA 2020 CORDWOOD, CERTIFIED AT 1.5 G/H

DO NOT REMOVE THIS LABEL

U.S. ENVIRONMENTAL PROTECTION AGENCY CERTIFIED TO COMPLY WITH 2020 PARTICULATE EMISSION STANDARDS USING CORDWOOD

INSTALL AND USE ONLY IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION AND OPERATING INSTRUCTIONS. ***DO NOT OBSTRUCT COMBUSTION AIR INLET***. DO NOT USE A FIREPLACE INSERT OR OTHER PRODUCTS NOT SPECIFIED FOR USE IN THIS PRODUCT. OPERATE WITH DOOR FULLY OPEN OR FULLY CLOSED.

MINIMUM CLEARANCES TO COMBUSTIBLES MATERIALS	
SIDEWALL	xx IN. (xxx mm) FROM FIREBOX OPENING
*HEIGHT OF MANTEL SHELF: MAX. 12 IN. (305 mm) DEEP	xx IN. (xxx mm) FROM FIREBOX OPENING
UNIT BACK, SIDES AND BOTTOM	0" (0 mm) TO SPACERS

*SEE INSTALLATION INSTRUCTIONS FOR OTHER MANTEL HEIGHTS VS DEPTHS.

COMBUSTIBLE MATERIALS ARE NOT PERMITTED ON FACE OF UNIT. NON-COMBUSTIBLE HEARTH EXTENSION MUST BE 18 IN. (457 mm) DEEP BY 40 1/2 IN. (1029 mm) WIDE, AS SPECIFIED IN THE INSTALLATION MANUAL.

COMPONENTS REQUIRED FOR INSTALLATION:

- USE 4 IN. OR 5 IN. (102 OR 127 mm) DIAMETER FLEXIBLE DUCT AND COMBUSTION AIR INLET ASSEMBLY.
- USE THE ICC MODEL 6 IN. (152 mm) EXCEL CHIMNEY AND LISTED COMPONENTS AS PER INSTALLATION INSTRUCTIONS.

REFER TO MANUFACTURER'S INSTALLATION AND OPERATING INSTRUCTIONS FOR OPTIONAL COMPONENTS: FANS, GRAVITY VENT SYSTEM, ETC. ONLY ORIGINAL RSF OPTIONS SHOULD BE USED WITH THIS FIREPLACE, AND PURCHASE THROUGH RSF DEALERS.

WARNING: THIS FIREPLACE HAS NOT BEEN TESTED WITH AN UNVENTED GAS LOG SET. TO REDUCE RISK OF FIRE OR INJURY, DO NOT INSTALL AN UNVENTED GAS LOG SET INTO THE FIREPLACE.

REPLACE GLASS ONLY WITH 5MM CERAMIC GLASS. OPERATE ONLY WITH FIREBRICK IN PLACE. FOR USE WITH SOLID WOOD FUEL ONLY. DO NOT OVERFIRE UNIT.

THIS WOOD HEATER NEEDS PERIODIC INSPECTION AND REPAIR FOR PROPER OPERATION. CONSULT THE OWNER'S MANUAL FOR FURTHER INFORMATION. IT IS AGAINST FEDERAL REGULATIONS TO OPERATE THIS WOOD HEATER IN A MANNER INCONSISTENT WITH THE OPERATING INSTRUCTIONS IN THE OWNER'S MANUAL.

THIS WOOD HEATER IS NOT APPROVED FOR USE WITH A FLUE DAMPER OTHER THAN AN OPEN-CLOSE FLUE DAMPER.

UL CERTIFIED

SAFETY US·CA
SÉCURITÉ US·CA
MH61405

Fireplace; Fire Chamber for Use with ICC Certified Model Residential Type and Building Heating Appliance

NUMBER:

RSF QR code .80" x .80"

SERIAL NO. / NO DE SÉRIE

DATE MANUFACTURED
DATE DE FABRICATION

MANUFACTURED BY / FABRIQUÉ PAR:
ICC, 400 J.F.KENNEDY, ST-JEROME, QC, CANADA, J7Y 4B7

RSF

MADE IN CANADA
FABRIQUÉ AU CANADA

NE PAS ENLEVER CETTE ÉTIQUETTE

FOYER PRÉFABRIQUÉ ET APPAREIL DE CHAUFFAGE HOMOLOGUÉ

MODÈLE: PERLE 3600

CERTIFIÉ CONFORME PAR EPA (É.-U.) AUX NORMES 2020 D'ÉMISSION DE PARTICULES EN UTILISANT DU BOIS DE CORDE.

MISE À L'ESSAIS SELON LES NORMES:
UL 127 / CAN/ULC-S610 / CAN/ULC-S627
CERTIFIÉ EPA 2020, BOIS DE CORDE, À 1.5 G/H

INSTALLER ET UTILISER SELON LES INSTRUCTIONS D'INSTALLATION ET DE FONCTIONNEMENT DU MANUFACTURIER. ***NE PAS OBSTRUER L'ENTRÉE D'AIR COMBURANT***. N'UTILISEZ PAS D'ENCASTRABLE OU AUTRES PRODUITS NON SPÉCIFIÉS POUR UTILISATION AVEC CE PRODUIT. FAIRE FONCTIONNER LE FOYER AVEC LA PORTE COMPLÈTEMENT OUVERTE OU FERMÉE.

DÉGAGEMENTS MINIMAUX AUX MATÉRIAUX COMBUSTIBLES	
MUR DE CÔTÉ	xx PO. (xxx mm) DE L'OUVERTURE DE LA BOITE À FEU
*HAUTEUR DE LA TABLETTE DE MANTEAU DE CHEMINÉE: MAX. 12 PO. (305 mm) PROFOND	xx PO. (xx mm) DE L'OUVERTURE DE LA BOITE À FEU
ARRIÈRE, CÔTÉS ET BASE DE L'APPAREIL	0" (0 mm) DES ESPACEURS

* VOIR LE MANUEL D'INSTALLATION POUR AUTRES HAUTEURS VS PROFONDEURS DE LA TABLETTE.

LES MATÉRIAUX COMBUSTIBLES NE SONT PAS PERMIS SUR LA FAÇADE DE L'APPAREIL. LE PROLONGEMENT DE L'ÂTRE INCOMBUSTIBLE DOIT ÊTRE DE 18 PO. (457 mm) DE PROFONDEUR PAR 40 1/2 PO. (1029 mm) DE LARGEUR MINIMUM SUIVANT LES SPÉCIFICATIONS DU MANUEL D'INSTALLATION.

PIÈCES REQUISES POUR L'INSTALLATION:

- TUYAU FLEXIBLE DE 4 PO. OU 5 PO. (102 OU 127 mm) DIA. ET PRISE D'ENTRÉE D'AIR.
- UTILISER UNE CHEMINÉE EXCEL 6 PO. (152 mm) DE DIAMÈTRE DE ICC ET SES COMPOSANTS HOMOLOGUÉES SELON LES INSTRUCTIONS D'INSTALLATION.

VOIR LES INSTRUCTIONS D'INSTALLATION DU MANUFACTURIER POUR LES COMPOSANTS OPTIONNELS: VENTILATEURS, SYSTÈME D'ÉVENT PAR GRAVITÉ, ETC. SEULES LES OPTONS ORIGINALES DE RSF DOIVENT ÊTRE UTILISÉES, ET ACHETÉES PAR L'ENTREMISE DE DÉTAILLANTS RSF.

AVERTISSEMENT: CE FOYER N'A PAS ÉTÉ TESTÉ AVEC UNE BÛCHE À GAZ SANS ÉVENT. POUR RÉDUIRE LES RISQUES DE FEU ET DE BLESSURES, NE PAS INSTALLER DE BÛCHE À GAZ SANS ÉVENT DANS CE FOYER.

LE REMPLACEMENT D'UNE VITRE DOIT SE FAIRE AVEC UNE VITRE CÉRAMIQUE DE 5MM D'ÉPAISSEUR SEULEMENT. OPÉRER SEULEMENT AVEC LES PIERRES RÉFRACTAIRES EN PLACE. POUR UTILISATION AVEC DU BOIS SEULEMENT. NE PAS SURCHAUFFER L'APPAREIL.

CET APPAREIL AU BOIS DOIT ÊTRE INSPECTÉ PRÉRIODIQUEMENT ET MAINTENU EN BON ÉTAT DE FONCTIONNEMENT. RÉFÉREZ-VOUS AU MANUEL DU PROPRIÉTAIRE POUR PLUS D'INFORMATION. IL EST INTERDIT PAR LES LOIS FÉDÉRALES D'OPÉRER CET APPAREIL AU BOIS SANS RESPECTER LES CONSIGNES D'OPÉRATION DU MANUEL DU PROPRIÉTAIRE.

CET APPAREIL AU BOIS N'EST PAS APPROUVÉ AVEC UN REGISTRE DE CHEMINÉE AUTRE QU'UN REGISTRE OUVERT-FERMÉ.

9303XX

Note: Some clearance final numbers are missing in tables since the safety testing program with UL is not completed yet.

Owner's Manual

Residential Factory Built Fireplace

Operation • Maintenance • Installation

FOCUS 3600

Keep these instructions for future use.

WOODBURNING FIREPLACES

Industrial Chimney Company Inc.
400 J.-F. Kennedy, St-Jerome, QC, Canada, J7Y 4B7
Telephone: (450) 565-6336
www.icc-rsf.com

RSF-IIF3600 – 2020-01

Dear Customer,

The FOCUS 3600 incorporates technology with elegance to give you a beautiful view of the fire without compromising on heating efficiency or environmental quality.

We have designed your new FOCUS 3600 to be easy to install, operate and maintain. It is in your best interest to become familiar with it. Study your manual to be sure that the installation is correct, then follow the guidelines for operation and maintenance.

We at RSF Woodburning Fireplaces congratulate you on your choice of the FOCUS 3600, and are confident that you have purchased a fireplace that is *simply, the best*.

Sincerely,

RSF Woodburning Fireplaces Team

May 2020

TABLE OF CONTENTS

SAFETY FIRST

DO'S AND DONT'S

If this fireplace is not properly installed, a house fire could result. For your safety, follow the installation directions. Contact your local authority having jurisdiction (such as municipal building department, fire department, fire prevention bureau, etc.) regarding restrictions and installation requirements, and the need to obtain a permit.

To ANYONE using this fireplace: these **DO's** and **DONT's** are for your safety.

1. **DO** read this instruction manual before lighting your first fire.
2. **DO** burn seasoned wood fuel or densified fuel logs or a combination of densified fuel logs and wood fuel.
3. **DO operate the fireplace with the door fully closed**. If the door is left partly open, gas and flame can be drawn out of the fireplace opening, creating both fire and smoke hazards.
4. **DO** keep all combustible materials (furniture, firewood, etc.) at least 4' away from the front of the fireplace.
5. This fireplace needs periodic inspection and repair for proper operation. **DO** learn to properly use it and maintain it.
6. **Do** have at least one smoke detector on each level of the house and at least one carbon monoxide detector.
7. To avoid glass breakage, **DO NOT** slam the fireplace door.
8. **DO NOT** ever use gasoline, gasoline-type lantern fuel, kerosene, charcoal lighter fluid or similar liquids to start or freshen up a fire in this fireplace. Keep all such liquids well away from the fireplace while it is in use.
9. DO NOT overfire the fireplace. If you are unable to slow down the burn rate of the fire or if the chimney connector behind the top louver glows red, you are overfiring the fireplace.
10. **DO NOT** use a fireplace grate or other products not specified for use with this fireplace.
11. The burn rates are set by the manual air control at the factory. **DO NOT** tamper with the air control. **DO NOT** install a flue damper that would allow you to reduce the chimney draft and thus slow the minimum burn rate.
12. To avoid damaging the fireplace, **DO NOT** operate it in a manner inconsistent with the operating instructions in this manual.
13. **DO NOT** install an insert in this fireplace.

◆ **NOTE:** We strongly recommend that our products be installed and serviced by professionals who are certified by the National Fireplace Institute in the U.S. or by Wood Energy Technology Transfer Inc. in Canada.

CREOSOTE: FORMATION AND REMOVAL

When wood is burned slowly, it produces tar and other organic vapors which combine with the expelled moisture from the wood to form creosote. The creosote vapors can condense in the relatively cool chimney of a slow burning fire. As a result, creosote residue accumulates on the flue lining. When ignited, this creosote makes an extremely hot fire.

The chimney should be inspected periodically during the heating season to see if a creosote build-up has occurred. The presence in a chimney of soot or creosote in excess of 1/8" (3mm) thick will indicate the need for immediate cleaning, possible modification of burning procedures, and more frequent inspections.

❖ **WARNING: BURN DRY WOOD ONLY.**
DO NOT BURN: DRIFTWOOD, TREATED WOOD, COAL, GARBAGE, OR PLASTIC.

Do not use construction scraps (e.g. 2x4 or plywood scraps) as your only supply of fuel as you can overheat and seriously damage the fireplace.

We do not recommend using wax fuel logs (e.g. Duraflame) in this fireplace because it will dirty the glass. If you choose to use them, do not use more than one at a time and do not poke or stir while it is burning. Use only firelogs that have been evaluated for fireplace use. In Canada, they must meet the requirements of ANSI/CAN/UL/ULC 2115, Processed Solid Fuel Firelogs and Firestarters. Refer to the firelog warnings and caution markings on packaging prior to use.

GENERAL SPECIFICATIONS

The FOCUS 3600 is environmentally friendly, and meets the 2020 United States Environmental Protection Agency (EPA) particulate emission standard with cordwood at an average emission rate of 1.5 grams per hour.

It also has an optimal efficiency of 79%. This has been established using the high heating value of the wood, under the best burning conditions and using CSA B415.1-10 calculations.

Furthermore, the weighted average EPA efficiency is 74%. The later has been established using the higher heating value of the wood, while burning EPA cordwood and using CSA B415.1-10 calculations.

It has been shown to deliver heat ranging from 13 000 to 50 000 BTU/h with an average of 25 000BTU/h. Please refer to the "Improving efficiency", the "Importance of draft", the "Burn Time vs. Heat Output" and the "Fuel" sections to better understand the various factors that influence the efficiency and heat output of your fireplace.

THE COMBUSTION CONTROL SYSTEM

Since the door is sealed, all combustion air must come through the FOCUS 3600's primary air control.

For the first few days, it is best to operate the fireplace with the primary air control fully open (handle pushed to the far right). Just control the fire as you would any normal fireplace, using one or two logs at a time for a smaller fire, or more logs for more heat. Once you become familiar with operating the fireplace with the control open, you can start experimenting with lower settings.

