Certificate of Conformity

Issued to:	England's Stove Works, Inc. Mr. Chris Terrell 589 S. Five Forks Rd. Monroe, VA 24574
Model:	32-NC
AKA:	50-TNC32, 50-SNC32
Effective Date:	May 21, 2020May 3, 2021
Revised Date*:	May 3, 2021
Report #	19-471

*See revision schedule on page 2 for summary of revision history.

Certification tests were performed by PFS-TECO located at 11785 SE Highway 212, Suite 305, Clackamas, OR 97015

PFS TECO certifies conformity to the following per 40 CFR Part 60 §60.533 (f) (A):

- The test report is complete and accurate.
- The instrumentation used for the test was properly calibrated.
- The representative model tested meets the applicable emission limits.
- The tests have been conducted per the appropriate guidelines.
- The manufacturer's Quality Control Plan has been reviewed to ensure that all production units are similar in all material respects that would affect emissions to the tested/certified model and that the units in the model line will meet all (other) applicable requirements.

PFS TECO certifies that the emissions levels as measured in the test report are in compliance with the 2020 PM emission limit of ≤ 2.5 g/hr using cordwood per EPA ALT 125. Efficiency measured per CSA B415.1-10

The average emissions for the 32-NC wood heater is **2.0 g/hr** with an average efficiency of **70%.** Average CO emissions are **2.3 g/min.**

Issued by: PFS TECO
11785 SE Highway 212
Suite 305
Clackamas, OR 97015

John Steinert, General Manager

PFS-TECO is accredited by IAS to ISO 17020:2012 "Criteria for Bodies Performing Inspections", and ISO 17025:2005 "Requirements for Testing Laboratories." PFS-TECO is also accredited by Standards Council of Canada to ISO 17065:2012 "Requirements for Bodies Operating Product Certification Systems."

Revision Summary

Date: May 21, 2020 – Original Issue

Date: May 3, 2021 – The following revisions to the report were reviewed:

-The notes section was edited to indicate that pre-test conditioning was performed at a medium combustion air setting, page 4. The conditioning data in appendix A was synthesized into a single summary sheet for ease of review.
-The Settings & Run Notes section was edited to clarify air settings used during testing, see page 9.
-The FB volume calculation drawing was added to the main body of the test report, see page 11.
-Manufacturers burn instructions were added to Appendix A, see page 24 of Non-CBI Test report.

England's Stove Works, Inc.

Project # 19-471
Model: 32-NC
AKA: 50-SNC32, 50-TNC32
Type: Wood-Fired Room Heater
May 21, 2020
Revised Date: May 3, 2021

ASTM E3053 Standard Test Method for Determining Particulate Matter Emissions from Wood Heaters Using Cordwood Test Fuel (EPA ALT-125)

Contact: Mr. Chris Terrell
589 S. Five Forks Rd.
Monroe, VA 24574
cterrell@englanderstoves.com

Prepared by: Aaron Kravitz, Testing Supervisor

11785 SE Highway 212 – Suite 305
Clackamas, OR 97015-9050
(503) 650-0088
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Revision Summary

Date: May 21, 2020 – Original Issue

Date: May 3, 2021 – The following revisions were made per request from EPA:

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Contents

Affidavit

PFS-TECO was contracted by England's Stove Works, Inc. to provide testing services for the 32-NC Wood-Fired Room Heater per ASTM E3053, *Standard Test Method for Determining Particulate Matter Emissions from Wood Heaters Using Cordwood Test Fuel*, which was approved for use under EPA ALT-125. All testing and associated procedures were conducted at PFS beginning on 4/22/2020 and ending on 4/24/2020. PFS's testing facility is located at 11785 SE Hwy 212, Clackamas, OR 97015. Testing procedures followed ASTM E3053, with variances as described in EPA ALT-125. Particulate sampling was performed per ASTM E2515, *Standard Test Method for Determination of Particulate Matter Emissions Collected by a Dilution Tunnel,* with the exception of caveats described in EPA ALT-125. A copy of EPA ALT-125 is included in Appendix A for reference, as required by the approval letter.

PFS-TECO is accredited by the U.S. Environmental Protection Agency for the certification and auditing of wood heaters pursuant to subpart AAA of 40 CFR Part 60, New Source Performance Standards for Residential Wood Heaters and subpart QQQQ of 40 CFR Part 60, Standards of Performance for New Hydronic Heaters and Forced Air Furnaces, Methods 28R, 28WHH, 28 WHH-PTS, and all methods listed in Sections 60.534 and 60.5476. PFS-TECO holds EPA Accreditation Certificate Numbers 4 and 4M (mobile). PFS-TECO is accredited by IAS to ISO 17020:2012 "Criteria for Bodies Performing Inspections", and ISO 17025:2005 "Requirements for Testing Laboratories." PFS-TECO is also accredited by Standards Council of Canada to ISO 17065:2012 "Requirements for Bodies Operating Product Certification Systems."

The following people were associated with the testing, analysis and report writing associated with this project.

Aaron Kravitz, Testing Supervisor

Introduction

England's Stove Works, Inc. of Monroe, VA contracted with PFS-TECO to perform EPA certification testing on the model 32-NC Wood-Fired Room Heater. All testing was performed at PFS-TECO's Portland, OR laboratory. All testing was performed by Aaron Kravitz.

Notes

- Prior to start of testing, 50 hours of conditioning was performed by PFS Lab Staff and a medium combustion air setting, per ASTM E3053.
- Prior to start of testing, the dilution tunnel was cleaned with a steel brush.
- Front filters were changed on sample train A at one hour for all 3 test runs.
- A total of 3 test runs were completed. Test runs were performed in accordance with ASTM E3053. For the three test runs used in the weighted average, no anomalies occurred. See the Run Narrative section for further detail on each run.

Wood Heater Identification and Testing

- Appliance Tested: ***32-NC***
- Serial Number: ***Un-serialized Prototype – PFS Tracking Number 0067***
- Manufacturer: ***England's Stove Works, Inc.***
- Catalyst: ***No***
- Heat exchange blower: ***None***
- Type: ***Wood Stove***
- Style: ***Free Standing***
- Date Received: ***Friday, February 14, 2020***
- Testing Period – Start: ***Wednesday, April 22, 2020***
  Finish: ***Friday, April 24, 2020***
- Test Location: ***PFS-TECO***
  11785 SE Hwy 212 Clackamas, OR 97015
- Elevation: ***~131 Feet above sea level***
- Test Technician(s): ***Aaron Kravitz***
- Observers: ***None***

Test Procedures and Equipment

All Sampling and analytical procedures were performed by Aaron Kravitz. All procedures used are directly from ASTM E3053 and ASTM E2515. See the list below for equipment used. See Appendix C submitted with this report for calibration data.

Equipment List:

Equipment ID#	Equipment Description
041	Rice Lake 3'x3' floor scale w/digital weight indicator
132	Digiweigh DWP-440 Platform Scale
53	APEX XC-60-ED Digital Emissions Sampling Box A
54	APEX XC-60-ED Digital Emissions Sampling Box B
57	California Analytical ZRE CO2/CO/O2 IR ANALYZER
064	Digital Barometer
109A/B	Troemner 100mg/200mg Audit Weights
107	Sartorius Analytical Balance
051	10 lb audit weight
101	Dewalt Tape Measure
117	Digital Calipers
095	Anemometer
111	Microtector
115	Delmhorst Wood Moisture Meter
SA17187	Gas Analyzer Calibration Span Gas
CC170624	Gas Analyzer Calibration Mid Gas

Results

The weighted average emissions rate for the 3 run test series was measured to be **2.0 g/hr** with a Higher Heating Value efficiency of **70%.** The average CO emission rate for the 3 tests was **2.3 g/min.** The England's Stove Works, Inc. model 32-NC Wood-Fired Room Heater meets the 2020 cordwood PM emission standard of ≤ 2.5 g/hr per CFR 40 part 60, §60.532 (c).

Detailed individual run data can be found in Appendix A submitted with this report.

Summary Table

	High Fire Test	Low Fire Test	Medium Fire Test
Date	4/22/2020	4/22/2020	4/24/2020
Run Number	1	2	3
PM Emission Rate (g/hr)	2.30	1.81	1.98
Burn Rate (kg/hr)	3.04	1.21	1.55
Heat Output (BTU/hr)	39,623	16,038	20,861
HHV Efficiency (%)	67.4%	69.7%	70.9%
LHV Efficiency (%)	72.1%	74.5%	75.8%
CO Emissions (g/MJ output)	4.63	5.81	5.29
CO Emissions (g/kg dry fuel)	62.33	80.84	74.84
CO Emissions (g/min)	3.23	1.64	1.94
1st Hour Emission Rate (g/hr)	0.76	8.77	3.70
Weighting Factor (%)	20%	40%	40%
Weighted particulate emission average of 3 test runs: 2.0 grams per hour.			
Weighted average HHV efficiency of 3 test runs: 70%.			
Average CO emission rate for 3 test runs: 2.3 grams per minute			

Test Run Narrative

Run 1

Run 1 was performed on 4/22/2020 as a high fire test run per ASTM E3053. Emissions sampling began from a cold start ignition of kindling and start-up fuel. The test fuel load was loaded 45 minutes into the test. Testing was completed when 90% of the test fuel load was consumed. Total test time was 238 minutes, main test fuel load burn time was 193 min. The particulate emissions rate from kindling ignition to test completion was 2.30 g/hr. The burn rate of the test fuel load was 3.04 kg/hr. The main test load portion of the run had an overall HHV efficiency of 67.4%. The train A front filter was changed at 1 hr. All test results were appropriate and valid. There were no anomalies and all test criteria were met.

Run 2

Run 2 was performed on 4/22/2020 as a low fire test run per ASTM E3053. The overall test duration was 629 minutes. The burn rate for the test run was 1.21 kg/hr. This run qualifies as a low burn because its duration exceeded 8 hours. The particulate emissions rate for the test run was 1.81 g/hr. The run had an overall HHV efficiency of 69.7%. The train A front filter was changed at 1 hr. All test results were appropriate and valid. There were no anomalies and all test criteria were met.

Run 3

Run 3 was performed on 4/24/2020 as a medium fire test run per ASTM E3053. The overall test duration was 481 minutes. The burn rate for the test run was 1.55 kg/hr, therefore the medium fire category requirements were met, less than the mid-point of the high and low burn rates (2.13 kg/hr). The particulate emissions rate for the test run was 1.98 g/hr. The run had an overall HHV efficiency of 70.9%. The train A front filter was changed at 1 hr. There were no anomalies and all criteria were met.

Test Conditions Summary

Testing conditions for all runs fell within allowable specifications of ASTM E3053 and ASTM E2515. A summary of facility conditions, fuel burned, and run times is listed below.

Runs	Ambient (°F)		Relative Humidity (%)		Average Barometric Pressure (In. Hg.)	Preburn Fuel Weight (lbs)	Test Fuel Weight (lbs)	Test Fuel Moisture (%DB)	Test Run Time (Min)
	Pre	Post	Pre	Post					
1	70	75	48	36	30.22	12.22[1]	29.6	22.2%	238[2]
2	74	69	36	48	30.23	29.6	33.76	20.4%	629
3	68	74	41	52	30.14	28.91	33.41	21.6%	481

[1]This is the weight of the kindling and startup fuel

[2]Total test time was 238 min, high fire test load burn duration was 193 min.

Appliance Operation and Test Settings

The appliance was operated according to procedures as described in the Operations Manual, found in Appendix B submitted with this report. Detailed run information can be found in Appendix A submitted with this report.

Settings & Run Notes

	Pre-Burn Air Setting	Test Run Air and Fan Settings
Run 1	N/A – Cold Start Ignition	Air control set to high fire test setting (maximum)
Run 2	Air control set to High Fire Setting in accordance with ASTM E3053	Air control set to maximum for first 6 minutes, then 2/3 open for 1.5 minutes, then 1/3 open for 4 minutes. At 11.5 minutes, air reduced to test setting* (minimum).
Run 3	Air control set to High Fire Setting in accordance with ASTM E3053	Air control set to maximum for first 5 minutes, then 2/3 open for 2 minutes, then 1/3 open for 3 minutes. At 10 minutes, air reduced to test setting**.

*The Run 2 test notes refer to a test setting of 13/16" (0.812") open from fully closed. This was the test setting used on the prototype unit. Production units feature a fixed stop that makes this air slide position the minimum setting. See Low Fixed Stop drawing in Appendix D.

**The Run 3 test notes refer to a test setting of 7/8" open. For production units featuring the fixed stop, the equivalent air setting would be 1/16" open from fully closed.

Appliance Description

Model(s): 32-NC

Additional Models Discussion: In addition to the tested model, this design is also offered under other model names by the manufacturer, the 50-SNC32, and the 50-TNC32. These models differ only in branding designations. All models utilize the same basic design with respect to performance and emission controls and are presumed to have the same emissions performance.

Appliance Type: Wood-Fired Room Heater

Firebox Volume: 2.92 ft^3

Air Introduction System: Primary Air enters the firebox from the bottom/rear of the appliance and is channeled up the sides on the appliance and down through the air wash. Primary air is controlled via a damper arm located below the ashlip which moves in (closed) and out (open). Secondary air is pulled through a fixed opening adjacent to the primary intake and channeled under the stove and up through 4 secondary air tubes. Dimensions on all these features can be found in Appendix D.

Baffles: A 20" x 19" x 1" vermiculite baffle is rests on top of the secondary air tubes. It consists of four individual panels.

Refractory Insulation: The firebox is lined with 1.25" thick firebrick.

Flue Outlet: 6-inch exhaust outlet located on the top of the appliance.

Catalytic Combustor: N/A

Fan: None available.

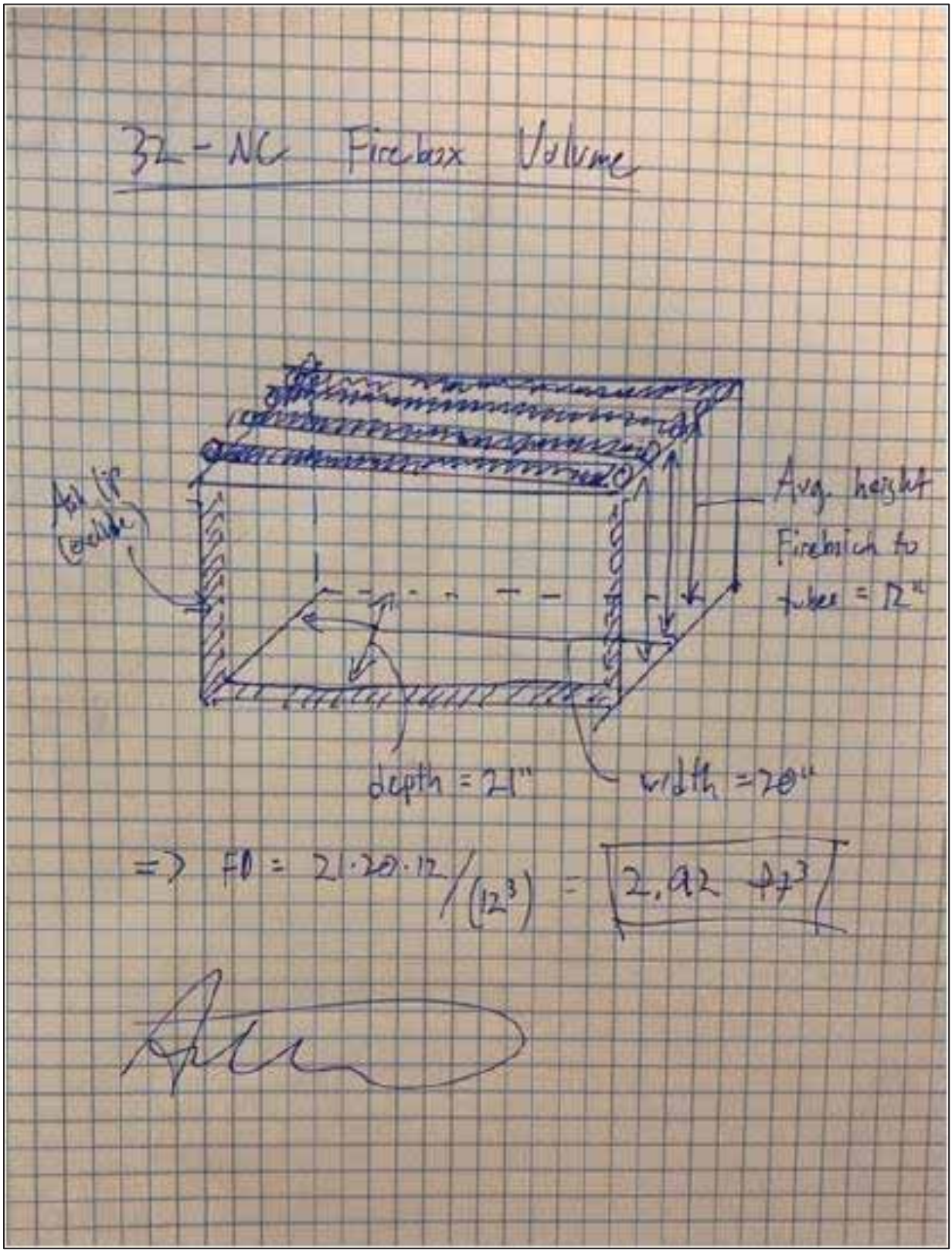
Appliance Dimensions

32-NC Unit Dimensions

Height	Width	Depth	Firebox Volume
31"	24"	27"	2.92 ft^3

Appliance design drawings can be found in Appendix D submitted with the CBI copy of this report.

Firebox Volume



Appliance Front

Appliance Left

Appliance Right

Appliance Rear

Test Fuel Properties

Test fuel used was Maple cordwood, split and air-dried to the specified moisture content range. Typical fuel loads are pictured below:

Typical Kindling Load

Typical Startup Load

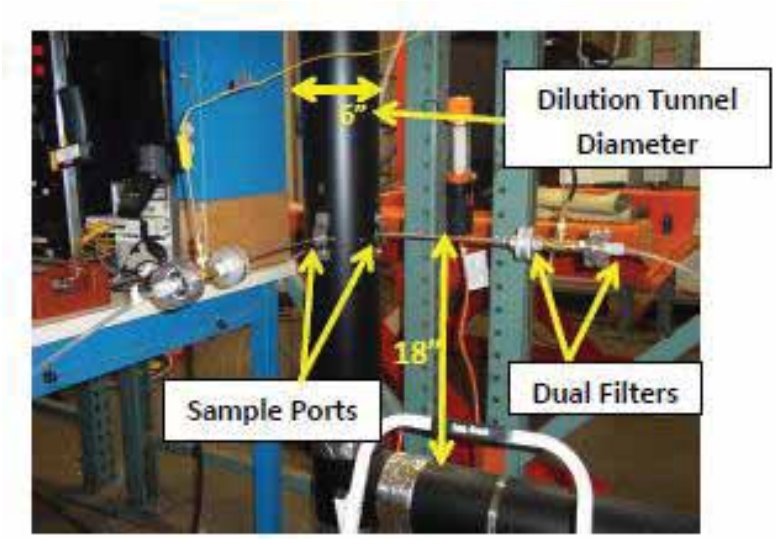
Typical High Fire Load

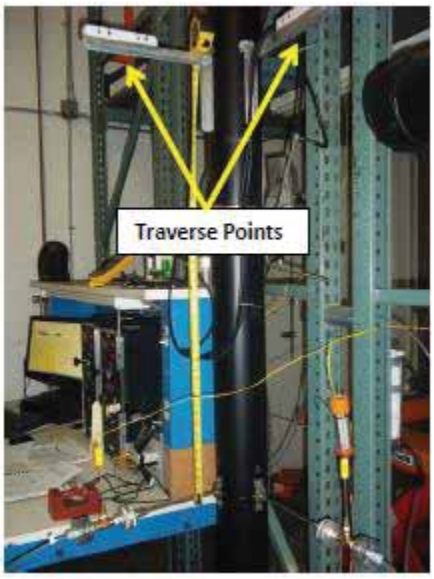
Typical Low Fire Load

Sampling Locations and Descriptions

Sample ports are located 16.5 feet downstream from any disturbances and 1 foot upstream from any disturbances. Flow rate traverse data was collected 12 feet downstream from any disturbances and 5.5 feet upstream from any disturbances. (See below).

Sample Points





Sampling Methods

ASTM E2515 was used in collecting particulate samples. The dilution tunnel is 6 inches in diameter. All sampling conditions per ASTM E2515 were followed. No alternate procedures were used with the exception of caveats described in ALT-125: Pall TX40 Emfab filters were used, filter temperatures were maintained between 80 and 90°F for all tests, filters were weighed in pairs where applicable, and no sampling intervals fell outside of proportional rates of +/- 10%.

Analytical Methods Description

All sample recovery and analysis procedures followed ASTM E2515 procedures. At the end of each test run, filters, O-Rings and probes were removed from their housings, dessicated for a minimum of 24 hours, and then weighed at 6 hour intervals to a constant weight per ASTM E2515-11 Section 10.

Calibration, Quality Control and Assurances

Calibration procedures and results were conducted per EPA Method 28R, ASTM E2515-11 and ASTM E3053. Test method quality control procedures (leak checks, volume meter checks, stratification checks, proportionality results) followed the procedures outlined.

Appliance Sealing and Storage

Upon completion of testing, the appliance was secured with metal strapping and the seal below was applied, the appliance was then returned to the manufacturer's location at: 589 S. Five Forks Rd. , Monroe, VA 24574 for archival.

Sealing Label

ATTENTION:

THIS SEAL IS NOT TO BE BROKEN WITHOUT PRIOR AUTHORIZATION FROM THE UNITED STATES ENVIRONMENTAL PROTECTION AGENCY.

THIS APPLIANCE HAS BEEN SEALED INACCORDANCE WITH REQUIREMNTS OF 40CFR PART 60 SUBPART AAA §60.535 (a)(2)(vii)

REPORT #_____ DATE SEALED_____

MANUFACTURER_____ MODEL #_____

Sealed Unit

List of Appendices

The following appendices have been submitted electronically in conjunction with this report:

Appendix A – Test Run Data, Technician Notes, Sample Analysis, and Alternate Test Method Approval

Appendix B – Labels and Manuals

Appendix C –Equipment Calibration Records

Appendix D – Design Drawings (CBI Report Only)

Appendix E – Manufacturer QAP (CBI Report Only)

WOOD HEATER TESTING SUMMARY

SECTION 1 – Model Identification	
Model Name(s)/Number(s)	32-NC
Manufacturer	England's Stove Works, Inc.
Address 1	589 S. Five Forks Rd
Address 2	Monroe, VA 24574
Appliance Category(s) (Free-standing, Insert, etc.)	Free-Standing
Usable Firebox Volume - ft^3	2.92
Catalytic/Non-Cat	Non-Cat
Convection Air Fan (No, Standard, Optional)	No
SECTION 1B – Laboratory Information	
Testing Laboratory	PFS-TECO
Address 1	11785 SE Hwy 212 Ste 305
Address 2	Clackamas, OR 97015
ISO/Accreditation Info	ISO 17025
Dates Tested	4/22/20 - 4/24/20
Test Methods/Standards	ASTM E3053 (ALT-125), ASTM E2515
Dilution Tunnel Inside Diameter - in.	6.00
Filter Diameter - mm	47
Filter Material	Pall Type TX40

SECTION 2 – Test Conditions Summary

Test Run #	1	2	3	
Date Tested	4/22/2020	4/22/2020	4/24/2020	
Test Run Category (L, M, H)	High Fire	Low Fire	Medium Fire	
Average Barometric Pressure - in Hg	30.22	30.23	30.14	
Max. Observed Ambient Temp - °F	78	75	77	
Min. Observed Ambient Temp - °F	70	69	68	
Max. Observed Filter Temp - °F	86	86	85	
Test Fuel Load				
Cordwood Fuel Species	Maple, Hard	Maple, Hard	Maple, Hard	
Specific Gravity (from Table 1)	0.6	0.6	0.6	
Higher Heating Value - Btu/lb (from Annex A1)	8587	8587	8587	
Nom. Test Fuel Load Piece Length - in.	18	18	18	
Number of Test Fuel Pieces	5	6	6	
Test Fuel Weight				
Kindling - As Fired lb	3.88	N/A	N/A	
Kindling Wt. - As % of Test Fuel Load	13%	N/A	N/A	
Kindling Moisture - % DB	10%	N/A	N/A	
Kindling - kg DB	1.60	N/A	N/A	
SU Fuel - As Fired lb	8.34	N/A	N/A	
SU Fuel Wt. - As % of Test Fuel Load	28%	N/A	N/A	
SU Fuel Moisture - % DB	20%	N/A	N/A	
SU Fuel - kg DB	3.15	N/A	N/A	
Test Fuel Load - As Fired lb	29.6	33.76	33.41	
Ave. Test Fuel Load MC % DB	22.2%	20.4%	21.6%	
Test Fuel Load - kg DB	10.99	12.72	12.46	
Test Fuel Loading Density - lb/ft3	10.14	11.58	11.44	
Residual SU Fuel Wt. - As Fired lb	4.00	N/A	N/A	
Residual SU Fuel Wt. - As % of Test Fuel Load	14%	N/A	N/A	
Test Run Duration - minutes	238	629	481	
Test Run Duration - h	3.97	10.48	8.02	
Run Duration of High Fire Load Only - minutes	193	N/A	N/A	
Run Duration of High Fire Load Only - h	3.22	N/A	N/A	
Test Fuel Load Wt. at End of Test - As Fired lb	2.7	0	0	
Total Fuel Burned - kg DB	12.70	12.72	12.46	
% Test Fuel Load Wt. at End of Test	9.1%	0.0%	0.0%	

SECTION 3 – Test Run Results Summary

Test Run #	1	2	3	
Date Tested	4/22/20	4/22/20	4/24/20	
Test Run Category	High Fire	Low Fire	Medium Fire	
Burn Rate - kg/h DB	3.04	1.21	1.55	
Heat Output - Btu/h	39,623	16,038	20,861	
Average Dilution Tunnel Flow Rate - dscfm	164.58	172.49	171.69	
Average Sample Flow Rates - dscfm	0	0	0	0
Train 1	0.131	0.132	0.132	
Train 2	0.131	0.131	0.131	
Total PM Emissions - g	0	0	0	0
Train 1	8.28	19.48	15.26	
Train 2	9.99	18.40	16.42	
Average	9.132	18.939	15.841	
PM Emission Train Precision - %	9.4%	2.9%	3.7%	
PM Emission Train Precision - g/kg	0.07	0.04	0.05	
PM Emission Rate - g/h	2.30	1.81	1.98	
Total CO Emissions - g	623	1030	933	
CO Emissions Rate - g/h	194	98	116	
Overall Efficiency - CSA B415.1-10	0	0	0	0
% HHV Basis	67%	70%	71%	
% LHV Basis	72%	75%	76%	

SECTION 4 - Weighted Average Summary

Test Run Category	High Fire	Low Fire	Medium Fire
Burn Rate - kg/h DB	3.04	1.21	1.55
PM Emission Rate - g/h	2.30	1.81	1.98
CO Emissions Rate - g/h	193.6	98.3	116.3
Overall Efficiency - CSA B415.1-10	0	0	0
% HHV Basis	67%	70%	71%
% LHV Basis	72%	75%	76%
Heat Output - Btu/h	39600	16000	20900
Category Weighting	20%	40%	40%

ASTM E 3053 Weighted Averages			
PM Emission Rate - g/h	2.0		
CO Emissions Rate - g/h (Arithmetic Average)	136.1		
CO Emissions Rate - g/min (Arithmetic Average)	2.3		
Overall Efficiency - CSA B415.1-10			
% HHV Basis	70%		
% LHV Basis	75%		
Heat Output Range - Btu/h	16000	to	39600

Pre-Conditioning Data

Client:	England's Stove Works	Job #:	19-471
Model:	32-NC	Tracking #:	67
Date(s):	May - June, 2019	Technician:	AK

Elapsed Time (hrs)	Flue (°F)	Catalyst Exit (°F)	Notes: Indicate initial air setting and any changes in in setting during conditioning, as well as weight and average moisture content of all fuel additions.
0	508		+37.2 lb @ 25% DB, air set to medium
1	463		
2	371		
3	260		
4	195		
5	182		
6	184		
7	173		
8	170		
9	167		
10	160		
11	398		+39.9 lb @ 21% DB, air set to medium
12	436		
13	347		
14	191		
15	212		
16	186		
17	180		
18	174		
19	163		
20	155		
21	145		
22	137		
23	405		+37.7 lb @ 22% DB, air set to medium
24	362		
25	268		
26	226		
27	188		
28	172		
29	161		
30	159		
31	159		
32	151		
33	144		
34	142		
35	137		
36	260		+37.4 lb @ 23% DB, air set to medium
37	156		
38	222		
39	254		
40	168		
41	152		
42	148		
43	143		
44	140		
45	134		
46	132		
47	340		+40.2 lb @ 26% DB, air set to medium
48	328		
49	306		
50	300		

Signature/Date:  5/3/2021

OPERATION

Continuous Operation – Daily Operation after your Break-In Fires

Start-up

- Load the firebox with 6-9 lb of startup wood, split to moderate (1/4 to ½ lb) size.
- On top of the startup wood, add 3-5 lb of dry kindling.
- Start-up: Ignite the kindling until an aggressive flame is established and reaches the secondary tubes at the top of the firebox.
- Close the door and set air to maximum

High Burn

- Load on to a coal bed with minimal large chunks of wood, if practical
- Load wood parallel to the sides of the firebox
- Place wood pieces as far back in the firebox as possible.
- Avoid loading arrangements that result in tightly packed wood pieces. Select orientations that result in gaps between wood pieces and/or wood pieces sitting higher in the firebox.
- Any bark should face up to facilitate quick ignition
- Once visible flame reaches the secondary tubes, close the door and set air to maximum

Low and Medium Burn

- Allow the stove to burn at its intended Medium or Low setting for at least 15 minutes prior to loading. This can be done by burning on High until down to the top of the coal bed range, then setting the air and allowing 15 minutes to elapse.
- Leave the door closed for the 15-minute period – rake the coal bed prior.
- As with the high burn:
    - *Load wood parallel to the sides of the firebox*
    - *Place wood pieces as far back in the firebox as possible.*
    - *Avoid loading arrangements that result in tightly packed wood pieces. Select orientations that result in gaps between wood pieces and/or wood pieces sitting higher in the firebox.*
    - *Any bark should face up to facilitate quick ignition*
    - *Once visible flame reaches the secondary tubes, close the door and set air to maximum*
- When visible secondary combustion is established (the flames are 'rolling' up near the tubes), begin to slowly reduce the air setting over at least 5 minutes. Ensure that secondary combustion is maintained as air is reduced.

WOOD STOVE TEST DATA PACKET
ASTM E3053/E2515

Run 1 Data Summary

Client:	Englands' Stove Works
Model:	32-NC
Job #:	19-471
Tracking #:	67
Test Date:	4/22/2020

Techician Signature — Date: 5/20/2020

TEST RESULTS - ASTM E3053 / ASTM E2515

Client: Englands' Stove Works
Model: 32-NC
Run #: 1

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/22/2020

Burn Rate (kg/hr):	3.04

	Ambient Sample	Sample Train A	Sample Train B	1st Hour Filter
Total Sample Volume (ft^3)	0.000	31.153	31.268	7.867
Average Gas Velocity in Dilution Tunnel (ft/sec)	15.50			
Average Gas Flow Rate in Dilution Tunnel (dscf/hr)	9874.8			
Average Gas Meter Temperature (˚F)	74.2	97.2	98.7	89.3
Total Sample Volume (dscf)	0.000	30.286	30.203	7.759
Average Tunnel Temperature (°F)	119.7			
Total Time of Test (min)	238			
Total Particulate Catch (mg)	0.0	6.4	7.7	0.6
Particulate Concentration, dry-standard (g/dscf)	0.0000000	0.0002113	0.0002549	0.0000773
Total PM Emissions (g)	0.00	8.28	9.99	0.76
Particulate Emission Rate (g/hr)	0.00	2.09	2.52	0.76
Emissions Factor (g/kg)	-	0.65	0.78	-
Difference from Average Total Particulate Emissions (g)	-	0.85	0.85	-
Difference from Average Emissions Factor (g/kg)	-	0.07	0.07	-

Final Average Results	
Total Particulate Emissions (g)	9.13
Particulate Emission Rate (g/hr)	2.30
Emissions Factor (g/kg)	0.72
HHV Efficiency (%)	67.4%
LHV Efficiency (%)	72.1%
CO Emissions (g/min)	3.23

Quality Checks	Requirement	Observed	Result
Dual Train Precision	Each train within 7.5% of average emissions (in grams), or emission factors within 0.5 g/kg	See Above	OK
Filter Temps	>80 °F, <90 °F	Min: 82 / Max: 86	OK
Face Velocity	< 30 ft/min	10.7	OK
Leakage Rate	Less than 4% of average sample rate	0.002 cfm	OK
Ambient Temp	55-90 °F	Min: 70 / Max: 78	OK
Negative Probe Weight Evaluation	<5% of Total Catch	Probe Catch Not Negative	OK
Pro-Rate Variation	90% of readings between 90-110%	98%	OK
	none greater than 120% or less than 80%	0	OK
	1 or fewer readings outside 90-110% (10 min basis)	1	OK

B415.1 Efficiency Results

Manufacturer: glands' Stove Works
Model: 32-NC
Date: 04/22/20
Run: 1
Control #: 19-471
Test Duration: 193
Output Category: High

Test Results in Accordance with CSA B415.1-09

	HHV Basis	LHV Basis
Overall Efficiency	67.4%	72.1%
Combustion Efficiency	95.8%	95.8%
Heat Transfer Efficiency	70.3%	75.2%

Output Rate (kJ/h)	41,770	39,623	**(Btu/h)**
Burn Rate (kg/h)	3.11	6.85	**(lb/h)**
Input (kJ/h)	61,992	58,806	**(Btu/h)**

Test Load Weight (dry kg)	9.99	22.02	**dry lb**
MC wet (%)	18.15		
MC dry (%)	22.17		
Particulate (g)	9.13		
CO (g)	623		
Test Duration (h)	3.22		

Emissions	**Particulate**	**CO**
g/MJ Output	0.07	4.63
g/kg Dry Fuel	0.91	62.33
g/h	2.84	193.58
g/min	0.05	3.23
lb/MM Btu Output	0.16	10.77

Air/Fuel Ratio (A/F)	14.88

VERSION: **2.2** **12/14/2009**

HIGH FIRE FUEL LOAD DATA - ASTM E3053

Client: Englands' Stove Works | Job #: 19-471
Model: 32-NC | Tracking #: 67
Run #: 1 | Technician: AK
Date: 4/22/2020

Nominal Loading Density (lbs/ft^3, wet basis):	10		
Usable Firebox Volume (ft^3):	2.92		
Target Load Weight (lbs):	29.20		
Total Load Weight Range (lbs):	27.70	to	30.70
Core Load Weight Range (lbs):	13.10	to	19.00
Remainder Load Weight Range (lbs):	10.20	to	16.10
Core Load Piece Range (lbs):	4.40	to	7.30
Remainder Load Piece Range (lbs):	2.90	to	16.10
Max Allowable Kindling Weight (lbs):	5.92		
Max Allowable Start-up Fuel Weight (lbs):	8.88		

CORE LOAD DATA

				Fuel Piece Moisture Readings (%DB)					Dry Weight	
Piece #	Length (in)	Weight (lbs)	Within Spec?	1	2	3	Ave.	Within Spec?	lbs	kg
1	18.00	5.52	In Range	18.0	25.2	20.1	21.1	In Range	4.56	2.07
2	18.00	6.60	In Range	18.9	20.1	19.0	19.3	In Range	5.53	2.51
3	18.00	5.55	In Range	25.7	19.7	18.0	21.1	In Range	4.58	2.08
Core Load Wt. (lbs)		17.67	In Range							

REMAINDER LOAD DATA (1 to 3 Pieces)

				Fuel Piece Moisture Readings (%DB)					Dry Weight	
Piece #	Length (in)	Weight (lbs)	Within Spec?	1	2	3	Ave.	Within Spec?	lbs	kg
1	18.00	7.39	In Range	24.7	29.0	22.4	25.4	In Range	5.89	2.67
2	18.00	4.54	In Range	24.6	19.7	27.5	23.9	In Range	3.66	1.66
3			NA				NA	NA	NA	NA
Remainder Load (lbs)		11.93	In Range							

Total Load Weight (lbs):	29.60	In Range	
Core Load % of Total Weight:	60%	In Range	45-65%
Remainder % of Total Weight:	40%	In Range	35-55%
Total Load % of Target Weight:	101%	In Range	95-105%
Actual Fuel Loading Density (lb/ft3):	10.1		
Total Load Average Moisture Content (%DB):	22.2	In Range	19-25%
Total Load Average Moisture Content (%WB):	18.1		
Total Test Load Weight (dry basis):	24.23 lbs	10.99 kg	

KINDLING AND START-UP FUEL

		Kindling Moisture Readings (%DB)					Dry Weight	
Kindling Weight (lbs)	Within Spec?	1	2	3	Avg.	Within Spec?	lbs	kg
3.88	In Range	10	10	10	10.0	In Range	3.53	1.60

		Start-up Moisture Readings (%DB)					Dry Weight	
Start-up Fuel Wt. (lb)	Within Spec?	1	2	3	Avg.	Within Spec?	lbs	kg
8.34	In Range	22.4	19.7	18.1	20.1	In Range	6.95	3.15

TEST FUEL LOADING RANGE

Allowable Residual Start-up Fuel Range (lb):	3.0	to	5.9	
Actual Residual Start-up Fuel Weight (lb):		4.0		In Range

TEST END POINT

High Fire Test Run End Point Range:	2.7	to	3.3	lb
Actual Fuel Load Ending Weight (lb):		2.7		In Range

Total Weight All Fuel Added: 41.82 lbs, wet basis
34.70 lbs, dry basis
15.74 kg, dry basis

Total Weight All Fuel Burned (dry basis): 28.00 lbs
12.70 kg

DILUTION TUNNEL & MISC. DATA - ASTM E3053 / E2515

Client:	Englands' Stove Works	Job #:	19-471
Model:	32-NC	Tracking #:	67
Run #:	1	Technician:	AK
Test Start Time:	13:10	Date:	4/22/2020
Test Type:	High Fire		