OPTIONS

For increased air circulation and marginally more heat output, you can add an optional fan (FO-FDHB8, FO-FDHB5-N, new fan, FO-CIF).

If you have any rooms directly above or adjacent to the room with the fireplace that you would like to heat, you may want to consider the Gravity Vent Kits (FO-V2, FO-VGC or FO-V3). The gravity vent distributes hot air to these rooms without the need for a blower.

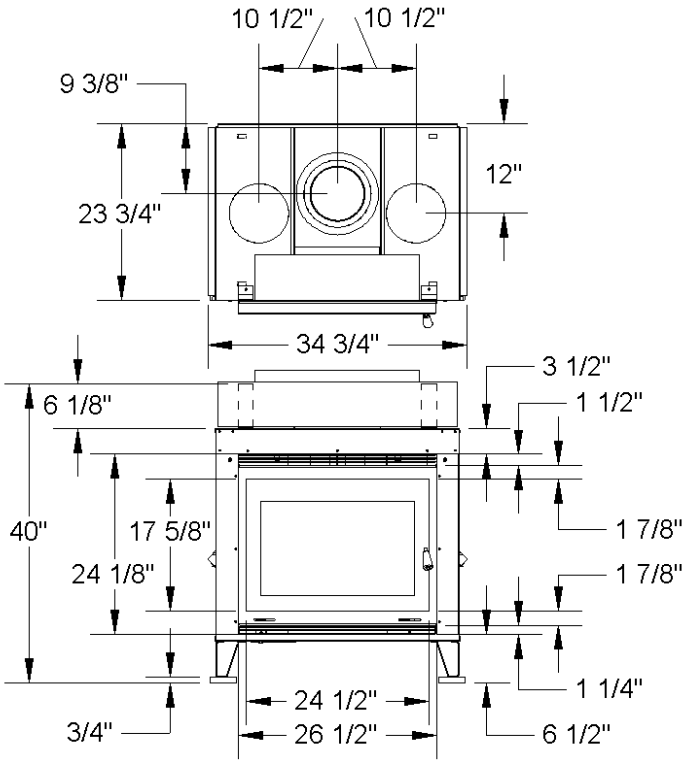
For a simple way to circulate a moderate amount of warm air from the fireplace to another room, we offer the Heat Dump Kit (FO-HD). It includes a 180 cfm blower and is most often used to provide supplemental heating to a basement room when the fireplace is on the main floor, but it can also be used to send the warm air to an adjacent room or upstairs.

◆ **NOTE**: Many options require wiring and/or electricity for their installation. If there is any chance that any of these options will be installed in the future then suitable wiring should be run during framing. Otherwise, it will be difficult to install these options later. You can refer to page 24 for a list of options that require electricity.

Detailed installation instructions are included in the box with each option. These can also be obtained from our Internet Web Site: www.icc-rsf.com.

❖**WARNING: THIS FIREPLACE HAS NOT BEEN TESTED WITH A GAS LOG SET (UNVENTED OR VENTED). TO REDUCE RISK OF FIRE OR INJURY, DO NOT INSTALL A GAS LOG SET (UNVENTED OR VENTED) INTO THIS FIREPLACE. DO NOT INSTALL A GAS LOG LIGHTER BECAUSE THE HEAT PRODUCED BY THE FIREPLACE WILL PERMANENTLY DAMAGE THE GAS LOG LIGHTER.**

UNIT DIMENSIONS AND CLEARANCES



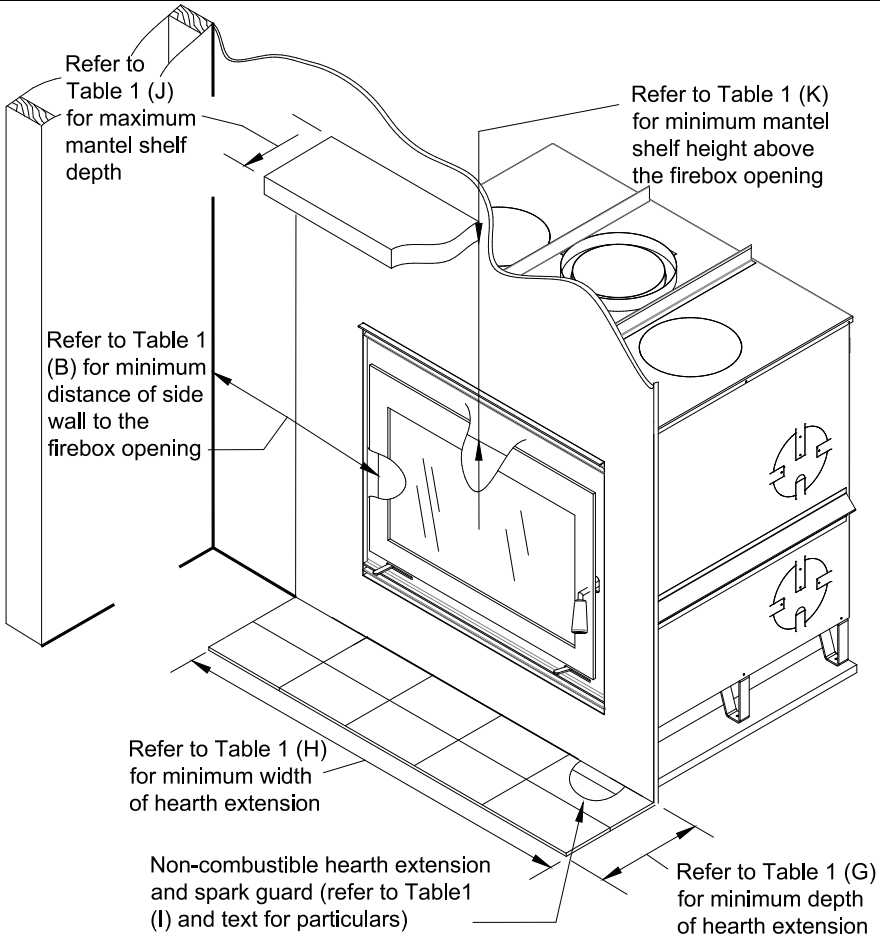


Figure 1 Unit Dimensions and Clearances

Table 1 Unit Dimensions and Clearances

A	Distance of combustible material from side, back and top standoffs	0" (0,0 mm)
B	Minimum distance from the side wall to the side of the firebox opening	12" (305 mm)
C	Minimum ceiling clearance: from the base of the fireplace to the ceiling • in the enclosure above the fireplace and • in the room in front of the fireplace	6' (1,83 m)
D	Minimum chimney height: minimum total chimney height from fireplace top to below the chimney rain cap – Refer to Table 3 on page 16 if elbows are present	12' (3,66 m)
E	Maximum chimney height: maximum total chimney height from fireplace top to below the chimney rain cap	45' (13,72 m)
F	Maximum chimney height supported by the fireplace	12' (3,66 m)
G	Minimum depth of non-combustible hearth extension: from the front of the fireplace	18" (457 mm)
H	Minimum width of non-combustible hearth extension: total width, must be centered on the firebox opening	40½" (1,03 m)
I	Minimum width of the spark guard	32½" (825 mm)
J	Maximum mantel shelf depth (see Table 2 for other mantel sizes)	12" (305 mm)
K	Minimum height of a combustible mantel shelf above the top of the firebox opening: to the bottom of the combustible mantel (refer to the "Installation: Mantel" section for particulars)	See Table 2

Table 2 Various Mantel Shelf Depths and Corresponding Installation Heights

Maximum Mantel Shelf Depth	Minimum Installation Height
0" to 4"	16½"
12"	28½"

No combustible mantel shelf can be installed lower than 16½" above the top of the firebox opening. A combustible mantel shelf cannot be deeper than 12".

For any combustible mantel shelf depths between 4" and 12", you can calculate the minimum installation height. For example:

- Mantel shelf depth to be installed: 9¼"
- So: ((**9.25** – 4) x 1.5) + 16.5 = 24.375 = 24 $^{3}/_{8}$"
- Thus minimum installation height of a **9¼"** mantel: **24$^{3}/_{8}$"** above the firebox opening.

If the combustible mantel shelf has a cross-section with variable depth, it has to be installed so that its widest part is not installed lower than the corresponding minimum installation height while making sure that the lowest point of the mantel is not installed lower the minimum installation height corresponding to it depth.

Refer to the "Installation: Mantel" section for particulars.

OPERATION

AIR CONTROLS

All the FOCUS 3600 air controls are located below the door (see Figure 2 and Figure 3).

Combustion Air Control

Unlike most open fireplaces, RSF fireplaces don't have flue dampers. Instead, the system is sealed by closing the door, and the amount of air entering the firebox is controlled by the combustion air control lever (see Figure 2). Setting the air control lever all the way open (towards the right) will allow the maximum amount of air into the firebox. Closing the air control (towards the left) will reduce the amount of air entering the firebox.

Figure 2 Combustion Air Control

Outside Air Control

The FOCUS 3600 is designed to use outside air for combustion (see Figure 3).

Setting the outside air control lever towards the right will completely open the outside air damper and allow fresh air into the base of the fireplace. Because outside air is generally colder and denser it will help to start the fire. In some cases, fresh air will help compensate for negative pressure problems within the house; however it will not prevent the fireplace from smoking in a severely depressurized house.

We recommend always using outside air for combustion but you may choose to use room air for combustion instead. To do so, move the outside air control lever towards the left to close the outside air damper. This control should be closed when the fireplace isn't burning to prevent cold air infiltration.

Figure 3 Outside Air Control

IMPROVING EFFICIENCY

The location of your fireplace will affect how efficiently it heats the home. Your fireplace should be located in part of the house you want to be the warmest. Trying to heat the main floor with a fireplace in the basement will generally overheat the basement and waste fuel. Certain RSF options offer the ability to move heat from the main floor to the basement. This allows you to efficiently heat your primary space while also heating the basement as a secondary space.

The efficiency will also be influenced by the draft in the chimney which will be influenced by various factors (refer to "Importance of draft" below) and by the amount of wood burning at any point (see "Burn Time vs. Heat Output" below). The efficiency will also be influenced by the quality of the wood (refer to "Fuel" below).

All of these factors must be taken into account and optimize so you can recover the maximum heat from your fireplace.

IMPORTANCE OF DRAFT

Draft is the natural force which pulls air from the fireplace up the chimney. The strength of draft in your chimney depends on a variety of factors, including chimney height, nearby obstructions, altitude, etc.

Excessive draft can result in a hotter fire than intended or reduced burn times as more air is pulled through the fireplace. It will also result in less heat recovery since the heat will not have as much time to irradiate into the room before being sucked into the chimney.

Weak draft can result in smoke entering the room and difficulty lighting or operating the fireplace. Weak draft is often incorrectly associated as a blockage in the air intake for the fireplace. Adding chimney height is the most common solution. See Table 3 for minimum chimney height recommendations.

BURN TIME VS. HEAT OUTPUT

The faster your fireplace burns the more heat it will create; however, faster fires result in much more hot air flow up the chimney which means you are sacrificing efficiency. Fast burning fires (lots of air) go through much more wood than slow burning fires. To get the most out of your FOCUS 3600 fireplace, adjust the combustion air control lever at the appropriate time. If the fire seems to be burning too quickly, turn the air down. If the fire is smoldering and there are no visible flames, turn the air up. This way you'll always be getting the most out of your fuel.

FUEL

All modern high efficiency fireplaces and woodstoves are designed to burn best with seasoned cordwood. Seasoned wood can be defined as wood that has been cut, split and let dry under cover for a minimum of 6 months, preferably a year or more. Dry seasoned wood generally contains less than 20% moisture content. Attempting to burn fuel with a high moisture content will be difficult and result in lower efficiency, increased creosote buildup and dark deposits on the glass. It's possible to burn a very large amount of wood and get very little heat if the wood is wet.

The type of wood you select is also important. All types of wood give off more or less the same number of BTU's per pound. Since softer woods are less dense than hardwoods it is possible to put more weight of hardwood in the firebox; in other words, all woodburning appliances will burn longer and more evenly with hardwoods. Never burn scrap, garbage, treated wood or driftwood as they produce much more pollution and can corrode the firebox and chimney as well. Burning large amounts of paper, cardboard, mill ends, or construction waste can easily over fire and damage the fireplace or even ignite a chimney fire if the flue is dirty.

FIRST FIRES

You will experience a slow start-up during the first few fires. The refractory bricks lining the firebox contain moisture from manufacturing and require a few hot fires to evaporate the moisture. While there is still moisture in the bricks, they will be black with smoke deposits. When the moisture has dissipated, the bricks will turn white. Unlike cast iron stoves, there is no need to cure the fireplace itself by starting with small fires and progressively larger ones. Feel free to light a large fire from the very start.

You will experience a slight odor during the first few fires. This odor comes from curing paint and oil burning off the metal. The odor may be strong enough to set off your smoke detector. Open the doors and windows to allow the room to properly ventilate.

LIGHTING

Ensure that the combustion air control lever is all the way in the open position. You will want as much air as possible for the lighting process.

We recommend that you prepare your fire in a top-down fashion. This will make for a faster start and a cleaning burn while starting.

Start by laying 2-3 layers of small wood pieces (about 10 pieces of 1" to 2" in diameter). Criss-cross the pieces so there is plenty of air circulation in between. Then continue by criss-crossing your kindling (about 20 pieces the size of your fingers) on top of the small wood. You can then add a few pieces of paper on top. **Never use any flammable liquid.** Light the fire at the top of the pile and close the door most of the way, but do not shut it completely. If the door is positioned correctly you will see air rushing into the fireplace, this will help the lighting process. Wait about 2 minutes and then close the door completely. The fire should continue to burn. If it looks like it wants to smolder, crack the door open for another minute or two before closing it again. The amount of time to keep the door slightly ajar at startup is dependant on the height of your chimney and the outside temperature: the higher and the colder, the longer the door needs to remains cracked but it should never be more than 5-6 minutes.

Once most of the startup fuel is down to a nice coal bed, add cordwood according to you needs, up to 6 logs at a time. The first layer of logs should be oriented front to back (i.e. North/South). The second layer should then be oriented left to right. Always put at least 2 layers of logs criss-crossed together, this will help them to light to burn cleanly. Again keep the door cracked for a couple of minutes while the bottom logs catch on fire, then you can close the door completely.

Keep the combustion air control on maximum until the next reload. This will help establish a strong draft in the chimney before you reduce the combustion air, ensuring a cleaner burn at the same time.

❖ **WARNING: DO NOT USE A GRATE OR ELEVATE THE FIRE.**

❖ **WARNING: MAKE SURE TO KEEP THE FIRE BEHIND THE FONT STEP. REPLACE THE LOGS IF THEY FALL AGAINST THE GLASS.**

CONTROLLING YOUR FIRE

To get maximum efficiency out of your fireplace you will want to adjust the amount of air entering the firebox at the appropriate times. Gauge how much to close the combustion air by how the fire reacts once the combustion air control lever has been moved. If the fire goes out and begins to smolder, there's too little combustion air entering the firebox. If this happens, reopen the combustion air control and wait a little longer before attempting to restrict the air again. If there's no change to the burn pattern, you can continue to close the combustion air further. Always close the combustion air control gradually, never from maximum to minimum in an instant. Eventually you should be able to close the combustion air all or most of the way. There should always be visible fire inside the firebox at every step of the process. It is normal for some installations that the air control cannot be fully closed and maintain a fire. Every home, installiaton, and draft is unique. Ensure there is visible flame to keep the glass and chimney clean.

REFUELING

Have your next wood load ready when you open the door. The temperature in the firebox will decrease as the door is open, so decreasing the amount of time the door is open will allow the firebox to remain hot. Do not rush.

Turn off the fans, if installed. The fans may cause smoke to spill out of the fireplace if they are running.

The door should be opened slowly to keep smoke from spilling into your room. If you have a problem with smoke spillage, check to see that all kitchen and bathroom fans have been shut off. They can cause negative pressure in the house which pulls smoke out of the fireplace.

Take the time to poke and stir the unburnt wood that is left in the firebox. This will help revive the fire. Place the new logs in the firebox. Try to maintain a clear a path in front of the pilot, which is the metal tube centered between the two andiron posts. The pilot brings an influx of air close to the coals that will help to keep the fire going. Once the new wood has been loaded, keep the door slightly ajar for a couple of minutes to get the fire going depending on how well seasoned your cordwood is and how much coals were left in the firebox. Once the new wood it well lit, close the door.

You can now adjust the combustion air control according to your needs.

If you have a fan installed,

- wait about 45 minutes after reloading before you start the fan again if you have the combustion air control set to anything between half-way to minimum
- wait about 20 minutes after reloading before you start the fan again if you have the combustion air control set to anything between half-way to maximum.

TROUBLESHOOTING PROBLEMS

If smoke comes into the house when the door is opened:

- You may have opened the door too quickly and created a suction of air into the room, this can be avoided by opening the door more slowly.
- Ensure your chimney is clean and your chimney cap is not plugged. Chimney caps with screens are more likely to become clogged with creosote buildup.
- Make sure you have adequate chimney height for your system. Refer to the Chimney section of this booklet and make sure to take altitude, and number of elbows into consideration.
- If you have purchased the inline fan, make sure the blower is off before opening the door.
- Check to see if other fans in the home are running, particularly a kitchen range hood, or bathroom exhaust fan. This can affect the pressure in the home.

- Try opening a window near the fireplace a little, this will equalize the pressure in the home and should correct a draft problem. Once proper draft is established the window can be closed.
- Make sure you've used enough kindling to establish a hot fire quickly. The most likely time that smoke will enter the home is during the lighting process.

If your fireplace burns excessively fast, seemingly uncontrollably:

- Check all door seals and gaskets to ensure that air is not leaking into the firebox. See "Door Adjustment" for details of how to verify the tightness of the door.
- Inspect the secondary air tubes in the top of the fireplace to ensure they are in good condition. An unwanted hole in the secondary air tubes can bring additional unwanted air into the fireplace.

MAINTENANCE

CHIMNEY CLEANING

Check the chimney for creosote buildup every week or so until experience shows how often you need to clean it. A buildup of 1/8" (3 mm) or more should be cleaned before more creosote accumulates. Close the fireplace door prior to sweeping. Use an 6" round brush.

The baffle in the firebox can be pulled forward or completely removed to gain better access to the flue from below. Whether you decide to remove it or pull it forward, great care should be given not to damage the back secondary air tube with the sweeping brush or while moving, removing and/or reinstalling the baffle.

To pull the baffle forward, simply pull it over the front secondary air tube.

To remove the baffle, first remove the front secondary air tube. Simply unscrew the secondary air tube on the left side, slide the tube toward the right until the left end drops out of its hole. Slide the tube back towards the left to get the right end out of its hole. To remove the baffle, push up and slide it off the brackets.

Do not forget to replace both the baffle and the secondary air tube as you removed them and be sure to properly orient the secondary air tube.

DISPOSAL OF ASHES

Remove the ashes before they become too deep, i.e., before you have a spillage problem when you open the door. The ashes should be placed in a metal container with a tight-fitting lid. 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. If the ashes are disposed of by burial, or otherwise locally dispersed, they should be retained in the closed container until all cinders have thoroughly cooled.

GENERAL CLEANING

The high heat paint can be cleaned with a soft damp cloth. Use a mild detergent and water. Do not use abrasive cleaners.

GLASS CLEANING

In a controlled combustion firebox, temperatures are not always high enough to keep the glass perfectly clean. A good hot fire once a day usually cleans off most of the deposits that have accumulated. Remember: the drier the wood and the hotter the fire, the cleaner the glass. A word of caution: although heat will not break the glass, impact can. Be careful not to hit the glass.

❖ **WARNING: NEVER CLEAN THE GLASS WITH AN ABRASIVE CLEANER. USE ONLY A CLEANER RECOMMENDED BY YOUR DEALER. NEVER CLEAN THE GLASS WHILE IT IS HOT, A SERIOUS BURN CAN RESULT. THERE ARE A NUMBER OF EXCELLENT WOOD STOVE GLASS CLEANERS AVAILABLE WHICH ARE FAR SUPERIOR TO REGULAR GLASS AND OVEN CLEANERS FOR WOOD STOVE APPLICATIONS.**

PAINT

❖ **WARNING: AVOID SPRAYING CERAMIC GLASS CLEANER OR OTHER CLEANERS ON THE PAINT OF THE FIREPLACE. THEY MAY REMOVE THE PAINT AND MAKE TOUCHUPS DIFFICULT.**

You can touch up the face of the FOCUS 3600 with *Stove Bright* Metallic Black high temperature paint which is available at most fireplaces dealers. Follow the directions outlined on the spray can. **DO NOT** attempt to paint the fireplace while it is still warm. Keep the spray can away from any source of heat or open flame. Ensure that there is adequate ventilation in the room from the time you start painting until the paint is dry. *Stove Bright* is available in a wide range of colors if you want to change the color of your FOCUS 3600.

We recommend that you take the time to protect or remove any item that you do not want to paint such as: the door glass, the plated door, the fireplace surroundings, etc. The glass can be removed from the door but you will have to replace the window gasket.

DOOR ADJUSTMENT

To check for a proper door seal, insert a sheet of paper between the door and the front of the fireplace and latch the door. Pull gently but firmly on the sheet of paper. If the paper either tears or is hard to retrieve, the adjustment is correct. Repeat this procedure along all sides of the door.

The most important factor for controlling the burn rate of the FOCUS 3600 is a good seal on the door gasket. If the door gasket is worn or damaged to the point where the seal is not adequate as described above, then remove and replace the gasket. Replacement kits are available from your RSF dealer.

If needed, the hinges can be adjusted to improve the alignment of the door latch with respect to the hole in the fireplace facing, and for easy installation/removal of the door.

◆ **NOTE:** An improperly adjusted door seal can have a significant effect on the performance and durability of the fireplace. A poorly adjusted door can result in reduced efficiency, over firing, excessive wood consumption and premature fireplace failure.

INSTALLATION

Check with your local authority having jurisdiction (such as municipal building department, fire department, fire prevention bureau, etc.) regarding restrictions and installation requirements, and the need to obtain a permit.

◆ **NOTE:** We recommend that you remove the door until after all finishing work is completed around the fireplace. This will reduce the possibility of scratches, vandalism, or damage to the finish caused by drywall dust, muriatic acid, plaster, cement, paint or any other harmful spray or liquid.

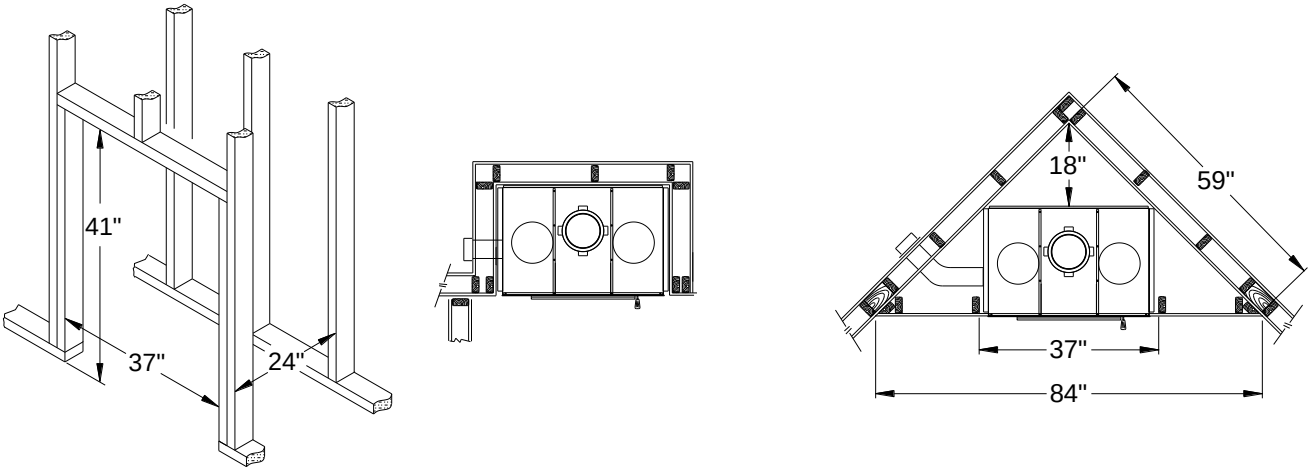
LOCATION

Your FOCUS 3600 fireplace may be installed in many different ways (see Figure 4) without any special floor reinforcement. We recommend that you take the time to plan your entire installation (fireplace, chimney, and options) before beginning the actual installation (refer to Figure 5).

Dimensions of the fireplace along with clearances are shown in Figure 1 and Table 1.

❖ **WARNING: IF THIS FIREPLACE IS NOT PROPERLY INSTALLED, A HOUSE FIRE CAN RESULT. FOR YOUR SAFETY, FOLLOW THE INSTALLATION INSTRUCTIONS AND CLEARANCES. DO NOT PACK REQUIRED AIR SPACES WITH INSULATION OR OTHER MATERIALS.**

1. Note the location of roof and floor joists. Try to choose a location that does not require cutting them.
2. Do not build shelves or cupboards in the area above the fireplace. This space must be kept empty.
3. If at all possible, run the chimney up through the inside of the house. If it must be run outside, it should be enclosed in an insulated enclosure (see Installation: Chase Enclosure). Remember, a cold chimney causes poor draft.



The framing dimensions are larger than required for ease of installation. The Heat Dump Option will require an extra 12" on the selected side.

Figure 4 FOCUS 3600 Framing Examples

FRAMING

The enclosure walls can be framed with any suitable materials (2x4 or 2x6 studs, plywood, gypsum board, etc.). Because of the high heat output potential of the FOCUS3600, combustible materials must NOT go closer to the fireplace than the standoffs, top, back and sides.

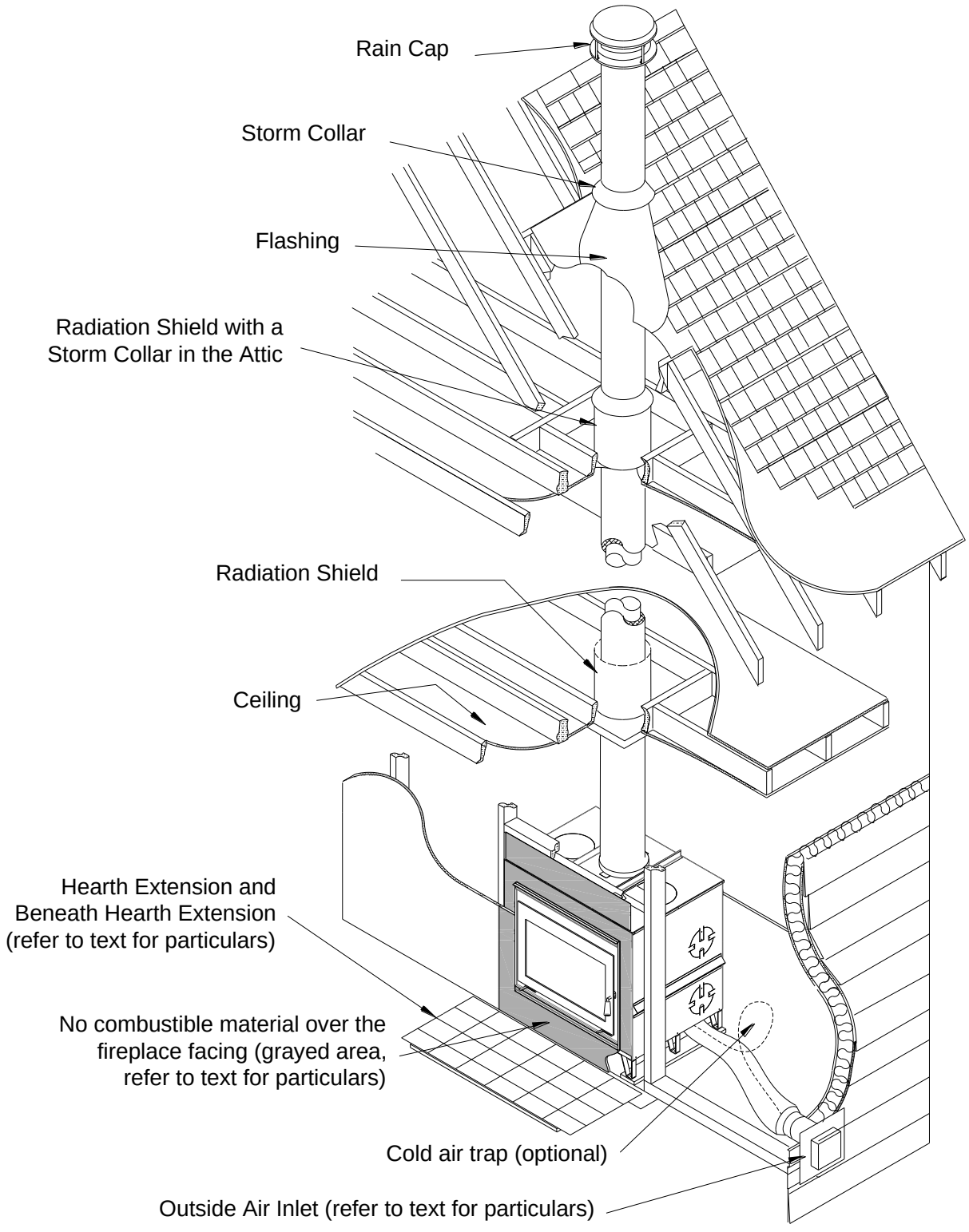


Figure 5 FOCUS 3600 General Installation

CEILING CLEARANCE

Ceiling clearance is the distance from the base of the fireplace to the ceiling. Under no circumstances should the distance between the ceiling firestop and the base fireplace be less than the dimension specified in Table 1 (C).