Recording Interval (min):	1
Total Sampling Time (min):	238
High Fire Test Load Time (min):	45

Meter Box γ Factor:	1.012	(A)
Meter Box γ Factor:	1.008	(B)
Meter Box γ Factor:		(Ambient)

Induced Draft Check (in. H_2O):	0		
Smoke Capture Check (%):	100%		
Date Flue Pipe Last Cleaned:	4/20/2020		

	Pre-Test	Post Test	Avg.
Barometric Pressure (in. Hg)	30.21	30.23	30.22
Relative Humidity (%)	48.0	36.0	
Room Air Velocity (ft/min)	0	0	
Scale Audit (lbs)	10.0	10.0	
Ambient Sample Volume:			ft^3

Sample Train Post-Test Leak Checks

(A)	0.002	cfm @	-12	in. Hg
(B)	0.002	cfm @	-15	in. Hg
(Ambient)		cfm @		in. Hg

DILUTION TUNNEL FLOW

Traverse Data

Point	dP (in H_2O)	Temp (°F)
1	0.040	71
2	0.072	71
3	0.074	71
4	0.028	71
5	0.026	71
6	0.066	71
7	0.072	71
8	0.028	71
Center	0.080	71

Static Pressure: -0.240 in. H_2O

Dilution Tunnel H_2O:	2.00	percent
Tunnel Diameter:	6	inches
Pitot Tube Cp:	0.99	[unitless]
Dilution Tunnel MW(dry):	29.00	lb/lb-mole
Dilution Tunnel MW(wet):	28.78	lb/lb-mole
Tunnel Area:	0.1963	ft^2
V_{strav}:	15.03	ft/sec
V_{scent}:	18.71	ft/sec
F_p:	0.803	[ratio]
Initial Tunnel Flow:	168.8	scf/min

TEST FUEL PROPERTIES

ASTM 3053-17 - Table A1.1 Fuel Properties by Fuel Species

Select Fuel Type	Species	%C	%H	%O	%Ash	MJ/kg	BTU/lb
	Ash, White	49.70	6.90	43.00	0.30	20.75	8927
	Beech	48.70	5.80	44.70	0.60	18.80	8088
	Birch, Sweet	49.80	6.50	43.40	0.30	20.12	8656
	Birch, Yellow	49.80	6.50	43.40	0.30	20.12	8656
	Doug Fir (Coast, Interior West/North)	48.73	6.87	43.90	0.50	19.81	8522
	Doug Fir (Interioir South)	48.73	6.87	43.90	0.50	19.81	8522
	Elm, Rock	50.40	6.60	42.30	0.70	20.49	8815
	Elm, Soft	50.40	6.60	42.30	0.70	20.49	8815
	Gum, Red	50.88	6.06	41.57	1.28	19.72	8478
	Larch, Western	50.54	6.36	42.40	0.70	17.58	7558
X	Maple, Hard	50.64	6.02	41.74	1.35	19.96	8587
	Maple, Sugar	50.64	6.02	41.74	1.35	19.96	8587
	Oak, Red	49.50	6.62	43.70	0.20	20.20	8690
	Oak, White	50.40	6.59	42.70	0.20	20.50	8819
	Pine, Southern	52.60	7.00	40.10	1.31	22.30	9587
	Pine, Southern Long Leaf	52.60	7.02	40.10	1.30	22.30	9594

WOODSTOVE PREBURN DATA

Client:	Englands' Stove Wor	Job #:	19-471
Model:	32-NC	Tracking #:	67
Run #:	1	Technician:	AK
		Date:	4/22/2020

High Fire Test Begins from Cold Start, No Preburn is Performed

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Englands' Stove Works
Model: 32-NC
Run #: 1

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/22/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
0	0.000		0.084	0.01	87	-0.11		12.3		72	74	83	70
1	0.124	0.124	0.078	1.74	87	-0.75	93	12.3	0	75	131	82	70
2	0.257	0.133	0.086	1.82	87	-0.77	95	12.2	-0.1	79	232	82	70
3	0.388	0.131	0.066	1.78	87	-0.9	107	12.1	-0.1	84	378	83	70
4	0.518	0.130	0.080	1.83	87	-0.73	98	12.0	-0.1	92	490	84	70
5	0.652	0.134	0.074	1.78	87	-0.61	105	11.9	-0.1	98	540	84	70
6	0.783	0.131	0.076	1.79	87	-0.87	102	11.8	-0.1	103	565	85	70
7	0.914	0.131	0.073	1.79	87	-0.78	104	11.7	-0.1	107	568	85	70
8	1.047	0.133	0.074	1.77	87	-0.89	106	11.6	-0.1	115	600	85	70
9	1.176	0.129	0.073	1.75	87	-0.78	103	11.5	-0.1	114	574	85	70
10	1.307	0.131	0.073	1.75	87	-1.05	105	11.2	-0.3	116	595	85	70
11	1.440	0.133	0.074	1.76	87	-0.86	106	11.0	-0.2	117	593	85	70
12	1.569	0.129	0.072	1.78	87	-0.94	104	10.7	-0.3	118	591	85	70
13	1.699	0.130	0.074	1.76	87	-0.72	104	10.5	-0.2	120	600	85	70
14	1.833	0.134	0.073	1.77	87	-0.75	108	10.2	-0.3	121	606	85	71
15	1.961	0.128	0.070	1.77	87	-0.85	106	9.8	-0.4	123	618	85	70
16	2.092	0.131	0.071	1.76	87	-0.87	107	9.6	-0.2	124	628	85	71
17	2.225	0.133	0.070	1.77	87	-0.82	110	9.3	-0.3	126	636	85	70
18	2.353	0.128	0.072	1.75	87	-0.75	105	9.1	-0.2	127	648	85	71
19	2.485	0.132	0.072	1.77	87	-1.1	108	8.8	-0.3	129	649	85	71
20	2.618	0.133	0.071	1.77	87	-1.08	109	8.6	-0.2	130	646	85	72
21	2.745	0.127	0.072	1.78	87	-0.77	104	8.1	-0.5	130	653	85	72
22	2.878	0.133	0.070	1.77	87	-1.11	111	7.9	-0.2	130	633	85	72
23	3.011	0.133	0.073	1.77	87	-0.84	108	7.9	0	128	612	85	72
24	3.138	0.127	0.072	1.78	88	-0.84	103	7.7	-0.2	128	597	85	72
25	3.272	0.134	0.073	1.78	88	-0.96	108	7.6	-0.1	125	584	85	72
26	3.403	0.131	0.074	1.78	88	-0.95	105	7.4	-0.2	123	576	85	72
27	3.531	0.128	0.075	1.76	88	-0.78	102	7.2	-0.2	126	564	85	71
28	3.666	0.135	0.073	1.78	88	-0.8	109	7.0	-0.2	128	563	85	71
29	3.796	0.130	0.075	1.76	88	-0.86	104	6.9	-0.1	129	557	85	71
30	3.926	0.130	0.077	1.77	89	-0.72	102	6.6	-0.3	129	564	85	72
31	4.062	0.136	0.073	1.80	89	-0.96	110	6.5	-0.1	129	560	85	72
32	4.191	0.129	0.072	1.78	89	-1.09	105	6.3	-0.2	128	551	85	72
33	4.321	0.130	0.075	1.80	89	-0.97	104	6.1	-0.2	128	541	85	72

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Englands' Stove Works
Model: 32-NC
Run #: 1

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/22/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
34	4.455	0.134	0.076	1.79	89	-1.03	106	5.9	-0.2	127	536	85	72
35	4.585	0.130	0.076	1.78	89	-0.96	103	5.9	0	126	532	85	72
36	4.717	0.132	0.075	1.77	90	-1.09	105	5.7	-0.2	125	532	85	72
37	4.851	0.134	0.074	1.76	90	-1.16	107	5.5	-0.2	124	514	85	72
38	4.982	0.131	0.077	1.80	90	-1.04	103	5.4	-0.1	123	511	85	72
39	5.112	0.130	0.072	1.75	90	-1.02	106	5.0	-0.4	135	599	85	72
40	5.245	0.133	0.076	1.76	90	-0.95	106	4.7	-0.3	133	598	85	72
41	5.375	0.130	0.073	1.78	91	-1.14	105	4.6	-0.1	132	583	85	73
42	5.505	0.130	0.075	1.76	91	-1.1	103	4.5	-0.1	130	563	85	72
43	5.639	0.134	0.075	1.76	91	-1	106	4.3	-0.2	128	545	85	72
44	5.769	0.130	0.075	1.78	91	-0.92	103	4.0	-0.3	126	523	85	73
45	5.899	0.130	0.073	1.76	91	-0.91	106	29.6	25.6	151	492	85	73
46	6.033	0.134	0.073	1.72	91	-1.2	109	29.3	-0.3	140	448	85	72
47	6.160	0.127	0.075	1.73	92	-1.43	101	29.3	0	128	419	85	72
48	6.290	0.130	0.076	1.72	92	-1.6	102	29.1	-0.2	122	431	85	72
49	6.422	0.132	0.075	1.70	92	-2.46	104	29.0	-0.1	121	457	85	72
50	6.554	0.132	0.074	1.96	92	-5.94	105	28.8	-0.2	121	484	84	73
51	6.681	0.127	0.071	1.34	92	-7.81	103	28.6	-0.2	121	498	84	72
52	6.808	0.127	0.072	1.55	93	-11.28	102	28.6	0	122	524	84	72
53	6.942	0.134	0.075	1.78	93	-0.77	106	28.4	-0.2	124	537	84	72
54	7.072	0.130	0.075	1.74	93	-0.9	102	28.2	-0.2	125	540	84	72
55	7.207	0.135	0.074	1.80	93	-0.6	107	27.8	-0.4	126	557	85	73
56	7.336	0.129	0.074	1.79	93	-0.76	103	27.7	-0.1	129	590	85	72
57	7.469	0.133	0.077	1.78	93	-0.82	104	27.5	-0.2	130	594	85	72
58	7.603	0.134	0.074	1.79	93	-0.83	107	27.2	-0.3	131	596	85	73
59	7.732	0.129	0.074	1.77	94	-0.9	103	26.9	-0.3	132	603	86	73
60	7.867	0.135	0.074	1.79	94	-0.81	108	26.6	-0.3	133	600	86	73
61	7.998	0.131	0.077	1.80	94	-0.78	102	26.5	-0.1	132	601	86	73
62	8.128	0.130	0.075	1.78	94	-0.75	103	26.1	-0.4	134	607	86	73
63	8.264	0.136	0.074	1.79	94	-0.6	109	25.9	-0.2	136	619	86	74
64	8.393	0.129	0.074	1.75	94	-0.72	103	25.8	-0.1	137	628	86	73
65	8.524	0.131	0.075	1.76	94	-1.12	104	25.3	-0.5	138	634	86	73
66	8.658	0.134	0.075	1.74	94	-0.98	107	25.1	-0.2	138	633	86	73
67	8.788	0.130	0.076	1.74	95	-0.89	103	24.8	-0.3	140	643	86	73

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Englands' Stove Works
Model: 32-NC
Run #: 1

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/22/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
68	8.920	0.132	0.073	1.75	95	-0.78	107	24.5	-0.3	141	649	86	73
69	9.053	0.133	0.076	1.76	95	-0.9	105	24.2	-0.3	141	657	86	73
70	9.183	0.130	0.075	1.72	95	-0.6	104	23.9	-0.3	142	650	86	74
71	9.313	0.130	0.074	1.74	95	-1.02	104	23.5	-0.4	143	659	86	75
72	9.446	0.133	0.072	1.73	95	-0.84	108	23.1	-0.4	143	660	86	74
73	9.575	0.129	0.073	1.73	95	-0.72	105	22.9	-0.2	144	665	86	75
74	9.705	0.130	0.072	1.71	95	-0.76	106	22.6	-0.3	145	664	86	75
75	9.836	0.131	0.072	1.72	96	-0.87	107	22.2	-0.4	145	668	86	75
76	9.965	0.129	0.072	1.70	96	-1.08	105	21.9	-0.3	146	673	86	75
77	10.094	0.129	0.072	1.69	96	-0.67	105	21.5	-0.4	147	680	86	75
78	10.225	0.131	0.073	1.71	96	-0.89	106	21.3	-0.2	147	673	86	75
79	10.352	0.127	0.074	1.67	96	-0.82	102	21.0	-0.3	148	679	86	75
80	10.480	0.128	0.075	1.68	96	-0.66	102	20.6	-0.4	148	675	86	76
81	10.611	0.131	0.072	1.67	96	-1.05	107	20.2	-0.4	149	678	86	76
82	10.738	0.127	0.073	1.66	96	-0.84	103	19.9	-0.3	149	679	86	76
83	10.864	0.126	0.075	1.64	96	-0.72	101	19.6	-0.3	149	673	86	76
84	10.995	0.131	0.073	1.66	97	-1.05	106	19.2	-0.4	149	675	86	75
85	11.123	0.128	0.073	1.74	97	-1	104	18.9	-0.3	148	676	86	74
86	11.250	0.127	0.073	1.74	97	-0.78	103	18.6	-0.3	149	670	86	75
87	11.385	0.135	0.075	1.75	97	-0.77	108	18.2	-0.4	149	675	86	75
88	11.516	0.131	0.073	1.75	97	-1.08	106	17.7	-0.5	149	671	86	75
89	11.645	0.129	0.072	1.73	97	-0.95	105	17.2	-0.5	149	676	86	75
90	11.781	0.136	0.074	1.74	97	-1.13	110	16.9	-0.3	149	672	86	75
91	11.911	0.130	0.076	1.76	98	-0.95	103	16.7	-0.2	148	665	86	75
92	12.041	0.130	0.076	1.74	98	-1.08	103	16.3	-0.4	148	661	86	73
93	12.175	0.134	0.074	1.74	98	-1.23	108	16.0	-0.3	147	658	86	74
94	12.304	0.129	0.077	1.70	98	-1.22	101	15.7	-0.3	147	656	86	73
95	12.434	0.130	0.075	1.74	98	-0.96	104	15.1	-0.6	147	651	86	73
96	12.567	0.133	0.076	1.71	98	-1.03	105	14.9	-0.2	147	655	86	73
97	12.698	0.131	0.076	1.83	98	-1.2	103	14.7	-0.2	147	657	86	74
98	12.830	0.132	0.076	1.76	98	-1.25	104	14.4	-0.3	147	654	86	74
99	12.963	0.133	0.075	1.76	98	-1.05	106	14.2	-0.2	146	655	86	74
100	13.094	0.131	0.076	1.76	98	-1.26	103	13.9	-0.3	146	653	86	74
101	13.224	0.130	0.077	1.73	98	-0.96	102	13.6	-0.3	146	648	86	74

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Englands' Stove Works
Model: 32-NC
Run #: 1

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/22/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
102	13.358	0.134	0.074	1.73	98	-1.33	107	13.4	-0.2	145	642	86	74
103	13.489	0.131	0.074	1.75	98	-1.21	105	13.2	-0.2	145	639	86	74
104	13.620	0.131	0.077	1.74	99	-1.25	103	12.9	-0.3	144	628	86	74
105	13.755	0.135	0.078	1.73	99	-1.05	105	12.8	-0.1	143	626	86	73
106	13.884	0.129	0.075	1.75	99	-1.24	102	12.5	-0.3	142	624	86	74
107	14.017	0.133	0.079	1.72	99	-1.42	103	12.2	-0.3	142	623	86	74
108	14.151	0.134	0.079	1.77	99	-1.14	103	12.1	-0.1	141	616	86	73
109	14.279	0.128	0.079	1.74	99	-1.15	99	11.8	-0.3	140	604	86	73
110	14.415	0.136	0.078	1.78	99	-1.3	105	11.5	-0.3	139	594	86	73
111	14.546	0.131	0.078	1.76	99	-1.26	101	11.3	-0.2	138	582	86	74
112	14.676	0.130	0.078	1.74	99	-1.14	100	11.3	0	137	575	86	74
113	14.812	0.136	0.078	1.76	99	-0.85	105	11.1	-0.2	136	571	86	75
114	14.941	0.129	0.076	1.76	99	-1.26	101	10.9	-0.2	135	563	86	75
115	15.073	0.132	0.078	1.74	99	-1.23	102	10.7	-0.2	135	560	86	76
116	15.207	0.134	0.076	1.72	99	-1.18	105	10.6	-0.1	135	562	86	77
117	15.338	0.131	0.077	1.74	99	-1.11	102	10.4	-0.2	134	559	86	77
118	15.470	0.132	0.078	1.73	99	-1.23	102	10.1	-0.3	134	563	86	76
119	15.603	0.133	0.077	1.72	99	-1.08	103	10.0	-0.1	134	562	86	76
120	15.734	0.131	0.077	1.73	99	-0.8	101	9.8	-0.2	134	558	86	76
121	15.865	0.131	0.077	1.71	99	-1.26	101	9.7	-0.1	133	558	86	77
122	16.000	0.135	0.076	1.74	99	-1.05	105	9.5	-0.2	132	553	86	78
123	16.130	0.130	0.077	1.73	99	-1.13	100	9.4	-0.1	131	545	86	77
124	16.262	0.132	0.077	1.72	100	-1.2	102	9.2	-0.2	130	543	86	75
125	16.396	0.134	0.076	1.73	100	-1.37	104	9.1	-0.1	130	540	86	76
126	16.525	0.129	0.077	1.72	100	-1.05	100	9.0	-0.1	129	527	86	77
127	16.660	0.135	0.078	1.72	100	-0.79	103	8.8	-0.2	128	515	86	78
128	16.793	0.133	0.078	1.74	100	-1.3	102	8.8	0	127	504	86	77
129	16.922	0.129	0.079	1.74	100	-0.78	98	8.7	-0.1	126	492	86	76
130	17.058	0.136	0.078	1.71	100	-1.09	104	8.6	-0.1	125	489	86	76
131	17.188	0.130	0.079	1.76	100	-1.1	98	8.5	-0.1	125	483	86	75
132	17.319	0.131	0.078	1.74	100	-1.25	100	8.5	0	124	475	86	75
133	17.454	0.135	0.081	1.75	100	-1.09	101	8.3	-0.2	123	471	86	77
134	17.585	0.131	0.077	1.73	100	-1.27	100	8.3	0	122	464	86	77
135	17.717	0.132	0.079	1.75	100	-1.12	100	8.3	0	121	463	86	78

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Englands' Stove Works
Model: 32-NC
Run #: 1

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/22/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
136	17.850	0.133	0.080	1.75	100	-1.23	100	8.2	-0.1	121	464	85	76
137	17.981	0.131	0.078	1.75	100	-1	99	8.1	-0.1	120	455	85	75
138	18.112	0.131	0.079	1.71	100	-1.35	99	7.9	-0.2	119	445	85	77
139	18.248	0.136	0.079	1.75	101	-1.07	103	8.0	0.1	118	439	85	77
140	18.378	0.130	0.079	1.72	101	-1.32	98	7.8	-0.2	117	433	85	77
141	18.509	0.131	0.080	1.72	101	-1.32	98	7.8	0	117	426	85	77
142	18.644	0.135	0.078	1.68	101	-1.13	102	7.8	0	116	420	85	77
143	18.772	0.128	0.078	1.66	101	-0.93	97	7.7	-0.1	115	416	85	77
144	18.903	0.131	0.079	1.65	101	-1.28	98	7.7	0	114	411	85	77
145	19.034	0.131	0.081	1.58	101	-1.45	97	7.6	-0.1	114	407	85	77
146	19.156	0.122	0.081	1.46	101	-1.53	90	7.5	-0.1	113	401	85	77
147	19.275	0.119	0.082	1.41	101	-1.51	88	7.5	0	113	401	85	76
148	19.403	0.128	0.082	1.78	101	-2.1	94	7.4	-0.1	112	398	85	76
149	19.534	0.131	0.081	1.70	101	-2.7	97	7.3	-0.1	112	394	85	76
150	19.665	0.131	0.081	1.79	101	-2.58	97	7.3	0	111	391	84	75
151	19.802	0.137	0.083	1.81	101	-2.44	100	7.3	0	111	386	84	76
152	19.936	0.134	0.083	1.81	101	-2.04	98	7.1	-0.2	110	384	84	77
153	20.071	0.135	0.085	1.84	101	-2.38	98	6.9	-0.2	110	382	84	76
154	20.205	0.134	0.083	1.79	101	-2.13	98	6.9	0	110	379	83	76
155	20.336	0.131	0.085	1.77	101	-2.21	94	6.9	0	110	379	83	76
156	20.473	0.137	0.084	1.80	101	-2.17	99	6.7	-0.2	109	376	83	75
157	20.607	0.134	0.083	1.80	101	-2.2	97	6.7	0	109	378	83	76
158	20.739	0.132	0.083	1.63	101	-2.34	96	6.7	0	109	378	84	76
159	20.862	0.123	0.085	1.28	101	-2.63	89	6.6	-0.1	109	378	84	75
160	20.971	0.109	0.083	1.03	101	-3.2	79	6.5	-0.1	108	378	84	75
161	21.072	0.101	0.080	0.93	101	-3.4	75	6.3	-0.2	109	377	84	76
162	21.169	0.097	0.082	0.87	101	-3.48	71	6.4	0.1	108	378	84	76
163	21.264	0.095	0.085	0.81	102	-3.57	68	6.2	-0.2	108	375	84	76
164	21.358	0.094	0.082	0.82	102	-3.71	69	6.3	0.1	108	374	84	76
165	21.450	0.092	0.082	0.79	102	-3.81	67	6.2	-0.1	107	372	84	76
166	21.548	0.098	0.084	2.04	102	-6.21	71	6.2	0	107	371	84	76
167	21.683	0.135	0.085	1.73	102	-5.52	97	6.1	-0.1	107	369	84	75
168	21.813	0.130	0.084	1.81	102	-5.39	94	6.0	-0.1	107	370	84	75
169	21.949	0.136	0.082	1.77	102	-5.04	99	5.8	-0.2	106	370	84	75

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Englands' Stove Works
Model: 32-NC
Run #: 1

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/22/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
170	22.108	0.159	0.084	2.84	102	-6.43	115	5.9	0.1	107	370	84	75
171	22.249	0.141	0.081	1.78	102	-4.57	104	5.8	-0.1	107	370	84	76
172	22.380	0.131	0.084	1.65	102	-4.45	95	5.8	0	106	371	84	75
173	22.508	0.128	0.082	1.68	102	-4.41	94	5.7	-0.1	106	374	84	75
174	22.640	0.132	0.082	1.71	102	-4.52	96	5.6	-0.1	106	372	84	75
175	22.703	0.063	0.082	1.69	102	-4.32	46	5.6	0	106	373	84	76
176	22.899	0.196	0.084	1.72	102	-4.37	142	5.4	-0.2	106	370	84	76
177	23.032	0.133	0.081	1.71	102	-4.16	98	5.4	0	106	368	84	76
178	23.162	0.130	0.084	1.74	102	-4.27	94	5.3	-0.1	105	366	84	76
179	23.291	0.129	0.083	1.74	102	-4.15	94	5.2	-0.1	105	365	84	76
180	23.426	0.135	0.081	1.76	102	-4.32	99	5.2	0	106	364	84	76
181	23.558	0.132	0.083	1.75	102	-4.11	96	5.1	-0.1	106	366	84	76
182	23.691	0.133	0.083	1.76	102	-4.21	97	5.0	-0.1	105	364	84	76
183	23.826	0.135	0.083	1.75	102	-4.24	98	5.0	0	105	362	84	76
184	23.955	0.129	0.082	1.76	102	-4.09	94	4.9	-0.1	104	358	84	76
185	24.090	0.135	0.085	1.78	102	-4.14	97	4.8	-0.1	104	356	84	75
186	24.224	0.134	0.084	1.77	102	-4.1	96	4.8	0	104	354	83	75
187	24.355	0.131	0.084	1.80	102	-4.23	94	4.8	0	104	351	83	75
188	24.493	0.138	0.084	1.81	102	-4.32	99	4.7	-0.1	103	344	83	76
189	24.625	0.132	0.082	1.81	102	-4.29	96	4.5	-0.2	103	339	83	76
190	24.760	0.135	0.084	1.83	102	-4.12	97	4.6	0.1	103	337	83	76
191	24.898	0.138	0.086	1.81	102	-4.27	98	4.6	0	102	333	83	75
192	25.029	0.131	0.081	1.81	102	-3.95	96	4.5	-0.1	102	329	83	75
193	25.165	0.136	0.084	1.82	102	-3.94	98	4.5	0	102	329	83	75
194	25.299	0.134	0.085	1.85	102	-3.95	95	4.4	-0.1	102	330	83	75
195	25.434	0.135	0.085	1.82	102	-3.99	96	4.4	0	101	327	83	76
196	25.573	0.139	0.084	1.86	102	-4	100	4.3	-0.1	101	323	83	75
197	25.707	0.134	0.082	1.86	102	-4.22	97	4.3	0	101	321	83	75
198	25.843	0.136	0.081	1.87	102	-3.92	99	4.2	-0.1	100	319	83	75
199	25.982	0.139	0.082	1.86	102	-4.15	101	4.2	0	100	316	83	75
200	26.111	0.129	0.081	1.71	102	-3.73	94	4.2	0	100	313	83	74
201	26.246	0.135	0.081	1.73	102	-3.85	99	4.1	-0.1	100	313	83	74
202	26.374	0.128	0.080	1.72	102	-3.85	94	4.1	0	100	312	83	75
203	26.514	0.140	0.080	1.72	102	-3.85	103	4.0	-0.1	100	312	83	75

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Englands' Stove Works
Model: 32-NC
Run #: 1

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/22/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
204	26.637	0.123	0.081	1.74	102	-3.8	90	3.9	-0.1	99	308	83	75
205	26.768	0.131	0.083	1.74	102	-3.82	94	3.9	0	99	307	83	75
206	26.899	0.131	0.079	1.76	102	-3.83	97	3.9	0	99	306	83	75
207	27.032	0.133	0.082	1.73	102	-3.67	97	3.8	-0.1	99	304	83	75
208	27.163	0.131	0.082	1.76	102	-3.87	95	3.8	0	99	304	83	75
209	27.293	0.130	0.082	1.76	102	-3.94	94	3.7	-0.1	99	302	83	74
210	27.426	0.133	0.081	1.74	102	-3.91	97	3.7	0	98	301	83	75
211	27.558	0.132	0.080	1.74	102	-3.65	97	3.5	-0.2	98	301	83	75
212	27.688	0.130	0.083	1.74	102	-3.76	94	3.6	0.1	98	299	83	74
213	27.824	0.136	0.082	1.77	102	-3.6	99	3.6	0	98	298	83	74
214	27.954	0.130	0.082	1.78	102	-3.89	94	3.5	-0.1	98	297	83	74
215	28.085	0.131	0.078	1.74	102	-3.66	97	3.5	0	98	296	83	75
216	28.220	0.135	0.080	1.77	102	-3.83	99	3.4	-0.1	98	296	83	74
217	28.349	0.129	0.081	1.74	102	-3.59	94	3.4	0	98	296	83	74
218	28.483	0.134	0.080	1.77	102	-3.62	99	3.3	-0.1	97	294	83	75
219	28.617	0.134	0.080	1.76	102	-3.94	98	3.3	0	97	294	83	75
220	28.743	0.126	0.082	1.75	102	-3.76	91	3.3	0	97	294	83	75
221	28.882	0.139	0.082	1.77	102	-3.63	101	3.2	-0.1	97	294	83	75
222	29.013	0.131	0.083	1.78	102	-3.77	94	3.2	0	97	296	83	75
223	29.145	0.132	0.082	1.77	102	-3.66	95	3.1	-0.1	97	296	83	75
224	29.280	0.135	0.082	1.77	102	-3.71	98	3.1	0	97	294	83	75
225	29.412	0.132	0.082	1.78	102	-3.5	96	3.1	0	97	293	83	75
226	29.544	0.132	0.083	1.79	102	-3.74	95	3.0	-0.1	97	291	83	75
227	29.681	0.137	0.084	1.79	102	-3.53	98	3.0	0	97	292	83	75
228	29.812	0.131	0.084	1.79	102	-3.59	93	2.9	-0.1	96	291	83	75
229	29.943	0.131	0.081	1.78	102	-3.6	95	2.9	0	96	289	83	75
230	30.079	0.136	0.083	1.78	102	-3.43	98	2.8	-0.1	96	288	83	75
231	30.211	0.132	0.084	1.81	102	-3.53	95	2.8	0	96	288	83	75
232	30.349	0.138	0.083	1.79	102	-3.52	99	2.8	0	96	288	83	75
233	30.480	0.131	0.081	1.81	102	-3.55	95	2.8	0	96	287	83	75
234	30.614	0.134	0.081	1.80	102	-3.79	97	2.8	0	96	288	83	75
235	30.750	0.136	0.084	1.80	102	-3.79	97	2.8	0	96	288	83	75
236	30.881	0.131	0.084	1.80	102	-3.66	94	2.8	0	95	287	83	75
237	31.015	0.134	0.081	1.81	102	-3.72	97	2.7	-0.1	95	286	83	75

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Englands' Stove Works
Model: 32-NC
Run #: 1

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/22/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
238	31.153	0.138	0.083	1.80	102	-3.58	99	2.7	0	95	286	83	75
Avg/Tot	31.153	0.131	0.078	1.73	97	-2.16	100			120	478	85	74.2

LAB SAMPLE DATA - ASTM E2515

Client: Englands' Stove Works
Model: 32-NC
Run #: 1

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/22/2020

	Sample ID	Tare, mg	Total, mg	Final, mg	Catch, mg
Train A Filters - First Hour	T442	96.9	96.9	97.5	0.6
Train A Filters - Remainder	T449	94.8	191.4	195.9	4.5
	T444	96.6			
Train A Probe	11A	117035.8	117035.8	117036.8	1.0
Train A O-Rings	11A	3422.3	3422.3	3422.6	0.3
Train B Filters	T445	96.8	290.6	294.3	3.7
	T446	96.9			
	T447	96.9			
Train B Probe	11B	117489.7	117489.7	117489.9	0.2
Train B O-Rings	11B	4233.1	4233.1	4236.9	3.8
Background Filter			0.0	0.0	

Placed in Dessicator on:	4/22/2020

Train A Filters - First Hour	97.9	4/24 9:25	97.6	4/25 12:06	97.5	4/25 17:59		
Train A Filters - Remainder	195.9	4/24 9:26	195.9	4/25 12:07				
Train A Probe	117036.9	4/25 11:57	117036.8	4/25 17:56				
Train A O-Rings	3424.7	4/25 12:00	3422.5	4/26 8:41	3422.6	4/27 8:08		
Train B Filters	294.5	4/24 9:26	294.3	4/25 12:08				
Train B Probe	117489.9	4/25 11:57	117489.9	4/25 17:56				
Train B O-Rings	4238.4	4/25 12:01	4236.8	4/26 8:41	4236.9	4/27 8:09		
Background Filter								

1st hour Sub-Total, mg:	0.6
Remainder Sub-Total, mg:	5.8
Train 1 Aggregate, mg:	**6.4**
Train 2 Aggregate, mg:	**7.7**
Ambient Aggregate, mg:	0.0

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Englands' Stove Works
Model: 32-NC
Run #: 1

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/22/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
0	0.000		0.00	88	-1		86	0.000	0.24	0.00
1	0.124	0.124	1.79	88	-3.36	92	85	0.000	0.85	0.08
2	0.253	0.129	1.78	88	0	92	85	-0.010	4.74	0.28
3	0.388	0.135	1.83	88	-3.36	110	85	-0.010	8.56	0.23
4	0.519	0.131	1.82	88	-3.48	98	85	-0.010	11.56	0.40
5	0.649	0.130	1.80	88	-2.3	102	86	-0.010	12.46	0.48
6	0.782	0.133	1.78	88	-0.47	103	86	0.000	11.42	0.38
7	0.911	0.129	1.77	88	-3.26	102	86	0.000	12.00	0.29
8	1.040	0.129	1.76	88	-2.01	102	86	0.000	11.54	0.23
9	1.173	0.133	1.77	88	-3.29	106	85	-0.010	12.38	0.37
10	1.302	0.129	1.76	88	-3.53	103	85	-0.010	12.89	0.43
11	1.431	0.129	1.80	88	-2.89	102	85	0.000	12.28	0.26
12	1.566	0.135	1.81	88	-3.47	109	85	-0.010	11.97	0.29
13	1.695	0.129	1.81	88	-0.6	103	85	-0.010	12.48	0.27
14	1.827	0.132	1.80	88	-1.1	106	85	0.000	12.49	0.22
15	1.961	0.134	1.80	88	-3.46	110	85	0.000	12.96	0.20
16	2.090	0.129	1.80	88	-2.63	105	85	0.000	13.28	0.22
17	2.223	0.133	1.80	88	-3.32	109	85	0.000	13.34	0.19
18	2.355	0.132	1.80	88	-2.78	108	85	0.000	13.70	0.29
19	2.484	0.129	1.79	88	-0.1	105	85	0.000	13.59	0.30
20	2.619	0.135	1.80	88	-0.45	110	85	0.000	13.32	0.19
21	2.750	0.131	1.80	88	-0.63	107	85	0.000	13.63	0.20
22	2.879	0.129	1.79	88	-0.08	107	85	0.000	13.13	0.17
23	3.014	0.135	1.79	88	-0.41	109	85	0.000	11.36	0.11
24	3.144	0.130	1.79	89	-3.52	105	85	0.000	9.88	0.13
25	3.275	0.131	1.79	89	-0.08	106	85	-0.010	9.72	0.17
26	3.408	0.133	1.79	89	-3.25	106	85	0.000	9.39	0.31
27	3.540	0.132	1.80	89	-0.2	105	85	0.000	0.94	0.01
28	3.671	0.131	1.80	89	-2.47	106	85	0.000	9.42	0.12
29	3.803	0.132	1.79	89	-2.63	105	85	0.000	10.16	0.13
30	3.935	0.132	1.80	90	-0.79	104	85	0.000	10.66	0.10
31	4.065	0.130	1.81	90	-2.41	105	85	0.000	10.29	0.15
32	4.199	0.134	1.79	90	-3.57	108	85	-0.010	10.00	0.12

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Englands' Stove Works
Model: 32-NC
Run #: 1

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/22/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
33	4.331	0.132	1.80	90	-3.32	105	85	-0.010	9.77	0.19
34	4.461	0.130	1.80	90	-0.13	102	85	-0.010	9.70	0.14
35	4.596	0.135	1.80	90	-2.7	107	85	0.000	9.59	0.12
36	4.725	0.129	1.79	91	-3.55	102	85	-0.010	8.58	0.14
37	4.858	0.133	1.80	91	-0.58	106	84	0.000	8.17	0.25
38	4.992	0.134	1.81	91	-0.77	105	85	-0.010	7.50	0.37
39	5.121	0.129	1.78	91	-0.21	105	85	-0.010	10.79	0.94
40	5.253	0.132	1.76	91	-0.33	104	85	-0.010	13.93	0.62
41	5.385	0.132	1.78	92	-0.11	106	84	0.000	12.91	0.22
42	5.513	0.128	1.77	92	-0.22	101	85	0.000	11.19	0.08
43	5.647	0.134	1.77	92	-3.55	106	84	0.000	9.21	0.12
44	5.778	0.131	1.76	92	-3.45	103	84	0.000	7.77	0.17
45	5.907	0.129	1.77	92	-1.29	105	84	0.000	6.48	0.20
46	6.040	0.133	1.69	93	-3.66	107	85	-0.010	5.00	0.39
47	6.169	0.129	1.70	93	-3.89	102	84	-0.010	1.87	0.31
48	6.297	0.128	1.80	93	-1.8	100	84	0.000	4.55	0.60
49	6.432	0.135	1.78	93	-6.49	106	84	0.000	5.52	0.28
50	6.565	0.133	1.78	93	-6.77	105	84	-0.010	7.06	0.24
51	6.692	0.127	1.44	94	-8.93	102	84	-0.010	7.51	0.22
52	6.833	0.141	1.72	94	0	113	83	0.000	8.02	0.26
53	6.963	0.130	1.76	94	-0.54	102	84	0.000	8.77	0.25
54	7.093	0.130	1.75	94	-3.26	102	84	0.000	8.81	0.25
55	7.226	0.133	1.82	94	-0.47	106	84	0.000	9.50	0.23
56	7.358	0.132	1.78	94	-0.54	105	85	0.000	10.66	0.23
57	7.490	0.132	1.80	94	-0.91	103	85	0.000	10.69	0.20
58	7.624	0.134	1.78	95	-0.18	106	85	-0.010	10.53	0.22
59	7.755	0.131	1.80	95	-0.73	104	84	0.000	10.98	0.19
60	7.887	0.132	1.78	95	-3.04	105	85	0.000	10.56	0.20
61	8.022	0.135	1.78	95	-0.36	105	85	-0.010	10.39	0.22
62	8.151	0.129	1.79	95	-2.81	102	84	0.000	10.76	0.21
63	8.285	0.134	1.78	95	-3.55	107	85	0.000	11.83	0.27
64	8.417	0.132	1.79	95	-3.61	106	85	-0.010	12.12	0.25
65	8.547	0.130	1.78	96	-3.57	103	85	-0.010	12.47	0.30

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Englands' Stove Works
Model: 32-NC
Run #: 1