UNPACKING YOUR FOCUS 3600

Make sure to remove, from the top of the fireplace, the two wood pieces (2"x4") that are glued to the top. They are there to protect the top of the fireplace and MUST be removed.

❖ WARNING: THERE ARE IMPORTANT COMPONENTS ATTACHED TO THE TOP OF THE FIREPLACE FOR SHIPPING. ENSURE THEY ARE NOT DISCARDED.

The following components MUST be installed and are attached to the top of the fireplace for shipping:

- The top standoff: it MUST be installed on the top of the fireplace, see "Standoff Installation" on page 14
- The L-shaped sparkguard: it MUST be installed at the bottom of the fireplace, see section "Beneath The Hearth Extension" on page 21.

The two 1"x4" attached to the legs of the fireplace will help move the fireplace in its final location. They can be left on the fireplace or removed depending on the particular installation.

The listing label has been temporarily placed in the firebox. Keep it there until the installation has been inspected. You can then drop it through the bottom louver, to the right of the firebox for future reference.

TOP LOUVER INSTALLATION

The top louver is not completely installed to facilitate the packaging. There are big flat bolts on either side of the top louver opening, visible from the front of the fireplace. Loosen them just enough to remove the padding that is holding them in place. This padding was installed to protect the louver during the shipping and MUST be removed. Pull the louver out until the top fin extends 1¾" out from the facing, the other fins should be aligned with the side lintels. Tighten both bolts.

Both louvers are fixed and cannot be removed.

STANDOFF INSTALLATION

Before you begin installing your fireplace, you MUST install the standoff provided on the top of the fireplace.

The back shield MUST be open on the back side as shown at the top of Figure 6. You can then install standoff on the fireplace as shown in Figure 6 with the screws provided in the manual bag.

DO NOT fill the gap between the fireplace and the standoff with insulation or any other material; it will be covered with the finishing material.

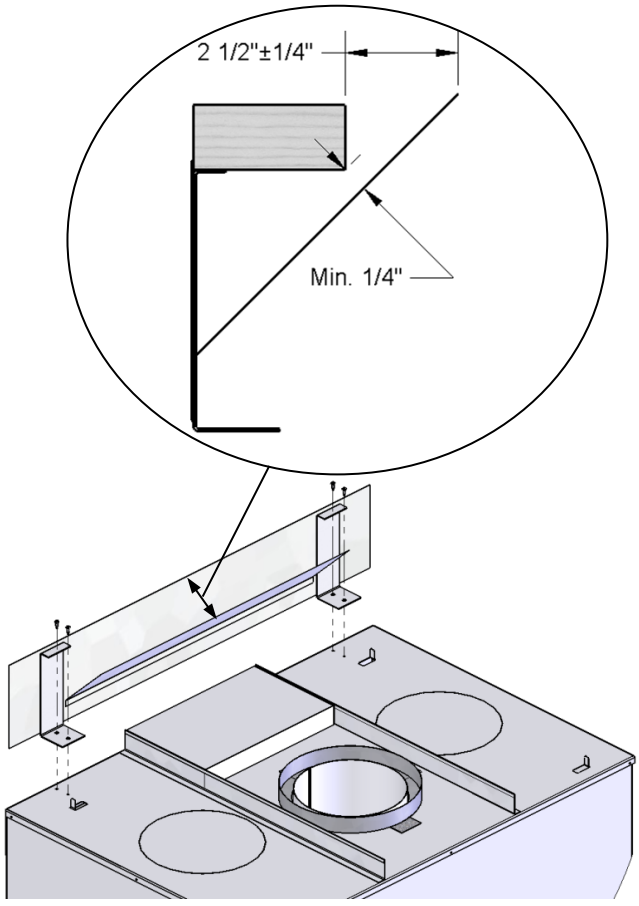


Figure 6 Standoff Installation

SECURING THE FIREPLACE IN PLACE

Once the fireplace is in its final location, take the time to attach it to the floor. You can either screw through the 1"x4" if you left them on the fireplace or through the hole in the legs of the fireplace if the 1"x4" have been removed. If possible, try to have at least one if not two 2" screws into the floor joist.

OUTSIDE AIR DUCT

After the fireplace is correctly positioned, connect the outside air inlet to the fireplace.

Use an insulated aluminium flexible duct rated at over 200° F. The duct should not exceed 12' vertical rise above the base of the unit. We suggest using the 4" RSF outside air kit (FO-INT).

The air inlet should always be at least 5' lower than the chimney rain cap and must never terminate in attic spaces.

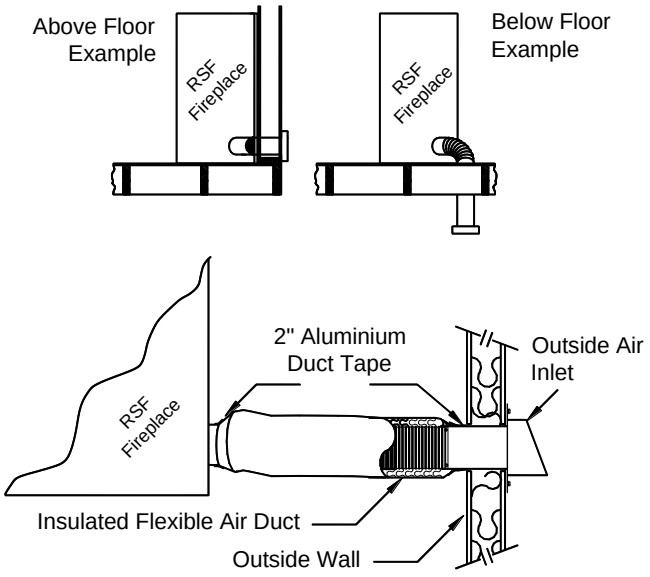


Figure 7 Outside Air Connection and Installation Example

A 4" diameter duct can be used if the total duct run is less than 25'. For longer runs, use 5" diameter duct. For a 5" run, you will need to start at the fireplace in 4" just to get from under the base and then use an increaser from 4" to 5" to be able to continue in 5".

Find a convenient location for the insulated flexible duct and outside air inlet. The outside air inlet can be above or below floor level (see Figure 7).

The connection for the outside air is located on the bottom of the fireplace. To ease the installation of the flexible duct, a special elbow was provided that allows the duct to be oriented as required.

1. Use a short Phillips screwdriver to remove the outside air cover located on the bottom of the fireplace on the left side, three screws hold it in place.
2. Bend the central part of the cover back and forth to break away the two tabs and remove the central part (see Figure 8).
3. Attach the 4" aluminium duct to the inlet of the outside air elbow with metal screws.
4. If the insulated flexible duct has a plastic covering, remove this plastic cover over the flexible duct so that there is no plastic cover on the duct under the fireplace and for at least 3" away from the fireplace. The plastic cover MUST NOT get within 3" of the fireplace.
5. Tape the insulation to the aluminum ducting where the plastic cover was pulled back. Using aluminium tape to hold it in place.
6. If using 5" flexible duct for the rest of the duct run, cut the 4" insulated flexible duct long enough to clear the fireplace. Completely remove the plastic cover over the 4" duct. Pull back the insulation on the extremity of the 4" duct and attach it to the 4"-5" increaser with metal screws. Pull back the plastic cover and the insulation from one extremity of the 5" duct. Attach that extremity of the 5" aluminium duct to the 4"-5" increaser with metal screws. Replace the insulation and plastic over the 4" and 5" insulated flexible duct and tape it in place with aluminium duct tape. Remember, the plastic cover MUST NOT get within 3" of the fireplace.
7. Insert the outside air elbow into the support (see Figure 9) and install this assembly onto the fireplace, using at least two of the screws that were removed previously but do not tighten it yet.

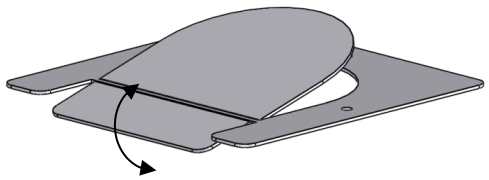


Figure 8 Removing the outside air cover

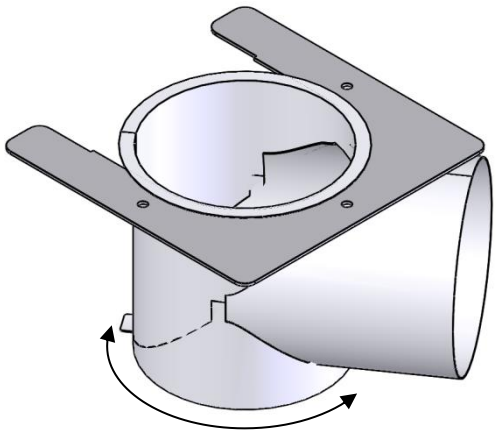


Figure 9 Installing the outside air elbow

8. Orient the outside air elbow in the direction you want the outside air duct to go and tighten the screws.
9. Make a 4 ¼" (5 ¼" if using a 5" diameter duct) hole in the outside wall of the house. Push the outside air inlet in from the outside. Seal the joint between the air inlet and the outside wall with an appropriate sealant.
10. Place the insulated flexible duct over the round sleeve on the outside air inlet. Carefully pull back the insulation and plastic cover, exposing the flexible duct. Attach the duct with metal screws to the air inlet. Replace the insulation and cover back over the duct. Tape the plastic cover in place with aluminium duct tape.

❖ **CAUTION: WHEN RUNNING THE DUCT AROUND CORNERS, BE SURE TO PREVENT CRIMPING THE DUCT IN A WAYTHAT WOULD RESTRICT THE COMBUSTION AIRFLOW.**

CHIMNEY

This fireplace is certified for use with 6" ICC Model EXCEL chimney only. Please refer to Table 1 (D-E) for the minimum and maximum chimney heights permitted with the FOCUS 3600 fireplace.

We recommend that the minimum height be increased by approximately 6" for every 1000' elevation above sea level. Every 15°, 30° or 45° offset (one pair of elbows) also increases the minimum height. See Table 3 for more precise recommended flue heights.

For example, if you are living 6015' above sea level, your chimney should terminate at least 15' from the top of the fireplace if it is a straight chimney or at least 18'6" if one 30° offset is used as shown in Table 3.

Table 3 Minimum Recommended Flue Heights

Elevation (ft)	Number Of Offset						
	Straight Chimney	1 x 15°	2 x 15°	1 x 30°	2 x 30°	1 x 45°	2 x 45°
0 - 1000	Minimum 12’	13’	14’	15’	18’	16’	20’
1001 - 2000	12’6”	13’6”	14’6”	15’6”	19’	16’6”	20’
2001 - 3000	13’	14’	15’	16’	19’6”	17’	21’6”
3001 - 4000	13’6”	14’6”	15’6”	17’	20’	18’	22’6”
4001 - 5000	14’	15’	16’	17’6”	21’	18’6”	23’
5001 - 6000	14’6”	15’6”	17’	18’	21’6”	19’	24’
6001 - 7000	15’	16’	17’6”	18’6”	22’	20’	24’6”
7001 - 8000	15’6”	16’6”	18’	19’	23’	20’6”	25’6”
8001 - 9000	16’	17’	18’6”	20’	24’	21’	26’6”
9001 - 10000	16’6”	17’6”	19’	20’6”	24’6”	22’	27’

Flue height is measured from the top of the fireplace to the top of the chimney before installing the rain cap.

If you have two different offsets (two pairs of different elbows), simply use the column for two offsets of the biggest pair of elbows at your elevation to get your Minimum Flue Height.

CHIMNEY INSTALLATION

Make sure to read the EXCEL Chimney installation manual concerning requirements for supports, bracing, anchors, etc. Refer to Table 1 (F) for the maximum chimney height that can be supported by the top of the fireplace.

❖ **WARNING: THE CLEARANCE BETWEEN THE CHIMNEY AND COMBUSTIBLE MATERIAL MUST BE 2" OR MORE. DO NOT FILL THIS AREA WITH INSULATION.**

1. Cut and frame the required holes in the floor(s), ceiling(s) and roof where the chimney will pass through. The rough opening in the framing is 12" square (the opening can be slightly bigger, but NEVER smaller).

2. From below, install a radiation shield in each floor through which the chimney passes. At the attic level, install a radiation shield and a storm collar as shown in Figure 10.

   ❖ WARNING: A RADIATION SHIELD MUST BE INSTALLED AT EACH FLOOR WHERE THE CHIMNEY PASSES THROUGH.

3. Place the first length of chimney on the fireplace. Secure the chimney length to the fireplace with the three screws provided. Assemble the rest of the chimney.

   The chimney must extend at least 3' above its point of contact with the roof and at least 2' higher than any wall, roof, or building within 10' of it. If the chimney is higher than 5' above the roof, it must be secured using a roof brace.

4. Put the roof flashing into place. Seal the joint between the roof and the flashing with roofing tar or an exterior sealant. For sloping roofs, place the flashing under the upper shingles and on top of the lower shingles. Secure the flashing to the roof using roofing nails or roofing screws.

   If the chimney is enclosed to the roof:

   - In **USA**: use a vented flashing;
   - In **Canada**: use a vented flashing, or a roof radiation shield with a regular flashing.

   ❖ WARNING: DO NOT BLOCK ANY OF THE OPENINGS IN THE VENTED FLASHING WITH SEALANT, CAULKING OR ANY OTHER MATERIALS.