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/22/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
66	8.681	0.134	1.77	96	-3.63	106	85	0.000	12.79	0.28
67	8.812	0.131	1.78	96	-2.57	103	85	0.000	13.00	0.31
68	8.942	0.130	1.78	96	-3.61	105	85	-0.010	13.11	0.36
69	9.075	0.133	1.77	96	-3.4	105	85	0.000	13.30	0.39
70	9.205	0.130	1.74	96	0	103	85	0.000	13.35	0.37
71	9.336	0.131	1.74	96	-2.21	105	85	0.000	13.59	0.31
72	9.468	0.132	1.74	96	-1.97	107	85	0.000	13.62	0.42
73	9.598	0.130	1.74	96	-3.15	105	85	0.000	13.64	0.50
74	9.728	0.130	1.73	97	-3.13	106	85	0.010	13.79	0.48
75	9.859	0.131	1.72	97	-1.79	107	85	0.000	13.90	0.48
76	9.988	0.129	1.70	97	-0.47	105	85	0.000	13.91	0.55
77	10.117	0.129	1.71	97	-0.78	105	85	-0.020	14.08	0.55
78	10.248	0.131	1.71	97	-2.55	106	85	0.000	13.88	0.65
79	10.376	0.128	1.68	97	-0.02	103	85	0.000	14.14	0.56
80	10.504	0.128	1.69	97	-0.49	102	85	0.000	14.15	0.58
81	10.635	0.131	1.67	97	-0.07	106	85	-0.010	14.37	0.60
82	10.762	0.127	1.68	98	-0.83	102	85	0.000	14.32	0.63
83	10.888	0.126	1.66	98	-0.04	100	85	-0.010	13.93	0.68
84	11.017	0.129	1.65	98	-0.67	104	85	-0.010	14.14	0.65
85	11.146	0.129	1.70	98	-3.76	104	85	-0.010	14.41	0.66
86	11.273	0.127	1.69	98	-0.16	102	84	-0.010	14.18	0.64
87	11.408	0.135	1.91	98	-3.74	107	84	0.000	14.00	0.52
88	11.545	0.137	1.90	98	-0.92	111	84	0.000	14.17	0.40
89	11.678	0.133	1.76	98	-2.03	108	84	0.000	14.06	0.38
90	11.811	0.133	1.77	99	-1.41	107	84	0.000	14.01	0.41
91	11.942	0.131	1.75	99	-3.39	104	84	0.000	13.83	0.40
92	12.072	0.130	1.75	99	-3.81	103	84	0.000	13.66	0.40
93	12.205	0.133	1.75	99	-0.91	107	84	0.000	13.59	0.40
94	12.337	0.132	1.76	99	-1.33	103	84	0.000	13.44	0.37
95	12.467	0.130	1.74	99	-3.31	103	84	-0.010	13.51	0.35
96	12.599	0.132	1.74	99	-3.69	104	84	0.000	13.57	0.37
97	12.730	0.131	1.74	99	-0.28	103	84	-0.010	13.61	0.37
98	12.860	0.130	1.75	99	-3.77	102	84	0.000	13.62	0.43

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Englands' Stove Works
Model: 32-NC
Run #: 1

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/22/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
99	12.992	0.132	1.75	99	-0.67	105	84	0.000	13.35	0.45
100	13.123	0.131	1.74	100	-3.83	103	84	0.000	13.33	0.37
101	13.252	0.129	1.73	100	-3.77	100	84	-0.010	13.01	0.43
102	13.385	0.133	1.73	100	-0.73	106	84	0.000	12.87	0.40
103	13.516	0.131	1.74	100	-1.38	104	84	-0.010	12.65	0.34
104	13.645	0.129	1.74	100	-2.3	101	84	0.000	12.40	0.29
105	13.779	0.134	1.75	100	-3.59	104	84	0.000	12.19	0.26
106	13.910	0.131	1.76	100	-3.64	103	84	-0.010	12.01	0.21
107	14.039	0.129	1.75	100	-2.68	99	84	0.000	11.94	0.12
108	14.173	0.134	1.74	100	-2.42	103	84	0.000	11.77	0.10
109	14.303	0.130	1.75	100	-0.27	100	84	-0.010	11.58	0.06
110	14.433	0.130	1.75	100	-3.61	100	84	-0.010	11.17	0.05
111	14.567	0.134	1.74	100	-3.19	103	84	0.000	10.79	0.07
112	14.696	0.129	1.75	100	-0.35	99	84	-0.010	10.53	0.07
113	14.827	0.131	1.74	100	-2.96	101	84	0.000	10.31	0.07
114	14.961	0.134	1.72	100	-0.78	104	85	0.000	10.51	0.07
115	15.090	0.129	1.75	100	-3.77	99	85	0.000	10.64	0.10
116	15.222	0.132	1.73	100	-2.71	103	85	-0.010	10.84	0.11
117	15.355	0.133	1.74	100	-3.03	103	85	0.010	10.78	0.11
118	15.483	0.128	1.75	100	-0.64	99	85	0.000	10.78	0.09
119	15.616	0.133	1.74	101	-1.01	103	85	-0.010	10.70	0.07
120	15.747	0.131	1.75	101	-3.89	101	85	-0.010	10.48	0.05
121	15.876	0.129	1.74	101	-3.84	99	85	0.010	10.29	0.06
122	16.010	0.134	1.75	101	-3.89	104	85	0.000	9.72	0.04
123	16.141	0.131	1.74	101	-0.24	101	85	-0.010	9.54	0.03
124	16.270	0.129	1.74	101	-0.3	99	85	-0.010	9.28	0.05
125	16.404	0.134	1.75	101	-0.32	104	85	-0.010	9.14	0.06
126	16.534	0.130	1.73	101	-3.77	100	84	0.000	8.83	0.09
127	16.665	0.131	1.74	101	-1.9	100	84	-0.010	8.20	0.10
128	16.797	0.132	1.75	101	-3.25	100	84	0.000	7.74	0.14
129	16.928	0.131	1.75	101	-3.26	99	84	0.000	7.62	0.18
130	17.059	0.131	1.74	101	-3.18	100	84	-0.020	7.25	0.24
131	17.191	0.132	1.74	101	-2.31	100	84	0.000	7.11	0.27

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Englands' Stove Works
Model: 32-NC
Run #: 1

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/22/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
132	17.323	0.132	1.75	101	-0.56	100	84	-0.010	6.96	0.30
133	17.453	0.130	1.75	102	-3.27	97	84	0.000	6.87	0.34
134	17.586	0.133	1.74	102	-3.48	101	84	0.000	6.79	0.36
135	17.717	0.131	1.73	102	-0.88	99	84	-0.010	6.66	0.37
136	17.847	0.130	1.75	102	-3.57	97	84	0.000	6.93	0.37
137	17.980	0.133	1.73	102	-3.73	101	84	-0.010	6.27	0.47
138	18.111	0.131	1.74	102	-0.95	98	84	0.000	5.93	0.53
139	18.241	0.130	1.76	102	-3.24	98	84	0.000	5.81	0.61
140	18.374	0.133	1.74	102	-0.31	100	84	-0.010	5.69	0.71
141	18.505	0.131	1.73	102	-1.74	97	84	-0.010	5.40	0.80
142	18.634	0.129	1.71	102	-0.34	97	84	-0.010	5.40	0.86
143	18.767	0.133	1.70	102	-0.3	100	84	-0.010	5.28	0.92
144	18.895	0.128	1.64	102	-3.6	96	84	-0.010	5.26	0.87
145	19.019	0.124	1.55	102	-3.9	92	84	-0.010	5.20	0.88
146	19.143	0.124	1.45	102	-1.14	91	84	0.000	5.15	0.91
147	19.261	0.118	1.34	102	-1.01	87	84	0.000	5.09	0.92
148	19.398	0.137	1.96	103	-4.31	101	84	-0.010	5.18	0.94
149	19.534	0.136	1.73	103	-4.99	100	84	0.000	5.21	0.91
150	19.665	0.131	1.79	103	-2.65	96	84	0.000	5.12	0.91
151	19.800	0.135	1.83	103	-3.51	98	84	-0.020	5.04	0.94
152	19.936	0.136	1.85	103	-5.3	99	84	-0.010	5.08	0.91
153	20.071	0.135	1.87	103	-3.63	97	84	0.000	4.98	0.94
154	20.205	0.134	1.76	103	-4.67	98	83	-0.010	5.14	0.92
155	20.340	0.135	1.77	103	-3.08	97	84	-0.010	5.26	0.88
156	20.469	0.129	1.77	103	-2.09	93	84	-0.010	5.23	0.90
157	20.605	0.136	1.77	103	-2.52	98	84	0.010	5.05	0.87
158	20.737	0.132	1.72	103	-5.05	96	84	0.000	5.23	0.89
159	20.859	0.122	1.41	103	-5.69	88	84	-0.020	5.32	0.82
160	20.973	0.114	1.24	103	-4.17	83	84	-0.010	5.19	0.80
161	21.082	0.109	1.15	103	-6.03	80	84	-0.010	5.26	0.80
162	21.190	0.108	1.13	103	-3.42	79	84	-0.010	5.25	0.73
163	21.295	0.105	1.10	103	-5.9	75	84	-0.010	5.19	0.74
164	21.400	0.105	1.09	103	-3.45	77	84	0.000	5.19	0.74

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Englands' Stove Works
Model: 32-NC
Run #: 1

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/22/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
165	21.505	0.105	1.08	103	-3.72	76	85	0.000	5.19	0.74
166	21.616	0.111	2.37	103	-6.62	80	85	0.000	5.24	0.71
167	21.754	0.138	1.72	103	-5.64	99	85	0.000	5.12	0.80
168	21.887	0.133	1.79	103	-4.85	96	84	0.000	5.06	0.81
169	22.020	0.133	1.82	103	-5.02	97	84	-0.010	5.13	0.73
170	22.219	0.199	2.77	103	-8.27	144	84	-0.010	5.26	0.66
171	22.327	0.108	1.83	103	-4.15	79	84	0.000	5.47	0.58
172	22.464	0.137	1.71	103	-6.4	99	84	0.000	5.31	0.60
173	22.594	0.130	1.70	103	-4.01	95	84	0.000	5.46	0.57
174	22.723	0.129	1.72	103	-4.43	94	84	0.000	5.49	0.53
175	22.855	0.132	1.75	103	-4.41	96	84	-0.010	5.49	0.56
176	22.985	0.130	1.75	103	-4.3	94	84	0.000	5.48	0.50
177	23.116	0.131	1.75	103	-3.9	96	84	-0.010	5.28	0.55
178	23.251	0.135	1.74	104	-4.57	97	84	0.000	5.15	0.56
179	23.382	0.131	1.78	104	-6.31	95	84	0.000	5.21	0.56
180	23.513	0.131	1.78	104	-5.88	96	84	0.000	5.31	0.57
181	23.647	0.134	1.78	104	-4.71	97	84	-0.010	5.22	0.57
182	23.781	0.134	1.78	104	-3.87	97	84	0.000	5.21	0.56
183	23.914	0.133	1.78	104	-3.77	96	84	-0.010	4.98	0.56
184	24.051	0.137	1.79	104	-3.77	99	84	0.000	4.79	0.62
185	24.178	0.127	1.69	104	-5.95	91	84	0.000	4.67	0.60
186	24.311	0.133	1.71	104	-5.77	95	83	-0.010	4.54	0.62
187	24.441	0.130	1.72	104	-3.62	93	83	-0.010	4.54	0.62
188	24.572	0.131	1.72	104	-3.68	94	83	-0.010	4.40	0.63
189	24.701	0.129	1.73	104	-5.22	93	83	-0.010	4.27	0.73
190	24.836	0.135	1.73	104	-3.52	97	83	0.000	4.25	0.72
191	24.964	0.128	1.73	104	-5.9	91	83	0.000	4.34	0.72
192	25.097	0.133	1.74	104	-5.53	97	83	-0.010	4.19	0.75
193	25.228	0.131	1.74	104	-3.56	94	84	-0.010	4.10	0.79
194	25.355	0.127	1.73	104	-5.82	90	84	-0.010	4.25	0.72
195	25.491	0.136	1.74	104	-4.89	97	84	0.000	4.18	0.74
196	25.623	0.132	1.75	104	-4.18	95	84	0.000	4.13	0.76
197	25.753	0.130	1.75	104	-3.93	94	84	0.010	4.00	0.72

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Englands' Stove Works
Model: 32-NC
Run #: 1

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/22/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
198	25.887	0.134	1.75	104	-3.75	97	84	0.000	4.14	0.69
199	26.021	0.134	1.77	104	-3.96	97	84	0.000	4.02	0.75
200	26.151	0.130	1.76	104	-3.62	94	84	0.000	3.99	0.74
201	26.286	0.135	1.76	104	-3.69	98	84	-0.010	3.99	0.74
202	26.418	0.132	1.76	104	-5.76	97	84	0.000	3.97	0.73
203	26.558	0.140	1.76	104	-5.76	103	84	0.000	3.97	0.73
204	26.685	0.127	1.78	104	-4.36	92	84	0.000	3.95	0.74
205	26.818	0.133	1.80	104	-3.65	95	84	-0.010	3.97	0.70
206	26.953	0.135	1.79	104	-3.98	99	84	0.000	3.94	0.69
207	27.086	0.133	1.80	104	-5.05	96	84	-0.010	3.92	0.69
208	27.216	0.130	1.77	104	-5.56	94	84	0.000	4.01	0.69
209	27.352	0.136	1.81	104	-4.39	98	84	-0.010	3.97	0.69
210	27.485	0.133	1.79	104	-5.71	97	84	-0.010	3.87	0.71
211	27.620	0.135	1.80	104	-3.49	99	83	0.000	3.95	0.69
212	27.756	0.136	1.80	104	-4.14	98	84	-0.010	4.00	0.70
213	27.889	0.133	1.81	104	-4.07	96	84	-0.010	3.88	0.71
214	28.022	0.133	1.80	104	-3.69	96	84	0.000	3.96	0.70
215	28.159	0.137	1.80	104	-4.43	101	84	0.000	3.98	0.69
216	28.290	0.131	1.83	104	-4.54	96	84	0.000	3.88	0.72
217	28.427	0.137	1.82	104	-5.56	99	84	-0.010	3.87	0.71
218	28.561	0.134	1.81	104	-5.57	98	84	0.000	3.87	0.71
219	28.695	0.134	1.82	104	-3.93	98	84	0.000	4.01	0.73
220	28.828	0.133	1.82	104	-3.34	96	84	0.010	3.88	0.72
221	28.965	0.137	1.82	104	-5.48	99	84	0.010	3.78	0.74
222	29.100	0.135	1.83	104	-5.62	97	84	0.000	3.97	0.72
223	29.236	0.136	1.84	104	-3.35	98	84	-0.010	3.80	0.78
224	29.369	0.133	1.83	104	-5.19	96	84	-0.010	3.87	0.77
225	29.505	0.136	1.84	104	-3.56	98	84	0.000	3.83	0.79
226	29.640	0.135	1.83	104	-5.03	97	84	0.000	3.97	0.75
227	29.774	0.134	1.84	104	-5.48	96	84	0.000	3.85	0.75
228	29.912	0.138	1.84	104	-3.29	98	84	0.000	3.93	0.76
229	30.043	0.131	1.83	104	-4.42	95	84	0.000	3.93	0.77
230	30.179	0.136	1.85	104	-5.55	97	84	0.000	3.83	0.74

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Englands' Stove Works
Model: 32-NC
Run #: 1

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/22/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
231	30.317	0.138	1.83	104	-5.58	98	84	0.000	3.90	0.72
232	30.452	0.135	1.83	104	-3.78	96	84	-0.010	3.84	0.71
233	30.589	0.137	1.84	104	-4.15	99	84	-0.010	3.75	0.67
234	30.722	0.133	1.85	104	-3.86	96	84	0.000	3.77	0.64
235	30.860	0.138	1.85	104	-3.58	98	84	0.010	3.93	0.63
236	30.995	0.135	1.86	104	-3.54	96	84	-0.010	3.78	0.61
237	31.128	0.133	1.85	104	-5.22	96	84	-0.010	3.79	0.60
238	31.268	0.140	1.86	104	-4.1	100	84	0.000	3.72	0.62
Avg/Tot	31.268	0.131	1.75	99	-3.05	100	84	-0.004	8.19	0.47

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Englands' Stove Works
Model: 32-NC
Run #: 1

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/22/2020

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
0	78	77	81	74	76	77.2	N/A
1	78	78	81	77	77	78.2	N/A
2	80	83	81	101	77	84.4	N/A
3	85	91	81	144	77	95.6	N/A
4	92	102	82	207	77	112.0	N/A
5	101	115	83	274	77	130.0	N/A
6	112	131	85	328	77	146.6	N/A
7	126	150	87	374	77	162.8	N/A
8	139	172	90	418	77	179.2	N/A
9	153	194	93	451	77	193.6	N/A
10	166	217	97	485	77	208.4	N/A
11	177	237	101	516	77	221.6	N/A
12	187	253	105	542	77	232.8	N/A
13	195	268	110	564	77	242.8	N/A
14	204	282	115	583	78	252.4	N/A
15	213	295	120	602	78	261.6	N/A
16	222	307	125	618	78	270.0	N/A
17	232	319	130	637	78	279.2	N/A
18	240	331	135	653	79	287.6	N/A
19	250	343	141	668	79	296.2	N/A
20	259	352	147	683	79	304.0	N/A
21	267	359	152	696	80	310.8	N/A
22	277	365	156	705	81	316.8	N/A
23	286	369	162	701	82	320.0	N/A
24	293	372	166	695	83	321.8	N/A
25	299	375	171	686	83	322.8	N/A
26	305	377	175	676	84	323.4	N/A
27	311	379	179	668	86	324.6	N/A
28	317	382	183	663	87	326.4	N/A
29	324	386	187	658	88	328.6	N/A
30	330	390	192	655	89	331.2	N/A
31	337	394	196	651	90	333.6	N/A
32	343	400	201	646	91	336.2	N/A
33	349	404	206	641	93	338.6	N/A
34	354	410	211	637	94	341.2	N/A
35	358	416	216	632	96	343.6	N/A
36	362	421	221	626	97	345.4	N/A
37	366	425	227	618	99	347.0	N/A
38	368	428	232	614	100	348.4	N/A
39	372	433	236	633	100	354.8	N/A
40	376	440	242	647	102	361.4	N/A
41	382	449	249	654	103	367.4	N/A
42	387	458	256	655	105	372.2	N/A
43	393	467	262	649	107	375.6	N/A
44	396	472	267	639	108	376.4	N/A
45	398	474	272	620	110	374.8	N/A
46	397	471	275	601	111	371.0	N/A
47	395	462	276	577	113	364.6	N/A
48	392	452	276	559	114	358.6	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Englands' Stove Works
Model: 32-NC
Run #: 1

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/22/2020

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
49	388	441	275	555	116	355.0	N/A
50	384	431	274	561	118	353.6	N/A
51	380	422	272	570	119	352.6	N/A
52	376	414	270	582	121	352.6	N/A
53	372	406	267	596	122	352.6	N/A
54	369	399	265	607	123	352.6	N/A
55	367	393	263	616	125	352.8	N/A
56	364	389	261	626	126	353.2	N/A
57	363	386	259	633	128	353.8	N/A
58	362	385	257	642	129	355.0	N/A
59	362	384	255	652	130	356.6	N/A
60	362	384	253	659	131	357.8	N/A
61	363	384	251	663	133	358.8	N/A
62	363	385	249	670	134	360.2	N/A
63	364	388	248	681	135	363.2	N/A
64	365	393	246	689	136	365.8	N/A
65	367	398	246	695	137	368.6	N/A
66	369	404	245	700	138	371.2	N/A
67	373	409	245	708	139	374.8	N/A
68	376	415	246	714	141	378.4	N/A
69	380	421	247	722	142	382.4	N/A
70	384	426	248	729	143	386.0	N/A
71	387	431	249	735	144	389.2	N/A
72	391	436	251	743	145	393.2	N/A
73	395	441	253	750	146	397.0	N/A
74	398	446	254	756	147	400.2	N/A
75	402	450	256	763	148	403.8	N/A
76	405	455	258	770	150	407.6	N/A
77	409	460	261	777	151	411.6	N/A
78	413	465	263	781	152	414.8	N/A
79	416	469	265	787	153	418.0	N/A
80	420	474	267	792	154	421.4	N/A
81	423	478	270	797	155	424.6	N/A
82	426	482	272	801	156	427.4	N/A
83	430	487	275	803	158	430.6	N/A
84	433	491	277	806	159	433.2	N/A
85	436	495	279	808	160	435.6	N/A
86	440	500	282	808	161	438.2	N/A
87	444	504	283	809	162	440.4	N/A
88	447	508	283	809	163	442.0	N/A
89	450	512	284	809	164	443.8	N/A
90	454	516	285	808	165	445.6	N/A
91	456	521	286	806	166	447.0	N/A
92	459	524	288	805	167	448.6	N/A
93	462	528	291	801	168	450.0	N/A
94	465	531	294	798	169	451.4	N/A
95	468	535	298	795	170	453.2	N/A
96	470	537	300	793	171	454.2	N/A
97	472	541	302	791	172	455.6	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Englands' Stove Works
Model: 32-NC
Run #: 1

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/22/2020

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
98	476	544	304	790	173	457.4	N/A
99	479	547	306	788	174	458.8	N/A
100	481	549	309	786	175	460.0	N/A
101	483	552	311	782	176	460.8	N/A
102	485	555	314	779	177	462.0	N/A
103	487	557	317	774	178	462.6	N/A
104	489	559	319	768	179	462.8	N/A
105	491	562	322	762	180	463.4	N/A
106	493	564	326	756	181	464.0	N/A
107	495	566	330	752	181	464.8	N/A
108	496	570	334	748	182	466.0	N/A
109	499	572	336	743	183	466.6	N/A
110	499	574	339	735	184	466.2	N/A
111	500	577	341	726	185	465.8	N/A
112	501	579	345	716	185	465.2	N/A
113	502	580	349	707	186	464.8	N/A
114	501	581	353	699	187	464.2	N/A
115	501	581	357	692	187	463.6	N/A
116	500	582	360	687	188	463.4	N/A
117	499	582	363	682	189	463.0	N/A
118	499	582	366	679	190	463.2	N/A
119	499	583	368	678	190	463.6	N/A
120	500	584	369	675	191	463.8	N/A
121	501	583	370	670	192	463.2	N/A
122	502	582	369	664	192	461.8	N/A
123	503	580	370	658	193	460.8	N/A
124	504	578	371	652	194	459.8	N/A
125	504	576	374	646	195	459.0	N/A
126	504	574	375	639	195	457.4	N/A
127	504	570	376	631	196	455.4	N/A
128	504	567	375	622	197	453.0	N/A
129	503	562	376	613	197	450.2	N/A
130	502	558	375	605	198	447.6	N/A
131	501	553	376	596	199	445.0	N/A
132	499	549	377	589	199	442.6	N/A
133	498	545	378	580	200	440.2	N/A
134	496	541	378	572	201	437.6	N/A
135	494	537	376	565	201	434.6	N/A
136	493	534	375	559	202	432.6	N/A
137	491	530	374	551	202	429.6	N/A
138	490	526	375	544	203	427.6	N/A
139	488	522	374	537	203	424.8	N/A
140	485	518	373	529	204	421.8	N/A
141	482	515	373	523	204	419.4	N/A
142	479	511	372	516	205	416.6	N/A
143	475	507	372	508	205	413.4	N/A
144	472	504	372	500	206	410.8	N/A
145	468	500	371	493	206	407.6	N/A
146	464	497	371	486	206	404.8	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Englands' Stove Works
Model: 32-NC
Run #: 1

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/22/2020

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
147	461	493	371	480	207	402.4	N/A
148	457	490	371	474	207	399.8	N/A
149	454	487	372	468	207	397.6	N/A
150	451	484	373	463	207	395.6	N/A
151	448	481	374	457	207	393.4	N/A
152	446	478	376	452	207	391.8	N/A
153	443	475	376	447	208	389.8	N/A
154	440	472	376	443	208	387.8	N/A
155	437	469	375	440	208	385.8	N/A
156	435	467	376	436	208	384.4	N/A
157	433	464	377	433	208	383.0	N/A
158	431	462	377	431	208	381.8	N/A
159	429	459	377	428	208	380.2	N/A
160	427	457	376	426	208	378.8	N/A
161	425	455	377	425	208	378.0	N/A
162	424	453	377	422	208	376.8	N/A
163	423	451	376	421	208	375.8	N/A
164	422	449	375	419	208	374.6	N/A
165	421	446	373	417	208	373.0	N/A
166	420	445	372	415	208	372.0	N/A
167	420	443	371	413	208	371.0	N/A
168	419	441	370	411	208	369.8	N/A
169	417	439	370	409	208	368.6	N/A
170	418	438	371	408	208	368.6	N/A
171	417	436	372	407	208	368.0	N/A
172	418	435	371	405	207	367.2	N/A
173	418	433	370	405	207	366.6	N/A
174	419	432	370	404	207	366.4	N/A
175	420	431	370	404	207	366.4	N/A
176	422	430	371	403	207	366.6	N/A
177	422	430	370	402	207	366.2	N/A
178	424	429	369	401	207	366.0	N/A
179	426	429	367	399	207	365.6	N/A
180	428	429	367	399	207	366.0	N/A
181	428	428	368	398	207	365.8	N/A
182	430	427	368	397	207	365.8	N/A
183	430	427	368	396	206	365.4	N/A
184	430	426	368	394	206	364.8	N/A
185	430	424	366	393	206	363.8	N/A
186	428	423	365	390	206	362.4	N/A
187	428	421	365	389	206	361.8	N/A
188	427	419	364	386	206	360.4	N/A
189	425	418	364	383	206	359.2	N/A
190	424	417	365	380	206	358.4	N/A
191	422	415	365	377	206	357.0	N/A
192	420	414	365	374	206	355.8	N/A
193	418	412	366	371	206	354.6	N/A
194	416	411	367	369	206	353.8	N/A
195	414	410	367	366	206	352.6	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Englands' Stove Works
Model: 32-NC
Run #: 1

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/22/2020

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
196	413	409	366	364	206	351.6	N/A
197	410	407	365	361	206	349.8	N/A
198	409	406	365	358	206	348.8	N/A
199	407	405	364	356	206	347.6	N/A
200	405	404	364	353	206	346.4	N/A
201	403	403	364	351	206	345.4	N/A
202	402	402	365	349	206	344.8	N/A
203	402	402	365	349	206	344.8	N/A
204	398	401	367	344	205	343.0	N/A
205	397	400	367	342	205	342.2	N/A
206	396	399	367	340	205	341.4	N/A
207	394	398	368	338	205	340.6	N/A
208	393	398	367	336	205	339.8	N/A
209	391	397	366	334	205	338.6	N/A
210	390	396	366	333	205	338.0	N/A
211	388	395	365	331	205	336.8	N/A
212	387	394	364	329	205	335.8	N/A
213	386	393	364	328	205	335.2	N/A
214	385	392	365	326	205	334.6	N/A
215	384	391	366	325	205	334.2	N/A
216	383	390	367	324	205	333.8	N/A
217	382	390	367	323	205	333.4	N/A
218	380	388	368	321	205	332.4	N/A
219	379	388	368	320	205	332.0	N/A
220	378	387	368	319	204	331.2	N/A
221	378	386	368	318	204	330.8	N/A
222	376	385	368	317	204	330.0	N/A
223	376	384	369	316	204	329.8	N/A
224	375	383	370	315	204	329.4	N/A
225	375	383	370	315	204	329.4	N/A
226	373	382	371	314	204	328.8	N/A
227	373	381	372	313	204	328.6	N/A
228	372	380	372	312	204	328.0	N/A
229	372	380	373	312	204	328.2	N/A
230	371	379	374	311	204	327.8	N/A
231	371	379	374	310	204	327.6	N/A
232	371	378	375	309	204	327.4	N/A
233	370	377	375	309	204	327.0	N/A
234	370	377	376	308	204	327.0	N/A
235	369	376	376	307	203	326.2	N/A
236	369	376	376	306	203	326.0	N/A
237	368	376	377	306	203	326.0	N/A
238	368	375	378	305	203	325.8	N/A
Average	396	434	304	539	166	368	N/A

ASTM E3053 Wood Heater Run Sheets

Client: England's Stove Works Job Number: 19-471 Tracking #: 67
Model: 32-NC Run Number: 1 Test Date: 4/22/20

Wood Heater Run Notes

Pre-Test Notes
Pre-Test Start Time: N/A
Air Control Setting: N/A

Time	Notes

Test Notes
Test Burn Start Time: 11:45
Air Control Setting: Fully Open

Time	Notes
0-60 sec	Torch Ignition
3:10	Closed door
39:00	Stirred & leveled coals (15 sec)
45:00	Loaded test fuel
46:00	Closed Door
60:00	Changed filter A
61:00	Changed filter B

Test Burn End Time: 17:08

Flue Gas Concentration Measurement

Calibration Gas Values: Span Gas CO_2 (%): 16.90 CO (%): 4.18
Mid Gas CO_2 (%): 10.00 CO (%): 2.51

Calibration Results:

	Pre Test			Post Test		
	Zero	Mid	Span	Zero	Mid	Span
Time	4/22 10:15	-	4/22 10:17	4/23 9:30	4/23 9:32	4/23 9:35
CO_2	0.00	-	16.90	-0.01	9.87	16.86
CO	0.000	-	4.180	-0.001	2.418	4.177

Flue Gas Probe Leak Check: Initial: No Leakage Final: No Leakage

Technician Signature: Date: 5/20/2020

ASTM E3053 Wood Heater Run Sheets

Client: England's Stove Works Job Number: 19-471 Tracking #: 67
Model: 32-NC Run Number: 1 Test Date: 4/22/20

Test Photos

Kindling Fuel Load

Start-up Fuel Load

High Fire Fuel Load

Residual Start-up Fuel Coal Bed

Technician Signature: _____ Date: 5/20/2020

ASTM E3053 Wood Heater Run Sheets

Client: England's Stove Works Job Number: 19-471 Tracking #: 67
Model: 32-NC Run Number: 1 Test Date: 4/22/20

High Fire Fuel Loaded

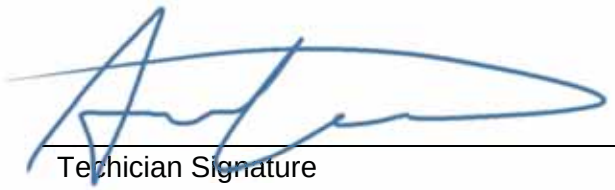
Residual High Fire Load Coal Bed

Technician Signature: _____ Date: 5/20/2020

WOOD STOVE TEST DATA PACKET
ASTM E3053/E2515

Run 2 Data Summary

Client:	Englands' Stove Works
Model:	32-NC
Job #:	19-471
Tracking #:	67
Test Date:	4/22/2020



Technician Signature

5/20/2020

Date

TEST RESULTS - ASTM E3053 / ASTM E2515

Client: Englands' Stove Works
Model: 32-NC
Run #: 2

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/22/2020

Burn Rate (kg/hr):	1.21

	Ambient Sample	Sample Train A	Sample Train B	1st Hour Filter
Total Sample Volume (ft^3)	0.000	82.760	82.172	7.716
Average Gas Velocity in Dilution Tunnel (ft/sec)	15.53			
Average Gas Flow Rate in Dilution Tunnel (dscf/hr)	10349.5			
Average Gas Meter Temperature (°F)	72.2	99.1	101.2	93.8
Total Sample Volume (dscf)	0.000	80.208	79.022	7.549
Average Tunnel Temperature (°F)	94.2			
Total Time of Test (min)	629			
Total Particulate Catch (mg)	0.0	14.4	13.4	6.4
Particulate Concentration, dry-standard (g/dscf)	0.0000000	0.0001795	0.0001696	0.0008478
Total PM Emissions (g)	0.00	19.48	18.40	8.77
Particulate Emission Rate (g/hr)	0.00	1.86	1.75	8.77
Emissions Factor (g/kg)	-	1.53	1.44	-
Difference from Average Total Particulate Emissions (g)	-	0.54	0.54	-
Difference from Average Emissions Factor (g/kg)	-	0.04	0.04	-

Final Average Results	
Total Particulate Emissions (g)	18.94
Particulate Emission Rate (g/hr)	1.81
Emissions Factor (g/kg)	1.49
HHV Efficiency (%)	69.7%
LHV Efficiency (%)	74.5%
CO Emissions (g/min)	1.64

Quality Checks	Requirement	Observed	Result
Dual Train Precision	Each train within 7.5% of average emissions (in grams), or emission factors within 0.5 g/kg	See Above	OK
Filter Temps	>80 °F, <90 °F	Min: 82 / Max: 86	OK
Face Velocity	< 30 ft/min	7.3	OK
Leakage Rate	Less than 4% of average sample rate	0.001 cfm	OK
Ambient Temp	55-90 °F	Min: 69 / Max: 75	OK
Negative Probe Weight Evaluation	<5% of Total Catch	Probe Catch Not Negative	OK
Pro-Rate Variation	90% of readings between 90-110%	100%	OK
	none greater than 120% or less than 80%	0	OK
	1 or fewer readings outside 90-110% (10 min basis)	0	OK

B415.1 Efficiency Results

Manufacturer: glands' Stove Works
Model: 32-NC
Date: 04/22/20
Run: 2
Control #: 19-471
Test Duration: 629
Output Category: Low

Test Results in Accordance with CSA B415.1-09

	HHV Basis	LHV Basis
Overall Efficiency	69.7%	74.5%
Combustion Efficiency	94.7%	94.7%
Heat Transfer Efficiency	73.6%	78.7%

Output Rate (kJ/h)	16,907	16,038	**(Btu/h)**
Burn Rate (kg/h)	1.22	2.68	**(lb/h)**
Input (kJ/h)	24,261	23,014	**(Btu/h)**

Test Load Weight (dry kg)	12.74	28.08	**dry lb**
MC wet (%)	16.91		
MC dry (%)	20.35		
Particulate (g)	18.94		
CO (g)	1,030		
Test Duration (h)	10.48		

Emissions	**Particulate**	**CO**
g/MJ Output	0.11	5.81
g/kg Dry Fuel	1.49	80.84
g/h	1.81	98.26
g/min	0.03	1.64
lb/MM Btu Output	0.25	13.51

Air/Fuel Ratio (A/F)	21.23

VERSION: **2.2** **12/14/2009**

LOW & MEDIUM FIRE FUEL LOAD DATA - ASTM E3053

Client: Englands' Stove Works
Job #: 19-471
Model: 32-NC
Tracking #: 67
Run #: 2
Technician: AK
Date: 4/22/2020

Nominal Loading Density (lbs/ft^3, wet basis):	12		
Usable Firebox Volume (ft^3):	2.92		
Target Load Weight (lbs):	34.99		
Total Load Weight Range (lbs):	33.24	to	36.74
Core Load Weight Range (lbs):	15.75	to	22.74
Remainder Load Weight Range (lbs):	12.25	to	19.25
Core Load Piece Range (lbs):	5.25	to	8.75
Remainder Load Piece Range (lbs):	3.50	to	10.50

CORE LOAD DATA

				Fuel Piece Moisture Readings (%DB)					Dry Weight	
Piece #	Length (in)	Weight (lbs)	Within Spec?	1	2	3	Ave.	Within Spec?	lbs	kg
1	18.00	5.84	In Range	18.2	18.8	19.1	18.7	In Range	4.92	2.23
2	18.00	6.60	In Range	18.9	20.1	19.0	19.3	In Range	5.53	2.51
3	18.00	5.30	In Range	21.0	24.2	26.3	23.8	In Range	4.28	1.94
Core Load Wt. (lbs)		17.74	In Range							

REMAINDER LOAD DATA (2 to 3 Pieces)

				Fuel Piece Moisture Readings (%DB)					Dry Weight	
Piece #	Length (in)	Weight (lbs)	Within Spec?	1	2	3	Ave.	Within Spec?	lbs	kg
1	18.00	7.80	In Range	19.4	19.8	20.2	19.8	In Range	6.51	2.95
2	18.00	4.37	In Range	18.4	27.5	18.9	21.6	In Range	3.59	1.63
3	18.00	3.85	In Range	18.6	19.4	21.2	19.7	In Range	3.22	1.46
Remainder Load (lbs)		16.02	In Range							

Remainder Load Small/Large Piece Weight Ratio:	49%	In Range	≤ 67%
Total Load Weight (lbs):	33.76	In Range	
Core Load % of Total Weight:	53%	In Range	45-65%
Remainder % of Total Weight:	47%	In Range	35-55%
Total Load % of Target Weight:	96%	In Range	95-105%
Actual Fuel Loading Density (lb/ft3):	11.6		
Total Load Average Moisture Content (%DB):	20.4	In Range	19-25%
Total Load Average Moisture Content (%WB):	16.9		
Total Test Load Weight (dry basis):	28.05 lbs	12.72 kg	

TEST FUEL LOADING RANGE

Allowable Charcoal Bed Weight Range (lb):	3.4	to	6.7
Actual Charcoal Bed Wt. (lb):	4.8	In Range	

TEST END POINT

Actual Fuel Load Ending Weight (lb): 0.0 Valid Test (≥90%)

Total Fuel Burned During Test Run:
33.8 lbs, wet basis
28.1 lbs, dry basis
12.72 kg, dry basis

DILUTION TUNNEL & MISC. DATA - ASTM E3053 / E2515

Client:	Englands' Stove Works	Job #:	19-471
Model:	32-NC	Tracking #:	67
Run #:	2	Technician:	AK
Test Start Time:	17:52	Date:	4/22/2020
Test Type:	Low Fire		

Recording Interval (min):	1
Total Sampling Time (min):	629

	Pre-Test	Post Test	Avg.
Barometric Pressure (in. Hg)	30.23	30.22	30.23
Relative Humidity (%)	36.0	48.0	
Room Air Velocity (ft/min)	0	0	
Scale Audit (lbs)	10.0	10.0	

Meter Box γ Factor:	1.012	(A)
Meter Box γ Factor:	1.008	(B)
Meter Box γ Factor:		(Ambient)

Ambient Sample Volume: ft^3

Induced Draft Check (in. H_2O):	0
Smoke Capture Check (%):	100%
Date Flue Pipe Last Cleaned:	4/20/2020

Sample Train Post-Test Leak Checks

(A)	0.001	cfm @	-6	in. Hg
(B)	0.000	cfm @	-9	in. Hg
(Ambient)		cfm @		in. Hg

DILUTION TUNNEL FLOW

Traverse Data

Point	dP (in H_2O)	Temp (°F)
1	0.040	71
2	0.072	71
3	0.074	71
4	0.028	71
5	0.026	71
6	0.066	71
7	0.072	71
8	0.028	71
Center	0.080	71

Static Pressure: -0.240 in. H_2O

Dilution Tunnel H_2O:	2.00	percent
Tunnel Diameter:	6	inches
Pitot Tube Cp:	0.99	[unitless]
Dilution Tunnel MW(dry):	29.00	lb/lb-mole
Dilution Tunnel MW(wet):	28.78	lb/lb-mole
Tunnel Area:	0.1963	ft^2
V_{strav}:	15.02	ft/sec
V_{scent}:	18.71	ft/sec
F_p:	0.803	[ratio]
Initial Tunnel Flow:	168.8	scf/min