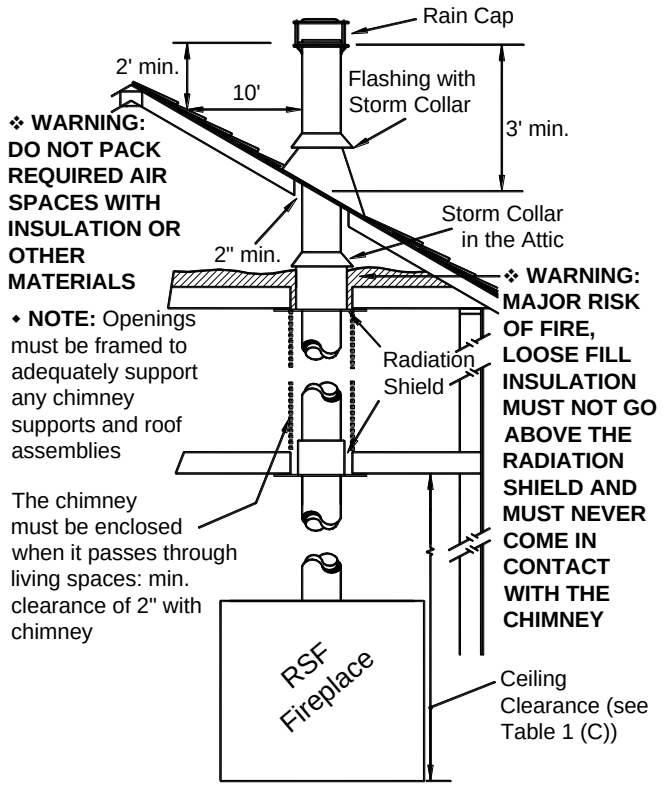


Figure 10 General Chimney Installation

5. Place the storm collar over the chimney and flashing. Place a bead of exterior sealant around the chimney below the storm collar, pull the storm collar through the sealant and seal it once again on the top with the exterior sealant (**DO NOT use roofing tar**).

6. Fit the rain cap on the chimney. Secure it tightly in place.

OFFSET CHIMNEY

An elbow may be installed directly on top of the fireplace if required. See the detailed offset charts in the EXCEL chimney installation manual. Use the offset option if you need to clear a joist or pass around a cupboard. See Figure 11 and Figure 12 for examples.

- Maximum offset angle:
  - In **USA**: 30°;
  - In **Canada**: 45°.
- Maximum number of elbows: four, resulting in two offsets and returns.

Install the fireplace and chimney as described earlier. When you require an elbow, proceed as follows:

1. Install the required elbow. Turn it in the desired direction, and fasten it to the chimney length with the three metal screws provided at the joints.

2. Install enough lengths to obtain the desired offset. Secure each joint with three metal screws. Refer to the offset charts provided with the EXCEL chimney installation manual for exact offset dimensions.

   If the chimney goes through an outside wall as shown in Figure 12 and is enclosed on the other side of the wall, then the outside plate of the angled wall rediation shield MUST NOT be installed.

3. Use another elbow to return the chimney to the vertical direction.

4. Install a roof support, a wall support, or an offset support above each offset to support the weight of the chimney (elbows are not designed to support the chimney above an offset).

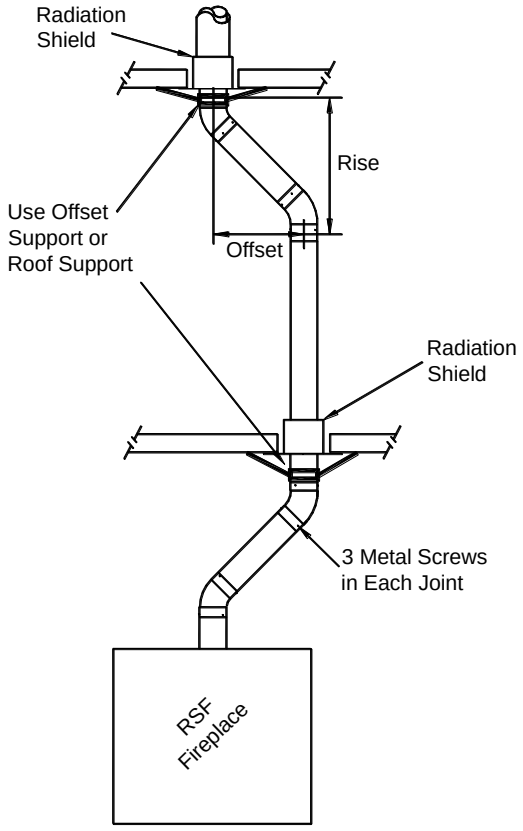


Figure 11 Offset Chimney Installation Example

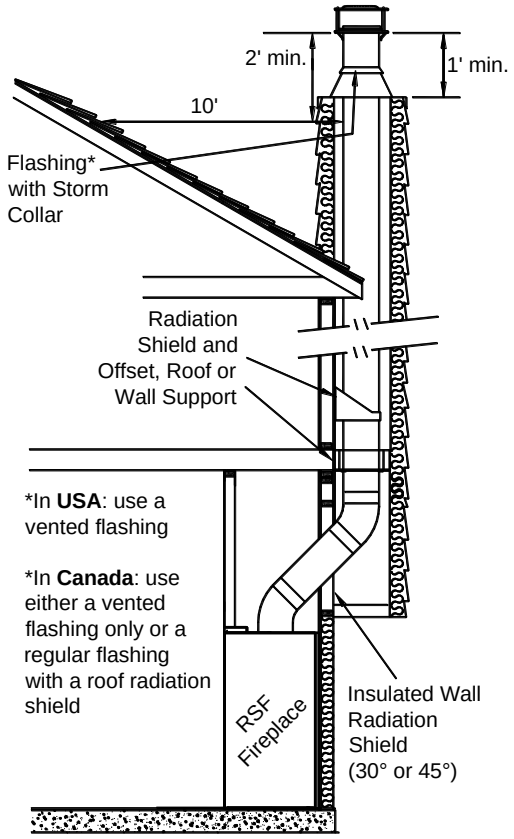


Figure 12 Offset Chimney Through a Wall Example

Through the Wall Offset

You can also go through the wall at an angle starting directly at the fireplace as depicted in Figure 12. An angled wall insulated radiation shield (XM-6EWRSI30 or XM-6EWRSI45) must be used wherever the chimney passed through an exterior wall. Make sure you have enough ceiling height. If not, you might want to consider installing the fireplace in an outside chase.

If the chimney is enclosed once outside of the house, do not install the outside plate of the angled wall insulated radiation shield.

Refer to the angled wall insulated radiation shield installation sheets for more detailed installations instructions.

CHASE ENCLOSURE

If the chimney runs up the outside of the house, we recommend that it be enclosed in a chase structure. The chase should be constructed in such a way that it is an extension of the home (see Figure 13). It should be well insulated between the footings and the floor of the home to prevent heat loss. If the climate in your area is mild, insulate the chase at least to the first firestop. If the climate in your area is very cold, insulate the chase to the top to keep the chimney warmer, increase the draft, and reduce creosote buildup. We also recommend insulating the ceiling of the chase just as if it were in the attic space. This will prevent cold air from dropping down through the chase and into the room where the fireplace is installed (see Figure 13).

Some local codes require that the walls be insulated, vapor sealed and sheathed with a fire rated gypsum board (see Figure 13). We strongly recommend this procedure for all installations to prevent cold drafts from originating in the fireplace enclosure. If you follow this procedure, we recommend that you do not insulate the wall above the front of the fireplace.

◆ **REMEMBER:** Check local codes concerning installation requirements and restrictions in your area.

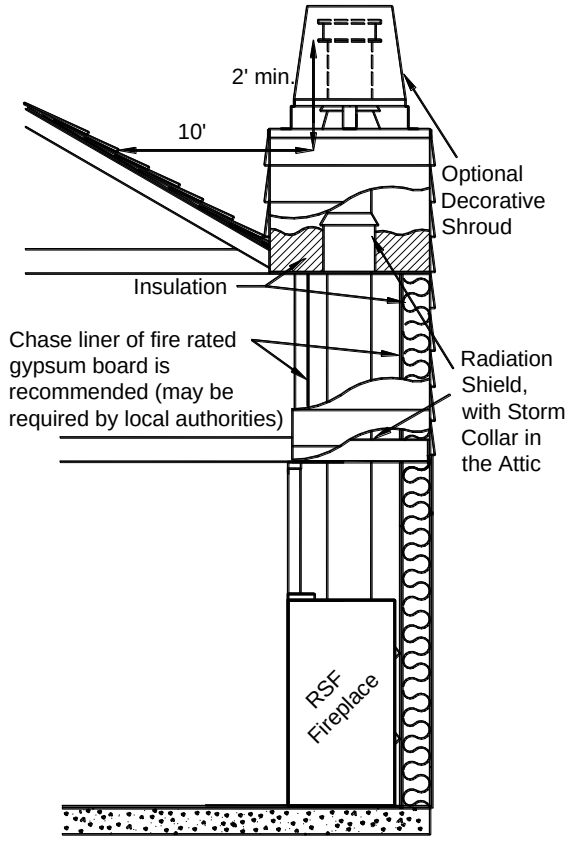


Figure 13 Chimney Installed with a Chase Enclosure Example

MASONRY CHIMNEY

Installing your FOCUS 3600 fireplace with a masonry chimney still requires using EXCEL chimney from the top of the fireplace to where it will connect to a listed liner that will run up inside the masonry chimney (see Figure 14).

The stainless steel liner should be fitted inside the clay liner all the way to the top of the masonry chimney. It is not meant to replace the clay liner. You can use either the EXCEL liner or any other listed liner to ULC-S635, ULC-S640 or UL-1777.

Special care is to be taken to make sure that you have a good solid connection between the EXCEL chimney and the liner. A masonry adaptor (FO-FDM6) was designed specifically for that purpose and is available from your RSF dealer. It will attach to the liner with 3 stainless steel rivets (provided) and to the EXCEL chimney with 3 screws (provided).

After mortaring in place, the connection between the EXCEL chimney and the liner should not be visible in order to isolate the heat released through the liner from the fireplace enclosure.

As depicted in Figure 14, you must install at least one 18" length of EXCEL chimney after the EXCEL chimney elbow. The uppermost part of the EXCEL chimney - where it enters the masonry chimney - must be a minimum of 12" from the ceiling.

◆ **NOTE:** If the ceiling is high enough, you can install one or more EXCEL chimney lengths directly on the fireplace before the elbow.

If you use a flexible liner, make sure to be careful when cleaning to ensure that the stainless steel flexible liner is not dislodged in any way.

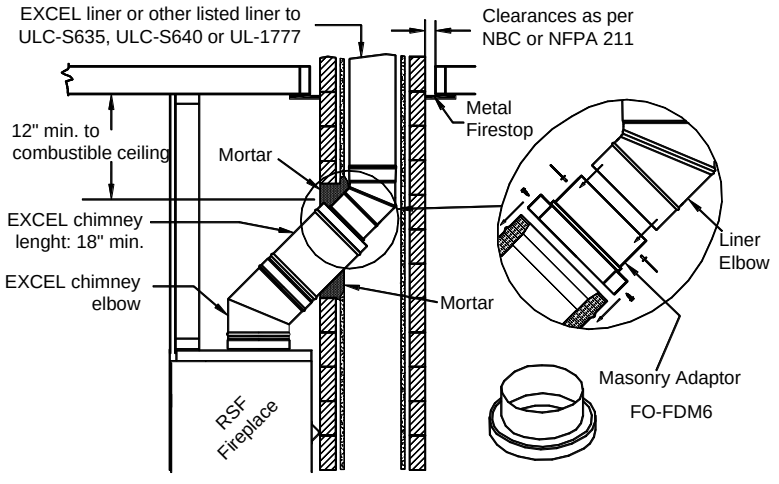


Figure 14 Connection to a Masonry Chimney

Using an Existing Masonry Chimney

❖ **WARNING: IF YOU ARE CONSIDERING USING AN EXISTING CHIMNEY, IT MUST FIRST BE THOROUGHLY INSPECTED BY AN AUTHORITY HAVING JURISDICTION TO DETERMINE THE FOLLOWING:**

1. The masonry chimney is well constructed and fully lined, in accordance with Local Building Codes and the National Building Code of Canada (NBC) or National Fire Protection Association chimney standard (NFPA 211).
2. It has been thoroughly cleaned of any soot or creosote residue and inspected to determine that it is in good working condition.
3. There is no insulation of any type in contact with the masonry chimney and there is no insulation stuffed anywhere in the chimney.
4. All the necessary clearances around the masonry chimney, along the complete run of the chimney, are respected as per NBC or NFPA 211. If the masonry chimney is enclosed in drywall, openings will probably be required in order to verify clearances at all points.
5. The masonry chimney will only be used for the fireplace and no other appliance.

If major repairs are required to meet the above conditions, a new chimney should be constructed.

To make the hole through the masonry chimney and make the connection to the fireplace, we recommend that you follow these steps:

1. Sight-in and mark the outline of where the EXCEL chimney will penetrate the masonry chimney.
2. Using a large (¾" - 2") masonry drill bit, drill a hole exactly in the center of the oval outline. With a masonry hammer and drill, slowly enlarge the hole to the size required. Remember to work from the center out. Be especially careful with the clay liner behind the brick because three sides of it must stay in place.
3. Bring the stainless steel liner down from the top of the chimney.

   If you are using a rigid liner you will need enough room to secure an elbow to it with at least two screws.

   If it is difficult to install rigid stainless steel liner in the existing masonry chimney or for a masonry chimney with less than 10"x10" inside, a listed stainless steel flexible liner can be used along with a flexible/rigid adaptor (LM-6LAF) available from your RSF dealer.
4. Install the liner elbow and masonry adaptor on the lower end of the liner.
5. Move the fireplace forward enough to install the EXCEL chimney on the fireplace (elbow and length) then move the fireplace back into position as you connect the masonry adaptor to the EXCEL chimney.

Using a New Masonry chimney

Since the masonry chimney is not build yet, we recommend that you position your fireplace, install the EXCEL chimney on it and connect to the first length of liner before building the chimney as explained above and shown in Figure 14 . The liner sections can easily be installed as the layers of brick are being placed. Since this is a new chimney, we recommend that you build it to the right size so you do not have to ovalize the liner.

◆ **Remember:** The stainless steel liner should be fitted inside the clay liner all the way to the top of the masonry chimney. It is not meant to replace the clay liner.

COVERING THE FIREPLACE FACING

Facing materials MUST BE NON-COMBUSTIBLE such as metal, brick, slate or ceramic tile. Gypsum board is NOT an acceptable facing material. Gypsum board cannot get closer to the fireplace than the side and top standoffs.

Facing this fireplace can be as simple as using cement boards that will be painted or gluing ceramic tiles with high temperature silicone sealant. The facing material can be installed directly against the lintels surrounding the door and louvers.

The area in front the fireplace legs, below the bottom louver, MUST also be covered with NON-COMBUSTIBLE materials (see Figure 5). The L-shape spark guard provided will cover the front of the legs and offer support for the facing materials. See below for the installation instruction of the spark guard.

The front surface of the top standoff is part of the fireplace facing and MUST also be covered with NON-COMBUSTIBLE materials (see Figure 5).

HEARTH EXTENSION

The area immediately in front of the fireplace must be protected by a non-combustible material such as brick, tile, stone, or slate. Refer to Table 1 (G-H) for the depth and width that the hearth protection should extend beyond the front and both sides of the door opening (see Figure 1). There is no minimum thickness required for the hearth extension.

BENEATH THE HEARTH EXTENSION

If the FOCUS 3600 is installed on a non-combustible floor, the spark guard is needed to cover the legs of the fireplace.

The L-shape spark guard provided will not only protect against sparks and small embers that may fall at the very front of the fireplace but it will also close the front of the legs and support the facing materials.

If you have decided to remove the 1"x4" below the fireplace legs, you will need to cut off ¾" from the tall side of the L-shape spark guard.

Install the L-shape spark guard provided (1" bend x 6 3/8" x 32½" piece of sheet metal) in front of the legs of the fireplace. It should be aligned with the fireplace. Use a couple of wood screws to attach it to the floor and use the two self-tapping screws provided to attach it to the base of the fireplace. If you plan on covering the facing of the fireplace with glued ceramic tiles, place the screws so that they will be located behind the grout joint.

If you are preparing a raised installation, more than ½", you will need a custom made spark guard:

- You can add a custom plate (thickness: 0.060" minimum, width: 32½", height: raised height + 1½" for overlap) that will be attached to the base of the fireplace as an extension to the provided L-shape spark guard. Install the provided L-shape spark guard as described above, attaching it to the thick plate instead of the base of the fireplace.
- Or you can make a custom L-shape spark guard (thickness: 0.024", width: 32½", height: raised height + 6 3/8" + 1" for the bend) and install it as above.

◆ **NOTE**: Custom-made spark guards are site built.

MANTEL

Masonry and other non-combustible mantels (shelf and posts) can be placed anywhere on or around the fireplace facing, without blocking any of the bottom and top louvers. If the non-combustible mantel is located between the top of the fireplace facing and the specified height for a combustible mantel, then the wall portion between the top of the fireplace facing and the mantel must be covered in non-combustible material. If the non-combustible mantel is located at the same height allowed for a combustible mantel, or higher, then no special wall covering is required below the mantel.

For combustible mantels shelves, please see Table 1 (J-K) for the maximum depth of the mantel shelf and their clearance requirements. See Figure 1 for an example.

Vertical mantel posts on the sides of the fireplace opening must be non-combustible. Combustible mantel posts are not permitted unless they meet the clearance required to a perpendicular sidewall (see Table 1 (B)).

REFRACTORY BRICK INSTALLATION

The refractory bricks are placed in the fireplace at the factory. If for any reason, they should need to be replaced, the following order should be observed. To remove any of the refractory bricks, just remove the andirons (back parts first, then the front parts) and then follow the installation procedure in the reverse sequence. Refer to Figure 15 to identify which refractory brick is the left and which is the right at each step of the installation.

1. First, start by placing the rear refractory brick in the firebox (1), then the right side (2) and left side (3) refractory bricks (3).

2. Continue by installing the soft insulation (4) on the bottom of the firebox. It fits tight between the front and the back refractory brick and between both side refractory bricks.
3. Then install the bottom refractory brick (5).
4. Finally, install the two front refractory bricks (6 on the right and 7 on the left).

These refractory bricks have been designed specifically for the FOCUS 3600 and no modifications are required to ensure a proper fit.

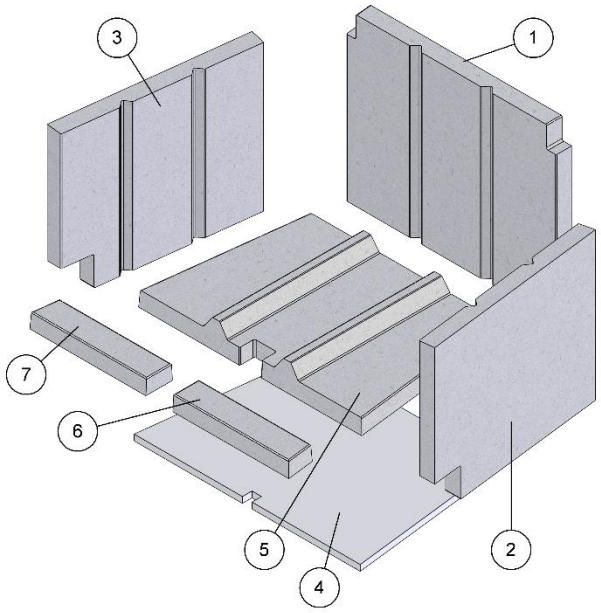


Figure 15 Refractory Bricks Installation

LISTING LABEL

The listing label is attached with a cable to the right of the bottom louver. Simply use a hook through the bottom louver, at its extreme right, to pull out the listing label and be able to read it.

Will be available soon.

COMPLETE OPTIONS LIST

		Electricity Required
FO-CID	Intake Duct (necessary for FO-CIF)	
FO-CIF	Inline Fan (needs also FO-CID)	✓
FO-DUCT5	Insulated Duct 5 feet	
FO-GRKX	Gasket Replacement Kit - FOCUS 3600	
FO-FDHB5-N	Internal Blower Kit	✓
FO-FDHB8	Internal Blower Kit	✓
New	Internal Blower Kit	✓
FO-FDM6	Masonry Chimney Adapter 6"	
FO-HD	Heat Dump Kit	✓
FO-INT	Outside Air Kit 4" Diameter	
FO-V2	Gravity Vent Kit	
FO-V3	Rectangular Gravity Vent Kit	
FO-VGC	Contemporary Grill for for FO-V2	

REPLACEMENT PARTS

Use only genuine RSF parts. The use of any substitutes will void the warranty and may put your safety at risk.

Will be available soon.
Contact your RSF dealer.

LIMITED WARRANTY

30 Years Limited Warranty

All RSF Woodburning Fireplaces models are warranted against defects in material and workmanship for a period of 30 years, subject to the following conditions:

During the first year **RSF Woodburning Fireplaces** will repair or replace, at our option, any parts which upon examination by an authorized **RSF Woodburning Fireplaces** representative, are found to be defective, except the parts listed in the EXCLUSIONS portion of this warranty. **RSF Woodburning Fireplaces** will also pay reasonable labor costs for the repair work.

During the second through fifth years **RSF Woodburning Fireplaces** will repair or replace, at our option, any parts which upon examination by an authorized **RSF Woodburning Fireplaces** representative, are found to be defective, except the parts listed in the EXCLUSIONS portion of this warranty. **RSF Woodburning Fireplaces** shall not be responsible for any labor costs associated with this repair work.

During the sixth through thirtieth years **RSF Woodburning Fireplaces** will provide replacement parts, if available, at 50% of the published retail price, except for the parts listed in the EXCLUSIONS portion of this warranty. **RSF Woodburning Fireplaces** shall not be responsible for any labor costs associated with this repair work.

EXCLUSIONS:

- Electrical components are warranted for one year only.
- Glass and plating.
- Andirons (front and back parts).
- Damage due to normal wear and tear, such as paint discoloration, worn gaskets, eroded or cracked refractory components.
- Repairs or replacements necessitated by vandalism, neglect, abuse, over-firing, improper fuel or fuel loads, or failure to adequately service the unit, as stated in the owner's manual.
- Repairs or replacements (particularly charges for travel and labor) not authorized by **RSF Woodburning Fireplaces** in advance.

LIMITATIONS:

- All items found to be defective will be replaced or repaired upon return of the defective part to an authorized **RSF Woodburning Fireplaces** dealer. **RSF Woodburning Fireplaces** will not be responsible for freight costs related to shipping replacement parts.
- Any complete fireplace, or part thereof, that is replaced or serviced under this warranty, will be warranted for a period not exceeding the remaining term of the original warranty.
- This warranty is not transferable.
- This warranty does not apply to damage to the appliance while in transit.
- This warranty does not apply if the installation does not conform to the installation requirements in the owner's manual.

RSF Woodburning Fireplaces is free of liability for any damages caused by the appliance, as well as material and labor charges incurred in the removal or re-installation of any **RSF Woodburning Fireplaces** fireplace under this warranty. Incidental or consequential damages are not covered by this warranty.

The remedies set forth herein are exclusive, and the liability of the seller shall not exceed the price of the fireplace or part thereof upon which the liability is based.

This warranty is expressly in lieu of all other warranties expressed or implied, including the warranties of merchantability and fitness for use and all other obligations or liabilities on the part of **RSF Woodburning Fireplaces.**

Nom de l'étiquette / Label Name:	Focus 3600, # série / serial #
Numéro de l'étiquette IDENCO / Printer (IDENCO) label reference number:	
Matériel de l'étiquette / Label Material:	Aluminium foil
Épaisseur de l'étiquette / Label Thickness:	0.002"
Couleur de l'étiquette / Label Color:	Noire mat avec lettrage blanc / Black mat with white letters
Dimension de l'étiquette / Label Dimension:	9.625" large/width x 4.625" haut/high (peut être changé si nécessaire)
Numéro de dessin / Drawing Number:	9303YY
Numéro Syteline / Syteline Number:	9303YY
Numéro sur l'étiquette / Reference Number on Label:	9303YY

LISTED FACTORY FIREPLACE AND SPACE HEATER

MODEL: FOCUS 3600

TESTED TO: UL 127 / CAN/ULC-S610 / CAN/ULC-S627
EPA 2020 CORDWOOD, CERTIFIED AT 1.5 G/H

DO NOT REMOVE THIS LABEL

U.S. ENVIRONMENTAL PROTECTION AGENCY CERTIFIED TO COMPLY WITH 2020 PARTICULATE EMISSION STANDARDS USING CORDWOOD

INSTALL AND USE ONLY IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION AND OPERATING INSTRUCTIONS. ***DO NOT OBSTRUCT COMBUSTION AIR INLET***. DO NOT USE A FIREPLACE INSERT OR OTHER PRODUCTS NOT SPECIFIED FOR USE IN THIS PRODUCT. OPERATE WITH DOOR FULLY OPEN OR FULLY CLOSED.

MINIMUM CLEARANCES TO COMBUSTIBLES MATERIALS	
SIDEWALL	xx IN. (xxx mm) FROM FIREBOX OPENING
*HEIGHT OF MANTEL SHELF: MAX. 12 IN. (305 mm) DEEP	xx IN. (xxx mm) FROM FIREBOX OPENING
UNIT BACK, SIDES AND BOTTOM	0" (0 mm) TO SPACERS

*SEE INSTALLATION INSTRUCTIONS FOR OTHER MANTEL HEIGHTS VS DEPTHS.

COMBUSTIBLE MATERIALS ARE NOT PERMITTED ON FACE OF UNIT. NON-COMBUSTIBLE HEARTH EXTENSION MUST BE 18 IN. (457 mm) DEEP BY 40 1/2 IN. (1029 mm) WIDE, AS SPECIFIED IN THE INSTALLATION MANUAL.

COMPONENTS REQUIRED FOR INSTALLATION:

- USE 4 IN. OR 5 IN. (102 OR 127 mm) DIAMETER FLEXIBLE DUCT AND COMBUSTION AIR INLET ASSEMBLY.
- USE THE ICC MODEL 6 IN. (152 mm) EXCEL CHIMNEY AND LISTED COMPONENTS AS PER INSTALLATION INSTRUCTIONS.

REFER TO MANUFACTURER'S INSTALLATION AND OPERATING INSTRUCTIONS FOR OPTIONAL COMPONENTS: FANS, GRAVITY VENT SYSTEM, ETC. ONLY ORIGINAL RSF OPTIONS SHOULD BE USED WITH THIS FIREPLACE, AND PURCHASE THROUGH RSF DEALERS.

WARNING: THIS FIREPLACE HAS NOT BEEN TESTED WITH AN UNVENTED GAS LOG SET. TO REDUCE RISK OF FIRE OR INJURY, DO NOT INSTALL AN UNVENTED GAS LOG SET INTO THE FIREPLACE.

REPLACE GLASS ONLY WITH 5MM CERAMIC GLASS. OPERATE ONLY WITH FIREBRICK IN PLACE. FOR USE WITH SOLID WOOD FUEL ONLY. DO NOT OVERFIRE UNIT.

THIS WOOD HEATER NEEDS PERIODIC INSPECTION AND REPAIR FOR PROPER OPERATION. CONSULT THE OWNER'S MANUAL FOR FURTHER INFORMATION. IT IS AGAINST FEDERAL REGULATIONS TO OPERATE THIS WOOD HEATER IN A MANNER INCONSISTENT WITH THE OPERATING INSTRUCTIONS IN THE OWNER'S MANUAL.

THIS WOOD HEATER IS NOT APPROVED FOR USE WITH A FLUE DAMPER OTHER THAN AN OPEN-CLOSE FLUE DAMPER.

UL CERTIFIED

SAFETY US·CA
SÉCURITÉ US·CA
MH61405

Fireplace; Fire Chamber for Use with ICC Certified Model Residential Type and Building Heating Appliance

NUMBER:

RSF QR code .80" x .80"

SERIAL NO. / NO DE SÉRIE

DATE MANUFACTURED
DATE DE FABRICATION

MANUFACTURED BY / FABRIQUÉ PAR:
ICC, 400 J.F.KENNEDY, ST-JEROME, QC, CANADA, J7Y 4B7

RSF

MADE IN CANADA
FABRIQUÉ AU CANADA

NE PAS ENLEVER CETTE ÉTIQUETTE

FOYER PRÉFABRIQUÉ ET APPAREIL DE CHAUFFAGE HOMOLOGUÉ

MODÈLE: FOCUS 3600

CERTIFIÉ CONFORME PAR EPA (É.-U.) AUX NORMES 2020 D'ÉMISSION DE PARTICULES EN UTILISANT DU BOIS DE CORDE.