TEST FUEL PROPERTIES

ASTM 3053-17 - Table A1.1 Fuel Properties by Fuel Species

Select Fuel Type	Species	%C	%H	%O	%Ash	MJ/kg	BTU/lb
	Ash, White	49.70	6.90	43.00	0.30	20.75	8927
	Beech	48.70	5.80	44.70	0.60	18.80	8088
	Birch, Sweet	49.80	6.50	43.40	0.30	20.12	8656
	Birch, Yellow	49.80	6.50	43.40	0.30	20.12	8656
	Doug Fir (Coast, Interior West/North)	48.73	6.87	43.90	0.50	19.81	8522
	Doug Fir (Interioir South)	48.73	6.87	43.90	0.50	19.81	8522
	Elm, Rock	50.40	6.60	42.30	0.70	20.49	8815
	Elm, Soft	50.40	6.60	42.30	0.70	20.49	8815
	Gum, Red	50.88	6.06	41.57	1.28	19.72	8478
	Larch, Western	50.54	6.36	42.40	0.70	17.58	7558
X	Maple, Hard	50.64	6.02	41.74	1.35	19.96	8587
	Maple, Sugar	50.64	6.02	41.74	1.35	19.96	8587
	Oak, Red	49.50	6.62	43.70	0.20	20.20	8690
	Oak, White	50.40	6.59	42.70	0.20	20.50	8819
	Pine, Southern	52.60	7.00	40.10	1.31	22.30	9587
	Pine, Southern Long Leaf	52.60	7.02	40.10	1.30	22.30	9594

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Englands' Stove Works
Model: 32-NC
Run #: 2

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/22/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
0	0.001		0.070	0.02	94	-0.16		33.8		112	351	84	74
1	0.091	0.090	0.073	1.74	93	-0.59	75	33.6	-0.2	123	314	84	75
2	0.220	0.129	0.073	1.73	93	-0.66	108	33.5	-0.1	131	334	84	74
3	0.348	0.128	0.076	1.70	93	-0.58	105	33.4	-0.1	130	330	85	75
4	0.480	0.132	0.077	1.76	92	-0.81	107	33.1	-0.3	118	367	85	74
5	0.610	0.130	0.078	1.76	92	-0.91	104	33.0	-0.1	113	393	85	74
6	0.740	0.130	0.078	1.75	92	-0.72	104	32.7	-0.3	114	455	84	74
7	0.872	0.132	0.078	1.78	92	-0.84	106	32.5	-0.2	115	485	84	74
8	1.002	0.130	0.076	1.75	92	-0.78	106	32.4	-0.1	116	491	84	75
9	1.131	0.129	0.077	1.73	92	-0.79	105	32.0	-0.4	118	521	84	75
10	1.265	0.134	0.075	1.72	92	-0.64	110	32.1	0.1	114	459	84	75
11	1.393	0.128	0.074	1.72	92	-0.58	105	31.9	-0.2	111	415	84	75
12	1.523	0.130	0.079	1.72	92	-0.78	103	31.8	-0.1	109	390	84	75
13	1.656	0.133	0.081	1.74	92	-0.61	104	31.7	-0.1	107	382	84	75
14	1.785	0.129	0.084	1.73	92	-0.59	99	31.6	-0.1	107	382	84	75
15	1.915	0.130	0.086	1.75	92	-0.85	99	31.5	-0.1	106	380	84	75
16	2.049	0.134	0.087	1.72	92	-0.65	101	31.4	-0.1	106	382	84	75
17	2.178	0.129	0.087	1.74	92	-0.95	97	31.3	-0.1	105	371	84	75
18	2.307	0.129	0.088	1.73	92	-0.99	97	31.2	-0.1	103	345	84	75
19	2.440	0.133	0.087	1.72	92	-0.63	100	31.1	-0.1	102	319	84	75
20	2.569	0.129	0.087	1.72	92	-0.87	97	31.0	-0.1	101	305	84	75
21	2.697	0.128	0.085	1.70	92	-0.74	97	30.9	-0.1	100	296	84	75
22	2.828	0.131	0.085	1.67	92	-0.9	99	30.8	-0.1	99	289	84	75
23	2.955	0.127	0.083	1.68	92	-0.86	97	30.7	-0.1	99	283	84	75
24	3.082	0.127	0.079	1.67	93	-1.05	100	30.7	0	98	278	84	75
25	3.210	0.128	0.077	1.64	93	-0.72	102	30.5	-0.2	97	273	84	75
26	3.335	0.125	0.077	1.63	93	-0.75	99	30.4	-0.1	97	268	84	74
27	3.459	0.124	0.074	1.60	93	-1.06	101	30.3	-0.1	96	267	84	75
28	3.587	0.128	0.073	1.58	93	-0.9	105	30.2	-0.1	96	274	84	74
29	3.713	0.126	0.075	1.55	93	-0.92	102	30.1	-0.1	98	278	84	74
30	3.836	0.123	0.077	1.62	93	-1.01	98	29.9	-0.2	98	282	83	74
31	3.961	0.125	0.079	1.61	93	-0.83	98	29.7	-0.2	98	287	83	74
32	4.089	0.128	0.079	1.61	93	-0.98	101	29.5	-0.2	104	414	83	74
33	4.214	0.125	0.080	1.64	94	-1.06	98	29.3	-0.2	103	409	83	74

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Englands' Stove Works
Model: 32-NC
Run #: 2

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/22/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
34	4.338	0.124	0.083	1.60	94	-0.96	95	29.1	-0.2	103	412	82	74
35	4.467	0.129	0.083	1.60	94	-0.77	99	28.9	-0.2	106	449	82	75
36	4.595	0.128	0.080	1.63	94	-0.84	101	28.7	-0.2	107	473	82	75
37	4.720	0.125	0.081	1.64	94	-0.85	97	28.5	-0.2	109	488	82	75
38	4.846	0.126	0.083	1.61	94	-0.98	97	28.3	-0.2	110	487	82	74
39	4.975	0.129	0.077	1.63	94	-1.12	104	28.1	-0.2	110	482	82	74
40	5.102	0.127	0.072	1.63	95	-0.91	105	27.9	-0.2	109	479	82	75
41	5.228	0.126	0.072	1.67	95	-0.77	104	27.8	-0.1	110	472	82	75
42	5.358	0.130	0.075	1.66	95	-1.13	106	27.6	-0.2	110	475	82	75
43	5.485	0.127	0.073	1.65	95	-0.95	104	27.4	-0.2	110	471	82	75
44	5.610	0.125	0.077	1.65	95	-1.13	100	27.3	-0.1	110	470	82	75
45	5.741	0.131	0.081	1.68	95	-0.86	102	27.1	-0.2	110	469	82	75
46	5.870	0.129	0.082	1.67	95	-0.84	100	27.0	-0.1	110	471	82	75
47	5.995	0.125	0.078	1.69	95	-0.74	99	26.9	-0.1	111	472	82	75
48	6.127	0.132	0.077	1.85	96	-0.5	105	26.7	-0.2	111	469	82	75
49	6.261	0.134	0.080	1.79	96	-0.8	105	26.5	-0.2	111	469	84	74
50	6.389	0.128	0.078	1.78	96	-0.57	102	26.4	-0.1	110	466	86	75
51	6.525	0.136	0.078	1.76	96	-0.94	108	26.2	-0.2	110	463	86	74
52	6.657	0.132	0.080	1.76	96	-0.88	103	26.1	-0.1	110	459	86	75
53	6.787	0.130	0.082	1.76	96	-0.7	101	26.0	-0.1	110	459	86	74
54	6.922	0.135	0.081	1.77	96	-0.7	105	25.8	-0.2	110	455	86	74
55	7.053	0.131	0.085	1.78	96	-1.04	99	25.7	-0.1	110	453	85	74
56	7.185	0.132	0.085	1.74	96	-0.98	101	25.6	-0.1	110	451	85	75
57	7.319	0.134	0.082	1.77	97	-1.01	103	25.4	-0.2	110	450	85	75
58	7.450	0.131	0.082	1.79	97	-0.6	101	25.2	-0.2	110	446	85	75
59	7.581	0.131	0.082	1.77	97	-0.8	101	25.2	0	110	443	85	74
60	7.717	0.136	0.077	1.78	97	-0.89	109	25.0	-0.2	110	439	84	75
61	7.847	0.130	0.079	1.77	97	-0.48	102	24.9	-0.1	110	442	84	75
62	7.979	0.132	0.083	1.77	97	-0.63	101	24.8	-0.1	109	428	84	75
63	8.114	0.135	0.084	1.76	97	-0.8	103	24.7	-0.1	108	407	84	75
64	8.243	0.129	0.078	1.79	97	-0.85	102	24.6	-0.1	108	403	84	74
65	8.377	0.134	0.080	1.74	97	-0.56	105	24.5	-0.1	107	409	84	74
66	8.510	0.133	0.080	1.76	97	-1.02	104	24.4	-0.1	107	414	84	75
67	8.639	0.129	0.077	1.74	97	-0.72	103	24.2	-0.2	107	409	84	74

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Englands' Stove Works
Model: 32-NC
Run #: 2

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/22/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
68	8.775	0.136	0.075	1.72	98	-0.79	109	24.1	-0.1	108	411	84	75
69	8.905	0.130	0.081	1.76	98	-0.55	101	24.0	-0.1	107	414	83	74
70	9.037	0.132	0.084	1.77	98	-0.94	100	23.9	-0.1	107	417	83	74
71	9.171	0.134	0.084	1.76	98	-0.57	102	23.7	-0.2	107	416	84	74
72	9.301	0.130	0.083	1.76	98	-0.89	100	23.6	-0.1	107	414	84	75
73	9.433	0.132	0.084	1.74	98	-0.67	100	23.5	-0.1	107	414	84	75
74	9.566	0.133	0.082	1.76	98	-1.13	102	23.4	-0.1	108	414	84	74
75	9.697	0.131	0.080	1.77	98	-0.74	102	23.3	-0.1	107	416	84	74
76	9.828	0.131	0.078	1.76	98	-0.89	104	23.1	-0.2	107	416	84	75
77	9.962	0.134	0.081	1.74	98	-0.68	104	23.1	0	108	416	84	75
78	10.093	0.131	0.080	1.73	98	-0.69	102	22.9	-0.2	107	418	84	75
79	10.224	0.131	0.078	1.71	98	-0.98	104	22.8	-0.1	107	421	84	74
80	10.358	0.134	0.081	1.73	98	-0.7	104	22.6	-0.2	107	420	84	74
81	10.487	0.129	0.079	1.74	98	-0.7	101	22.5	-0.1	108	421	84	75
82	10.619	0.132	0.076	1.72	98	-0.36	106	22.4	-0.1	108	421	84	75
83	10.754	0.135	0.077	1.74	99	-0.88	107	22.3	-0.1	108	423	84	73
84	10.882	0.128	0.082	1.76	99	-0.71	98	22.1	-0.2	108	424	84	74
85	11.016	0.134	0.080	1.73	99	-0.74	104	22.0	-0.1	108	423	84	75
86	11.148	0.132	0.081	1.75	99	-0.66	102	22.0	0	108	423	84	75
87	11.277	0.129	0.085	1.72	99	-0.69	97	21.8	-0.2	108	422	84	75
88	11.412	0.135	0.082	1.71	99	-0.85	104	21.6	-0.2	108	424	84	75
89	11.543	0.131	0.080	1.73	99	-0.97	102	21.5	-0.1	108	426	84	75
90	11.672	0.129	0.080	1.73	99	-0.74	101	21.3	-0.2	109	425	84	75
91	11.807	0.135	0.080	1.73	99	-0.61	105	21.2	-0.1	108	426	84	75
92	11.937	0.130	0.074	1.73	99	-0.79	105	21.1	-0.1	108	426	84	74
93	12.068	0.131	0.077	1.72	99	-0.65	104	21.0	-0.1	108	427	84	74
94	12.201	0.133	0.075	1.73	99	-0.73	107	20.8	-0.2	108	424	84	74
95	12.332	0.131	0.077	1.72	99	-0.99	104	20.7	-0.1	108	424	84	74
96	12.463	0.131	0.077	1.70	99	-0.67	104	20.6	-0.1	109	426	84	74
97	12.596	0.133	0.078	1.71	99	-0.78	105	20.5	-0.1	109	435	84	74
98	12.726	0.130	0.076	1.73	99	-0.72	104	20.3	-0.2	109	443	84	74
99	12.857	0.131	0.078	1.72	99	-0.77	103	20.2	-0.1	110	454	84	74
100	12.990	0.133	0.079	1.74	99	-1.04	105	20.0	-0.2	110	455	84	74
101	13.120	0.130	0.078	1.73	99	-0.59	103	19.9	-0.1	110	459	84	74

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Englands' Stove Works
Model: 32-NC
Run #: 2

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/22/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
102	13.252	0.132	0.084	1.72	100	-0.96	100	19.7	-0.2	110	464	84	74
103	13.385	0.133	0.085	1.74	100	-0.87	101	19.6	-0.1	111	462	84	74
104	13.515	0.130	0.085	1.72	100	-0.9	99	19.3	-0.3	111	467	84	74
105	13.646	0.131	0.085	1.73	100	-0.81	99	19.3	0	111	471	84	74
106	13.780	0.134	0.083	1.73	100	-1.03	103	19.1	-0.2	111	471	84	74
107	13.908	0.128	0.080	1.75	100	-0.92	100	19.0	-0.1	111	469	84	74
108	14.041	0.133	0.077	1.72	100	-0.93	106	18.8	-0.2	111	470	84	74
109	14.175	0.134	0.078	1.71	100	-0.81	106	18.6	-0.2	111	466	84	74
110	14.303	0.128	0.078	1.71	100	-0.87	101	18.5	-0.1	111	470	84	74
111	14.437	0.134	0.079	1.72	100	-0.63	105	18.4	-0.1	111	471	84	74
112	14.569	0.132	0.081	1.72	100	-0.69	102	18.2	-0.2	111	463	84	75
113	14.697	0.128	0.083	1.68	100	-0.77	98	18.1	-0.1	111	468	84	74
114	14.833	0.136	0.081	1.69	100	-1.06	105	18.0	-0.1	111	465	84	74
115	14.963	0.130	0.082	1.70	100	-0.83	100	17.7	-0.3	111	465	84	75
116	15.093	0.130	0.084	1.70	100	-0.83	99	17.7	0	111	461	84	75
117	15.228	0.135	0.077	1.72	100	-0.82	107	17.5	-0.2	111	457	84	74
118	15.358	0.130	0.079	1.71	100	-0.78	102	17.3	-0.2	111	460	84	75
119	15.489	0.131	0.081	1.70	100	-0.8	101	17.3	0	111	460	84	75
120	15.622	0.133	0.079	1.70	100	-1.2	104	17.1	-0.2	111	458	84	74
121	15.753	0.131	0.077	1.74	100	-0.72	104	16.9	-0.2	111	459	84	75
122	15.884	0.131	0.083	1.71	100	-0.59	100	16.9	0	111	461	84	75
123	16.018	0.134	0.081	1.76	100	-0.98	104	16.7	-0.2	111	461	84	74
124	16.148	0.130	0.079	1.75	101	-0.79	102	16.5	-0.2	111	460	84	74
125	16.279	0.131	0.081	1.74	101	-0.87	101	16.5	0	111	465	84	75
126	16.414	0.135	0.081	1.73	101	-0.94	105	16.3	-0.2	111	464	84	74
127	16.544	0.130	0.080	1.74	101	-0.7	101	16.2	-0.1	111	468	84	74
128	16.675	0.131	0.082	1.72	101	-0.71	101	16.0	-0.2	111	467	84	75
129	16.809	0.134	0.082	1.74	101	-0.71	103	15.9	-0.1	111	466	84	75
130	16.938	0.129	0.079	1.71	101	-0.95	101	15.8	-0.1	111	461	84	75
131	17.071	0.133	0.079	1.71	101	-0.84	104	15.6	-0.2	111	462	84	74
132	17.205	0.134	0.079	1.70	101	-0.78	105	15.5	-0.1	111	459	84	74
133	17.333	0.128	0.077	1.70	101	-0.53	101	15.4	-0.1	111	460	84	75
134	17.468	0.135	0.076	1.72	101	-0.29	107	15.3	-0.1	111	467	84	75
135	17.599	0.131	0.076	1.73	101	-0.92	104	15.1	-0.2	111	465	84	74

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Englands' Stove Works
Model: 32-NC
Run #: 2

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/22/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
136	17.729	0.130	0.077	1.72	101	-0.45	103	15.0	-0.1	111	469	84	74
137	17.865	0.136	0.078	1.72	101	-0.7	107	14.8	-0.2	111	470	84	74
138	17.995	0.130	0.079	1.71	101	-0.72	102	14.7	-0.1	111	470	84	74
139	18.125	0.130	0.082	1.70	101	-0.68	100	14.6	-0.1	111	474	84	74
140	18.260	0.135	0.085	1.70	101	-0.72	102	14.4	-0.2	112	474	84	74
141	18.390	0.130	0.084	1.68	101	-0.74	99	14.3	-0.1	112	477	84	74
142	18.522	0.132	0.082	1.70	101	-0.66	101	14.1	-0.2	112	473	84	74
143	18.655	0.133	0.084	1.72	101	-1.03	101	14.0	-0.1	111	467	84	74
144	18.786	0.131	0.083	1.70	101	-0.69	100	13.9	-0.1	111	460	85	75
145	18.916	0.130	0.083	1.70	101	-0.97	99	13.8	-0.1	111	457	84	74
146	19.051	0.135	0.084	1.68	101	-1	103	13.7	-0.1	110	453	84	75
147	19.182	0.131	0.083	1.68	101	-0.78	100	13.6	-0.1	110	453	84	74
148	19.313	0.131	0.080	1.70	101	-0.66	102	13.4	-0.2	110	451	84	74
149	19.447	0.134	0.079	1.70	101	-0.71	105	13.2	-0.2	110	445	84	74
150	19.576	0.129	0.075	1.68	101	-0.83	104	13.2	0	109	446	84	74
151	19.709	0.133	0.074	1.70	101	-0.61	107	13.1	-0.1	110	445	84	75
152	19.843	0.134	0.075	1.70	101	-1.01	107	13.0	-0.1	110	440	84	74
153	19.971	0.128	0.077	1.70	101	-0.62	102	12.9	-0.1	109	443	84	74
154	20.106	0.135	0.076	1.73	101	-0.76	108	12.8	-0.1	110	442	84	75
155	20.237	0.131	0.077	1.70	101	-0.9	104	12.7	-0.1	110	442	85	75
156	20.366	0.129	0.075	1.71	101	-0.66	104	12.6	-0.1	110	442	85	75
157	20.502	0.136	0.074	1.70	101	-0.75	110	12.5	-0.1	110	441	85	74
158	20.632	0.130	0.074	1.71	101	-0.74	105	12.3	-0.2	110	439	84	75
159	20.763	0.131	0.075	1.72	101	-0.83	105	12.2	-0.1	110	442	84	74
160	20.897	0.134	0.079	1.71	101	-1.09	105	12.1	-0.1	110	440	84	74
161	21.027	0.130	0.084	1.73	101	-0.85	99	12.0	-0.1	110	442	84	75
162	21.159	0.132	0.082	1.72	101	-0.86	101	11.8	-0.2	110	441	84	74
163	21.293	0.134	0.081	1.74	101	-0.73	103	11.7	-0.1	110	444	84	75
164	21.423	0.130	0.079	1.73	101	-0.8	101	11.6	-0.1	110	445	84	74
165	21.554	0.131	0.080	1.73	101	-0.92	102	11.5	-0.1	110	438	84	75
166	21.688	0.134	0.078	1.71	101	-0.95	106	11.3	-0.2	110	446	84	75
167	21.819	0.131	0.082	1.73	101	-1.09	101	11.3	0	110	446	84	75
168	21.950	0.131	0.081	1.77	101	-0.99	101	11.1	-0.2	110	445	84	75
169	22.084	0.134	0.083	1.74	101	-0.76	102	11.1	0	110	444	84	75

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Englands' Stove Works
Model: 32-NC
Run #: 2

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/22/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
170	22.214	0.130	0.079	1.74	101	-0.81	102	10.9	-0.2	110	444	85	75
171	22.345	0.131	0.078	1.73	101	-0.95	103	10.9	0	110	444	85	75
172	22.480	0.135	0.078	1.76	101	-0.77	106	10.7	-0.2	110	444	85	75
173	22.609	0.129	0.082	1.73	101	-0.8	99	10.6	-0.1	110	445	85	75
174	22.743	0.134	0.083	1.77	101	-0.96	103	10.4	-0.2	110	447	85	75
175	22.876	0.133	0.084	1.78	101	-0.8	101	10.4	0	110	448	85	75
176	23.006	0.130	0.082	1.75	101	-0.9	100	10.3	-0.1	109	441	85	75
177	23.143	0.137	0.081	1.79	102	-1.09	106	10.1	-0.2	109	438	85	75
178	23.273	0.130	0.080	1.77	102	-0.61	101	10.0	-0.1	108	435	85	75
179	23.405	0.132	0.078	1.76	102	-1	104	10.0	0	109	431	84	75
180	23.540	0.135	0.080	1.76	102	-0.75	105	9.9	-0.1	108	432	84	75
181	23.672	0.132	0.080	1.75	102	-0.74	102	9.9	0	108	431	84	75
182	23.803	0.131	0.082	1.77	102	-0.81	100	9.6	-0.3	108	432	84	75
183	23.939	0.136	0.080	1.75	102	-0.9	105	9.6	0	109	430	84	75
184	24.070	0.131	0.081	1.74	102	-0.8	101	9.6	0	108	431	84	75
185	24.202	0.132	0.079	1.77	102	-0.79	103	9.5	-0.1	108	432	84	75
186	24.337	0.135	0.082	1.76	102	-1.06	104	9.4	-0.1	109	431	84	75
187	24.467	0.130	0.078	1.77	102	-0.65	102	9.3	-0.1	108	430	84	75
188	24.602	0.135	0.078	1.77	102	-0.93	106	9.2	-0.1	108	429	84	75
189	24.734	0.132	0.078	1.77	102	-0.98	104	9.1	-0.1	108	426	84	75
190	24.865	0.131	0.079	1.74	102	-1.07	102	9.0	-0.1	108	424	84	75
191	25.001	0.136	0.076	1.77	102	-0.7	108	8.8	-0.2	108	426	84	75
192	25.131	0.130	0.078	1.76	102	-0.69	102	8.8	0	108	423	84	74
193	25.264	0.133	0.078	1.76	102	-0.67	104	8.6	-0.2	107	418	84	74
194	25.398	0.134	0.079	1.75	102	-1	104	8.6	0	107	409	84	75
195	25.530	0.132	0.080	1.76	102	-0.83	102	8.4	-0.2	106	402	84	75
196	25.661	0.131	0.080	1.75	102	-0.86	101	8.4	0	106	394	84	75
197	25.797	0.136	0.078	1.74	102	-0.88	106	8.4	0	105	393	84	75
198	25.927	0.130	0.077	1.78	102	-0.7	102	8.3	-0.1	105	391	84	74
199	26.060	0.133	0.075	1.75	102	-0.96	106	8.2	-0.1	105	388	84	74
200	26.196	0.136	0.073	1.74	102	-0.94	110	8.1	-0.1	105	384	84	74
201	26.324	0.128	0.074	1.75	102	-0.78	102	8.1	0	104	381	84	75
202	26.460	0.136	0.076	1.76	102	-0.79	108	8.1	0	104	376	84	74
203	26.592	0.132	0.079	1.74	102	-0.84	103	8.1	0	104	373	84	74

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Englands' Stove Works
Model: 32-NC
Run #: 2

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/22/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
204	26.723	0.131	0.081	1.76	102	-0.74	100	8.0	-0.1	103	370	84	74
205	26.858	0.135	0.082	1.75	102	-1.03	103	7.8	-0.2	103	367	84	74
206	26.989	0.131	0.083	1.73	102	-0.97	99	7.9	0.1	103	363	84	74
207	27.122	0.133	0.082	1.76	102	-0.84	101	7.9	0	103	363	84	74
208	27.256	0.134	0.081	1.74	102	-0.98	103	7.7	-0.2	102	360	84	74
209	27.387	0.131	0.080	1.76	102	-0.79	101	7.7	0	102	358	84	74
210	27.519	0.132	0.082	1.72	102	-0.68	101	7.6	-0.1	102	356	84	74
211	27.654	0.135	0.084	1.76	102	-0.87	101	7.6	0	102	353	84	74
212	27.784	0.130	0.086	1.75	102	-0.86	97	7.6	0	102	352	84	74
213	27.917	0.133	0.086	1.73	102	-0.73	99	7.5	-0.1	101	349	84	74
214	28.052	0.135	0.084	1.71	102	-0.94	101	7.5	0	101	348	84	74
215	28.181	0.129	0.083	1.75	102	-0.77	98	7.4	-0.1	100	347	84	74
216	28.316	0.135	0.081	1.76	102	-0.66	103	7.4	0	100	346	84	74
217	28.448	0.132	0.080	1.75	102	-0.68	101	7.3	-0.1	100	344	84	74
218	28.578	0.130	0.082	1.74	102	-0.87	99	7.2	-0.1	100	344	84	74
219	28.714	0.136	0.085	1.75	102	-0.96	101	7.2	0	100	342	84	74
220	28.844	0.130	0.084	1.74	102	-0.99	97	7.2	0	100	339	84	74
221	28.976	0.132	0.083	1.74	102	-0.93	99	7.0	-0.2	99	336	84	74
222	29.110	0.134	0.085	1.74	102	-0.76	100	7.1	0.1	99	338	84	74
223	29.241	0.131	0.084	1.72	102	-0.77	98	7.0	-0.1	99	337	84	74
224	29.372	0.131	0.083	1.74	102	-0.73	99	6.9	-0.1	99	340	84	74
225	29.506	0.134	0.085	1.71	102	-0.85	100	6.9	0	100	346	84	73
226	29.637	0.131	0.087	1.71	102	-0.78	97	6.7	-0.2	100	350	84	74
227	29.768	0.131	0.086	1.76	102	-0.77	97	6.8	0.1	99	350	84	74
228	29.902	0.134	0.085	1.71	102	-0.88	100	6.7	-0.1	99	351	84	73
229	30.032	0.130	0.084	1.75	102	-0.88	97	6.7	0	99	351	84	73
230	30.163	0.131	0.083	1.70	102	-0.95	99	6.6	-0.1	100	355	84	73
231	30.297	0.134	0.082	1.72	102	-0.87	102	6.6	0	99	346	84	74
232	30.425	0.128	0.084	1.72	102	-1	96	6.5	-0.1	99	331	84	73
233	30.557	0.132	0.082	1.71	102	-0.7	100	6.5	0	98	321	84	73
234	30.692	0.135	0.085	1.72	102	-0.63	101	6.4	-0.1	97	313	84	73
235	30.819	0.127	0.085	1.73	102	-0.68	94	6.4	0	97	309	84	73
236	30.954	0.135	0.084	1.74	102	-0.74	101	6.4	0	97	306	84	74
237	31.085	0.131	0.082	1.75	102	-0.81	99	6.4	0	96	302	84	74

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Englands' Stove Works
Model: 32-NC
Run #: 2

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/22/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
238	31.214	0.129	0.084	1.72	102	-0.77	96	6.3	-0.1	96	300	84	73
239	31.349	0.135	0.082	1.73	102	-0.99	102	6.2	-0.1	96	298	84	73
240	31.480	0.131	0.083	1.78	102	-0.69	99	6.3	0.1	96	296	84	74
241	31.610	0.130	0.083	1.72	102	-0.81	98	6.2	-0.1	95	293	84	73
242	31.745	0.135	0.083	1.72	102	-0.77	102	6.2	0	95	292	84	73
243	31.875	0.130	0.082	1.71	102	-0.68	98	6.1	-0.1	95	290	84	73
244	32.006	0.131	0.083	1.71	102	-0.97	99	6.2	0.1	95	289	84	73
245	32.140	0.134	0.082	1.75	102	-0.86	101	6.2	0	95	286	84	73
246	32.270	0.130	0.085	1.72	102	-0.95	97	6.0	-0.2	94	284	84	73
247	32.402	0.132	0.086	1.72	102	-1.1	97	6.2	0.2	94	283	84	73
248	32.535	0.133	0.088	1.73	102	-0.7	97	6.1	-0.1	94	281	84	73
249	32.666	0.131	0.086	1.71	102	-0.91	97	6.1	0	94	280	84	73
250	32.797	0.131	0.085	1.71	102	-0.87	97	6.1	0	94	279	84	73
251	32.932	0.135	0.085	1.71	102	-0.86	100	6.0	-0.1	93	278	84	73
252	33.061	0.129	0.085	1.71	102	-0.71	96	6.0	0	93	277	84	73
253	33.193	0.132	0.084	1.72	102	-0.7	98	6.0	0	93	275	84	73
254	33.327	0.134	0.088	1.71	102	-0.76	98	5.8	-0.2	93	275	84	73
255	33.456	0.129	0.085	1.72	102	-0.95	96	5.9	0.1	92	273	84	73
256	33.590	0.134	0.084	1.69	102	-1.17	100	5.9	0	92	273	84	73
257	33.723	0.133	0.083	1.70	102	-0.97	99	5.9	0	92	272	84	73
258	33.851	0.128	0.084	1.70	102	-0.8	96	5.7	-0.2	92	271	84	73
259	33.987	0.136	0.080	1.69	102	-1.06	104	5.8	0.1	92	271	84	73
260	34.118	0.131	0.082	1.69	101	-0.72	99	5.8	0	92	269	83	73
261	34.248	0.130	0.083	1.70	102	-0.76	98	5.7	-0.1	92	269	83	73
262	34.383	0.135	0.083	1.70	101	-0.87	101	5.7	0	92	269	83	73
263	34.512	0.129	0.084	1.69	101	-0.76	97	5.7	0	92	267	83	73
264	34.644	0.132	0.087	1.70	101	-0.78	97	5.7	0	92	267	83	73
265	34.778	0.134	0.087	1.72	101	-0.86	98	5.7	0	92	267	83	73
266	34.909	0.131	0.085	1.69	101	-0.93	97	5.6	-0.1	91	265	83	73
267	35.040	0.131	0.082	1.72	101	-0.84	99	5.6	0	91	265	83	73
268	35.173	0.133	0.081	1.72	101	-0.83	101	5.6	0	91	265	83	73
269	35.305	0.132	0.082	1.70	101	-0.77	100	5.6	0	91	264	83	73
270	35.436	0.131	0.085	1.73	101	-1.02	97	5.5	-0.1	91	262	83	73
271	35.570	0.134	0.085	1.72	101	-0.67	99	5.5	0	91	261	83	73

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Englands' Stove Works
Model: 32-NC
Run #: 2

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/22/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
272	35.700	0.130	0.085	1.71	101	-0.88	97	5.5	0	91	261	83	73
273	35.831	0.131	0.086	1.70	101	-0.97	97	5.5	0	91	261	83	73
274	35.966	0.135	0.085	1.71	101	-0.8	100	5.4	-0.1	91	259	83	73
275	36.095	0.129	0.083	1.74	101	-0.85	97	5.4	0	91	260	83	73
276	36.229	0.134	0.084	1.69	101	-0.73	100	5.4	0	91	258	83	72
277	36.362	0.133	0.085	1.73	101	-0.95	99	5.4	0	91	258	83	73
278	36.490	0.128	0.083	1.72	101	-0.78	96	5.4	0	91	257	83	72
279	36.626	0.136	0.083	1.73	101	-0.71	102	5.3	-0.1	91	257	83	73
280	36.757	0.131	0.084	1.74	101	-0.71	98	5.3	0	90	257	83	72
281	36.887	0.130	0.083	1.73	101	-0.5	98	5.3	0	90	256	83	72
282	37.022	0.135	0.082	1.75	101	-0.93	102	5.3	0	90	256	83	72
283	37.152	0.130	0.082	1.73	101	-0.62	98	5.3	0	90	256	83	72
284	37.284	0.132	0.081	1.71	101	-0.79	100	5.2	-0.1	90	256	83	72
285	37.418	0.134	0.079	1.73	101	-0.81	103	5.2	0	90	255	83	72
286	37.549	0.131	0.081	1.71	101	-0.78	99	5.2	0	90	255	83	72
287	37.680	0.131	0.084	1.72	101	-0.8	98	5.2	0	90	255	83	72
288	37.814	0.134	0.083	1.71	101	-0.71	100	5.1	-0.1	90	255	83	72
289	37.945	0.131	0.085	1.71	101	-0.7	97	5.1	0	90	255	83	72
290	38.076	0.131	0.088	1.72	101	-0.9	95	5.0	-0.1	90	254	83	72
291	38.211	0.135	0.088	1.70	101	-0.63	99	5.1	0.1	90	254	83	72
292	38.340	0.129	0.087	1.72	101	-0.94	95	5.0	-0.1	90	254	83	72
293	38.472	0.132	0.087	1.71	101	-0.68	96	5.0	0	89	254	83	72
294	38.607	0.135	0.087	1.70	101	-1	99	5.0	0	90	254	83	72
295	38.735	0.128	0.085	1.72	101	-1.03	95	5.0	0	90	255	83	72
296	38.870	0.135	0.087	1.73	101	-0.71	99	4.9	-0.1	90	256	83	72
297	39.002	0.132	0.088	1.75	101	-0.83	96	4.9	0	90	256	83	72
298	39.131	0.129	0.088	1.76	101	-0.88	94	4.9	0	90	256	83	72
299	39.267	0.136	0.084	1.75	101	-0.97	101	4.9	0	90	256	83	72
300	39.397	0.130	0.084	1.73	101	-0.93	97	4.8	-0.1	89	256	83	72
301	39.528	0.131	0.081	1.73	101	-0.8	99	4.8	0	90	256	83	72
302	39.662	0.134	0.079	1.74	101	-0.93	103	4.8	0	90	256	83	72
303	39.793	0.131	0.080	1.73	101	-0.77	100	4.8	0	89	256	83	72
304	39.925	0.132	0.084	1.75	101	-0.84	98	4.8	0	89	255	83	72
305	40.058	0.133	0.085	1.76	101	-0.72	99	4.8	0	89	256	83	72

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Englands' Stove Works
Model: 32-NC
Run #: 2

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/22/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
306	40.189	0.131	0.086	1.75	101	-0.96	96	4.6	-0.2	89	256	83	72
307	40.320	0.131	0.086	1.71	101	-1.11	96	4.7	0.1	89	256	83	72
308	40.455	0.135	0.087	1.74	101	-0.67	99	4.6	-0.1	89	255	83	72
309	40.585	0.130	0.085	1.76	101	-0.71	96	4.7	0.1	90	256	83	72
310	40.716	0.131	0.086	1.77	101	-0.76	97	4.7	0	89	255	83	72
311	40.851	0.135	0.082	1.77	101	-0.97	102	4.5	-0.2	89	255	83	72
312	40.979	0.128	0.083	1.74	101	-0.61	96	4.5	0	89	255	83	72
313	41.114	0.135	0.082	1.75	101	-0.9	102	4.5	0	89	256	83	72
314	41.247	0.133	0.083	1.76	101	-0.86	100	4.5	0	89	255	83	72
315	41.375	0.128	0.081	1.73	101	-0.77	97	4.5	0	89	255	83	72
316	41.511	0.136	0.086	1.75	101	-1.22	100	4.5	0	89	255	83	72
317	41.642	0.131	0.085	1.74	101	-0.87	97	4.5	0	89	255	83	72
318	41.772	0.130	0.084	1.75	101	-0.98	97	4.5	0	89	254	83	72
319	41.907	0.135	0.082	1.75	101	-0.98	102	4.4	-0.1	89	254	83	72
320	42.037	0.130	0.084	1.74	101	-0.91	97	4.4	0	89	254	83	72
321	42.169	0.132	0.084	1.74	101	-0.74	99	4.4	0	89	254	83	72
322	42.303	0.134	0.083	1.74	101	-0.73	100	4.3	-0.1	89	254	83	72
323	42.434	0.131	0.082	1.72	101	-0.74	99	4.3	0	89	255	83	72
324	42.565	0.131	0.084	1.72	101	-0.66	97	4.3	0	89	255	83	72
325	42.698	0.133	0.085	1.72	101	-0.81	98	4.3	0	89	255	83	72
326	42.830	0.132	0.084	1.75	101	-0.76	98	4.3	0	89	255	83	72
327	42.961	0.131	0.084	1.74	101	-0.95	97	4.3	0	89	255	83	72
328	43.096	0.135	0.087	1.73	101	-0.65	99	4.3	0	89	255	83	72
329	43.225	0.129	0.086	1.74	100	-0.91	95	4.2	-0.1	89	256	83	72
330	43.357	0.132	0.086	1.73	101	-0.87	97	4.1	-0.1	89	255	83	72
331	43.492	0.135	0.083	1.73	100	-1.01	101	4.2	0.1	89	256	83	72
332	43.620	0.128	0.083	1.76	100	-0.84	96	4.2	0	89	255	83	72
333	43.755	0.135	0.082	1.73	100	-0.69	102	4.2	0	89	255	83	72
334	43.887	0.132	0.081	1.73	100	-0.69	100	4.1	-0.1	89	255	83	72
335	44.016	0.129	0.082	1.72	100	-0.93	97	4.1	0	89	255	83	72
336	44.152	0.136	0.086	1.74	100	-0.75	100	4.1	0	89	255	83	72
337	44.282	0.130	0.086	1.74	100	-0.7	96	4.1	0	89	255	83	72
338	44.413	0.131	0.087	1.73	100	-1	96	4.0	-0.1	89	254	83	72
339	44.548	0.135	0.087	1.72	100	-1	99	4.0	0	89	255	83	72

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Englands' Stove Works
Model: 32-NC
Run #: 2