MISE À L'ESSAIS SELON LES NORMES:
UL 127 / CAN/ULC-S610 / CAN/ULC-S627
CERTIFIÉ EPA 2020, BOIS DE CORDE, À 1.5 G/H

INSTALLER ET UTILISER SELON LES INSTRUCTIONS D'INSTALLATION ET DE FONCTIONNEMENT DU MANUFACTURIER. ***NE PAS OBSTRUER L'ENTRÉE D'AIR COMBURANT***. N'UTILISEZ PAS D'ENCASTRABLE OU AUTRES PRODUITS NON SPÉCIFIÉS POUR UTILISATION AVEC CE PRODUIT. FAIRE FONCTIONNER LE FOYER AVEC LA PORTE COMPLÈTEMENT OUVERTE OU FERMÉE.

DÉGAGEMENTS MINIMAUX AUX MATÉRIAUX COMBUSTIBLES	
MUR DE CÔTÉ	xx PO. (xxx mm) DE L'OUVERTURE DE LA BOITE À FEU
*HAUTEUR DE LA TABLETTE DE MANTEAU DE CHEMINÉE: MAX. 12 PO. (305 mm) PROFOND	xx PO. (xxx mm) DE L'OUVERTURE DE LA BOITE À FEU
ARRIÈRE, CÔTÉS ET BASE DE L'APPAREIL	0" (0 mm) AUX ESPACEURS

* VOIR LE MANUEL D'INSTALLATION POUR AUTRES HAUTEURS VS PROFONDEURS DE LA TABLETTE.

LES MATÉRIAUX COMBUSTIBLES NE SONT PAS PERMIS SUR LA FAÇADE DE L'APPAREIL. LE PROLONGEMENT DE L'ÂTRE INCOMBUSTIBLE DOIT ÊTRE DE 18 PO. (457 mm) DE PROFONDEUR PAR 40 1/2 PO. (1029 mm) DE LARGEUR MINIMUM SUIVANT LES SPÉCIFICATIONS DU MANUEL D'INSTALLATION.

PIÈCES REQUISES POUR L'INSTALLATION:

- TUYAU FLEXIBLE DE 4 PO. OU 5 PO. (102 OU 127 mm) DIA. ET PRISE D'ENTRÉE D'AIR.
- UTILISER UNE CHEMINÉE EXCEL 6 PO. (152 mm) DE DIAMÈTRE DE ICC ET SES COMPOSANTS HOMOLOGUÉES SELON LES INSTRUCTIONS D'INSTALLATION.

VOIR LES INSTRUCTIONS D'INSTALLATION DU MANUFACTURIER POUR LES COMPOSANTS OPTIONNELS: VENTILATEURS, SYSTÈME D'ÉVENT PAR GRAVITÉ, ETC. SEULES LES OPTONS ORIGINALES DE RSF DOIVENT ÊTRE UTILISÉES, ET ACHETÉES PAR L'ENTREMISE DE DÉTAILLANTS RSF.

AVERTISSEMENT: CE FOYER N'A PAS ÉTÉ TESTÉ AVEC UNE BÛCHE À GAZ SANS ÉVENT. POUR RÉDUIRE LES RISQUES DE FEU ET DE BLESSURES, NE PAS INSTALLER DE BÛCHE À GAZ SANS ÉVENT DANS CE FOYER.

LE REMPLACEMENT D'UNE VITRE DOIT SE FAIRE AVEC UNE VITRE CÉRAMIQUE DE 5MM D'ÉPAISSEUR SEULEMENT. OPÉRER SEULEMENT AVEC LES PIERRES RÉFRACTAIRES EN PLACE. POUR UTILISATION AVEC DU BOIS SEULEMENT. NE PAS SURCHAUFFER L'APPAREIL.

CET APPAREIL AU BOIS DOIT ÊTRE INSPECTÉ PRÉRIODIQUEMENT ET MAINTENU EN BON ÉTAT DE FONCTIONNEMENT. RÉFÉREZ-VOUS AU MANUEL DU PROPRIÉTAIRE POUR PLUS D'INFORMATION. IL EST INTERDIT PAR LES LOIS FÉDÉRALES D'OPÉRER CET APPAREIL AU BOIS SANS RESPECTER LES CONSIGNES D'OPÉRATION DU MANUEL DU PROPRIÉTAIRE.

CET APPAREIL AU BOIS N'EST PAS APPROUVÉ AVEC UN REGISTRE DE CHEMINÉE AUTRE QU'UN REGISTRE OUVERT-FERMÉ.

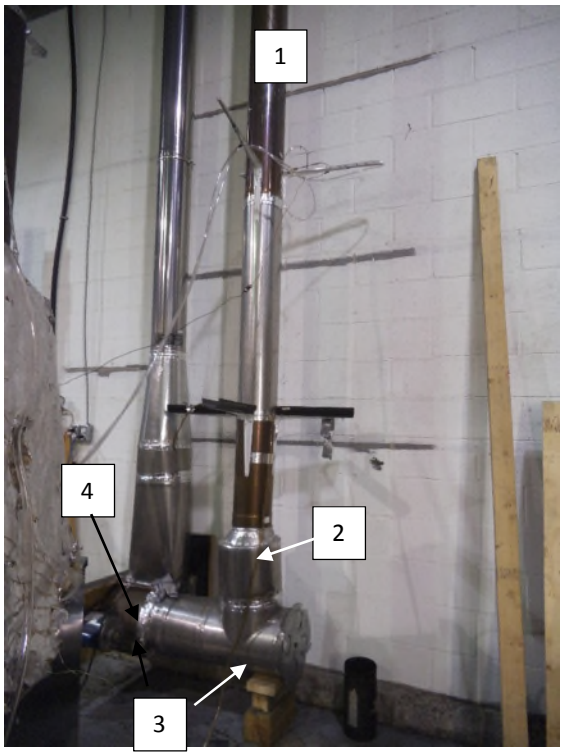
9303YY

Note: Some clearance final numbers are missing in tables since the safety testing program with UL is not completed yet.

APPENDIX 8: Photographs of test set up

Dilution picture Dia 8

Picture 1: Sampling system



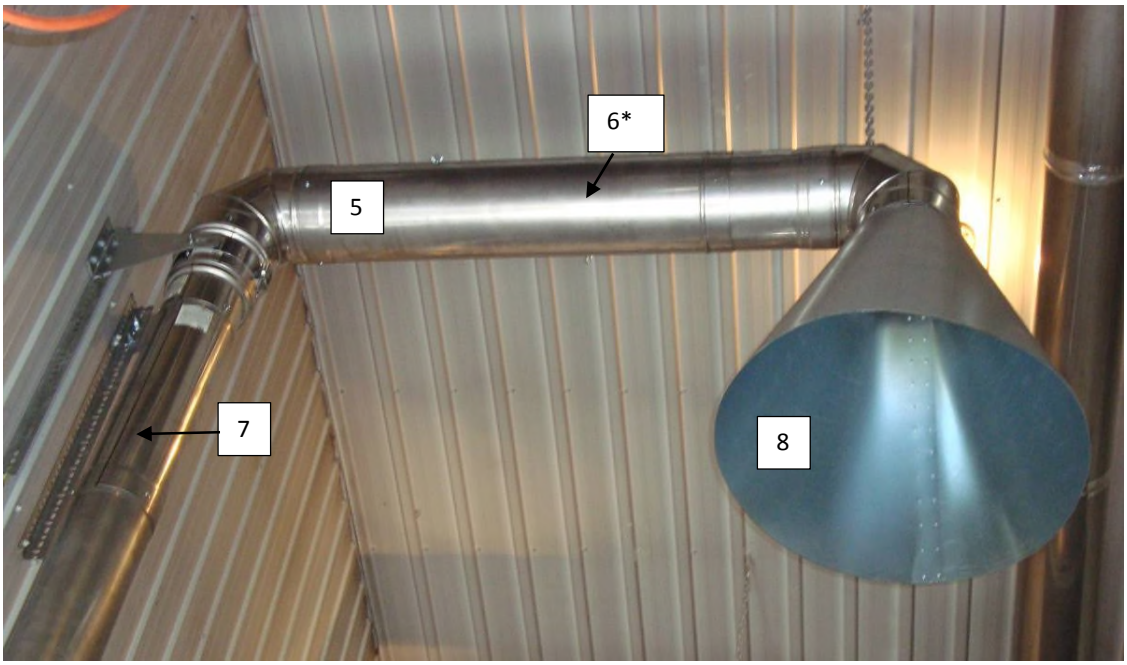
1 : 8 in dia Stainless steel pipe

2 : 16 in. Between sampling probe and lower elbow

3 : Air intake with damper to adjust flow rate

4 : Exhaust blower

Picture 2: Hood and mixing baffle



*The arrow point the deflectors inside of the pipe

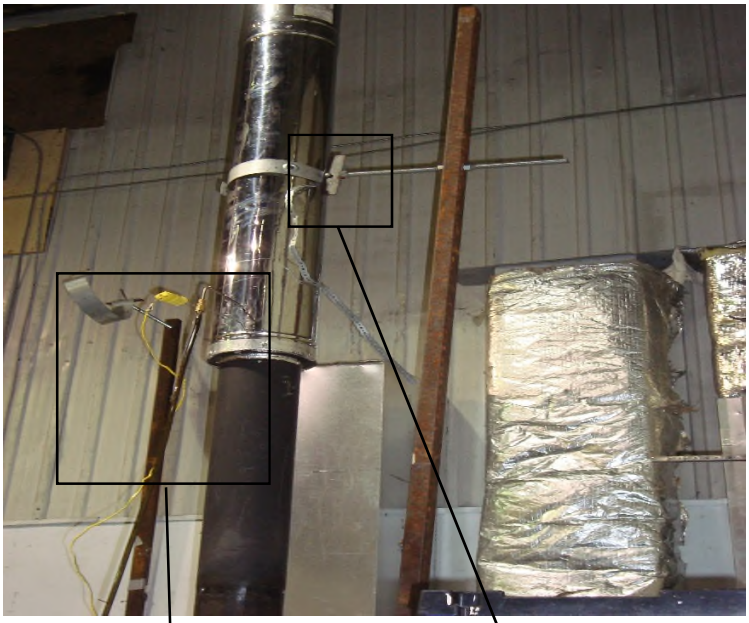
5 : 8 in. dia. Stainless steel pipe

6 : Mixing baffle (2) location 1 foot between baffles

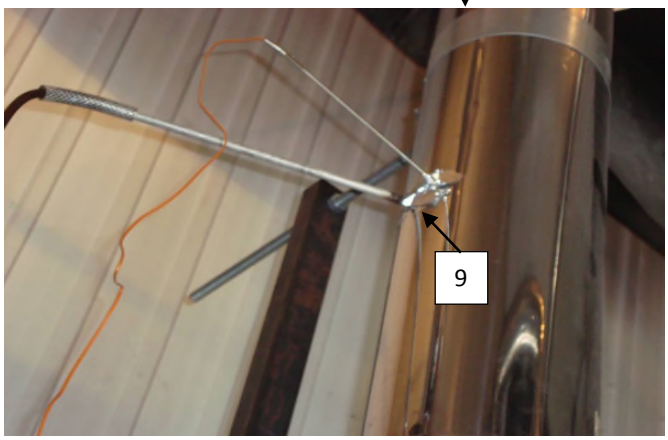
7 : 10 feet long between velocity port and upper elbow

8 : 48 in. dia. Galvanized steel smoke captures hood

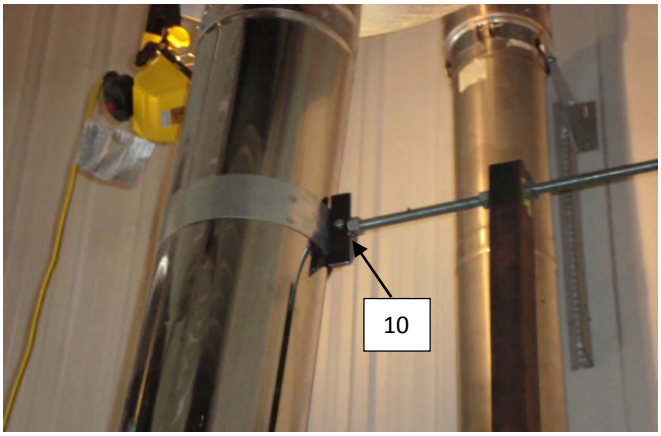
Picture 3: Stack sampling



Picture 3.1: Gas analysis and temperature probe



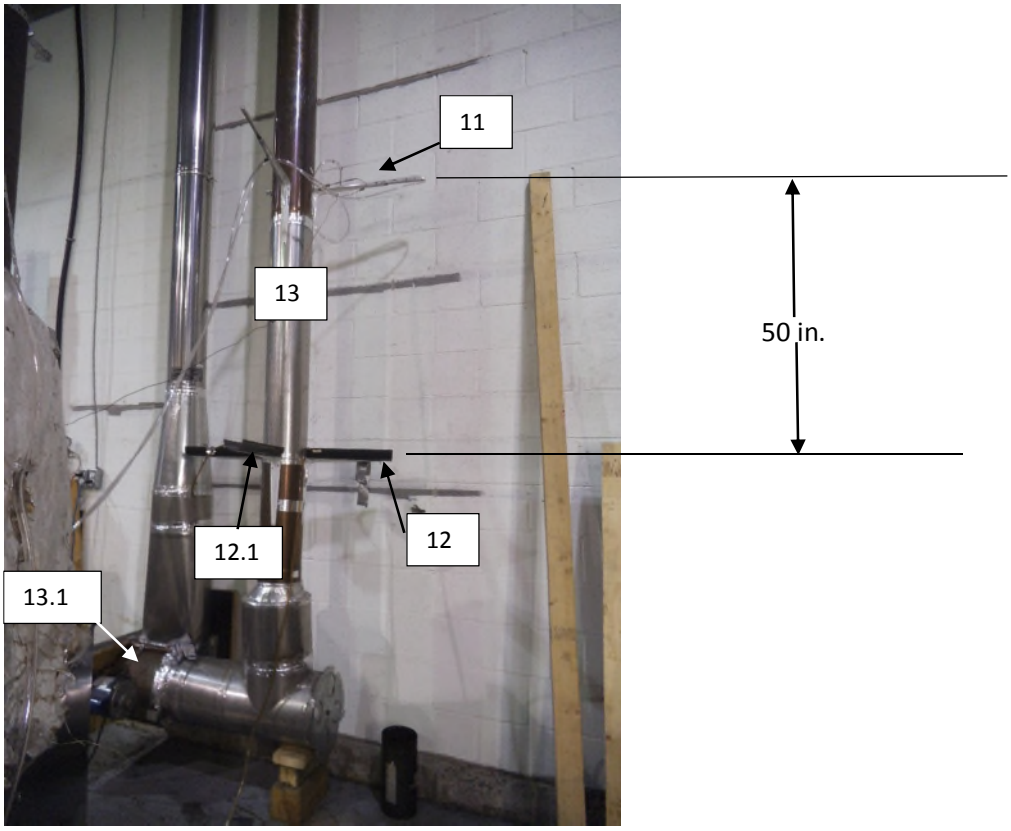
Picture 3.2: chimney support



9 : Temperature and gas analyser sampling ports located 9 feet above platform

10 : Exhaust system support bracket

Picture 4: Tunnel flow measurement and sampling probe



11 : Velocity port

12 :Sampling port, 2 sampling probes with 2x48 mm. dia.filter each. Filter used: Millipore AP4004700