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/22/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
340	44.678	0.130	0.085	1.72	100	-0.73	97	3.9	-0.1	89	254	83	72
341	44.810	0.132	0.084	1.71	100	-0.82	99	4.0	0.1	89	254	83	72
342	44.943	0.133	0.086	1.71	100	-1.02	98	3.9	-0.1	89	253	83	72
343	45.075	0.132	0.084	1.71	100	-0.78	99	3.9	0	89	254	83	72
344	45.205	0.130	0.083	1.72	100	-0.87	98	3.9	0	89	254	83	72
345	45.339	0.134	0.086	1.71	100	-0.76	99	3.9	0	89	254	83	72
346	45.471	0.132	0.086	1.71	100	-0.74	97	3.9	0	89	253	83	72
347	45.601	0.130	0.080	1.70	100	-0.84	99	3.9	0	89	252	83	72
348	45.736	0.135	0.079	1.70	100	-0.85	104	3.8	-0.1	89	252	83	71
349	45.865	0.129	0.078	1.70	100	-0.96	100	3.8	0	89	253	83	71
350	45.999	0.134	0.078	1.71	100	-0.68	104	3.8	0	88	252	83	72
351	46.133	0.134	0.080	1.73	100	-1.09	103	3.8	0	88	252	83	71
352	46.261	0.128	0.084	1.71	100	-0.87	95	3.8	0	88	253	83	72
353	46.396	0.135	0.084	1.70	100	-0.76	100	3.7	-0.1	88	253	83	72
354	46.527	0.131	0.083	1.69	100	-0.58	98	3.7	0	88	251	83	72
355	46.657	0.130	0.081	1.72	100	-0.92	99	3.7	0	88	252	83	71
356	46.793	0.136	0.079	1.71	100	-0.82	105	3.7	0	88	251	83	72
357	46.923	0.130	0.080	1.72	100	-0.81	99	3.7	0	89	250	83	72
358	47.054	0.131	0.081	1.72	100	-0.57	99	3.6	-0.1	88	251	83	72
359	47.188	0.134	0.082	1.69	100	-0.76	101	3.5	-0.1	88	251	83	71
360	47.319	0.131	0.083	1.73	100	-0.87	98	3.6	0.1	88	252	83	71
361	47.451	0.132	0.085	1.70	100	-0.67	98	3.6	0	88	251	83	71
362	47.584	0.133	0.083	1.73	100	-0.67	100	3.5	-0.1	88	252	83	71
363	47.715	0.131	0.085	1.74	100	-0.91	97	3.6	0.1	88	250	83	71
364	47.846	0.131	0.085	1.70	100	-1.02	97	3.5	-0.1	88	251	83	71
365	47.981	0.135	0.086	1.72	100	-0.75	100	3.5	0	88	251	83	71
366	48.111	0.130	0.083	1.73	100	-0.97	97	3.5	0	88	251	83	71
367	48.242	0.131	0.086	1.72	100	-0.6	96	3.5	0	88	250	83	71
368	48.376	0.134	0.085	1.73	100	-0.72	99	3.5	0	88	250	83	71
369	48.505	0.129	0.085	1.73	100	-0.73	96	3.4	-0.1	88	251	83	71
370	48.639	0.134	0.082	1.74	100	-1.05	101	3.4	0	88	251	83	71
371	48.772	0.133	0.083	1.76	100	-0.69	100	3.4	0	88	251	83	71
372	48.900	0.128	0.079	1.72	100	-0.94	98	3.4	0	88	251	83	71
373	49.035	0.135	0.077	1.73	100	-0.75	105	3.3	-0.1	88	252	83	71

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Englands' Stove Works
Model: 32-NC
Run #: 2

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/22/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
374	49.166	0.131	0.080	1.74	100	-1.05	100	3.4	0.1	88	251	82	71
375	49.297	0.131	0.081	1.75	100	-1.02	100	3.3	-0.1	88	250	82	71
376	49.432	0.135	0.080	1.75	100	-0.99	103	3.3	0	88	250	82	71
377	49.562	0.130	0.079	1.72	100	-0.73	100	3.3	0	88	250	82	71
378	49.693	0.131	0.082	1.74	100	-1.01	99	3.3	0	88	250	82	71
379	49.827	0.134	0.076	1.72	100	-0.62	105	3.3	0	88	250	82	71
380	49.958	0.131	0.077	1.76	100	-0.7	102	3.2	-0.1	88	251	82	71
381	50.089	0.131	0.080	1.74	100	-0.55	100	3.1	-0.1	88	251	82	71
382	50.223	0.134	0.080	1.74	100	-0.87	102	3.2	0.1	88	250	82	71
383	50.353	0.130	0.079	1.76	100	-0.53	100	3.2	0	88	252	82	71
384	50.484	0.131	0.084	1.71	100	-0.64	97	3.2	0	88	251	82	71
385	50.619	0.135	0.084	1.74	100	-0.99	100	3.2	0	88	251	82	71
386	50.749	0.130	0.082	1.72	100	-0.86	98	3.2	0	88	251	82	71
387	50.880	0.131	0.086	1.74	100	-0.85	96	3.1	-0.1	88	251	82	71
388	51.015	0.135	0.087	1.73	100	-0.82	99	3.1	0	88	250	82	71
389	51.143	0.128	0.086	1.74	100	-0.7	94	3.0	-0.1	88	252	82	71
390	51.278	0.135	0.085	1.74	100	-0.79	100	3.0	0	88	251	82	71
391	51.411	0.133	0.084	1.74	100	-0.88	99	3.0	0	88	251	83	71
392	51.539	0.128	0.082	1.73	100	-0.35	96	3.0	0	88	250	83	71
393	51.674	0.135	0.083	1.75	100	-0.61	101	3.0	0	88	251	83	71
394	51.805	0.131	0.084	1.72	100	-0.63	97	3.0	0	88	251	82	71
395	51.935	0.130	0.086	1.77	100	-0.85	96	2.9	-0.1	88	251	82	71
396	52.070	0.135	0.086	1.74	100	-0.72	100	2.9	0	88	251	82	71
397	52.200	0.130	0.084	1.74	100	-0.85	97	2.9	0	88	251	83	71
398	52.331	0.131	0.082	1.72	100	-0.62	99	2.9	0	88	251	83	71
399	52.465	0.134	0.081	1.74	99	-0.98	102	2.9	0	88	251	83	71
400	52.596	0.131	0.081	1.74	99	-0.93	100	2.7	-0.2	88	251	83	71
401	52.727	0.131	0.083	1.75	99	-0.93	98	2.8	0.1	88	250	83	71
402	52.860	0.133	0.086	1.76	99	-0.86	98	2.8	0	88	251	83	71
403	52.991	0.131	0.088	1.74	99	-0.58	96	2.8	0	88	251	83	71
404	53.122	0.131	0.087	1.74	99	-0.9	96	2.8	0	88	252	82	71
405	53.256	0.134	0.086	1.73	99	-0.88	99	2.7	-0.1	88	252	82	71
406	53.387	0.131	0.086	1.75	99	-0.78	97	2.7	0	88	252	82	71
407	53.518	0.131	0.084	1.72	99	-0.65	98	2.8	0.1	88	252	82	71

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Englands' Stove Works
Model: 32-NC
Run #: 2

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/22/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
408	53.653	0.135	0.081	1.72	99	-0.87	103	2.7	-0.1	88	253	82	71
409	53.781	0.128	0.081	1.74	99	-0.7	98	2.7	0	88	253	82	71
410	53.914	0.133	0.083	1.73	99	-0.69	100	2.5	-0.2	88	253	82	71
411	54.048	0.134	0.081	1.73	99	-1.08	102	2.6	0.1	88	253	82	71
412	54.176	0.128	0.084	1.73	99	-0.99	96	2.6	0	88	253	82	71
413	54.311	0.135	0.087	1.76	99	-0.75	99	2.6	0	88	253	83	71
414	54.442	0.131	0.090	1.75	99	-1.02	95	2.6	0	88	253	83	71
415	54.571	0.129	0.091	1.74	99	-0.66	93	2.5	-0.1	88	253	82	71
416	54.707	0.136	0.090	1.73	99	-0.77	98	2.5	0	88	253	82	71
417	54.837	0.130	0.086	1.72	99	-0.83	96	2.5	0	88	252	82	71
418	54.968	0.131	0.084	1.73	99	-0.94	98	2.5	0	88	252	82	71
419	55.102	0.134	0.082	1.74	99	-0.75	101	2.5	0	88	253	82	71
420	55.232	0.130	0.078	1.74	99	-0.9	100	2.5	0	88	252	82	71
421	55.364	0.132	0.081	1.75	99	-0.71	100	2.4	-0.1	88	253	82	71
422	55.497	0.133	0.083	1.76	99	-0.87	100	2.4	0	87	253	82	71
423	55.628	0.131	0.083	1.72	99	-0.86	98	2.4	0	88	252	82	71
424	55.759	0.131	0.085	1.75	99	-0.82	97	2.4	0	87	253	82	71
425	55.892	0.133	0.087	1.76	99	-0.73	98	2.4	0	88	252	82	71
426	56.023	0.131	0.085	1.74	99	-0.71	97	2.3	-0.1	88	251	82	71
427	56.154	0.131	0.084	1.74	99	-0.9	98	2.2	-0.1	88	251	82	71
428	56.288	0.134	0.086	1.74	99	-0.71	99	2.2	0	88	249	82	71
429	56.418	0.130	0.085	1.75	99	-0.85	96	2.3	0.1	88	249	82	71
430	56.549	0.131	0.082	1.73	99	-0.91	99	2.3	0	88	248	82	71
431	56.684	0.135	0.082	1.73	99	-0.91	102	2.3	0	87	248	83	71
432	56.812	0.128	0.084	1.75	99	-0.81	96	2.2	-0.1	87	248	83	71
433	56.946	0.134	0.081	1.74	99	-0.94	102	2.2	0	87	247	83	71
434	57.079	0.133	0.080	1.74	99	-0.72	102	2.2	0	87	247	83	71
435	57.207	0.128	0.084	1.72	99	-0.95	95	2.2	0	87	246	83	71
436	57.342	0.135	0.085	1.74	99	-0.73	100	2.2	0	87	246	83	71
437	57.473	0.131	0.084	1.73	99	-0.97	98	2.1	-0.1	87	245	82	71
438	57.602	0.129	0.084	1.75	99	-0.87	96	2.1	0	87	244	82	71
439	57.738	0.136	0.087	1.75	99	-0.94	100	2.1	0	87	244	82	71
440	57.867	0.129	0.083	1.76	99	-1.01	97	2.1	0	87	243	82	71
441	57.998	0.131	0.083	1.74	99	-0.8	99	2.1	0	87	243	82	71

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Englands' Stove Works
Model: 32-NC
Run #: 2

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/22/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
442	58.132	0.134	0.082	1.74	99	-0.88	101	2.1	0	87	242	82	71
443	58.262	0.130	0.082	1.73	99	-0.89	98	2.1	0	87	241	82	71
444	58.394	0.132	0.080	1.71	99	-0.84	101	2.0	-0.1	87	241	82	71
445	58.527	0.133	0.081	1.75	99	-0.65	101	2.0	0	87	240	82	71
446	58.658	0.131	0.084	1.72	99	-0.85	98	2.0	0	87	240	82	71
447	58.788	0.130	0.086	1.73	99	-0.67	96	2.0	0	87	240	82	71
448	58.922	0.134	0.086	1.71	99	-0.86	99	2.0	0	87	239	82	71
449	59.053	0.131	0.087	1.73	99	-0.82	96	2.0	0	87	238	82	71
450	59.184	0.131	0.088	1.72	99	-0.7	96	1.8	-0.2	86	237	82	71
451	59.317	0.133	0.083	1.70	99	-0.86	99	1.9	0.1	86	237	82	71
452	59.447	0.130	0.083	1.73	99	-0.66	97	1.9	0	86	238	82	71
453	59.578	0.131	0.083	1.73	99	-0.88	98	1.8	-0.1	86	236	82	70
454	59.712	0.134	0.081	1.75	99	-0.77	101	1.8	0	86	236	82	70
455	59.840	0.128	0.078	1.73	99	-0.87	99	1.9	0.1	86	235	82	71
456	59.974	0.134	0.077	1.74	99	-0.8	104	1.9	0	86	235	82	71
457	60.107	0.133	0.076	1.74	99	-0.59	104	1.8	-0.1	86	234	82	70
458	60.235	0.128	0.075	1.73	99	-0.78	101	1.8	0	86	234	82	71
459	60.370	0.135	0.075	1.73	99	-0.82	106	1.8	0	86	234	82	71
460	60.501	0.131	0.079	1.73	99	-0.66	101	1.8	0	86	233	82	71
461	60.630	0.129	0.082	1.72	99	-0.96	97	1.8	0	86	232	82	71
462	60.765	0.135	0.082	1.73	99	-1.05	102	1.8	0	86	232	82	71
463	60.896	0.131	0.083	1.74	99	-0.69	98	1.8	0	86	231	82	71
464	61.025	0.129	0.083	1.71	99	-1.04	97	1.6	-0.2	86	230	82	71
465	61.160	0.135	0.085	1.73	99	-0.62	100	1.7	0.1	86	230	82	71
466	61.289	0.129	0.087	1.73	99	-0.62	95	1.7	0	86	230	82	71
467	61.421	0.132	0.087	1.75	99	-0.72	97	1.7	0	86	230	82	71
468	61.554	0.133	0.087	1.72	99	-1.08	98	1.7	0	86	228	82	70
469	61.685	0.131	0.085	1.75	99	-1.09	97	1.7	0	86	228	82	70
470	61.816	0.131	0.083	1.73	99	-0.84	98	1.7	0	86	228	82	71
471	61.949	0.133	0.079	1.73	99	-0.65	102	1.6	-0.1	86	226	82	70
472	62.080	0.131	0.078	1.75	99	-1.08	101	1.6	0	85	226	82	70
473	62.211	0.131	0.078	1.74	99	-1.03	101	1.6	0	85	226	82	71
474	62.346	0.135	0.080	1.73	99	-0.64	103	1.6	0	85	225	82	71
475	62.476	0.130	0.081	1.74	99	-0.7	99	1.6	0	85	225	82	71

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Englands' Stove Works
Model: 32-NC
Run #: 2

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/22/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
476	62.607	0.131	0.082	1.73	99	-0.85	99	1.6	0	85	225	82	71
477	62.741	0.134	0.084	1.74	99	-0.96	100	1.5	-0.1	85	224	82	71
478	62.870	0.129	0.085	1.75	99	-0.95	95	1.5	0	85	225	82	70
479	63.002	0.132	0.083	1.72	99	-0.86	99	1.5	0	85	224	82	70
480	63.136	0.134	0.083	1.73	98	-0.94	100	1.5	0	85	223	82	70
481	63.264	0.128	0.083	1.73	98	-0.84	96	1.5	0	85	223	82	70
482	63.399	0.135	0.081	1.76	98	-0.8	103	1.5	0	85	223	82	70
483	63.531	0.132	0.079	1.72	98	-0.77	102	1.5	0	85	222	82	70
484	63.659	0.128	0.079	1.72	98	-1.09	99	1.5	0	85	221	82	70
485	63.794	0.135	0.078	1.74	98	-0.89	105	1.5	0	85	221	82	70
486	63.925	0.131	0.076	1.75	98	-0.74	102	1.4	-0.1	85	221	82	70
487	64.055	0.130	0.075	1.74	98	-0.99	102	1.4	0	85	220	82	70
488	64.190	0.135	0.079	1.72	98	-0.7	104	1.4	0	85	220	82	70
489	64.319	0.129	0.079	1.74	98	-0.82	99	1.4	0	85	220	82	71
490	64.451	0.132	0.078	1.71	98	-0.77	102	1.4	0	85	219	82	71
491	64.584	0.133	0.081	1.71	98	-0.92	101	1.4	0	84	219	82	70
492	64.715	0.131	0.081	1.74	98	-0.86	99	1.4	0	84	218	82	70
493	64.846	0.131	0.074	1.73	98	-0.79	104	1.4	0	85	218	82	70
494	64.979	0.133	0.076	1.72	98	-0.99	104	1.4	0	84	218	82	70
495	65.110	0.131	0.078	1.74	98	-1.01	101	1.3	-0.1	84	217	82	70
496	65.240	0.130	0.077	1.74	98	-0.78	101	1.3	0	84	216	82	70
497	65.375	0.135	0.080	1.73	98	-0.94	103	1.3	0	84	215	82	70
498	65.505	0.130	0.086	1.73	98	-0.69	96	1.3	0	84	216	82	70
499	65.636	0.131	0.085	1.74	98	-0.97	97	1.3	0	84	216	82	70
500	65.770	0.134	0.086	1.74	98	-0.93	99	1.3	0	84	215	82	70
501	65.899	0.129	0.087	1.73	98	-1.07	95	1.2	-0.1	84	215	82	70
502	66.032	0.133	0.087	1.73	98	-0.89	97	1.3	0.1	84	215	82	70
503	66.166	0.134	0.088	1.74	98	-0.69	97	1.2	-0.1	84	214	82	70
504	66.294	0.128	0.089	1.74	98	-0.79	93	1.2	0	84	214	82	70
505	66.429	0.135	0.087	1.73	98	-0.91	99	1.2	0	84	213	82	70
506	66.560	0.131	0.088	1.72	98	-0.66	96	1.2	0	84	213	82	70
507	66.689	0.129	0.085	1.72	98	-1.02	96	1.2	0	84	212	82	70
508	66.824	0.135	0.082	1.73	98	-0.87	102	1.2	0	84	211	82	70
509	66.955	0.131	0.082	1.75	98	-0.75	99	1.1	-0.1	84	211	82	70

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Englands' Stove Works
Model: 32-NC
Run #: 2

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/22/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
510	67.085	0.130	0.082	1.74	98	-0.71	98	1.1	0	84	211	82	70
511	67.220	0.135	0.081	1.72	98	-0.96	102	1.1	0	84	210	82	70
512	67.349	0.129	0.085	1.74	98	-0.71	96	1.1	0	84	209	82	70
513	67.480	0.131	0.085	1.75	98	-0.63	97	1.1	0	84	209	82	70
514	67.615	0.135	0.082	1.75	98	-1.1	102	1.1	0	84	208	82	70
515	67.745	0.130	0.080	1.76	98	-0.79	99	1.1	0	83	209	82	70
516	67.876	0.131	0.080	1.77	98	-0.61	100	1.1	0	83	207	82	70
517	68.009	0.133	0.079	1.73	98	-0.91	102	1.1	0	83	207	82	70
518	68.140	0.131	0.081	1.72	98	-0.64	99	1.1	0	83	207	82	70
519	68.271	0.131	0.085	1.74	98	-0.61	97	1.1	0	83	206	82	70
520	68.405	0.134	0.087	1.75	98	-0.87	98	1.0	-0.1	83	205	82	70
521	68.535	0.130	0.087	1.77	98	-0.96	95	1.0	0	83	204	82	70
522	68.666	0.131	0.086	1.76	98	-0.64	97	1.0	0	83	203	82	70
523	68.801	0.135	0.082	1.76	98	-0.73	101	1.0	0	83	204	82	70
524	68.929	0.128	0.080	1.76	98	-0.63	98	1.0	0	83	204	82	70
525	69.063	0.134	0.078	1.75	98	-0.84	104	1.0	0	83	203	82	70
526	69.196	0.133	0.078	1.75	98	-0.62	103	0.9	-0.1	83	203	82	70
527	69.324	0.128	0.078	1.73	98	-0.75	99	1.0	0.1	83	202	82	70
528	69.459	0.135	0.081	1.75	98	-0.86	103	0.9	-0.1	83	201	82	70
529	69.590	0.131	0.083	1.73	98	-0.65	98	0.9	0	83	201	82	70
530	69.719	0.129	0.083	1.74	98	-0.66	96	0.9	0	83	201	82	70
531	69.855	0.136	0.083	1.71	98	-1	102	0.9	0	83	201	82	70
532	69.985	0.130	0.083	1.74	98	-0.97	97	0.9	0	82	200	82	70
533	70.116	0.131	0.081	1.73	98	-0.76	99	0.8	-0.1	82	199	82	70
534	70.250	0.134	0.078	1.75	98	-0.77	103	0.9	0.1	82	199	82	70
535	70.379	0.129	0.079	1.73	98	-0.98	99	0.9	0	82	198	82	70
536	70.511	0.132	0.078	1.75	98	-0.64	102	0.9	0	82	198	82	70
537	70.645	0.134	0.079	1.76	98	-0.67	103	0.9	0	82	198	82	70
538	70.775	0.130	0.082	1.73	98	-0.61	98	0.9	0	82	197	82	70
539	70.906	0.131	0.086	1.74	98	-0.75	96	0.8	-0.1	82	197	82	70
540	71.039	0.133	0.087	1.74	98	-0.96	97	0.8	0	82	196	82	70
541	71.170	0.131	0.088	1.75	98	-0.89	95	0.8	0	82	196	82	70
542	71.301	0.131	0.088	1.74	98	-0.9	95	0.8	0	82	196	82	70
543	71.435	0.134	0.084	1.76	98	-0.74	100	0.8	0	82	196	82	70

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Englands' Stove Works
Model: 32-NC
Run #: 2

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/22/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
544	71.565	0.130	0.083	1.77	98	-0.96	97	0.8	0	82	195	82	70
545	71.696	0.131	0.083	1.74	98	-0.68	98	0.8	0	82	195	82	70
546	71.831	0.135	0.082	1.73	98	-1	101	0.8	0	82	194	82	70
547	71.959	0.128	0.083	1.74	98	-0.83	96	0.7	-0.1	82	194	82	70
548	72.093	0.134	0.084	1.75	98	-0.75	100	0.9	0.2	82	193	82	70
549	72.226	0.133	0.085	1.75	98	-0.58	98	0.7	-0.2	82	193	82	70
550	72.354	0.128	0.084	1.76	98	-0.94	95	0.7	0	82	193	82	70
551	72.489	0.135	0.086	1.74	98	-0.5	99	0.7	0	82	192	82	70
552	72.620	0.131	0.085	1.74	98	-0.91	97	0.7	0	82	192	82	70
553	72.749	0.129	0.089	1.73	98	-1.04	93	0.7	0	81	191	82	70
554	72.885	0.136	0.085	1.72	98	-0.82	100	0.7	0	81	191	82	70
555	73.015	0.130	0.087	1.71	98	-1.02	95	0.7	0	81	191	82	70
556	73.145	0.130	0.081	1.75	98	-0.86	98	0.7	0	81	191	82	70
557	73.279	0.134	0.081	1.75	98	-0.93	101	0.7	0	81	191	82	70
558	73.409	0.130	0.080	1.74	98	-0.76	99	0.7	0	81	190	82	70
559	73.541	0.132	0.080	1.72	98	-0.69	101	0.7	0	81	190	82	70
560	73.674	0.133	0.079	1.74	98	-0.91	102	0.6	-0.1	81	190	82	70
561	73.804	0.130	0.085	1.69	98	-0.99	96	0.6	0	81	189	82	70
562	73.936	0.132	0.083	1.74	98	-0.54	99	0.6	0	81	189	82	70
563	74.069	0.133	0.081	1.71	98	-0.82	101	0.6	0	81	188	82	70
564	74.199	0.130	0.084	1.71	98	-0.83	97	0.6	0	81	189	82	70
565	74.330	0.131	0.083	1.72	98	-0.93	98	0.6	0	81	188	82	70
566	74.464	0.134	0.083	1.74	98	-0.77	100	0.5	-0.1	81	187	82	70
567	74.594	0.130	0.083	1.75	98	-0.87	97	0.6	0.1	81	187	82	70
568	74.725	0.131	0.082	1.74	98	-0.69	99	0.7	0.1	81	186	82	70
569	74.860	0.135	0.079	1.75	98	-0.85	103	0.6	-0.1	81	186	82	70
570	74.988	0.128	0.077	1.76	98	-1.11	99	0.6	0	81	186	82	70
571	75.121	0.133	0.076	1.75	98	-0.76	104	0.5	-0.1	81	185	82	70
572	75.255	0.134	0.078	1.73	98	-0.98	103	0.5	0	81	185	82	70
573	75.382	0.127	0.082	1.75	98	-0.99	96	0.5	0	81	185	82	70
574	75.517	0.135	0.082	1.74	98	-0.48	102	0.5	0	81	185	82	70
575	75.649	0.132	0.083	1.75	98	-1	99	0.5	0	81	183	82	69
576	75.777	0.128	0.083	1.74	98	-0.73	96	0.5	0	81	184	82	70
577	75.913	0.136	0.081	1.74	98	-0.75	103	0.5	0	81	184	82	70

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Englands' Stove Works
Model: 32-NC
Run #: 2

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/22/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
578	76.043	0.130	0.079	1.74	98	-1	99	0.5	0	81	183	82	70
579	76.174	0.131	0.082	1.72	98	-0.62	99	0.5	0	81	183	82	70
580	76.308	0.134	0.084	1.75	98	-1.01	100	0.5	0	81	183	82	70
581	76.437	0.129	0.086	1.72	98	-0.9	95	0.4	-0.1	80	182	82	70
582	76.569	0.132	0.086	1.76	98	-0.75	97	0.4	0	80	182	82	69
583	76.703	0.134	0.088	1.76	98	-1.04	97	0.4	0	80	182	82	69
584	76.833	0.130	0.086	1.73	98	-0.81	95	0.4	0	80	182	82	69
585	76.965	0.132	0.083	1.74	98	-0.7	98	0.4	0	80	182	82	69
586	77.098	0.133	0.083	1.74	98	-0.76	100	0.4	0	80	182	82	69
587	77.228	0.130	0.082	1.75	98	-1	98	0.4	0	80	182	82	70
588	77.359	0.131	0.082	1.76	98	-0.97	98	0.4	0	80	181	82	69
589	77.494	0.135	0.082	1.76	97	-0.85	101	0.4	0	80	181	82	70
590	77.624	0.130	0.085	1.76	97	-0.53	96	0.4	0	80	181	82	70
591	77.755	0.131	0.084	1.75	98	-0.88	97	0.3	-0.1	80	181	82	70
592	77.889	0.134	0.085	1.74	97	-0.83	99	0.3	0	80	180	82	69
593	78.018	0.129	0.084	1.77	97	-0.83	96	0.4	0.1	80	180	82	70
594	78.151	0.133	0.087	1.77	97	-0.77	97	0.3	-0.1	80	179	82	69
595	78.285	0.134	0.086	1.75	97	-0.92	99	0.4	0.1	80	179	82	69
596	78.413	0.128	0.085	1.76	97	-0.6	95	0.3	-0.1	80	179	82	69
597	78.547	0.134	0.084	1.78	97	-0.79	100	0.3	0	80	179	82	69
598	78.679	0.132	0.082	1.77	97	-0.9	99	0.3	0	80	179	82	69
599	78.807	0.128	0.078	1.76	97	-0.63	99	0.3	0	80	179	82	69
600	78.943	0.136	0.077	1.75	97	-0.81	105	0.3	0	80	179	82	69
601	79.073	0.130	0.081	1.75	97	-0.79	99	0.3	0	80	179	82	69
602	79.203	0.130	0.081	1.74	97	-1.06	99	0.2	-0.1	80	180	82	69
603	79.338	0.135	0.081	1.75	97	-1.1	102	0.3	0.1	80	179	82	69
604	79.467	0.129	0.081	1.73	97	-0.68	98	0.3	0	80	179	82	69
605	79.599	0.132	0.083	1.74	97	-0.86	99	0.3	0	80	179	82	69
606	79.733	0.134	0.082	1.74	97	-1	101	0.2	-0.1	80	179	82	69
607	79.863	0.130	0.084	1.76	97	-0.61	97	0.2	0	80	178	82	69
608	79.994	0.131	0.087	1.74	97	-0.96	96	0.2	0	80	179	82	69
609	80.127	0.133	0.089	1.76	97	-0.61	96	0.2	0	80	178	82	69
610	80.258	0.131	0.090	1.76	97	-0.83	94	0.2	0	80	178	82	69
611	80.388	0.130	0.087	1.76	97	-0.66	95	0.2	0	80	178	82	69

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Englands' Stove Works
Model: 32-NC
Run #: 2

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/22/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
612	80.523	0.135	0.085	1.75	97	-0.67	100	0.2	0	80	179	82	69
613	80.653	0.130	0.084	1.75	97	-0.95	97	0.2	0	80	178	82	69
614	80.783	0.130	0.082	1.76	97	-0.77	98	0.2	0	80	178	82	69
615	80.918	0.135	0.080	1.76	97	-0.9	103	0.2	0	80	176	82	69
616	81.046	0.128	0.083	1.73	97	-0.53	96	0.2	0	80	177	82	69
617	81.179	0.133	0.082	1.73	97	-0.9	100	0.2	0	80	177	82	69
618	81.313	0.134	0.083	1.75	97	-0.96	100	0.1	-0.1	79	177	82	69
619	81.441	0.128	0.083	1.74	97	-0.69	96	0.2	0.1	79	177	82	69
620	81.575	0.134	0.085	1.75	97	-1.06	99	0.1	-0.1	79	176	82	69
621	81.707	0.132	0.083	1.74	97	-0.56	99	0.1	0	79	176	82	69
622	81.835	0.128	0.085	1.75	97	-0.96	95	0.1	0	79	176	82	69
623	81.970	0.135	0.084	1.76	97	-0.9	101	0.1	0	79	175	82	69
624	82.101	0.131	0.084	1.73	97	-0.87	97	0.1	0	79	175	82	69
625	82.231	0.130	0.082	1.74	97	-0.58	98	0.1	0	79	174	82	69
626	82.366	0.135	0.082	1.74	97	-0.86	102	0.1	0	79	174	82	69
627	82.495	0.129	0.080	1.75	97	-0.79	98	0.1	0	79	174	82	69
628	82.626	0.131	0.082	1.73	97	-0.9	99	0.1	0	79	174	82	69
629	82.760	0.134	0.080	1.74	97	-0.75	102	0.0	-0.1	79	173	82	69
Avg/Tot	82.760	0.132	0.082	1.73	99	-0.82	100			94	301	83	72.2

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Englands' Stove Works
Model: 32-NC
Run #: 2

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/22/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
0	0.001		0.00	95	-1		85	0.000	4.16	0.54
1	0.084	0.083	1.71	95	-2.74	70	85	0.000	3.67	0.51
2	0.216	0.132	1.75	94	-0.13	112	85	-0.010	2.18	0.20
3	0.346	0.130	1.75	94	-3.11	108	85	-0.010	3.20	0.42
4	0.475	0.129	1.74	94	-1.1	105	85	-0.010	5.21	0.68
5	0.607	0.132	1.73	93	-0.23	107	85	0.000	7.43	0.79
6	0.736	0.129	1.74	93	-0.18	104	85	0.010	6.86	0.64
7	0.865	0.129	1.74	93	-0.91	104	85	-0.010	7.99	0.50
8	0.996	0.131	1.73	93	-0.2	108	84	-0.010	8.69	0.33
9	1.126	0.130	1.73	93	-2.98	107	84	0.000	8.88	0.26
10	1.255	0.129	1.74	93	-3.03	107	84	-0.010	9.64	0.24
11	1.386	0.131	1.73	93	-0.2	109	84	0.000	8.62	0.26
12	1.515	0.129	1.73	93	-0.85	103	84	-0.010	6.09	0.31
13	1.644	0.129	1.74	93	-2.74	102	84	-0.010	4.98	0.40
14	1.775	0.131	1.73	93	-2.58	101	84	0.000	4.99	0.49
15	1.904	0.129	1.73	93	-2.78	99	84	0.000	5.18	0.47
16	2.033	0.129	1.74	93	-0.97	98	84	0.000	5.26	0.49
17	2.163	0.130	1.72	93	-3.19	99	84	-0.010	5.48	0.49
18	2.292	0.129	1.70	93	-0.21	98	84	0.000	5.60	0.54
19	2.421	0.129	1.71	93	-0.27	98	84	-0.020	4.42	0.59
20	2.552	0.131	1.69	93	-2.33	99	84	0.000	3.66	0.69
21	2.680	0.128	1.67	93	-2.95	98	84	0.000	3.50	0.82
22	2.805	0.125	1.66	93	-0.41	96	84	-0.010	3.57	0.89
23	2.934	0.129	1.65	93	-2.51	100	84	0.000	3.62	0.97
24	3.061	0.127	1.62	94	-3.37	101	84	0.000	3.59	0.98
25	3.186	0.125	1.62	94	-0.33	100	84	-0.010	3.68	0.99
26	3.310	0.124	1.60	94	-3.3	99	84	0.000	3.70	0.99
27	3.438	0.128	1.59	94	-1.24	105	84	0.010	3.93	1.02
28	3.561	0.123	1.58	94	-1.09	101	84	0.000	3.97	1.03
29	3.684	0.123	1.55	94	-2.55	100	84	0.000	4.10	1.17
30	3.810	0.126	1.59	94	-3.4	101	84	-0.010	4.28	1.46
31	3.936	0.126	1.59	95	-3.34	100	84	-0.010	4.53	1.61
32	4.060	0.124	1.61	95	-0.62	99	84	0.000	4.82	1.75

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Englands' Stove Works
Model: 32-NC
Run #: 2

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/22/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
33	4.185	0.125	1.61	95	-3.4	98	84	0.000	10.97	0.57
34	4.312	0.127	1.61	95	-0.4	98	84	-0.010	9.07	0.57
35	4.437	0.125	1.61	95	-1.25	97	84	0.000	10.17	0.53
36	4.561	0.124	1.62	95	-3.27	98	84	0.000	11.57	0.63
37	4.687	0.126	1.62	95	-0.54	99	84	-0.010	12.03	0.46
38	4.816	0.129	1.61	95	-0.81	100	84	-0.010	11.80	0.41
39	4.941	0.125	1.64	96	-2.23	101	84	0.000	11.23	0.36
40	5.067	0.126	1.63	96	-0.4	105	84	-0.010	10.43	0.32
41	5.194	0.127	1.64	96	-3.05	106	84	-0.010	9.76	0.32
42	5.320	0.126	1.63	96	-1.16	103	84	-0.010	9.76	0.28
43	5.445	0.125	1.63	96	-1.03	104	84	-0.010	9.68	0.24
44	5.573	0.128	1.64	96	-3.31	103	84	0.000	9.30	0.26
45	5.701	0.128	1.62	96	-3.17	101	84	0.000	9.07	0.27
46	5.826	0.125	1.65	96	-0.34	98	84	0.000	9.05	0.23
47	5.953	0.127	1.86	97	-2.8	102	84	0.000	9.18	0.25
48	6.089	0.136	1.76	97	-3.04	110	85	0.000	9.02	0.24
49	6.217	0.128	1.77	97	-3.08	101	85	0.000	8.96	0.25
50	6.349	0.132	1.76	97	-2.49	106	85	-0.010	8.96	0.22
51	6.482	0.133	1.77	97	-0.3	107	85	0.000	8.69	0.24
52	6.612	0.130	1.76	97	-0.25	103	85	-0.010	8.71	0.26
53	6.744	0.132	1.76	97	-2.45	103	85	-0.010	8.44	0.28
54	6.877	0.133	1.76	97	-2.8	104	85	-0.010	8.37	0.27
55	7.005	0.128	1.75	98	-2.6	98	85	-0.010	8.24	0.28
56	7.138	0.133	1.76	98	-0.21	102	85	0.000	7.99	0.28
57	7.270	0.132	1.76	98	-0.18	103	85	0.000	8.01	0.28
58	7.400	0.130	1.76	98	-1	101	85	-0.010	7.62	0.34
59	7.534	0.134	1.74	98	-3.11	105	85	0.010	7.48	0.34
60	7.665	0.131	1.76	98	-1.59	105	84	0.000	7.42	0.37
61	7.795	0.130	1.74	98	-2.15	103	84	0.000	7.34	0.40
62	7.928	0.133	1.75	98	-0.64	103	84	-0.010	7.08	0.48
63	8.058	0.130	1.75	98	-1.83	100	84	-0.010	6.19	0.63
64	8.189	0.131	1.75	99	-0.31	104	84	0.000	5.71	0.84
65	8.322	0.133	1.74	99	-0.74	105	84	0.000	5.92	0.77

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Englands' Stove Works
Model: 32-NC
Run #: 2

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/22/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
66	8.454	0.132	1.76	99	-0.11	104	84	0.000	6.45	0.63
67	8.584	0.130	1.77	99	-1.28	104	84	0.000	6.66	0.57
68	8.717	0.133	1.75	99	-0.9	108	84	0.000	6.44	0.68
69	8.848	0.131	1.75	99	-3.05	102	84	0.000	6.80	0.52
70	8.978	0.130	1.76	99	-3.1	100	84	0.000	7.04	0.48
71	9.111	0.133	1.74	99	-2.21	102	84	-0.010	6.93	0.53
72	9.242	0.131	1.76	99	-3.16	101	84	-0.010	7.04	0.51
73	9.372	0.130	1.74	99	-0.87	100	84	0.000	7.12	0.51
74	9.506	0.134	1.76	100	-3.08	104	84	0.000	7.28	0.49
75	9.636	0.130	1.76	100	-0.39	102	84	0.000	7.25	0.50
76	9.766	0.130	1.75	100	-0.19	104	84	-0.010	7.41	0.48
77	9.900	0.134	1.75	100	-2.21	105	84	-0.020	7.47	0.48
78	10.029	0.129	1.75	100	-2.95	101	84	-0.010	7.47	0.47
79	10.159	0.130	1.74	100	-3.12	104	84	0.000	7.71	0.44
80	10.294	0.135	1.75	100	-1.14	105	84	0.000	7.58	0.46
81	10.422	0.128	1.74	100	-2.37	101	84	-0.010	7.62	0.46
82	10.554	0.132	1.74	100	-2.58	107	84	-0.010	7.66	0.49
83	10.688	0.134	1.74	100	-2.47	107	84	-0.010	7.65	0.48
84	10.816	0.128	1.75	100	-0.24	99	84	0.000	7.70	0.46
85	10.948	0.132	1.73	100	-2.51	104	84	-0.010	7.63	0.50
86	11.081	0.133	1.76	100	-2.69	104	84	-0.010	7.62	0.47
87	11.209	0.128	1.74	101	-0.6	97	84	0.000	7.61	0.49
88	11.342	0.133	1.74	101	-3.17	103	84	-0.010	7.65	0.50
89	11.474	0.132	1.74	101	-2.66	103	84	0.000	7.69	0.51
90	11.603	0.129	1.75	101	-0.25	101	84	-0.010	7.73	0.50
91	11.736	0.133	1.73	101	-2.37	104	84	-0.010	7.83	0.46
92	11.867	0.131	1.75	101	-2.87	107	84	0.000	7.88	0.50
93	11.996	0.129	1.74	101	-3.14	103	84	0.000	7.76	0.49
94	12.130	0.134	1.74	101	-3.08	108	84	0.000	7.86	0.49
95	12.260	0.130	1.73	101	-0.48	104	84	-0.010	7.93	0.48
96	12.390	0.130	1.74	101	-0.41	104	84	-0.010	7.93	0.46
97	12.522	0.132	1.75	101	-1.59	105	84	0.000	8.25	0.43
98	12.652	0.130	1.74	101	-3.11	105	84	0.000	8.85	0.32

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Englands' Stove Works
Model: 32-NC
Run #: 2

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/22/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
99	12.783	0.131	1.74	101	-0.4	104	84	-0.010	9.25	0.28
100	12.915	0.132	1.73	101	-2.35	105	84	0.000	9.46	0.27
101	13.046	0.131	1.73	101	-2.54	104	85	-0.010	9.55	0.29
102	13.176	0.130	1.74	101	-3.03	100	85	0.000	9.55	0.28
103	13.308	0.132	1.73	101	-3.03	101	85	-0.010	9.52	0.26
104	13.439	0.131	1.75	101	-0.25	100	85	0.000	9.63	0.27
105	13.569	0.130	1.76	102	-0.77	99	85	-0.010	9.62	0.27
106	13.701	0.132	1.73	102	-1.97	102	85	-0.010	9.59	0.27
107	13.832	0.131	1.74	102	-2.69	103	85	0.000	9.53	0.26
108	13.962	0.130	1.73	102	-2.45	104	84	-0.010	9.47	0.25
109	14.094	0.132	1.74	102	-1.29	105	84	0.000	9.59	0.25
110	14.225	0.131	1.74	102	-0.35	104	84	0.000	9.41	0.22
111	14.354	0.129	1.74	102	-2.76	102	84	-0.010	9.39	0.25
112	14.487	0.133	1.73	102	-1.86	104	84	-0.010	9.38	0.25
113	14.618	0.131	1.74	102	-0.94	101	84	0.000	9.30	0.18
114	14.747	0.129	1.72	102	-2.11	101	84	0.000	9.19	0.23
115	14.881	0.134	1.74	102	-0.85	104	84	0.000	9.18	0.24
116	15.012	0.131	1.75	102	-3.03	100	84	-0.010	9.15	0.24
117	15.141	0.129	1.74	102	-2.7	103	84	0.000	9.20	0.23
118	15.275	0.134	1.73	102	-2.76	106	84	0.000	9.06	0.23
119	15.404	0.129	1.74	102	-3.12	101	84	0.000	9.23	0.22
120	15.534	0.130	1.73	102	-0.62	103	84	0.000	9.13	0.19
121	15.668	0.134	1.73	102	-1.86	107	84	-0.010	9.02	0.21
122	15.797	0.129	1.74	102	-2.17	99	84	-0.010	9.05	0.23
123	15.927	0.130	1.72	102	-0.4	101	84	0.000	9.06	0.22
124	16.061	0.134	1.75	102	-2.84	106	84	0.000	9.19	0.21
125	16.190	0.129	1.72	103	-3.16	101	84	0.000	9.18	0.23
126	16.321	0.131	1.75	103	-0.99	102	84	0.000	9.23	0.21
127	16.455	0.134	1.73	103	-0.31	105	84	0.000	9.18	0.20
128	16.583	0.128	1.73	103	-0.32	99	84	-0.010	9.24	0.22
129	16.715	0.132	1.73	103	-0.35	102	84	0.010	9.28	0.22
130	16.847	0.132	1.73	103	-1.23	104	84	-0.010	9.13	0.20
131	16.976	0.129	1.74	103	-0.35	101	84	-0.010	9.07	0.21

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Englands' Stove Works
Model: 32-NC
Run #: 2

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/22/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
132	17.109	0.133	1.74	103	-2.82	105	84	0.000	9.04	0.26
133	17.240	0.131	1.75	103	-0.25	105	84	0.000	9.12	0.23
134	17.369	0.129	1.73	103	-0.47	103	84	0.000	9.22	0.25
135	17.502	0.133	1.74	103	-0.59	107	84	-0.010	9.11	0.24
136	17.633	0.131	1.72	103	-0.2	105	84	0.000	9.21	0.21
137	17.763	0.130	1.74	103	-1.52	103	85	-0.020	9.23	0.21
138	17.896	0.133	1.75	103	-0.51	105	85	0.000	9.28	0.23
139	18.027	0.131	1.73	103	-2.89	101	85	0.000	9.27	0.26
140	18.157	0.130	1.74	103	-0.24	99	85	0.000	9.46	0.26
141	18.289	0.132	1.72	103	-1.24	101	85	0.000	9.41	0.26
142	18.419	0.130	1.74	103	-0.85	101	85	-0.010	9.49	0.27
143	18.550	0.131	1.73	103	-3.21	100	85	-0.010	9.62	0.27
144	18.682	0.132	1.74	103	-2.55	102	85	-0.010	9.57	0.28
145	18.813	0.131	1.73	103	-1.58	101	85	-0.010	9.60	0.28
146	18.944	0.131	1.72	103	-0.46	100	85	-0.010	9.37	0.31
147	19.076	0.132	1.74	103	-1.6	101	85	0.000	9.18	0.32
148	19.207	0.131	1.72	103	-0.91	103	85	0.000	9.01	0.31
149	19.337	0.130	1.73	103	-2.99	102	85	0.000	8.83	0.28
150	19.469	0.132	1.73	103	-0.38	107	84	0.000	8.68	0.28
151	19.601	0.132	1.74	103	-2.61	107	84	-0.010	8.61	0.26
152	19.730	0.129	1.74	103	-0.92	104	84	0.000	8.60	0.25
153	19.863	0.133	1.74	103	-0.39	106	84	0.000	8.48	0.24
154	19.994	0.131	1.75	103	-0.68	105	84	-0.010	8.52	0.23
155	20.124	0.130	1.73	103	-1.32	104	84	0.010	8.55	0.24
156	20.257	0.133	1.73	103	-2.23	108	84	0.000	8.71	0.24
157	20.388	0.131	1.74	103	-3.17	107	84	-0.010	8.72	0.23
158	20.518	0.130	1.73	103	-0.42	106	84	0.000	8.76	0.23
159	20.651	0.133	1.73	103	-1.28	108	84	-0.010	8.81	0.24
160	20.781	0.130	1.74	103	-0.31	103	84	-0.010	8.86	0.21
161	20.911	0.130	1.74	103	-0.59	99	84	0.000	8.94	0.21
162	21.045	0.134	1.74	103	-3.05	104	84	0.000	8.98	0.21
163	21.174	0.129	1.73	103	-2.87	100	84	0.000	8.94	0.21
164	21.306	0.132	1.75	103	-0.33	104	84	-0.010	8.96	0.21

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Englands' Stove Works
Model: 32-NC
Run #: 2

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/22/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
165	21.439	0.133	1.70	103	-2.02	104	84	0.000	8.94	0.20
166	21.568	0.129	1.74	103	-2.4	102	84	-0.010	8.99	0.18
167	21.700	0.132	1.73	103	-2.48	102	84	0.000	9.06	0.17
168	21.832	0.132	1.73	103	-3.15	103	84	0.000	9.06	0.19
169	21.961	0.129	1.74	103	-2.41	99	84	0.000	9.11	0.20
170	22.094	0.133	1.74	103	-0.63	105	84	0.000	9.10	0.20
171	22.226	0.132	1.74	103	-0.89	105	84	0.000	9.17	0.18
172	22.355	0.129	1.73	103	-1.36	102	84	0.000	9.07	0.17
173	22.488	0.133	1.72	103	-0.93	103	84	-0.010	9.11	0.14
174	22.619	0.131	1.74	103	-2.71	101	84	0.000	9.00	0.15
175	22.749	0.130	1.74	103	-0.18	100	84	-0.010	9.10	0.14
176	22.882	0.133	1.73	103	-2.86	103	84	-0.010	9.19	0.16
177	23.012	0.130	1.75	104	-0.67	101	84	0.000	9.19	0.14
178	23.143	0.131	1.74	103	-0.31	103	84	0.000	9.12	0.13
179	23.276	0.133	1.73	104	-0.93	105	84	0.000	9.13	0.13
180	23.406	0.130	1.73	104	-2.36	102	84	-0.010	9.24	0.12
181	23.537	0.131	1.73	104	-3.16	102	84	-0.010	9.15	0.13
182	23.670	0.133	1.74	104	-3.02	103	85	0.000	9.25	0.13
183	23.801	0.131	1.75	104	-2.15	102	85	0.000	9.05	0.13
184	23.931	0.130	1.73	104	-2.41	101	85	0.000	8.89	0.14
185	24.063	0.132	1.73	104	-3.14	104	85	0.000	8.68	0.17
186	24.195	0.132	1.74	104	-0.46	102	85	0.000	8.55	0.17
187	24.324	0.129	1.74	104	-3.18	102	85	0.000	8.38	0.19
188	24.457	0.133	1.73	104	-0.72	105	85	0.000	8.33	0.20
189	24.588	0.131	1.74	104	-1.16	104	85	-0.010	8.40	0.19
190	24.718	0.130	1.73	104	-2.67	102	85	-0.010	8.28	0.21
191	24.852	0.134	1.74	104	-2.75	107	85	0.000	8.31	0.23
192	24.982	0.130	1.74	104	-2.48	103	85	-0.010	8.29	0.22
193	25.112	0.130	1.74	104	-1.38	103	85	-0.010	8.33	0.23
194	25.246	0.134	1.74	104	-3.2	105	85	0.000	8.34	0.21
195	25.376	0.130	1.74	104	-3.04	102	84	0.000	8.30	0.21
196	25.506	0.130	1.74	104	-2.9	101	84	0.000	8.33	0.23
197	25.640	0.134	1.73	104	-3.08	106	84	0.000	8.26	0.22

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Englands' Stove Works
Model: 32-NC
Run #: 2

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/22/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
198	25.769	0.129	1.74	104	-3	102	84	0.010	8.25	0.22
199	25.901	0.132	1.74	104	-1.74	106	84	0.000	8.28	0.21
200	26.034	0.133	1.74	104	-0.96	108	84	-0.010	8.18	0.21
201	26.163	0.129	1.74	104	-3.15	104	84	0.000	8.18	0.21
202	26.296	0.133	1.75	104	-3.04	106	84	0.000	7.99	0.23
203	26.428	0.132	1.74	104	-3.13	103	84	0.000	7.69	0.27
204	26.556	0.128	1.73	104	-2.91	99	84	0.000	7.48	0.32
205	26.690	0.134	1.74	104	-2.97	103	84	0.000	7.37	0.37
206	26.821	0.131	1.73	104	-0.28	100	84	0.010	7.08	0.41
207	26.951	0.130	1.74	104	-0.62	100	84	0.000	7.00	0.45
208	27.085	0.134	1.74	104	-2.13	104	84	0.000	6.85	0.45
209	27.215	0.130	1.73	104	-3.16	101	84	0.000	6.70	0.48
210	27.345	0.130	1.74	104	-2.61	100	84	0.000	6.60	0.52
211	27.478	0.133	1.74	104	-0.63	101	84	0.000	6.52	0.54
212	27.609	0.131	1.73	104	-0.37	98	84	0.010	6.52	0.55
213	27.739	0.130	1.74	104	-2.19	97	84	-0.010	6.33	0.58
214	27.872	0.133	1.71	104	-3.15	101	84	-0.010	6.37	0.61
215	28.003	0.131	1.74	104	-0.97	100	84	-0.010	6.22	0.61
216	28.134	0.131	1.75	104	-0.21	101	84	0.000	6.24	0.65
217	28.266	0.132	1.73	104	-2.93	102	84	0.000	6.10	0.63
218	28.397	0.131	1.74	104	-2.25	100	84	-0.010	6.14	0.65
219	28.527	0.130	1.73	104	-3.06	98	84	-0.010	6.10	0.64
220	28.659	0.132	1.73	104	-1.07	100	84	0.000	6.06	0.68
221	28.790	0.131	1.73	104	-2.9	99	84	0.010	6.05	0.68
222	28.920	0.130	1.73	104	-3.06	98	84	-0.010	6.04	0.67
223	29.053	0.133	1.73	104	-0.5	100	84	0.000	6.08	0.66
224	29.184	0.131	1.72	104	-3.14	99	84	-0.010	6.02	0.69
225	29.313	0.129	1.73	104	-3.16	97	84	0.010	5.95	0.69
226	29.447	0.134	1.72	104	-2.18	100	84	0.000	6.01	0.70
227	29.577	0.130	1.72	104	-0.35	97	84	-0.010	5.87	0.69
228	29.706	0.129	1.73	104	-0.16	97	84	0.000	5.88	0.72
229	29.840	0.134	1.73	104	-2.87	101	84	-0.010	5.82	0.74
230	29.969	0.129	1.72	104	-0.27	98	84	0.010	5.83	0.72

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Englands' Stove Works
Model: 32-NC
Run #: 2

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/22/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
231	30.098	0.129	1.72	104	-0.43	99	84	-0.010	5.79	0.73
232	30.232	0.134	1.72	104	-2.86	101	84	0.000	5.91	0.68
233	30.361	0.129	1.72	104	-1.41	98	84	0.000	5.90	0.67
234	30.490	0.129	1.73	104	-0.28	97	84	0.000	5.89	0.66
235	30.624	0.134	1.72	104	-1.95	100	84	0.010	5.97	0.64
236	30.753	0.129	1.73	104	-3	97	84	-0.010	5.99	0.60
237	30.883	0.130	1.71	104	-3.09	99	84	0.000	6.02	0.57
238	31.017	0.134	1.72	104	-0.97	101	84	0.000	6.07	0.56
239	31.145	0.128	1.71	104	-0.53	97	84	0.000	6.06	0.55
240	31.277	0.132	1.71	104	-3.09	100	84	-0.010	6.03	0.57
241	31.409	0.132	1.71	104	-1.03	100	84	0.000	5.76	0.59
242	31.538	0.129	1.72	104	-2.85	98	84	-0.010	5.65	0.63
243	31.669	0.131	1.71	104	-1.69	100	84	-0.010	5.62	0.63
244	31.802	0.133	1.72	104	-2.35	101	84	0.000	5.44	0.65
245	31.930	0.128	1.73	104	-0.65	97	84	0.000	5.37	0.69
246	32.063	0.133	1.73	104	-1.97	100	84	0.000	5.22	0.69
247	32.194	0.131	1.74	104	-1.02	97	84	-0.010	5.18	0.69
248	32.322	0.128	1.73	104	-0.18	94	84	-0.010	5.05	0.72
249	32.455	0.133	1.71	104	-3.14	99	84	-0.010	4.95	0.70
250	32.586	0.131	1.73	104	-2.57	98	84	0.000	4.93	0.69
251	32.715	0.129	1.71	104	-2.59	96	84	-0.010	4.95	0.69
252	32.848	0.133	1.73	104	-3.23	99	84	-0.010	4.83	0.72
253	32.979	0.131	1.72	104	-0.43	98	84	0.000	4.84	0.70
254	33.109	0.130	1.73	104	-2.68	95	84	-0.010	4.77	0.70
255	33.242	0.133	1.73	104	-0.7	99	84	0.000	4.77	0.74
256	33.372	0.130	1.73	104	-3.14	98	84	0.000	4.72	0.72
257	33.502	0.130	1.72	104	-0.27	98	84	0.010	4.74	0.72
258	33.635	0.133	1.75	104	-2.28	100	84	-0.010	4.73	0.74
259	33.765	0.130	1.71	104	-0.94	100	84	-0.010	4.73	0.70
260	33.895	0.130	1.73	104	-0.47	99	84	-0.010	4.63	0.71
261	34.027	0.132	1.75	104	-1.62	100	84	-0.010	4.64	0.74
262	34.157	0.130	1.72	104	-0.31	98	84	-0.010	4.70	0.70
263	34.288	0.131	1.74	104	-0.22	99	84	-0.010	4.61	0.70

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Englands' Stove Works
Model: 32-NC
Run #: 2

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/22/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
264	34.420	0.132	1.74	104	-2.34	97	84	-0.010	4.59	0.70
265	34.550	0.130	1.73	104	-1.11	96	84	-0.010	4.61	0.70
266	34.681	0.131	1.72	103	-0.91	98	84	0.000	4.68	0.70
267	34.813	0.132	1.73	104	-3.21	100	84	0.000	4.71	0.71
268	34.944	0.131	1.73	103	-0.28	100	84	0.000	4.56	0.70
269	35.074	0.130	1.73	103	-1.33	99	84	0.000	4.67	0.67
270	35.206	0.132	1.74	103	-2.18	99	84	0.000	4.65	0.68
271	35.337	0.131	1.72	103	-0.24	98	84	-0.010	4.63	0.69
272	35.467	0.130	1.72	103	-0.83	97	84	0.010	4.64	0.67
273	35.599	0.132	1.73	103	-2.1	98	84	0.000	4.58	0.67
274	35.730	0.131	1.72	103	-2.04	98	84	-0.010	4.65	0.68
275	35.859	0.129	1.74	103	-0.88	98	84	0.000	4.58	0.67
276	35.992	0.133	1.72	103	-2.62	100	84	0.010	4.66	0.70
277	36.123	0.131	1.72	103	-2.11	98	84	-0.010	4.57	0.70
278	36.253	0.130	1.72	103	-1.76	98	84	0.000	4.63	0.72
279	36.386	0.133	1.74	103	-0.31	101	84	0.000	4.58	0.74
280	36.516	0.130	1.73	103	-0.78	98	84	-0.010	4.53	0.75
281	36.646	0.130	1.73	103	-2.71	98	84	-0.010	4.48	0.75
282	36.779	0.133	1.73	103	-1.18	101	84	0.000	4.58	0.75
283	36.909	0.130	1.74	103	-0.46	99	84	0.000	4.52	0.76
284	37.038	0.129	1.73	103	-0.4	99	84	-0.010	4.54	0.76
285	37.172	0.134	1.73	103	-1.07	104	84	0.000	4.50	0.76
286	37.301	0.129	1.73	103	-1.87	98	84	-0.020	4.55	0.75
287	37.432	0.131	1.71	103	-0.65	98	84	-0.010	4.56	0.76
288	37.565	0.133	1.72	103	-3	100	84	0.000	4.59	0.74
289	37.694	0.129	1.72	103	-2.46	96	84	0.000	4.55	0.78
290	37.826	0.132	1.74	103	-0.33	97	84	-0.010	4.66	0.74
291	37.959	0.133	1.73	103	-2.79	98	84	-0.010	4.57	0.74
292	38.087	0.128	1.74	103	-2.88	95	84	-0.010	4.54	0.73
293	38.219	0.132	1.73	103	-0.2	97	84	-0.010	4.48	0.72
294	38.352	0.133	1.72	103	-0.94	98	84	-0.010	4.60	0.74
295	38.479	0.127	1.73	103	-0.87	95	84	0.000	4.57	0.72
296	38.613	0.134	1.73	103	-1.65	99	84	-0.010	4.56	0.72

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Englands' Stove Works
Model: 32-NC
Run #: 2

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/22/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
297	38.744	0.131	1.73	103	-2.53	96	84	-0.010	4.49	0.72
298	38.873	0.129	1.72	103	-0.36	95	84	-0.010	4.48	0.70
299	39.006	0.133	1.74	103	-2.9	100	84	0.000	4.52	0.72
300	39.137	0.131	1.73	103	-0.36	98	84	0.000	4.58	0.71
301	39.266	0.129	1.74	103	-1.04	99	84	0.000	4.43	0.70
302	39.399	0.133	1.72	103	-3.09	103	84	0.000	4.52	0.71
303	39.530	0.131	1.73	103	-0.25	100	84	0.000	4.58	0.69
304	39.659	0.129	1.72	103	-1.72	97	84	0.000	4.51	0.70
305	39.793	0.134	1.73	103	-2.64	100	84	0.000	4.51	0.71
306	39.923	0.130	1.73	103	-0.48	96	84	0.000	4.68	0.70
307	40.053	0.130	1.73	103	-2.61	96	84	-0.010	4.71	0.70
308	40.185	0.132	1.74	103	-0.27	97	84	-0.010	4.61	0.71
309	40.315	0.130	1.73	103	-3.1	97	84	0.000	4.64	0.68
310	40.446	0.131	1.73	103	-3.08	97	84	0.000	4.59	0.68
311	40.578	0.132	1.74	103	-3.04	100	84	0.000	4.57	0.66
312	40.709	0.131	1.72	103	-2.82	99	84	0.000	4.64	0.67
313	40.839	0.130	1.73	103	-0.91	99	84	0.000	4.65	0.65
314	40.971	0.132	1.75	103	-0.92	100	84	-0.010	4.66	0.67
315	41.102	0.131	1.74	103	-0.41	100	84	-0.010	4.63	0.66
316	41.232	0.130	1.74	103	-0.2	96	84	0.000	4.69	0.64
317	41.364	0.132	1.72	103	-0.73	99	84	0.000	4.59	0.65
318	41.495	0.131	1.74	103	-2.99	98	84	0.000	4.66	0.64
319	41.625	0.130	1.74	103	-1.1	99	84	-0.010	4.61	0.64
320	41.757	0.132	1.72	103	-1.02	99	84	0.000	4.61	0.63
321	41.888	0.131	1.73	103	-0.31	98	84	-0.010	4.67	0.63
322	42.017	0.129	1.74	103	-1.8	97	84	-0.010	4.60	0.64
323	42.150	0.133	1.72	103	-0.61	101	84	-0.010	4.59	0.64
324	42.281	0.131	1.73	103	-0.42	98	84	-0.010	4.50	0.63
325	42.411	0.130	1.73	103	-1.91	97	84	0.000	4.64	0.62
326	42.544	0.133	1.72	103	-0.61	100	84	-0.010	4.55	0.62
327	42.674	0.130	1.74	103	-1.09	97	84	-0.010	4.60	0.61
328	42.804	0.130	1.74	103	-2.64	96	84	-0.010	4.55	0.60
329	42.937	0.133	1.73	103	-3.04	98	84	0.000	4.57	0.60

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Englands' Stove Works
Model: 32-NC
Run #: 2

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/22/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
330	43.067	0.130	1.74	103	-0.6	97	84	0.000	4.55	0.61
331	43.196	0.129	1.73	103	-0.36	97	84	0.000	4.46	0.60
332	43.330	0.134	1.73	103	-0.2	101	84	-0.010	4.55	0.60
333	43.459	0.129	1.74	103	-0.21	98	84	0.000	4.53	0.62
334	43.589	0.130	1.73	103	-3.14	99	84	0.000	4.51	0.60
335	43.723	0.134	1.74	103	-2.54	102	84	0.000	4.61	0.59
336	43.852	0.129	1.71	103	-3.02	96	84	0.000	4.59	0.60
337	43.983	0.131	1.74	103	-0.2	97	84	-0.010	4.60	0.60
338	44.116	0.133	1.72	103	-2.56	98	84	-0.010	4.54	0.60
339	44.245	0.129	1.73	103	-0.75	95	84	-0.010	4.54	0.56
340	44.376	0.131	1.73	103	-2.5	98	84	0.000	4.58	0.58
341	44.509	0.133	1.73	103	-3.11	100	84	0.000	4.51	0.57
342	44.637	0.128	1.72	103	-0.27	95	84	-0.010	4.48	0.58
343	44.770	0.133	1.73	103	-2.27	100	84	0.000	4.54	0.56
344	44.902	0.132	1.73	103	-3.08	100	84	-0.010	4.41	0.58
345	45.030	0.128	1.73	103	-1.12	95	84	-0.010	4.56	0.55
346	45.163	0.133	1.73	103	-1.9	99	84	0.000	4.49	0.56
347	45.294	0.131	1.73	103	-0.29	101	84	0.000	4.41	0.56
348	45.423	0.129	1.73	102	-3.16	100	84	0.000	4.46	0.57
349	45.556	0.133	1.73	102	-1.93	104	84	-0.020	4.53	0.54
350	45.687	0.131	1.73	102	-3.11	102	84	0.000	4.36	0.54
351	45.816	0.129	1.74	102	-0.99	99	84	0.000	4.39	0.53
352	45.950	0.134	1.75	102	-2.72	100	84	0.000	4.36	0.52
353	46.080	0.130	1.73	102	-2.05	97	84	0.000	4.36	0.52
354	46.210	0.130	1.71	102	-1.1	98	84	-0.010	4.32	0.53
355	46.342	0.132	1.73	102	-2.76	101	84	0.000	4.39	0.54
356	46.472	0.130	1.73	102	-3.13	101	84	-0.010	4.42	0.50
357	46.602	0.130	1.73	102	-0.52	100	84	0.000	4.32	0.51
358	46.735	0.133	1.73	102	-2.77	102	84	0.000	4.35	0.49
359	46.865	0.130	1.73	102	-3.16	99	84	0.000	4.39	0.51
360	46.995	0.130	1.73	102	-3.22	98	83	0.000	4.32	0.50
361	47.128	0.133	1.72	102	-0.29	99	83	0.000	4.31	0.51
362	47.259	0.131	1.74	102	-0.38	99	83	-0.010	4.18	0.50

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Englands' Stove Works
Model: 32-NC
Run #: 2

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/22/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
363	47.389	0.130	1.73	102	-0.73	97	83	-0.010	4.28	0.48
364	47.521	0.132	1.72	102	-0.27	99	83	0.000	4.29	0.48
365	47.651	0.130	1.72	102	-3.01	97	83	0.010	4.26	0.48
366	47.781	0.130	1.73	102	-2.06	98	84	0.010	4.31	0.47
367	47.913	0.132	1.73	102	-2.71	98	84	0.000	4.39	0.47
368	48.044	0.131	1.74	102	-2.58	98	84	-0.010	4.39	0.46
369	48.174	0.130	1.73	102	-3.14	97	84	-0.010	4.35	0.47
370	48.306	0.132	1.74	102	-1.67	100	84	-0.010	4.33	0.47
371	48.437	0.131	1.74	102	-2.55	99	84	-0.010	4.36	0.46
372	48.566	0.129	1.73	102	-2.73	100	84	0.000	4.31	0.45
373	48.699	0.133	1.72	102	-2.67	104	84	0.000	4.25	0.46
374	48.829	0.130	1.74	102	-2.8	100	84	0.000	4.28	0.48
375	48.959	0.130	1.73	102	-2.6	100	84	0.000	4.26	0.45
376	49.092	0.133	1.75	102	-2.55	102	84	0.000	4.26	0.49
377	49.223	0.131	1.73	102	-2.74	101	84	0.000	4.29	0.44
378	49.352	0.129	1.74	102	-0.43	98	84	-0.010	4.37	0.46
379	49.485	0.133	1.73	102	-0.38	105	84	0.000	4.34	0.45
380	49.615	0.130	1.73	102	-3.09	102	84	0.000	4.39	0.46
381	49.745	0.130	1.74	102	-1.5	100	84	-0.010	4.30	0.45
382	49.878	0.133	1.74	102	-0.67	102	84	0.000	4.26	0.46
383	50.007	0.129	1.73	102	-1.76	100	84	0.010	4.30	0.47
384	50.137	0.130	1.74	102	-3.14	97	84	-0.010	4.29	0.48
385	50.271	0.134	1.73	102	-0.94	100	84	-0.010	4.31	0.46
386	50.399	0.128	1.74	102	-3.05	97	84	0.000	4.36	0.46
387	50.530	0.131	1.73	102	-1.91	97	83	0.000	4.30	0.47
388	50.664	0.134	1.73	102	-3.17	99	83	0.000	4.35	0.46
389	50.792	0.128	1.71	102	-0.29	95	83	0.000	4.22	0.45
390	50.924	0.132	1.74	102	-0.47	98	83	0.000	4.32	0.47
391	51.056	0.132	1.72	102	-2.46	99	83	0.000	4.33	0.46
392	51.185	0.129	1.74	102	-1.82	98	83	-0.010	4.37	0.44
393	51.316	0.131	1.74	102	-0.2	99	84	-0.010	4.27	0.45
394	51.449	0.133	1.73	102	-1.2	100	84	0.000	4.34	0.45
395	51.577	0.128	1.74	102	-0.52	95	84	0.000	4.34	0.45

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Englands' Stove Works
Model: 32-NC
Run #: 2

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/22/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
396	51.709	0.132	1.74	102	-0.96	98	84	0.010	4.40	0.43
397	51.841	0.132	1.74	102	-2.77	99	84	0.000	4.35	0.46
398	51.969	0.128	1.73	102	-2.84	97	84	0.000	4.34	0.45
399	52.102	0.133	1.73	102	-1.53	102	84	0.000	4.34	0.45
400	52.233	0.131	1.74	102	-3.07	100	84	-0.010	4.32	0.46
401	52.362	0.129	1.71	102	-3.17	97	84	-0.010	4.26	0.47
402	52.495	0.133	1.74	102	-0.16	99	84	0.000	4.40	0.43
403	52.626	0.131	1.72	102	-0.87	96	84	0.000	4.42	0.47
404	52.755	0.129	1.73	102	-2.44	95	84	0.000	4.34	0.46
405	52.888	0.133	1.73	102	-0.32	99	84	-0.010	4.41	0.44
406	53.018	0.130	1.75	102	-0.43	97	84	0.000	4.38	0.45
407	53.147	0.129	1.72	102	-0.3	97	83	0.000	4.35	0.45
408	53.281	0.134	1.74	102	-3.08	103	83	0.000	4.45	0.47
409	53.411	0.130	1.72	102	-1.04	100	83	0.000	4.39	0.46
410	53.540	0.129	1.73	102	-0.19	98	83	0.000	4.43	0.47
411	53.673	0.133	1.74	102	-2.64	101	83	0.000	4.40	0.46
412	53.803	0.130	1.74	102	-0.28	98	83	-0.010	4.32	0.46
413	53.933	0.130	1.73	102	-1.55	96	83	0.000	4.40	0.47
414	54.065	0.132	1.74	102	-0.87	96	83	-0.010	4.40	0.47
415	54.195	0.130	1.73	102	-1.93	94	83	0.000	4.34	0.47
416	54.325	0.130	1.73	102	-3.14	94	83	0.000	4.46	0.46
417	54.457	0.132	1.75	102	-2.11	98	83	-0.010	4.35	0.45
418	54.588	0.131	1.72	102	-1.81	98	83	0.010	4.45	0.44
419	54.718	0.130	1.74	102	-0.53	99	83	0.000	4.39	0.47
420	54.850	0.132	1.70	102	-0.3	103	83	0.000	4.42	0.45
421	54.980	0.130	1.73	102	-2.81	99	84	0.000	4.37	0.44
422	55.110	0.130	1.73	102	-0.37	98	84	0.000	4.45	0.43
423	55.242	0.132	1.73	102	-3.13	100	84	0.000	4.51	0.47
424	55.373	0.131	1.74	102	-0.7	98	84	0.010	4.44	0.44
425	55.503	0.130	1.74	102	-0.61	96	84	0.000	4.34	0.46
426	55.635	0.132	1.73	101	-0.4	99	84	-0.010	4.36	0.43
427	55.765	0.130	1.73	101	-3.02	98	84	-0.010	4.35	0.47
428	55.895	0.130	1.73	101	-3.17	97	84	0.010	4.33	0.45

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Englands' Stove Works
Model: 32-NC
Run #: 2

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/22/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
429	56.027	0.132	1.73	101	-0.59	99	84	0.010	4.35	0.45
430	56.158	0.131	1.74	101	-2.93	100	84	-0.010	4.37	0.46
431	56.287	0.129	1.73	101	-1.55	98	84	0.000	4.41	0.46
432	56.419	0.132	1.73	101	-1.18	99	84	0.000	4.35	0.46
433	56.550	0.131	1.74	101	-2.66	100	84	0.000	4.36	0.46
434	56.679	0.129	1.74	101	-2.69	100	84	0.000	4.27	0.47
435	56.812	0.133	1.73	101	-0.97	100	84	0.000	4.35	0.44
436	56.942	0.130	1.73	101	-0.85	97	84	-0.010	4.23	0.44
437	57.071	0.129	1.72	101	-2.24	97	84	-0.010	4.17	0.46
438	57.204	0.133	1.73	101	-0.4	100	84	0.000	4.12	0.45
439	57.335	0.131	1.72	101	-0.29	97	83	0.000	4.10	0.45
440	57.464	0.129	1.75	101	-2.91	97	83	-0.010	4.12	0.45
441	57.597	0.133	1.72	101	-1.73	101	83	0.000	4.11	0.47
442	57.727	0.130	1.75	101	-0.22	99	83	0.000	4.01	0.44
443	57.856	0.129	1.73	101	-0.84	98	83	-0.020	4.08	0.48
444	57.989	0.133	1.73	101	-0.6	102	83	0.000	4.12	0.50
445	58.119	0.130	1.74	101	-0.74	99	83	0.000	3.95	0.45
446	58.248	0.129	1.74	101	-2.97	97	83	0.000	3.92	0.46
447	58.382	0.134	1.74	101	-2.61	100	83	-0.010	3.92	0.47
448	58.511	0.129	1.74	101	-2.45	96	83	-0.010	3.94	0.45
449	58.641	0.130	1.73	101	-0.22	96	83	0.000	3.94	0.46
450	58.774	0.133	1.73	101	-2.22	98	83	0.000	3.93	0.47
451	58.903	0.129	1.74	101	-1.02	97	83	0.000	3.85	0.48
452	59.032	0.129	1.73	101	-0.57	97	84	0.000	3.82	0.48
453	59.166	0.134	1.74	101	-1.88	101	83	-0.010	3.85	0.48
454	59.294	0.128	1.73	101	-2	98	83	-0.010	3.76	0.46
455	59.425	0.131	1.72	101	-0.26	102	84	-0.010	3.81	0.45
456	59.558	0.133	1.73	101	-3.18	104	84	0.000	3.78	0.47
457	59.687	0.129	1.72	101	-0.22	102	84	0.010	3.76	0.47
458	59.818	0.131	1.75	101	-3.2	104	84	0.000	3.70	0.46
459	59.951	0.133	1.72	101	-1.12	105	84	-0.010	3.78	0.44
460	60.079	0.128	1.74	101	-2.58	99	84	0.000	3.72	0.47
461	60.210	0.131	1.74	101	-1.11	100	84	0.000	3.71	0.45

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Englands' Stove Works
Model: 32-NC
Run #: 2

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/22/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
462	60.343	0.133	1.74	101	-0.47	101	84	0.000	3.66	0.44
463	60.471	0.128	1.73	101	-0.22	96	84	-0.010	3.64	0.46
464	60.603	0.132	1.73	101	-0.26	100	84	-0.010	3.61	0.46
465	60.735	0.132	1.74	101	-3.09	99	84	-0.010	3.63	0.47
466	60.863	0.128	1.74	101	-1.32	95	84	0.000	3.58	0.45
467	60.996	0.133	1.73	101	-0.87	98	84	0.010	3.64	0.47
468	61.127	0.131	1.74	101	-3.08	97	84	-0.010	3.58	0.46
469	61.255	0.128	1.73	101	-2.7	96	84	-0.010	3.58	0.46
470	61.388	0.133	1.74	101	-2.05	101	84	-0.010	3.63	0.45
471	61.519	0.131	1.75	101	-1.91	102	84	-0.010	3.56	0.46
472	61.647	0.128	1.74	101	-2.69	100	84	-0.010	3.49	0.46
473	61.780	0.133	1.73	101	-0.27	104	84	-0.010	3.64	0.43
474	61.911	0.131	1.74	101	-3.14	101	84	0.000	3.50	0.42
475	62.040	0.129	1.72	101	-2.52	99	84	0.000	3.48	0.43
476	62.173	0.133	1.73	101	-1.86	101	84	0.000	3.50	0.43
477	62.303	0.130	1.73	101	-1.95	97	83	-0.010	3.46	0.42
478	62.433	0.130	1.74	101	-0.23	97	83	0.010	3.48	0.45
479	62.565	0.132	1.72	101	-3.12	99	83	0.000	3.41	0.44
480	62.696	0.131	1.74	101	-3.17	99	83	-0.010	3.38	0.44
481	62.825	0.129	1.74	101	-1.32	97	83	-0.010	3.32	0.44
482	62.958	0.133	1.75	101	-0.25	102	83	-0.010	3.43	0.43
483	63.088	0.130	1.72	101	-1.71	101	83	0.000	3.36	0.41
484	63.217	0.129	1.73	101	-3.24	100	83	0.000	3.37	0.42
485	63.350	0.133	1.72	101	-0.84	104	83	0.000	3.34	0.44
486	63.479	0.129	1.73	101	-0.84	101	83	0.000	3.35	0.42
487	63.610	0.131	1.74	101	-3.19	104	83	-0.010	3.31	0.42
488	63.742	0.132	1.73	101	-3	102	84	-0.010	3.35	0.45
489	63.871	0.129	1.73	101	-3.04	100	84	0.000	3.34	0.43
490	64.001	0.130	1.73	101	-2.32	101	84	0.000	3.31	0.42
491	64.134	0.133	1.74	101	-3.19	102	84	0.000	3.25	0.41
492	64.264	0.130	1.73	101	-0.22	99	84	0.000	3.25	0.43
493	64.394	0.130	1.75	101	-2.5	104	84	-0.010	3.31	0.41
494	64.526	0.132	1.75	101	-0.27	104	84	0.000	3.29	0.42

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Englands' Stove Works
Model: 32-NC
Run #: 2