12.1 :Sampling port, sampling probes with 2x48 mm. dia.filter each. Filter used: Millipore AP4004700, for first hour sampling

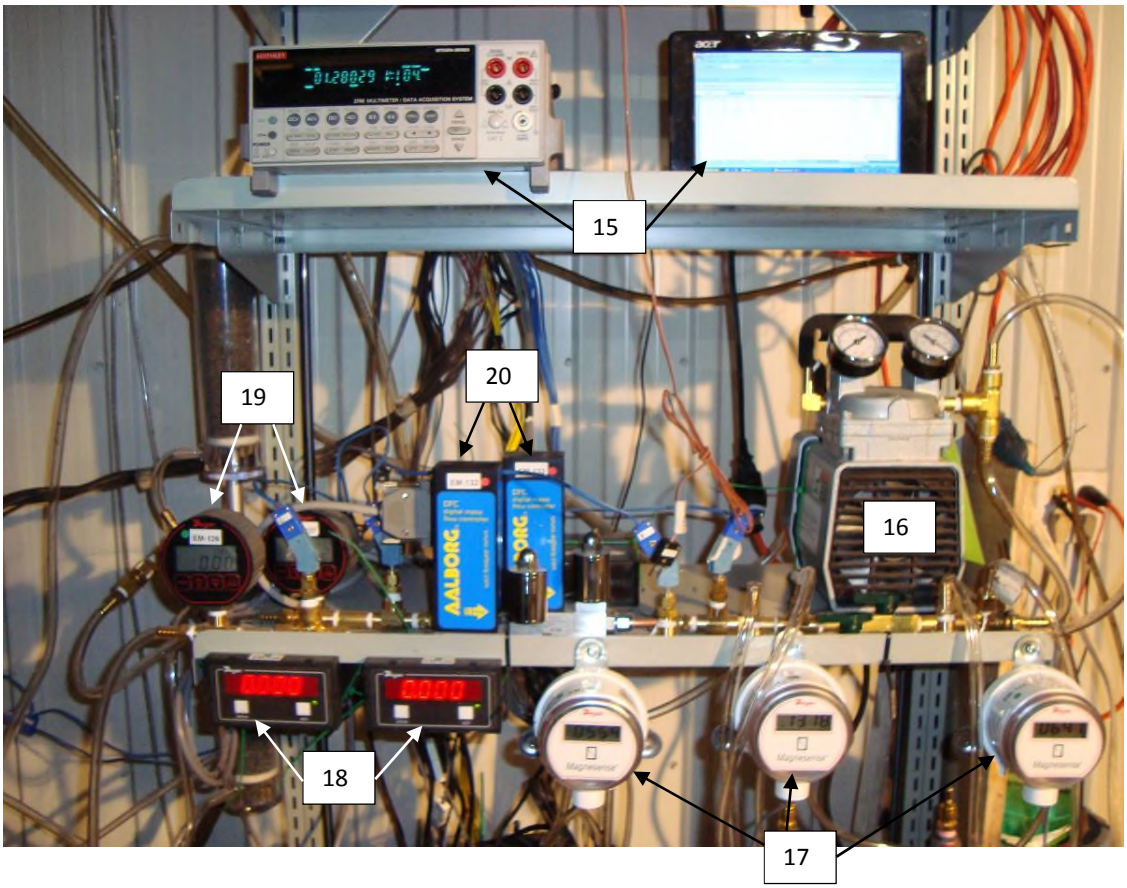
13 :18 feet long dilution tunnel

13.1 :Extraction blower

Picture 5: Draft sampling

14 : Draft sampling port located 6 in.from the flue outlet

Picture 6: Equipments



15 : Acquisition system

16 : Vacuum pump

17 : Digital manometer

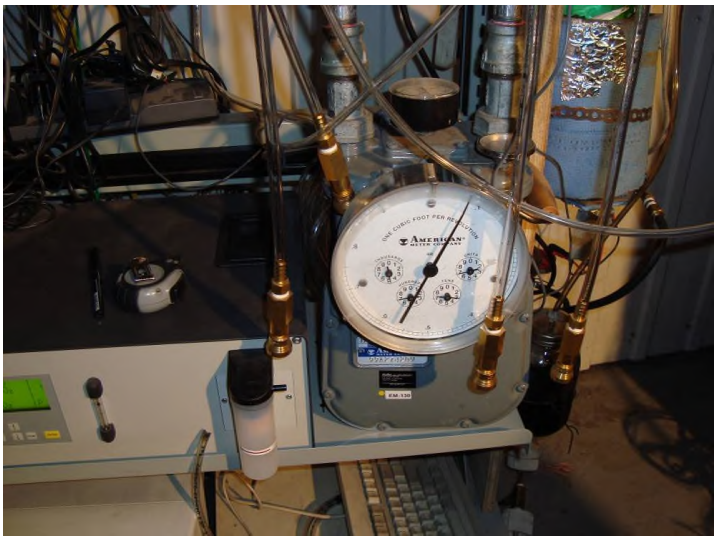
18 : Digital read out for mass flow meter

19 : Digital vacuum gage

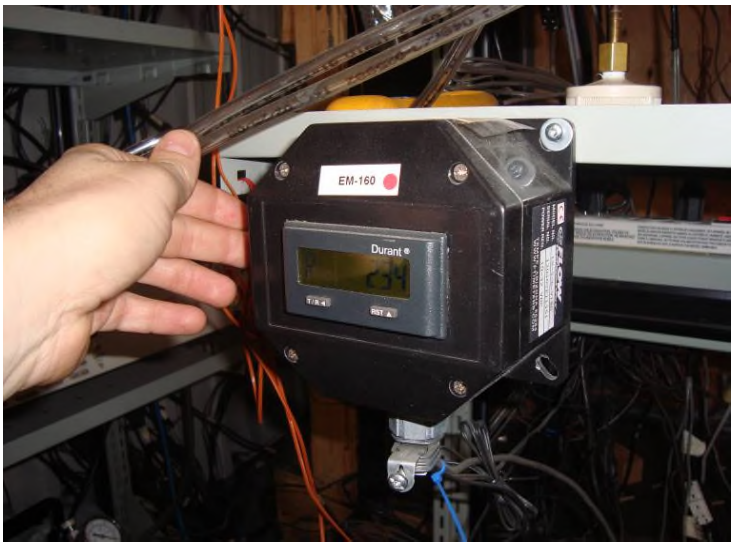
20 : Mass flow meter

Picture 7: Gaz analyser

Picture 8: Reference dry gas meter

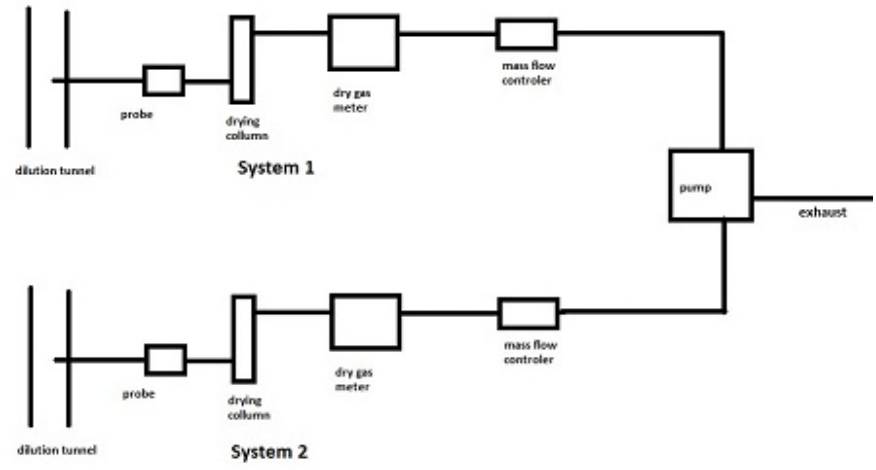


Picture 10: Water flow meter

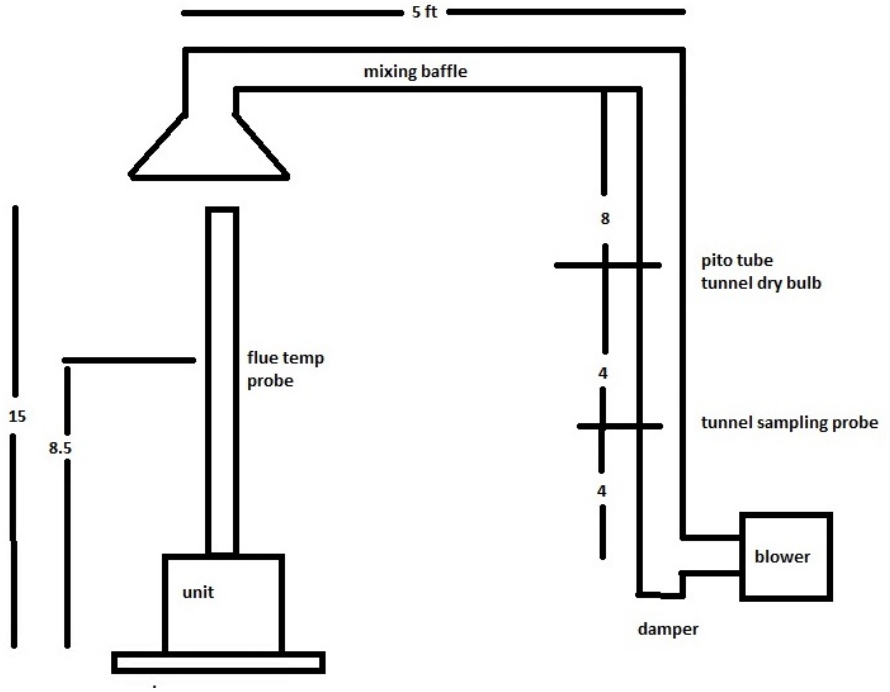


Picture 11: Dry gas meter

Picture 12 : Dilution tunnel sample system



Picture 13: Dilution tunnel



APPENDIX 9: Test load photographs

POLYTESTS
TESTING THROUGH YOUR REALITY

Run 1.1

POLYTESTS
TESTING THROUGH YOUR REALITY

Run 1.2

POLYTESTS
TESTING THROUGH YOUR REALITY

Run 2.1

APPENDIX 10: Laboratory Operating Procedures

APPENDIX 12: Volume calculations

APPENDIX 13: Operating instruction

ICC Project #:	Product / Produit:	Model / Modèle:	Tech./Eng.:	Date:	Agency Project #:
JLAB047	RSF Fireplace	FF-JLAB047	Luc Gilbert	2020-01	

EMISSION TESTING – JLAB047 FIREPLACE TEST PROCEDURE

Preburn (Kindling + Startup) - Applies to High, Medium and Low Fire

This section outlines details of Preburn (kindling + startup) procedure.


1. Primary air should be set to the maximum setting.
2. Pile 4.5 lb of startup pieces first and 3 lb of kindling on the top, up to the tubes, for a total between 7.4 and 7.5 lb of wood. As for pieces size, startup is the equivalent of 1"x1"x12" appx, and kindling is the equivalent of 1/2"x5/8"x12" appx.
3. Light up the fire, door open, with a propane torch for 50-60 sec. directly on the kindling top pieces.
4. Close the door, leave it cracked for about 30 sec. Close door completely.
5. Let it burn until the scale shows around 2.2 -2.3 lb of residual wood.

Hi Fire Test Procedure

This section outlines the Hi Fire procedure.

1. When the scale shows a residual weight of 2.2 - 2.3 lb, Open the door, rake to level coalbed, bring the non-burned pieces to the front.


2. The Hi Fire load should be between 15 to 15.5 lb. Load the 4 first 12in logs x 12" long on the leveled coalbed.
3. Load the 2 x 16in. long on the top. Push the back one against the back refractory. The front one should be about 2in. back from the end of the first-row logs, making sure it won't fall in the front door when burned.
4. Close the door, leave it cracked to get good flames on the first-row logs. At between 3-4 min., engage the door handle halfway on the door lock. At the 5 min. period, close de door handle completely.

5. Fan can be turned ON 20 min. after loading, at maximum setting.
6. When the scale shows 3.7 lb, which means the residual of both Preburn and Hi, the High Fire ends.

Medium and Low Fire Test Procedure

This section outlines the Medium and Low Fire procedure.

1. When the scale shows a residual weight of 3.6 lb, this corresponds to the Hi end of the loading range for the Medium / Low Fire. At this time, the air setting handle is still adjusted to maximum.
2. Tare scale.
3. Open the door, rake the coals and level the coalbed, bringing hot coals to the front.

4. The Medium / Low Fire load weight should be between 18 to 18.5 lb. Load the 4 first 12in logs x 12" long on the leveled coalbed.
5. Load the 2 x 16in. long on the top. Push the back one against the back refractory. The front one should be about 2in. back from the end of the first-row logs, making sure it won't fall in the front door when burned.
6. Close the door, leave it cracked to get good flames on the first-row logs. At between 3-4 min., engage the door handle halfway on the door lock. At the 5 min. period, close de door handle completely.
7. Medium Fire: During the period between 6 to 13 minutes from start, the Medium Fire air setting can be gradually closed to its final position, about 1/8-1/4" higher than the minimum setting.

   Low Fire: During the period between 8 to 13 minutes from start, the Low Fire air setting can be gradually closed to 1/8" higher than the minimum setting. At 15 min., move the handle to the minimum setting.
8. Medium Fire: Fan can be turned ON 20 min. after loading, at maximum setting.

   Low Fire: Fan can be turned ON 50 min. after loading, at maximum setting.
9. The test (Medium or Low) ends when the scale has reached 0 on the scale.

APPENDIX 14: Drawing Air flow pattern

APPENDIX 15: Application for wood stove program