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/22/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
495	64.656	0.130	1.72	101	-0.77	101	84	0.000	3.24	0.41
496	64.786	0.130	1.74	101	-0.88	102	84	-0.010	3.23	0.42
497	64.918	0.132	1.74	101	-1.16	101	84	0.010	3.34	0.39
498	65.049	0.131	1.74	101	-3.19	97	84	0.000	3.26	0.40
499	65.179	0.130	1.73	101	-0.18	97	84	0.000	3.25	0.42
500	65.311	0.132	1.74	101	-0.72	98	84	-0.010	3.28	0.40
501	65.441	0.130	1.74	101	-2.24	96	84	0.000	3.19	0.42
502	65.571	0.130	1.73	101	-3.24	96	84	0.000	3.20	0.41
503	65.703	0.132	1.74	101	-0.33	96	84	0.000	3.24	0.40
504	65.834	0.131	1.74	101	-2.69	95	84	0.000	3.16	0.41
505	65.963	0.129	1.73	101	-1.74	95	84	0.000	3.22	0.39
506	66.095	0.132	1.73	101	-0.56	97	84	-0.010	3.24	0.40
507	66.226	0.131	1.74	101	-0.36	98	84	-0.010	3.15	0.41
508	66.355	0.129	1.74	101	-2.62	98	84	0.000	3.17	0.39
509	66.487	0.132	1.73	101	-0.9	100	84	-0.010	3.25	0.39
510	66.618	0.131	1.73	101	-3.02	99	84	0.000	3.25	0.39
511	66.747	0.129	1.75	101	-1.34	98	84	-0.010	3.16	0.40
512	66.880	0.133	1.73	101	-0.35	99	84	0.000	3.14	0.41
513	67.010	0.130	1.74	101	-3.07	97	84	-0.010	3.16	0.39
514	67.140	0.130	1.72	101	-2.94	99	84	-0.010	3.07	0.40
515	67.273	0.133	1.74	101	-1.08	102	84	-0.020	3.00	0.40
516	67.403	0.130	1.72	101	-1.05	100	83	0.000	3.00	0.39
517	67.532	0.129	1.74	101	-0.53	100	83	0.000	3.04	0.40
518	67.665	0.133	1.74	101	-0.58	101	83	-0.010	3.03	0.39
519	67.795	0.130	1.75	101	-3.12	97	83	0.000	2.98	0.38
520	67.925	0.130	1.73	101	-2.93	95	83	0.000	2.97	0.40
521	68.058	0.133	1.73	101	-0.73	98	83	0.010	2.91	0.38
522	68.187	0.129	1.74	101	-0.31	96	83	-0.010	2.93	0.39
523	68.317	0.130	1.74	101	-2.02	98	83	-0.010	2.83	0.37
524	68.450	0.133	1.74	101	-3.02	102	83	-0.010	2.88	0.40
525	68.579	0.129	1.72	101	-3.12	100	83	0.000	2.86	0.39
526	68.709	0.130	1.73	101	-1.91	101	84	0.000	2.87	0.37
527	68.843	0.134	1.74	101	-2.74	104	84	0.000	2.81	0.39

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Englands' Stove Works
Model: 32-NC
Run #: 2

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/22/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
528	68.971	0.128	1.74	101	-3.11	98	84	0.000	2.82	0.37
529	69.101	0.130	1.74	101	-1.85	98	84	-0.010	2.77	0.36
530	69.235	0.134	1.75	101	-0.21	101	84	-0.010	2.76	0.39
531	69.363	0.128	1.73	101	-0.97	97	84	-0.010	2.83	0.37
532	69.494	0.131	1.73	101	-0.26	99	84	-0.010	2.73	0.38
533	69.627	0.133	1.74	101	-0.63	101	84	-0.010	2.75	0.36
534	69.755	0.128	1.74	101	-3.13	99	84	0.000	2.81	0.39
535	69.887	0.132	1.74	101	-2.93	102	84	-0.010	2.78	0.38
536	70.020	0.133	1.74	101	-2.96	103	84	0.000	2.76	0.39
537	70.148	0.128	1.75	101	-0.39	99	84	0.000	2.78	0.37
538	70.279	0.131	1.74	100	-3.04	99	84	-0.010	2.71	0.37
539	70.412	0.133	1.74	100	-1.31	99	83	0.000	2.70	0.38
540	70.540	0.128	1.74	100	-0.23	94	83	-0.010	2.74	0.38
541	70.672	0.132	1.73	100	-1.06	97	83	0.000	2.66	0.40
542	70.804	0.132	1.75	101	-0.2	96	83	0.000	2.73	0.36
543	70.932	0.128	1.74	101	-1.28	96	83	-0.010	2.61	0.38
544	71.064	0.132	1.73	100	-3.18	99	83	-0.010	2.64	0.38
545	71.195	0.131	1.75	100	-0.9	99	83	0.000	2.75	0.37
546	71.324	0.129	1.73	100	-3.06	98	83	0.000	2.68	0.35
547	71.457	0.133	1.73	100	-2.94	100	83	0.000	2.66	0.36
548	71.588	0.131	1.74	100	-0.85	98	83	-0.010	2.66	0.37
549	71.716	0.128	1.73	100	-3.2	95	83	-0.010	2.63	0.38
550	71.849	0.133	1.74	100	-0.24	100	83	-0.010	2.67	0.37
551	71.980	0.131	1.73	100	-3.22	97	83	0.000	2.66	0.37
552	72.109	0.129	1.74	100	-2.5	96	83	-0.010	2.69	0.36
553	72.242	0.133	1.72	100	-3.19	97	83	0.000	2.58	0.35
554	72.372	0.130	1.73	100	-1.02	97	83	0.000	2.52	0.36
555	72.501	0.129	1.72	100	-0.76	95	83	0.000	2.64	0.34
556	72.634	0.133	1.75	100	-2.75	101	84	-0.010	2.65	0.34
557	72.764	0.130	1.74	100	-1.85	99	84	-0.010	2.54	0.35
558	72.893	0.129	1.71	100	-2.98	99	84	-0.010	2.50	0.36
559	73.026	0.133	1.73	100	-2.29	102	84	0.000	2.64	0.36
560	73.156	0.130	1.73	100	-0.26	100	84	-0.010	2.52	0.35

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Englands' Stove Works
Model: 32-NC
Run #: 2

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/22/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
561	73.286	0.130	1.74	100	-1.26	97	84	0.000	2.56	0.37
562	73.418	0.132	1.74	100	-3.16	99	83	-0.010	2.54	0.35
563	73.548	0.130	1.73	100	-3.15	99	83	0.000	2.62	0.34
564	73.678	0.130	1.73	100	-2.36	98	83	0.000	2.69	0.34
565	73.810	0.132	1.74	100	-0.75	99	83	0.000	2.57	0.37
566	73.940	0.130	1.75	100	-0.79	98	83	0.000	2.51	0.37
567	74.070	0.130	1.73	100	-1.01	98	83	-0.010	2.52	0.35
568	74.202	0.132	1.74	100	-0.24	100	83	-0.010	2.55	0.35
569	74.332	0.130	1.73	100	-0.54	100	83	0.000	2.53	0.36
570	74.462	0.130	1.74	100	-2.85	101	83	0.000	2.48	0.35
571	74.594	0.132	1.72	100	-2.9	104	83	0.000	2.57	0.36
572	74.724	0.130	1.74	100	-0.99	101	83	-0.010	2.48	0.35
573	74.854	0.130	1.73	100	-2.81	99	83	0.000	2.42	0.35
574	74.987	0.133	1.73	100	-2.32	101	83	0.000	2.46	0.36
575	75.117	0.130	1.75	100	-2.36	98	83	-0.010	2.46	0.36
576	75.247	0.130	1.74	100	-2.23	98	83	-0.010	2.33	0.36
577	75.379	0.132	1.73	100	-0.39	100	83	-0.010	2.40	0.34
578	75.509	0.130	1.74	100	-3.19	100	83	-0.010	2.46	0.37
579	75.639	0.130	1.73	100	-1.52	99	83	0.010	2.39	0.34
580	75.771	0.132	1.75	100	-0.66	99	83	-0.010	2.32	0.35
581	75.901	0.130	1.74	100	-2.37	96	83	0.000	2.38	0.34
582	76.031	0.130	1.73	100	-0.24	96	84	0.000	2.43	0.35
583	76.163	0.132	1.73	100	-0.94	96	84	0.000	2.41	0.34
584	76.294	0.131	1.74	100	-3.03	97	84	0.010	2.49	0.36
585	76.423	0.129	1.75	100	-0.53	97	84	-0.010	2.29	0.34
586	76.555	0.132	1.73	100	-0.9	100	84	0.000	2.36	0.35
587	76.685	0.130	1.75	100	-0.78	99	84	-0.010	2.39	0.36
588	76.815	0.130	1.74	100	-2.23	98	84	0.010	2.36	0.35
589	76.947	0.132	1.73	100	-3.06	100	84	0.000	2.36	0.36
590	77.077	0.130	1.73	100	-0.81	97	84	-0.010	2.47	0.34
591	77.206	0.129	1.74	100	-2.05	96	84	0.000	2.35	0.35
592	77.339	0.133	1.73	100	-2.89	99	84	0.000	2.37	0.34
593	77.469	0.130	1.74	100	-0.95	97	84	0.010	2.35	0.35

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Englands' Stove Works
Model: 32-NC
Run #: 2

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/22/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
594	77.598	0.129	1.73	100	-2.39	95	84	0.000	2.26	0.34
595	77.732	0.134	1.74	100	-2.01	99	84	0.010	2.38	0.33
596	77.862	0.130	1.72	100	-3.08	97	84	0.000	2.30	0.34
597	77.991	0.129	1.75	100	-0.28	96	83	0.000	2.39	0.33
598	78.124	0.133	1.75	100	-0.15	101	83	-0.010	2.31	0.36
599	78.254	0.130	1.75	100	-3.02	101	83	0.010	2.34	0.35
600	78.383	0.129	1.74	100	-3.08	100	83	-0.010	2.36	0.35
601	78.516	0.133	1.74	100	-3.18	101	83	0.000	2.33	0.34
602	78.645	0.129	1.74	100	-3.14	98	83	0.000	2.29	0.33
603	78.775	0.130	1.74	100	-0.89	99	83	0.000	2.34	0.36
604	78.908	0.133	1.72	100	-0.86	101	83	0.000	2.36	0.33
605	79.037	0.129	1.74	100	-3.16	97	83	-0.010	2.37	0.33
606	79.166	0.129	1.73	100	-3.15	97	83	0.000	2.31	0.35
607	79.300	0.134	1.74	100	-0.35	100	83	-0.010	2.29	0.34
608	79.429	0.129	1.74	100	-2.86	95	83	0.000	2.36	0.34
609	79.559	0.130	1.73	100	-3.04	94	83	-0.010	2.36	0.36
610	79.692	0.133	1.73	100	-0.58	96	83	0.000	2.36	0.38
611	79.821	0.129	1.74	100	-2.4	95	83	0.000	2.42	0.38
612	79.951	0.130	1.73	100	-3.01	97	83	0.010	2.49	0.37
613	80.084	0.133	1.73	100	-3.09	100	83	-0.010	2.36	0.38
614	80.212	0.128	1.75	100	-0.26	97	83	-0.010	2.47	0.36
615	80.343	0.131	1.73	100	-0.41	101	83	-0.010	2.34	0.36
616	80.476	0.133	1.74	100	-0.22	100	83	0.000	2.40	0.36
617	80.604	0.128	1.73	100	-3.18	97	83	0.000	2.45	0.36
618	80.735	0.131	1.74	100	-2.99	99	83	0.000	2.45	0.35
619	80.868	0.133	1.73	100	-2.71	100	84	-0.010	2.44	0.35
620	80.996	0.128	1.74	100	-0.2	95	84	0.000	2.38	0.34
621	81.128	0.132	1.73	100	-0.35	99	84	0.000	2.40	0.36
622	81.260	0.132	1.73	100	-2.84	98	84	0.000	2.45	0.34
623	81.388	0.128	1.74	100	-2.58	96	84	-0.010	2.32	0.34
624	81.520	0.132	1.73	100	-1.42	98	84	-0.010	2.30	0.34
625	81.652	0.132	1.74	100	-3.13	100	84	-0.010	2.23	0.37
626	81.780	0.128	1.73	100	-0.17	97	84	0.000	2.32	0.36

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Englands' Stove Works
Model: 32-NC
Run #: 2

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/22/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
627	81.912	0.132	1.73	100	-1.78	101	84	0.000	2.30	0.33
628	82.044	0.132	1.75	100	-1.74	100	84	0.000	2.27	0.34
629	82.172	0.128	1.73	100	-0.23	98	83	0.010	2.22	0.32
Avg/Tot	82.172	0.131	1.73	101	-1.73	100	84	-0.004	5.30	0.46

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Englands' Stove Works
Model: 32-NC
Run #: 2

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/22/2020

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
0	426	461	424	359	225	379.0	N/A
1	428	459	425	354	225	378.2	N/A
2	427	454	424	348	227	376.0	N/A
3	424	448	421	345	226	372.8	N/A
4	420	442	419	356	226	372.6	N/A
5	416	438	414	374	226	373.6	N/A
6	412	433	409	394	227	375.0	N/A
7	409	428	403	412	227	375.8	N/A
8	405	422	397	435	227	377.2	N/A
9	401	417	391	465	228	380.4	N/A
10	398	413	384	485	228	381.6	N/A
11	396	408	379	488	229	380.0	N/A
12	393	403	373	484	229	376.4	N/A
13	389	398	367	480	229	372.6	N/A
14	386	393	362	477	230	369.6	N/A
15	382	387	356	475	230	366.0	N/A
16	379	382	352	473	230	363.2	N/A
17	375	377	347	472	231	360.4	N/A
18	372	372	342	465	231	356.4	N/A
19	369	367	339	452	231	351.6	N/A
20	365	363	335	440	231	346.8	N/A
21	362	359	331	428	232	342.4	N/A
22	358	355	328	416	232	337.8	N/A
23	354	351	324	405	232	333.2	N/A
24	351	347	321	396	232	329.4	N/A
25	347	343	318	386	232	325.2	N/A
26	344	340	315	378	232	321.8	N/A
27	341	337	312	370	232	318.4	N/A
28	337	333	310	362	232	314.8	N/A
29	335	329	307	356	232	311.8	N/A
30	331	326	305	351	232	309.0	N/A
31	326	325	303	346	232	306.4	N/A
32	323	322	302	367	232	309.2	N/A
33	323	321	300	395	231	314.0	N/A
34	323	320	298	421	231	318.6	N/A
35	323	322	296	446	230	323.4	N/A
36	325	327	294	469	230	329.0	N/A
37	329	332	292	491	230	334.8	N/A
38	333	338	291	509	229	340.0	N/A
39	337	344	289	523	229	344.4	N/A
40	341	349	289	538	229	349.2	N/A
41	344	353	288	550	228	352.6	N/A
42	347	357	287	562	228	356.2	N/A
43	349	361	288	572	227	359.4	N/A
44	350	363	287	578	227	361.0	N/A
45	351	366	287	582	226	362.4	N/A
46	352	369	287	584	226	363.6	N/A
47	354	371	287	587	225	364.8	N/A
48	355	373	287	588	225	365.6	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Englands' Stove Works
Model: 32-NC
Run #: 2

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/22/2020

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
49	357	375	286	589	225	366.4	N/A
50	358	377	286	588	224	366.6	N/A
51	359	379	286	588	224	367.2	N/A
52	360	380	285	587	223	367.0	N/A
53	361	381	285	585	223	367.0	N/A
54	362	381	285	585	222	367.0	N/A
55	362	382	284	583	222	366.6	N/A
56	362	382	284	581	221	366.0	N/A
57	363	383	284	579	221	366.0	N/A
58	363	383	283	577	220	365.2	N/A
59	363	384	282	575	220	364.8	N/A
60	361	385	282	573	219	364.0	N/A
61	361	386	281	571	219	363.6	N/A
62	360	387	280	565	218	362.0	N/A
63	359	386	279	555	218	359.4	N/A
64	357	384	278	549	217	357.0	N/A
65	355	381	277	546	217	355.2	N/A
66	354	378	276	544	216	353.6	N/A
67	353	375	275	542	216	352.2	N/A
68	352	372	274	541	215	350.8	N/A
69	351	370	273	540	215	349.8	N/A
70	351	368	272	540	215	349.2	N/A
71	350	366	270	540	214	348.0	N/A
72	350	364	270	540	213	347.4	N/A
73	349	363	269	540	213	346.8	N/A
74	349	363	267	540	213	346.4	N/A
75	349	361	267	540	212	345.8	N/A
76	349	361	266	541	212	345.8	N/A
77	348	360	266	542	211	345.4	N/A
78	348	360	265	542	211	345.2	N/A
79	348	360	264	543	210	345.0	N/A
80	348	360	264	543	210	345.0	N/A
81	348	360	264	545	209	345.2	N/A
82	348	359	263	546	209	345.0	N/A
83	348	360	263	546	208	345.0	N/A
84	347	361	263	547	208	345.2	N/A
85	347	361	263	548	207	345.2	N/A
86	348	362	262	549	207	345.6	N/A
87	347	361	262	549	206	345.0	N/A
88	347	363	262	551	206	345.8	N/A
89	348	363	262	552	205	346.0	N/A
90	348	364	262	553	205	346.4	N/A
91	348	363	262	555	204	346.4	N/A
92	347	363	261	556	203	346.0	N/A
93	348	363	261	556	203	346.2	N/A
94	348	363	261	557	202	346.2	N/A
95	348	364	260	558	201	346.2	N/A
96	349	364	261	560	201	347.0	N/A
97	350	364	261	562	200	347.4	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Englands' Stove Works
Model: 32-NC
Run #: 2

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/22/2020

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
98	350	366	262	565	200	348.6	N/A
99	353	366	262	569	199	349.8	N/A
100	355	370	262	573	199	351.8	N/A
101	357	373	262	577	198	353.4	N/A
102	359	377	263	579	198	355.2	N/A
103	361	380	264	581	197	356.6	N/A
104	363	384	264	582	197	358.0	N/A
105	365	388	266	583	197	359.8	N/A
106	367	392	267	584	196	361.2	N/A
107	368	396	268	585	196	362.6	N/A
108	370	399	270	587	195	364.2	N/A
109	371	402	272	588	195	365.6	N/A
110	372	406	273	588	194	366.6	N/A
111	373	407	274	588	194	367.2	N/A
112	374	411	275	590	194	368.8	N/A
113	375	413	277	589	193	369.4	N/A
114	377	415	278	589	193	370.4	N/A
115	378	417	280	588	193	371.2	N/A
116	379	418	281	587	193	371.6	N/A
117	381	422	282	586	192	372.6	N/A
118	382	423	283	584	192	372.8	N/A
119	383	425	283	585	192	373.6	N/A
120	384	426	282	585	191	373.6	N/A
121	386	427	284	585	191	374.6	N/A
122	386	429	285	585	191	375.2	N/A
123	388	430	286	586	190	376.0	N/A
124	389	432	287	586	190	376.8	N/A
125	392	434	288	587	190	378.2	N/A
126	393	435	288	587	190	378.6	N/A
127	396	436	289	587	190	379.6	N/A
128	398	437	290	588	189	380.4	N/A
129	399	439	291	587	189	381.0	N/A
130	401	442	291	587	189	382.0	N/A
131	401	443	292	586	189	382.2	N/A
132	403	445	293	585	188	382.8	N/A
133	404	447	294	586	188	383.8	N/A
134	405	447	294	587	188	384.2	N/A
135	407	450	295	587	188	385.4	N/A
136	408	451	296	588	188	386.2	N/A
137	409	454	298	588	188	387.4	N/A
138	410	455	298	589	188	388.0	N/A
139	411	456	300	589	188	388.8	N/A
140	411	458	302	592	188	390.2	N/A
141	412	460	303	593	188	391.2	N/A
142	413	462	305	594	188	392.4	N/A
143	413	464	306	591	188	392.4	N/A
144	414	465	307	588	188	392.4	N/A
145	414	466	308	584	188	392.0	N/A
146	415	467	309	582	188	392.2	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Englands' Stove Works
Model: 32-NC
Run #: 2

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/22/2020

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
147	416	466	310	580	188	392.0	N/A
148	417	466	310	579	188	392.0	N/A
149	418	465	310	578	188	391.8	N/A
150	419	464	310	575	188	391.2	N/A
151	420	465	310	573	188	391.2	N/A
152	421	465	311	571	188	391.2	N/A
153	423	465	312	570	188	391.6	N/A
154	424	466	312	569	189	392.0	N/A
155	425	466	313	568	189	392.2	N/A
156	427	466	314	567	189	392.6	N/A
157	428	467	315	567	189	393.2	N/A
158	429	467	315	566	189	393.2	N/A
159	431	467	316	566	189	393.8	N/A
160	432	470	317	566	189	394.8	N/A
161	432	471	317	566	189	395.0	N/A
162	434	472	317	566	189	395.6	N/A
163	435	472	318	566	189	396.0	N/A
164	435	474	319	567	189	396.8	N/A
165	437	474	319	566	189	397.0	N/A
166	438	475	320	566	190	397.8	N/A
167	439	476	321	566	190	398.4	N/A
168	440	477	323	566	190	399.2	N/A
169	441	478	324	565	190	399.6	N/A
170	442	480	325	565	190	400.4	N/A
171	443	481	325	565	190	400.8	N/A
172	444	483	325	564	190	401.2	N/A
173	446	485	326	564	191	402.4	N/A
174	447	486	327	564	191	403.0	N/A
175	448	489	328	565	191	404.2	N/A
176	450	489	328	564	191	404.4	N/A
177	451	490	329	562	191	404.6	N/A
178	451	489	331	559	191	404.2	N/A
179	452	488	332	557	191	404.0	N/A
180	452	485	333	554	191	403.0	N/A
181	453	485	335	552	192	403.4	N/A
182	453	483	336	551	192	403.0	N/A
183	453	482	338	551	192	403.2	N/A
184	454	481	338	550	192	403.0	N/A
185	454	480	339	549	192	402.8	N/A
186	454	480	340	548	193	403.0	N/A
187	455	480	341	548	193	403.4	N/A
188	455	481	342	548	193	403.8	N/A
189	455	481	343	547	193	403.8	N/A
190	456	481	343	545	193	403.6	N/A
191	455	482	344	544	193	403.6	N/A
192	456	482	345	542	194	403.8	N/A
193	457	483	346	539	194	403.8	N/A
194	458	485	347	536	194	404.0	N/A
195	458	485	348	531	194	403.2	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Englands' Stove Works
Model: 32-NC
Run #: 2

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/22/2020

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
196	457	485	349	526	194	402.2	N/A
197	456	482	350	522	194	400.8	N/A
198	453	479	351	517	195	399.0	N/A
199	451	476	351	513	195	397.2	N/A
200	448	472	352	508	195	395.0	N/A
201	445	469	352	503	195	392.8	N/A
202	443	465	352	499	195	390.8	N/A
203	441	461	352	495	195	388.8	N/A
204	438	458	352	490	196	386.8	N/A
205	436	455	353	485	196	385.0	N/A
206	434	452	353	481	196	383.2	N/A
207	431	449	352	477	196	381.0	N/A
208	430	446	352	473	196	379.4	N/A
209	428	443	353	469	196	377.8	N/A
210	426	441	353	466	197	376.6	N/A
211	424	439	354	463	197	375.4	N/A
212	423	437	355	460	197	374.4	N/A
213	421	435	355	457	197	373.0	N/A
214	420	433	356	453	198	372.0	N/A
215	419	431	356	451	198	371.0	N/A
216	417	429	357	449	198	370.0	N/A
217	416	427	358	447	198	369.2	N/A
218	415	426	358	445	198	368.4	N/A
219	414	424	359	443	198	367.6	N/A
220	413	423	360	440	198	366.8	N/A
221	412	421	361	437	198	365.8	N/A
222	411	420	361	435	198	365.0	N/A
223	410	418	362	433	198	364.2	N/A
224	409	417	363	433	198	364.0	N/A
225	408	416	364	433	199	364.0	N/A
226	407	416	364	434	199	364.0	N/A
227	407	415	365	435	199	364.2	N/A
228	406	415	365	437	199	364.4	N/A
229	405	414	366	437	199	364.2	N/A
230	405	415	367	438	199	364.8	N/A
231	405	416	368	437	199	365.0	N/A
232	404	417	368	432	199	364.0	N/A
233	403	416	369	426	199	362.6	N/A
234	403	415	368	419	199	360.8	N/A
235	402	414	368	413	199	359.2	N/A
236	401	412	369	407	199	357.6	N/A
237	400	411	370	402	199	356.4	N/A
238	399	408	371	397	199	354.8	N/A
239	399	407	372	392	199	353.8	N/A
240	398	405	373	387	199	352.4	N/A
241	397	404	374	383	199	351.4	N/A
242	397	402	374	379	199	350.2	N/A
243	396	400	375	375	199	349.0	N/A
244	395	400	375	371	199	348.0	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Englands' Stove Works
Model: 32-NC
Run #: 2

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/22/2020

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
245	394	398	376	368	199	347.0	N/A
246	394	397	376	364	199	346.0	N/A
247	392	396	377	361	199	345.0	N/A
248	392	394	377	358	199	344.0	N/A
249	391	393	378	356	199	343.4	N/A
250	390	392	378	353	199	342.4	N/A
251	390	391	378	351	198	341.6	N/A
252	389	390	379	348	198	340.8	N/A
253	388	389	379	346	198	340.0	N/A
254	387	388	380	344	198	339.4	N/A
255	387	387	380	341	198	338.6	N/A
256	386	386	380	340	198	338.0	N/A
257	386	385	380	338	198	337.4	N/A
258	385	384	380	336	198	336.6	N/A
259	384	384	380	334	198	336.0	N/A
260	384	384	381	333	198	336.0	N/A
261	383	382	381	332	198	335.2	N/A
262	382	382	381	331	198	334.8	N/A
263	382	380	381	329	198	334.0	N/A
264	381	380	381	328	198	333.6	N/A
265	380	379	382	327	198	333.2	N/A
266	380	380	382	326	198	333.2	N/A
267	380	379	382	325	198	332.8	N/A
268	379	379	382	324	198	332.4	N/A
269	379	378	383	323	197	332.0	N/A
270	378	377	383	322	197	331.4	N/A
271	378	377	384	321	197	331.4	N/A
272	378	377	384	320	197	331.2	N/A
273	378	377	384	319	197	331.0	N/A
274	378	376	384	318	197	330.6	N/A
275	377	376	383	317	197	330.0	N/A
276	377	375	384	316	197	329.8	N/A
277	377	374	384	315	197	329.4	N/A
278	377	374	384	314	197	329.2	N/A
279	377	374	385	313	197	329.2	N/A
280	376	373	384	313	197	328.6	N/A
281	377	374	384	312	197	328.8	N/A
282	376	372	385	311	197	328.2	N/A
283	376	372	385	310	197	328.0	N/A
284	376	372	385	310	197	328.0	N/A
285	376	372	385	309	197	327.8	N/A
286	376	371	385	309	197	327.6	N/A
287	376	371	386	308	197	327.6	N/A
288	376	370	386	308	197	327.4	N/A
289	376	371	386	307	197	327.4	N/A
290	376	370	387	307	197	327.4	N/A
291	376	370	387	306	197	327.2	N/A
292	376	370	387	306	197	327.2	N/A
293	376	369	388	305	197	327.0	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Englands' Stove Works
Model: 32-NC
Run #: 2

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/22/2020

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
294	376	369	388	305	196	326.8	N/A
295	376	370	388	306	197	327.4	N/A
296	376	370	389	306	196	327.4	N/A
297	376	370	389	305	196	327.2	N/A
298	376	372	389	305	196	327.6	N/A
299	376	371	389	305	196	327.4	N/A
300	376	372	389	305	196	327.6	N/A
301	376	373	389	305	196	327.8	N/A
302	376	373	390	305	196	328.0	N/A
303	376	373	389	306	196	328.0	N/A
304	376	373	390	306	196	328.2	N/A
305	376	373	390	306	196	328.2	N/A
306	376	374	390	306	196	328.4	N/A
307	376	374	390	306	196	328.4	N/A
308	376	375	390	306	196	328.6	N/A
309	377	375	391	306	196	329.0	N/A
310	376	376	390	306	196	328.8	N/A
311	376	376	389	306	196	328.6	N/A
312	376	376	388	305	196	328.2	N/A
313	376	376	387	305	196	328.0	N/A
314	376	377	387	305	196	328.2	N/A
315	376	378	387	305	196	328.4	N/A
316	376	378	386	305	196	328.2	N/A
317	376	379	386	305	196	328.4	N/A
318	375	379	386	305	196	328.2	N/A
319	375	378	386	305	196	328.0	N/A
320	375	378	386	305	196	328.0	N/A
321	375	379	385	305	196	328.0	N/A
322	375	380	385	305	196	328.2	N/A
323	375	380	385	305	196	328.2	N/A
324	375	379	385	305	196	328.0	N/A
325	375	380	384	305	196	328.0	N/A
326	375	380	384	305	196	328.0	N/A
327	375	381	384	305	196	328.2	N/A
328	375	380	384	305	196	328.0	N/A
329	374	381	384	305	196	328.0	N/A
330	374	381	384	305	196	328.0	N/A
331	375	381	384	305	196	328.2	N/A
332	374	381	383	305	196	327.8	N/A
333	374	382	384	305	196	328.2	N/A
334	374	382	384	305	196	328.2	N/A
335	373	382	384	305	196	328.0	N/A
336	373	381	384	304	196	327.6	N/A
337	373	383	384	305	196	328.2	N/A
338	373	382	384	305	196	328.0	N/A
339	372	382	384	305	196	327.8	N/A
340	372	382	384	305	196	327.8	N/A
341	372	382	384	304	196	327.6	N/A
342	371	382	384	304	196	327.4	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Englands' Stove Works
Model: 32-NC
Run #: 2

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/22/2020

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
343	371	381	383	304	196	327.0	N/A
344	371	381	383	304	196	327.0	N/A
345	371	381	383	304	196	327.0	N/A
346	370	381	383	304	196	326.8	N/A
347	370	380	383	304	196	326.6	N/A
348	370	380	383	303	196	326.4	N/A
349	369	379	383	303	196	326.0	N/A
350	369	379	382	303	196	325.8	N/A
351	369	379	382	303	196	325.8	N/A
352	369	378	382	303	196	325.6	N/A
353	368	378	381	303	196	325.2	N/A
354	368	378	380	302	196	324.8	N/A
355	368	377	380	302	196	324.6	N/A
356	367	377	380	302	195	324.2	N/A
357	367	377	380	302	196	324.4	N/A
358	367	377	380	302	195	324.2	N/A
359	366	376	379	302	195	323.6	N/A
360	366	376	378	301	195	323.2	N/A
361	365	375	379	301	195	323.0	N/A
362	365	375	378	301	195	322.8	N/A
363	365	375	377	301	195	322.6	N/A
364	365	375	377	301	195	322.6	N/A
365	364	374	376	301	195	322.0	N/A
366	364	374	376	301	195	322.0	N/A
367	364	373	375	301	195	321.6	N/A
368	364	374	375	301	195	321.8	N/A
369	364	373	374	301	195	321.4	N/A
370	364	373	374	301	195	321.4	N/A
371	363	372	374	300	195	320.8	N/A
372	363	372	374	301	195	321.0	N/A
373	363	372	373	301	195	320.8	N/A
374	362	372	373	300	194	320.2	N/A
375	362	371	372	300	194	319.8	N/A
376	362	372	371	300	194	319.8	N/A
377	362	371	372	300	194	319.8	N/A
378	362	370	371	300	194	319.4	N/A
379	362	370	371	300	194	319.4	N/A
380	362	370	371	300	194	319.4	N/A
381	362	370	370	300	194	319.2	N/A
382	362	370	370	300	194	319.2	N/A
383	362	370	370	300	194	319.2	N/A
384	361	370	370	300	194	319.0	N/A
385	362	370	369	300	194	319.0	N/A
386	362	369	369	300	194	318.8	N/A
387	362	370	369	300	194	319.0	N/A
388	362	370	368	300	194	318.8	N/A
389	362	369	368	300	193	318.4	N/A
390	362	370	368	301	193	318.8	N/A
391	362	369	369	300	193	318.6	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Englands' Stove Works
Model: 32-NC
Run #: 2

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/22/2020

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
392	362	369	368	300	193	318.4	N/A
393	363	368	369	300	193	318.6	N/A
394	363	369	368	301	193	318.8	N/A
395	362	368	368	300	193	318.2	N/A
396	362	368	368	301	193	318.4	N/A
397	362	369	368	301	193	318.6	N/A
398	363	368	368	301	193	318.6	N/A
399	363	369	367	301	193	318.6	N/A
400	362	369	367	301	193	318.4	N/A
401	362	369	367	301	193	318.4	N/A
402	363	368	366	301	193	318.2	N/A
403	362	369	366	301	193	318.2	N/A
404	363	369	367	302	193	318.8	N/A
405	362	369	366	301	193	318.2	N/A
406	363	369	366	302	193	318.6	N/A
407	363	369	366	302	193	318.6	N/A
408	363	368	366	302	193	318.4	N/A
409	363	369	366	302	192	318.4	N/A
410	363	369	366	302	192	318.4	N/A
411	363	370	366	302	192	318.6	N/A
412	363	369	366	303	192	318.6	N/A
413	363	369	365	302	192	318.2	N/A
414	363	370	365	302	192	318.4	N/A
415	363	369	365	303	192	318.4	N/A
416	362	370	365	303	192	318.4	N/A
417	362	370	365	303	192	318.4	N/A
418	362	370	365	303	192	318.4	N/A
419	362	369	364	303	192	318.0	N/A
420	362	370	363	303	192	318.0	N/A
421	362	370	363	303	192	318.0	N/A
422	361	369	363	303	192	317.6	N/A
423	362	370	363	303	192	318.0	N/A
424	362	370	363	303	192	318.0	N/A
425	362	369	363	303	191	317.6	N/A
426	362	369	363	303	191	317.6	N/A
427	362	369	363	302	191	317.4	N/A
428	362	370	363	302	191	317.6	N/A
429	362	369	362	301	191	317.0	N/A
430	362	368	362	301	191	316.8	N/A
431	361	368	362	300	191	316.4	N/A
432	361	369	361	300	191	316.4	N/A
433	361	368	362	299	191	316.2	N/A
434	361	367	361	298	191	315.6	N/A
435	360	367	361	298	191	315.4	N/A
436	360	366	361	297	191	315.0	N/A
437	360	366	361	296	191	314.8	N/A
438	359	366	360	296	190	314.2	N/A
439	359	365	360	295	190	313.8	N/A
440	358	365	360	295	190	313.6	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Englands' Stove Works
Model: 32-NC
Run #: 2

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/22/2020

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
441	358	364	360	294	190	313.2	N/A
442	358	364	359	293	190	312.8	N/A
443	357	364	359	292	190	312.4	N/A
444	356	363	359	292	190	312.0	N/A
445	355	362	358	291	190	311.2	N/A
446	355	362	358	291	190	311.2	N/A
447	354	361	358	290	189	310.4	N/A
448	354	361	358	289	189	310.2	N/A
449	353	360	358	288	189	309.6	N/A
450	353	360	357	288	189	309.4	N/A
451	352	360	357	287	189	309.0	N/A
452	351	359	357	287	189	308.6	N/A
453	350	360	357	286	189	308.4	N/A
454	350	359	356	285	189	307.8	N/A
455	349	358	356	285	189	307.4	N/A
456	348	357	355	284	189	306.6	N/A
457	348	356	355	284	189	306.4	N/A
458	348	356	355	283	188	306.0	N/A
459	347	356	354	282	188	305.4	N/A
460	346	355	353	282	188	304.8	N/A
461	345	354	352	281	188	304.0	N/A
462	345	355	351	280	188	303.8	N/A
463	343	354	351	280	188	303.2	N/A
464	343	353	351	279	187	302.6	N/A
465	342	353	350	278	187	302.0	N/A
466	342	352	349	277	187	301.4	N/A
467	341	351	349	277	187	301.0	N/A
468	340	352	348	276	187	300.6	N/A
469	339	350	347	276	187	299.8	N/A
470	338	351	346	275	187	299.4	N/A
471	337	350	345	274	186	298.4	N/A
472	337	349	344	274	186	298.0	N/A
473	336	348	344	273	186	297.4	N/A
474	335	349	343	273	186	297.2	N/A
475	334	348	342	272	186	296.4	N/A
476	333	348	341	272	186	296.0	N/A
477	332	346	340	271	186	295.0	N/A
478	332	346	340	270	185	294.6	N/A
479	331	345	340	270	185	294.2	N/A
480	330	345	339	269	185	293.6	N/A
481	329	345	339	269	185	293.4	N/A
482	328	344	338	268	185	292.6	N/A
483	328	344	339	268	185	292.8	N/A
484	326	343	337	267	184	291.4	N/A
485	326	343	337	266	184	291.2	N/A
486	325	343	337	266	184	291.0	N/A
487	325	342	336	265	184	290.4	N/A
488	324	342	336	265	184	290.2	N/A
489	323	341	335	264	183	289.2	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Englands' Stove Works
Model: 32-NC
Run #: 2

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/22/2020

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
490	322	340	334	264	183	288.6	N/A
491	321	340	334	263	183	288.2	N/A
492	320	340	333	263	183	287.8	N/A
493	319	340	333	262	183	287.4	N/A
494	319	339	332	261	182	286.6	N/A
495	318	338	332	261	182	286.2	N/A
496	317	338	332	261	182	286.0	N/A
497	316	337	331	260	182	285.2	N/A
498	316	337	330	259	182	284.8	N/A
499	315	337	330	259	182	284.6	N/A
500	314	337	330	258	181	284.0	N/A
501	314	336	329	258	181	283.6	N/A
502	313	335	328	258	181	283.0	N/A
503	312	335	327	257	181	282.4	N/A
504	312	335	327	257	181	282.4	N/A
505	311	334	327	256	181	281.8	N/A
506	310	334	327	256	180	281.4	N/A
507	308	333	325	255	180	280.2	N/A
508	308	333	325	254	180	280.0	N/A
509	308	333	324	254	180	279.8	N/A
510	306	332	324	253	179	278.8	N/A
511	306	331	323	253	179	278.4	N/A
512	305	331	323	252	179	278.0	N/A
513	304	330	322	251	179	277.2	N/A
514	303	330	321	251	179	276.8	N/A
515	302	329	320	250	178	275.8	N/A
516	301	329	320	250	178	275.6	N/A
517	299	328	319	249	178	274.6	N/A
518	299	328	319	248	178	274.4	N/A
519	298	328	318	248	178	274.0	N/A
520	297	327	317	247	178	273.2	N/A
521	296	326	317	246	177	272.4	N/A
522	295	326	316	246	177	272.0	N/A
523	294	325	316	245	177	271.4	N/A
524	293	325	315	245	177	271.0	N/A
525	292	324	314	244	177	270.2	N/A
526	292	324	313	243	176	269.6	N/A
527	291	323	313	243	176	269.2	N/A
528	290	323	312	242	176	268.6	N/A
529	288	322	312	242	176	268.0	N/A
530	288	322	311	241	176	267.6	N/A
531	287	321	310	241	175	266.8	N/A
532	286	321	309	240	175	266.2	N/A
533	285	320	308	239	175	265.4	N/A
534	284	319	308	239	175	265.0	N/A
535	283	319	308	238	175	264.6	N/A
536	282	318	307	238	174	263.8	N/A
537	282	318	307	237	174	263.6	N/A
538	280	317	306	236	174	262.6	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Englands' Stove Works
Model: 32-NC
Run #: 2

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/22/2020

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
539	280	316	306	236	174	262.4	N/A
540	279	316	305	236	174	262.0	N/A
541	278	315	305	235	174	261.4	N/A
542	277	314	304	234	173	260.4	N/A
543	276	313	304	234	173	260.0	N/A
544	276	313	303	233	173	259.6	N/A
545	274	312	303	233	173	259.0	N/A
546	274	312	302	232	172	258.4	N/A
547	273	312	301	232	172	258.0	N/A
548	272	311	301	231	172	257.4	N/A
549	272	310	300	231	172	257.0	N/A
550	271	310	300	231	172	256.8	N/A
551	270	309	299	230	171	255.8	N/A
552	269	308	299	230	171	255.4	N/A
553	268	308	298	229	171	254.8	N/A
554	268	308	297	229	171	254.6	N/A
555	268	307	297	228	171	254.2	N/A
556	267	306	297	228	171	253.8	N/A
557	266	306	296	227	170	253.0	N/A
558	265	306	296	227	170	252.8	N/A
559	264	305	295	227	170	252.2	N/A
560	264	305	295	226	170	252.0	N/A
561	263	304	294	226	169	251.2	N/A
562	263	304	294	225	169	251.0	N/A
563	262	303	293	225	169	250.4	N/A
564	260	302	292	225	169	249.6	N/A
565	260	302	292	224	168	249.2	N/A
566	259	301	291	223	168	248.4	N/A
567	259	301	291	223	168	248.4	N/A
568	258	300	291	223	168	248.0	N/A
569	258	299	290	222	168	247.4	N/A
570	257	299	289	222	167	246.8	N/A
571	257	298	289	221	167	246.4	N/A
572	256	297	289	221	167	246.0	N/A
573	256	297	288	220	167	245.6	N/A
574	255	296	288	220	167	245.2	N/A
575	254	296	287	220	166	244.6	N/A
576	253	295	287	219	166	244.0	N/A
577	253	295	286	219	166	243.8	N/A
578	252	294	285	219	166	243.2	N/A
579	252	293	285	218	165	242.6	N/A
580	251	293	285	218	165	242.4	N/A
581	251	293	284	217	165	242.0	N/A
582	250	291	284	217	165	241.4	N/A
583	249	291	284	216	164	240.8	N/A
584	249	290	284	216	164	240.6	N/A
585	248	291	284	216	164	240.6	N/A
586	248	290	284	215	164	240.2	N/A
587	248	289	283	215	164	239.8	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Englands' Stove Works
Model: 32-NC
Run #: 2

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/22/2020

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
588	247	289	283	215	163	239.4	N/A
589	246	288	282	214	163	238.6	N/A
590	245	288	282	214	163	238.4	N/A
591	245	287	282	214	163	238.2	N/A
592	245	287	281	214	162	237.8	N/A
593	244	286	281	213	162	237.2	N/A
594	244	286	281	213	162	237.2	N/A
595	243	285	281	213	162	236.8	N/A
596	243	285	280	212	162	236.4	N/A
597	243	285	280	212	161	236.2	N/A
598	242	284	280	212	161	235.8	N/A
599	242	283	280	211	161	235.4	N/A
600	241	283	280	211	161	235.2	N/A
601	241	283	280	211	160	235.0	N/A
602	240	283	280	211	160	234.8	N/A
603	240	283	280	211	160	234.8	N/A
604	240	282	281	211	160	234.8	N/A
605	240	282	281	210	160	234.6	N/A
606	239	282	281	210	159	234.2	N/A
607	239	282	282	210	159	234.4	N/A
608	239	282	282	210	159	234.4	N/A
609	238	281	281	210	159	233.8	N/A
610	238	281	282	210	159	234.0	N/A
611	238	281	282	209	158	233.6	N/A
612	238	281	281	209	158	233.4	N/A
613	237	280	281	209	158	233.0	N/A
614	237	280	281	209	158	233.0	N/A
615	236	280	280	209	158	232.6	N/A
616	235	280	279	209	157	232.0	N/A
617	235	279	279	208	157	231.6	N/A
618	235	279	278	208	157	231.4	N/A
619	235	278	277	208	157	231.0	N/A
620	234	278	277	208	157	230.8	N/A
621	233	278	276	207	156	230.0	N/A
622	233	277	275	207	156	229.6	N/A
623	233	277	275	207	156	229.6	N/A
624	232	276	274	206	156	228.8	N/A
625	232	276	273	206	156	228.6	N/A
626	232	276	272	206	155	228.2	N/A
627	231	275	272	205	155	227.6	N/A
628	231	275	271	205	155	227.4	N/A
629	230	275	270	205	155	227.0	N/A
Average	355	374	334	339	192	325	N/A

LAB SAMPLE DATA - ASTM E2515

Client: Englands' Stove Works
Model: 32-NC
Run #: 2

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/22/2020

	Sample ID	Tare, mg	Total, mg	Final, mg	Catch, mg
Train A Filters - First Hour	T450	94.3	94.3	100.7	6.4
Train A Filters - Remainder	T451	94.1	188.0	193.4	5.4
	T452	93.9			
Train A Probe	12A	116889.3	116889.3	116890.2	0.9
Train A O-Rings	12A	3393.8	3393.8	3395.5	1.7
Train B Filters	T453	94.2	282.8	294.1	11.3
	T454	94.2			
	T448	94.4			
Train B Probe	12B	117941.7	117941.7	117943.5	1.8
Train B O-Rings	12B	3404.1	3404.1	3404.4	0.3
Background Filter			0.0	0.0	

Placed in Dessicator on:	4/23/2020

Train A Filters - First Hour	100.8	4/25 12:09	100.7	4/25 18:00				
Train A Filters - Remainder	193.6	4/25 12:09	193.4	4/25 17:59				
Train A Probe	116890.3	4/25 11:58	116890.2	4/25 17:57				
Train A O-Rings	3395.4	4/25 12:02	3395.5	4/26 8:43				
Train B Filters	294.3	4/25 12:09	294.1	4/25 17:59				
Train B Probe	117943.9	4/25 11:59	117943.5	4/25 17:57	117943.5	4/26 8:44		
Train B O-Rings	3404.6	4/25 12:02	3404.4	4/26 8:43				
Background Filter								

1st hour Sub-Total, mg:	6.4
Remainder Sub-Total, mg:	8.0
Train 1 Aggregate, mg:	**14.4**
Train 2 Aggregate, mg:	**13.4**
Ambient Aggregate, mg:	0.0

ASTM E3053 Wood Heater Run Sheets

Client: England's Stove Works Job Number: 19-471 Tracking #: 67
Model: 32-NC Run Number: 2 Test Date: 4/22/20

Wood Heater Run Notes

Pre-Test Notes
Pre-Test Start Time: N/A
Air Control Setting: N/A

Time	Notes
	See run 1

Test Notes
Test Burn Start Time: 17:52
Air Control Setting: 13/16" open

Time	Notes
0:45	Fuel loaded
5:00	Closed door, air set to fully open
6:00	Air adjusted to 2/3 open
7:30	Air adjusted to 1/3 open
11:30	Air adjusted to test setting
46:00	Changed filter B
60:00	Changed filter A

Test Burn End Time: 4/23 04:21

Flue Gas Concentration Measurement

Calibration Gas Values: Span Gas CO_2 (%): 16.90 CO (%): 4.18
Mid Gas CO_2 (%): 10.00 CO (%): 2.51

Calibration Results:

	Pre Test			Post Test		
	Zero	Mid	Span	Zero	Mid	Span
Time	4/22 10:15	-	4/22 10:17	4/23 9:30	4/23 9:32	4/23 9:35
CO_2	0.00	-	16.90	-0.01	9.87	16.86
CO	0.000	-	4.180	-0.001	2.418	4.177

Flue Gas Probe Leak Check: Initial: No Leakage Final: No Leakage

Technician Signature: Date: 5/20/2020

ASTM E3053 Wood Heater Run Sheets

Client: England's Stove Works Job Number: 19-471 Tracking #: 67
Model: 32-NC Run Number: 2 Test Date: 4/22/20

Test Photos

Low Fire Fuel Load

Low Fire Fuel Loaded

Technician Signature: _____ Date: 5/20/2020

WOOD STOVE TEST DATA PACKET
ASTM E3053/E2515

Run 3 Data Summary

Client:	Englands' Stove Works
Model:	32-NC
Job #:	19-471
Tracking #:	67
Test Date:	4/24/2020

Technician Signature

5/20/2020
Date

TEST RESULTS - ASTM E3053 / ASTM E2515

Client: Englands' Stove Works
Model: 32-NC
Run #: 3

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/24/2020

Burn Rate (kg/hr):	1.55

	Ambient Sample	Sample Train A	Sample Train B	1st Hour Filter
Total Sample Volume (ft^3)	0.000	63.656	63.219	7.794
Average Gas Velocity in Dilution Tunnel (ft/sec)	15.68			
Average Gas Flow Rate in Dilution Tunnel (dscf/hr)	10301.5			
Average Gas Meter Temperature (°F)	74.2	97.6	99.1	79.8
Total Sample Volume (dscf)	0.000	61.691	60.854	7.802
Average Tunnel Temperature (°F)	100.3			
Total Time of Test (min)	481			
Total Particulate Catch (mg)	0.0	11.4	12.1	2.8
Particulate Concentration, dry-standard (g/dscf)	0.0000000	0.0001848	0.0001988	0.0003589
Total PM Emissions (g)	0.00	15.26	16.42	3.70
Particulate Emission Rate (g/hr)	0.00	1.90	2.05	3.70
Emissions Factor (g/kg)	-	1.22	1.32	-
Difference from Average Total Particulate Emissions (g)	-	0.58	0.58	-
Difference from Average Emissions Factor (g/kg)	-	0.05	0.05	-

Final Average Results	
Total Particulate Emissions (g)	15.84
Particulate Emission Rate (g/hr)	1.98
Emissions Factor (g/kg)	1.27
HHV Efficiency (%)	70.9%
LHV Efficiency (%)	75.8%
CO Emissions (g/min)	1.94

Quality Checks	Requirement	Observed	Result
Dual Train Precision	Each train within 7.5% of average emissions (in grams), or emission factors within 0.5 g/kg	See Above	OK
Filter Temps	>80 °F, <90 °F	Min: 82 / Max: 85	OK
Face Velocity	< 30 ft/min	8.4	OK
Leakage Rate	Less than 4% of average sample rate	0 cfm	OK
Ambient Temp	55-90 °F	Min: 68 / Max: 77	OK
Negative Probe Weight Evaluation	<5% of Total Catch	Probe Catch Not Negative	OK
Pro-Rate Variation	90% of readings between 90-110%	99%	OK
	none greater than 120% or less than 80%	0	OK
	1 or fewer readings outside 90-110% (10 min basis)	1	OK

B415.1 Efficiency Results

Manufacturer: glands' Stove Works
Model: 32-NC
Date: 04/24/20
Run: 3
Control #: 19-471
Test Duration: 481
Output Category: Medium

Test Results in Accordance with CSA B415.1-09

	HHV Basis	LHV Basis
Overall Efficiency	70.9%	75.8%
Combustion Efficiency	95.1%	95.1%
Heat Transfer Efficiency	74.5%	79.7%

Output Rate (kJ/h)	21,991	20,861	**(Btu/h)**
Burn Rate (kg/h)	1.55	3.43	**(lb/h)**
Input (kJ/h)	31,024	29,429	**(Btu/h)**

Test Load Weight (dry kg)	12.46	27.46	**dry lb**
MC wet (%)	17.78		
MC dry (%)	21.62		
Particulate (g)	15.84		
CO (g)	933		
Test Duration (h)	8.02		

Emissions	**Particulate**	**CO**
g/MJ Output	0.09	5.29
g/kg Dry Fuel	1.27	74.84
g/h	1.98	116.32
g/min	0.03	1.94
lb/MM Btu Output	0.21	12.29

Air/Fuel Ratio (A/F)	17.93

VERSION: **2.2** **12/14/2009**

HIGH FIRE FUEL LOAD DATA - ASTM E3053

Client: Englands' Stove Works | Job #: 19-471
Model: 32-NC | Tracking #: 67
Run #: 3 | Technician: AK
Date: 4/24/2020

Nominal Loading Density (lbs/ft^3, wet basis):	10		
Usable Firebox Volume (ft^3):	2.92		
Target Load Weight (lbs):	29.20		
Total Load Weight Range (lbs):	27.70	to	30.70
Core Load Weight Range (lbs):	13.10	to	19.00
Remainder Load Weight Range (lbs):	10.20	to	16.10
Core Load Piece Range (lbs):	4.40	to	7.30
Remainder Load Piece Range (lbs):	2.90	to	16.10
Max Allowable Kindling Weight (lbs):	5.78		
Max Allowable Start-up Fuel Weight (lbs):	8.67		

CORE LOAD DATA

				Fuel Piece Moisture Readings (%DB)					Dry Weight	
Piece #	Length (in)	Weight (lbs)	Within Spec?	1	2	3	Ave.	Within Spec?	lbs	kg
1		4.91	In Range	25.0	24.4	28.2	25.9	In Range	3.90	1.77
2		6.36	In Range	22.3	20.4	21.4	21.4	In Range	5.24	2.38
3		6.52	In Range	26.4	24.8	25.3	25.5	In Range	5.20	2.36
Core Load Wt. (lbs)		17.79	In Range							

REMAINDER LOAD DATA (1 to 3 Pieces)

				Fuel Piece Moisture Readings (%DB)					Dry Weight	
Piece #	Length (in)	Weight (lbs)	Within Spec?	1	2	3	Ave.	Within Spec?	lbs	kg
1		7.85	In Range	27.1	18.7	28.5	24.8	In Range	6.29	2.85
2		3.27	In Range	20.0	21.4	16.8	19.4	In Range	2.74	1.24
3			NA				NA	NA	NA	NA
Remainder Load (lbs)		11.12	In Range							

Total Load Weight (lbs):	28.91	In Range	
Core Load % of Total Weight:	62%	In Range	45-65%
Remainder % of Total Weight:	38%	In Range	35-55%
Total Load % of Target Weight:	99%	In Range	95-105%
Actual Fuel Loading Density (lb/ft3):	9.9		
Total Load Average Moisture Content (%DB):	23.7	In Range	19-25%
Total Load Average Moisture Content (%WB):	19.2		
Total Test Load Weight (dry basis):	23.37 lbs	10.60 kg	

KINDLING AND START-UP FUEL

		Kindling Moisture Readings (%DB)					Dry Weight	
Kindling Weight (lbs)	Within Spec?	1	2	3	Avg.	Within Spec?	lbs	kg
2.41	In Range	10	10	10	10.0	In Range	2.19	0.99

		Start-up Moisture Readings (%DB)					Dry Weight	
Start-up Fuel Wt. (lb)	Within Spec?	1	2	3	Avg.	Within Spec?	lbs	kg
7.85	In Range	21.8	26.4	25.9	24.7	In Range	6.30	2.86

TEST FUEL LOADING RANGE

Allowable Residual Start-up Fuel Range (lb):	2.9	to	5.8	
Actual Residual Start-up Fuel Weight (lb):		5.7		In Range

LOW & MEDIUM FIRE FUEL LOAD DATA - ASTM E3053

Client: Englands' Stove Works
Job #: 19-471
Model: 32-NC
Tracking #: 67
Run #: 3
Technician: AK
Date: 4/24/2020

Nominal Loading Density (lbs/ft^3, wet basis):	12		
Usable Firebox Volume (ft^3):	2.92		
Target Load Weight (lbs):	35.04		
Total Load Weight Range (lbs):	33.29	to	36.79
Core Load Weight Range (lbs):	15.77	to	22.78
Remainder Load Weight Range (lbs):	12.26	to	19.27
Core Load Piece Range (lbs):	5.26	to	8.76
Remainder Load Piece Range (lbs):	3.50	to	10.51

CORE LOAD DATA

				Fuel Piece Moisture Readings (%DB)					Dry Weight	
Piece #	Length (in)	Weight (lbs)	Within Spec?	1	2	3	Ave.	Within Spec?	lbs	kg
1	18.00	5.68	In Range	18.7	19.4	17.6	18.6	In Range	4.79	2.17
2	18.00	5.31	In Range	19.3	16.8	20.2	18.8	In Range	4.47	2.03
3	18.00	5.51	In Range	22.1	21.0	19.7	20.9	In Range	4.56	2.07
Core Load Wt. (lbs)		16.50	In Range							

REMAINDER LOAD DATA (2 to 3 Pieces)

				Fuel Piece Moisture Readings (%DB)					Dry Weight	
Piece #	Length (in)	Weight (lbs)	Within Spec?	1	2	3	Ave.	Within Spec?	lbs	kg
1	18.00	8.41	In Range	25.7	27.7	20.1	24.5	In Range	6.76	3.06
2	18.00	4.06	In Range	19.4	25.8	25.0	23.4	In Range	3.29	1.49
3	18.00	4.44	In Range	25.2	24.7	19.3	23.1	In Range	3.61	1.64
Remainder Load (lbs)		16.91	In Range							

Remainder Load Small/Large Piece Weight Ratio:	48%	In Range	≤ 67%
Total Load Weight (lbs):	33.41	In Range	
Core Load % of Total Weight:	49%	In Range	45-65%
Remainder % of Total Weight:	51%	In Range	35-55%
Total Load % of Target Weight:	95%	In Range	95-105%
Actual Fuel Loading Density (lb/ft3):	11.4		
Total Load Average Moisture Content (%DB):	21.6	In Range	19-25%
Total Load Average Moisture Content (%WB):	17.8		
Total Test Load Weight (dry basis):	27.47 lbs	12.46 kg	

TEST FUEL LOADING RANGE

Allowable Charcoal Bed Weight Range (lb):	3.4	to 6.6	
Actual Charcoal Bed Wt. (lb):	5.8	In Range	

TEST END POINT

Actual Fuel Load Ending Weight (lb): 0.0 Valid Test (≥90%)

Total Fuel Burned During Test Run:
33.4 lbs, wet basis
27.5 lbs, dry basis
12.46 kg, dry basis

DILUTION TUNNEL & MISC. DATA - ASTM E3053 / E2515

Client:	Englands' Stove Works	Job #:	19-471
Model:	32-NC	Tracking #:	67
Run #:	3	Technician:	AK
Test Start Time:	11:45	Date:	4/24/2020
Test Type:	Medium Fire		

Recording Interval (min):	1
Total Sampling Time (min):	481

	Pre-Test	Post Test	Avg.
Barometric Pressure (in. Hg)	30.22	30.06	30.14
Relative Humidity (%)	41.0	52.0	
Room Air Velocity (ft/min)	0	0	
Scale Audit (lbs)	10.0	10.0	
Ambient Sample Volume:			ft^3

Meter Box γ Factor:	1.012	(A)
Meter Box γ Factor:	1.008	(B)
Meter Box γ Factor:		(Ambient)

Induced Draft Check (in. H_2O):	0
Smoke Capture Check (%):	100%
Date Flue Pipe Last Cleaned:	4/20/2020

Sample Train Post-Test Leak Checks

(A)	0.000	cfm @	-5	in. Hg
(B)	0.000	cfm @	-8	in. Hg
(Ambient)		cfm @		in. Hg

DILUTION TUNNEL FLOW

Traverse Data

Point	dP (in H_2O)	Temp (°F)
1	0.032	102
2	0.062	102
3	0.066	102
4	0.044	102
5	0.028	102
6	0.064	102
7	0.072	102
8	0.036	102
Center	0.080	102

Static Pressure: -0.240 in. H_2O

Dilution Tunnel H_2O:	2.00	percent
Tunnel Diameter:	6	inches
Pitot Tube Cp:	0.99	[unitless]
Dilution Tunnel MW(dry):	29.00	lb/lb-mole
Dilution Tunnel MW(wet):	28.78	lb/lb-mole
Tunnel Area:	0.1963	ft^2
V_{strav}:	15.54	ft/sec
V_{scent}:	19.25	ft/sec
F_p:	0.808	[ratio]
Initial Tunnel Flow:	164.9	scf/min

TEST FUEL PROPERTIES

ASTM 3053-17 - Table A1.1 Fuel Properties by Fuel Species

Select Fuel Type	Species	%C	%H	%O	%Ash	MJ/kg	BTU/lb
	Ash, White	49.70	6.90	43.00	0.30	20.75	8927
	Beech	48.70	5.80	44.70	0.60	18.80	8088
	Birch, Sweet	49.80	6.50	43.40	0.30	20.12	8656
	Birch, Yellow	49.80	6.50	43.40	0.30	20.12	8656
	Doug Fir (Coast, Interior West/North)	48.73	6.87	43.90	0.50	19.81	8522
	Doug Fir (Interioir South)	48.73	6.87	43.90	0.50	19.81	8522
	Elm, Rock	50.40	6.60	42.30	0.70	20.49	8815
	Elm, Soft	50.40	6.60	42.30	0.70	20.49	8815
	Gum, Red	50.88	6.06	41.57	1.28	19.72	8478
	Larch, Western	50.54	6.36	42.40	0.70	17.58	7558
X	Maple, Hard	50.64	6.02	41.74	1.35	19.96	8587
	Maple, Sugar	50.64	6.02	41.74	1.35	19.96	8587
	Oak, Red	49.50	6.62	43.70	0.20	20.20	8690
	Oak, White	50.40	6.59	42.70	0.20	20.50	8819
	Pine, Southern	52.60	7.00	40.10	1.31	22.30	9587
	Pine, Southern Long Leaf	52.60	7.02	40.10	1.30	22.30	9594

WOODSTOVE PREBURN DATA

Client: Englands' Stove Wor
Model: 32-NC
Run #: 3

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/24/2020

Recording Interval (min): 1
Run Time (min): 181

			Temperatures (°F)							
Elapsed Time (min)	Scale Reading (lbs)	Flue Draft (in H_2O)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Flue	Ambient
0	10.2	-0.014	67	67	67	67	67	67.0	67	65
1	10.0	-0.005	67	68	67	72	67	68.2	128	65
2	10.0	-0.010	69	73	67	109	67	77.0	274	65
3	9.9	0.004	75	85	68	132	67	85.4	292	65
4	9.7	0.003	83	96	69	143	67	91.6	281	65
5	9.5	-0.002	90	107	71	150	67	97.0	293	65
6	9.1	0.000	100	121	74	175	67	107.4	422	65
7	8.7	-0.002	113	139	78	210	67	121.4	464	65
8	8.5	0.002	127	154	83	241	67	134.4	408	65
9	8.3	-0.001	139	165	86	273	67	146.0	401	65
10	8.1	-0.006	149	174	90	306	67	157.2	422	65
11	7.9	0.006	159	187	94	345	67	170.4	489	66
12	7.5	-0.005	169	206	99	381	67	184.4	519	65
13	7.4	0.000	180	225	104	419	68	199.2	548	65
14	7.1	0.002	192	243	110	461	68	214.8	571	65
15	6.9	0.000	204	259	116	493	68	228.0	571	65
16	6.7	0.001	215	275	123	512	68	238.6	545	65
17	6.4	0.007	226	289	129	523	69	247.2	517	65
18	6.0	0.002	235	302	135	546	69	257.4	581	66
19	5.9	-0.012	244	315	141	550	70	264.0	517	66
20	5.8	-0.001	251	321	147	545	71	267.0	480	65
21	34.3	0.001	257	324	152	533	71	267.4	478	66
22	34.1	-0.004	261	324	157	508	72	264.4	456	65
23	33.8	-0.001	263	319	161	506	73	264.4	449	65
24	33.3	0.004	263	314	164	495	74	262.0	457	65
25	33.1	-0.008	262	311	164	523	75	267.0	524	66
26	32.7	-0.002	263	307	163	559	76	273.6	562	66
27	32.6	-0.011	263	303	162	601	77	281.2	617	65
28	32.3	0.008	265	300	160	645	78	289.6	671	66
29	32.0	0.005	267	300	159	681	79	297.2	685	65
30	31.7	0.001	269	305	158	705	80	303.4	665	65
31	31.3	-0.008	271	310	157	720	81	307.8	657	65
32	31.2	-0.012	273	314	157	732	82	311.6	657	65
33	30.9	0.000	275	319	157	741	83	315.0	652	65
34	30.7	0.003	277	322	157	750	85	318.2	656	65
35	30.5	-0.007	279	325	156	758	86	320.8	655	66
36	30.2	0.005	281	326	156	765	87	323.0	656	65
37	29.8	-0.004	285	326	157	770	89	325.4	661	65
38	29.7	-0.003	288	327	157	773	90	327.0	664	65
39	29.4	-0.002	292	331	158	774	92	329.4	656	65
40	29.2	0.009	296	335	159	769	93	330.4	645	65
41	28.9	-0.003	299	339	160	760	95	330.6	637	65
42	28.7	0.003	302	346	161	754	96	331.8	646	66
43	28.5	-0.010	305	354	162	752	98	334.2	649	66
44	28.2	0.005	308	360	164	751	99	336.4	647	66
45	27.9	-0.006	311	365	165	751	101	338.6	649	65

WOODSTOVE PREBURN DATA

Client: Englands' Stove Wor
Model: 32-NC
Run #: 3

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/24/2020

Recording Interval (min): 1
Run Time (min): 181

			Temperatures (°F)							
Elapsed Time (min)	Scale Reading (lbs)	Flue Draft (in H_2O)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Flue	Ambient
46	27.7	-0.005	315	369	166	752	102	340.8	651	65
47	27.4	0.000	318	374	167	753	104	343.2	649	65
48	27.1	-0.004	322	378	169	753	105	345.4	654	66
49	26.9	-0.001	325	382	170	755	107	347.8	661	65
50	26.6	-0.011	329	386	171	757	108	350.2	653	66
51	26.3	0.004	332	390	173	759	110	352.8	653	65
52	26.1	-0.001	336	395	174	755	112	354.4	654	66
53	25.8	-0.003	339	399	176	749	113	355.2	654	66
54	25.5	-0.007	342	404	179	744	115	356.8	650	66
55	25.2	0.004	346	408	181	742	117	358.8	651	66
56	24.9	-0.001	349	413	183	741	118	360.8	654	66
57	24.7	-0.006	353	418	186	741	120	363.6	653	66
58	24.4	-0.005	356	422	188	741	121	365.6	652	66
59	24.1	0.001	360	427	191	741	123	368.4	646	66
60	23.8	0.003	364	431	194	740	124	370.6	642	67
61	23.6	-0.006	367	435	197	739	126	372.8	637	66
62	23.3	0.001	371	439	199	738	127	374.8	640	66
63	23.0	-0.001	375	443	203	738	129	377.6	643	66
64	22.7	-0.009	379	447	206	738	130	380.0	636	66
65	22.5	0.004	382	450	210	739	132	382.6	642	67
66	22.2	-0.002	386	454	212	740	133	385.0	641	67
67	22.0	-0.005	389	458	215	740	135	387.4	637	67
68	21.7	-0.009	392	462	217	741	136	389.6	630	67
69	21.4	0.003	396	464	219	741	138	391.6	631	67
70	21.2	0.000	399	467	221	741	139	393.4	630	67
71	20.9	-0.007	402	470	224	741	140	395.4	624	67
72	20.7	-0.005	406	474	226	739	142	397.4	630	67
73	20.5	-0.017	409	477	229	736	143	398.8	631	67
74	20.2	-0.005	412	481	233	734	144	400.8	629	67
75	20.0	-0.001	414	484	235	731	146	402.0	625	67
76	19.8	-0.001	417	487	237	729	147	403.4	624	67
77	19.5	-0.010	420	489	240	728	148	405.0	617	67
78	19.3	0.005	422	492	243	726	150	406.6	619	67
79	19.1	-0.001	425	495	245	725	151	408.2	620	68
80	18.9	-0.001	427	498	248	723	152	409.6	616	68
81	18.6	-0.001	430	501	250	721	154	411.2	610	67
82	18.4	-0.007	434	503	254	718	155	412.8	602	67
83	18.2	-0.001	436	505	258	715	156	414.0	595	67
84	18.0	-0.010	440	508	262	712	158	416.0	599	67
85	17.8	-0.003	442	510	264	710	159	417.0	598	68
86	17.6	-0.011	445	512	265	708	160	418.0	594	67
87	17.4	-0.002	448	515	266	705	161	419.0	597	68
88	17.2	-0.005	451	518	268	702	163	420.4	592	67
89	17.0	-0.002	454	520	270	698	164	421.2	593	67
90	16.8	-0.005	456	522	272	695	165	422.0	581	67
91	16.6	-0.005	458	523	274	693	166	422.8	572	68

WOODSTOVE PREBURN DATA

Client: Englands' Stove Wor
Model: 32-NC
Run #: 3

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/24/2020

Recording Interval (min): 1
Run Time (min): 181

			Temperatures (°F)							
Elapsed Time (min)	Scale Reading (lbs)	Flue Draft (in H_2O)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Flue	Ambient
92	16.4	-0.003	461	523	278	689	167	423.6	561	67
93	16.2	-0.002	462	523	281	685	169	424.0	553	67
94	16.0	-0.005	464	521	283	680	170	423.6	543	67
95	15.9	0.003	465	518	285	674	171	422.6	535	66
96	15.7	-0.013	466	514	287	667	172	421.2	524	67
97	15.5	0.006	467	510	289	660	173	419.8	526	67
98	15.4	-0.003	467	506	290	652	174	417.8	513	67
99	15.3	-0.007	466	502	291	645	175	415.8	509	67
100	15.1	-0.004	466	498	292	639	176	414.2	503	67
101	15.0	0.001	466	495	293	632	177	412.6	501	67
102	14.7	-0.002	466	492	294	627	178	411.4	499	67
103	14.7	-0.006	466	489	295	622	179	410.2	505	67
104	14.6	-0.005	465	488	296	618	180	409.4	504	67
105	14.4	-0.001	465	486	298	615	181	409.0	510	67
106	14.3	-0.007	465	485	298	613	182	408.6	507	68
107	14.1	0.001	464	486	298	611	183	408.4	506	67
108	14.0	-0.004	465	486	299	611	184	409.0	503	67
109	13.9	0.003	465	486	300	608	185	408.8	502	67
110	13.7	-0.004	466	486	301	606	186	409.0	510	66
111	13.6	-0.007	466	485	302	603	187	408.6	507	67
112	13.5	-0.007	466	484	303	601	188	408.4	507	67
113	13.3	0.002	467	483	305	598	189	408.4	514	67
114	13.2	-0.011	467	482	306	597	190	408.4	514	67
115	13.0	-0.001	468	482	306	594	191	408.2	515	67
116	13.0	-0.007	468	481	307	592	192	408.0	508	67
117	12.8	-0.011	469	480	309	589	193	408.0	504	67
118	12.6	0.002	470	479	311	586	194	408.0	504	67
119	12.6	0.005	471	479	313	582	194	407.8	500	67
120	12.5	-0.002	471	478	315	579	195	407.6	507	67
121	12.4	-0.007	470	479	316	576	196	407.4	505	67
122	12.3	-0.003	470	480	316	572	197	407.0	502	67
123	12.2	0.003	471	480	317	569	198	407.0	504	68
124	12.0	-0.001	470	482	319	568	198	407.4	503	67
125	12.0	-0.007	470	482	321	566	199	407.6	501	67
126	11.8	0.002	469	484	321	564	200	407.6	498	67
127	11.7	-0.004	469	486	322	562	200	407.8	489	67
128	11.5	-0.001	469	488	322	561	201	408.2	493	67
129	11.3	0.003	468	489	322	559	202	408.0	490	67
130	11.2	0.008	467	490	323	557	203	408.0	481	67
131	11.2	0.005	466	489	324	555	203	407.4	470	67
132	11.1	0.001	466	488	324	552	204	406.8	469	67
133	11.0	0.002	464	486	325	546	204	405.0	464	67
134	10.9	-0.007	463	484	325	539	205	403.2	451	67
135	10.9	0.002	461	482	327	532	206	401.6	444	67
136	10.8	-0.011	459	481	327	525	206	399.6	436	67
137	10.6	0.005	457	479	328	518	207	397.8	435	66

WOODSTOVE PREBURN DATA

Client: Englands' Stove Wor
Model: 32-NC
Run #: 3

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/24/2020

Recording Interval (min): 1
Run Time (min): 181

			Temperatures (°F)							
Elapsed Time (min)	Scale Reading (lbs)	Flue Draft (in H_2O)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Flue	Ambient
138	10.6	-0.014	456	477	329	512	207	396.2	432	67
139	10.5	-0.010	454	475	329	506	208	394.4	430	67
140	10.4	-0.004	453	473	328	501	208	392.6	426	66
141	10.3	-0.006	451	472	328	495	209	391.0	423	66
142	10.1	-0.004	449	470	328	489	209	389.0	418	67
143	10.1	-0.004	449	468	328	483	210	387.6	411	67
144	10.1	0.006	448	466	328	477	210	385.8	404	68
145	10.0	0.000	446	463	328	472	211	384.0	397	68
146	9.8	-0.003	445	461	328	467	211	382.4	394	66
147	9.8	-0.007	442	458	328	461	211	380.0	387	66
148	9.7	0.001	441	455	328	456	212	378.4	382	67
149	9.7	-0.005	439	452	328	450	212	376.2	380	67
150	9.6	0.004	437	449	328	445	212	374.2	377	67
151	9.5	0.001	436	447	328	441	212	372.8	375	67
152	9.4	-0.014	434	444	328	437	213	371.2	374	67
153	9.3	-0.003	432	442	328	433	213	369.6	371	67
154	9.2	-0.001	431	439	328	429	213	368.0	369	67
155	9.2	-0.003	429	437	327	425	213	366.2	366	67
156	9.1	-0.011	428	434	329	422	213	365.2	365	67
157	9.0	-0.009	426	432	329	419	213	363.8	365	67
158	9.0	0.008	425	430	330	415	214	362.8	360	67
159	8.8	-0.009	423	427	329	413	214	361.2	359	67
160	8.8	0.001	422	426	329	410	214	360.2	356	67
161	8.7	-0.002	420	423	329	407	214	358.6	356	67
162	8.7	-0.004	419	422	329	404	214	357.6	349	67
163	8.6	-0.003	417	420	328	401	214	356.0	348	67
164	8.4	-0.009	416	418	328	398	214	354.8	343	67
165	8.2	0.000	415	418	329	406	212	356.0	430	67
166	8.2	-0.004	415	425	332	426	212	362.0	451	67
167	8.1	-0.005	416	431	335	444	212	367.6	455	67
168	7.9	-0.006	417	436	337	461	212	372.6	458	67
169	7.7	0.000	419	440	339	474	212	376.8	456	67
170	7.7	0.007	421	444	341	485	212	380.6	455	68
171	7.6	-0.003	422	448	343	494	212	383.8	453	67
172	7.5	0.001	423	451	345	499	212	386.0	445	68
173	7.3	-0.009	423	452	347	502	213	387.4	438	68
174	6.6	-0.009	423	453	348	497	217	387.6	447	67
175	7.1	-0.004	424	455	350	503	212	388.8	464	67
176	7.1	-0.007	426	457	351	506	212	390.4	440	67
177	4.9	-0.005	428	459	352	507	212	391.6	412	68
178	6.9	-0.008	429	461	354	506	213	392.6	405	67
179	6.8	-0.005	430	462	356	505	214	393.4	398	68
180	6.7	0.003	431	463	357	498	225	394.8	442	68
181	6.6	-0.006	431	467	360	497	226	396.2	407	68

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Englands' Stove Works
Model: 32-NC
Run #: 3

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/24/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
0	0.000		0.072	0.02	73	-0.12		33.4		110	392	83	68
1	0.091	0.091	0.073	1.57	73	-0.98	78	33.3	-0.1	128	369	83	68
2	0.223	0.132	0.078	1.76	73	-0.95	109	32.9	-0.4	124	424	83	68
3	0.355	0.132	0.087	1.78	73	-1	103	32.8	-0.1	123	483	84	68
4	0.480	0.125	0.081	1.76	73	-0.85	101	32.6	-0.2	125	523	84	68
5	0.610	0.130	0.084	1.77	73	-0.71	103	32.1	-0.5	123	514	84	68
6	0.742	0.132	0.089	1.78	73	-0.9	102	31.7	-0.4	120	484	84	68
7	0.869	0.127	0.091	1.75	73	-1.09	97	31.5	-0.2	119	474	84	68
8	0.998	0.129	0.085	1.75	73	-1.13	101	31.3	-0.2	119	476	84	68
9	1.129	0.131	0.075	1.76	74	-0.99	110	31.1	-0.2	120	475	84	68
10	1.257	0.128	0.069	1.77	74	-1.05	112	30.9	-0.2	120	490	84	68
11	1.386	0.129	0.072	1.79	74	-1.01	110	30.7	-0.2	120	495	84	69
12	1.517	0.131	0.082	1.77	74	-0.95	105	30.5	-0.2	119	472	84	70
13	1.646	0.129	0.067	1.78	74	-0.75	114	30.3	-0.2	118	462	83	69
14	1.775	0.129	0.074	1.77	75	-0.72	108	30.1	-0.2	118	465	83	70
15	1.907	0.132	0.088	1.74	75	-0.94	102	30.0	-0.1	118	468	83	71
16	2.034	0.127	0.096	1.74	75	-0.86	94	29.8	-0.2	118	467	84	70
17	2.163	0.129	0.084	1.79	75	-0.82	102	29.6	-0.2	118	465	84	71
18	2.295	0.132	0.082	1.77	76	-1.07	105	29.5	-0.1	118	465	84	71
19	2.423	0.128	0.087	1.76	76	-1.01	99	29.3	-0.2	118	463	84	71
20	2.554	0.131	0.093	1.80	76	-1.05	98	29.1	-0.2	118	464	84	71
21	2.687	0.133	0.091	1.79	76	-0.78	100	28.9	-0.2	118	465	84	71
22	2.815	0.128	0.079	1.77	77	-0.94	104	28.7	-0.2	119	467	84	71
23	2.946	0.131	0.091	1.79	77	-1.07	99	28.5	-0.2	119	463	84	71
24	3.078	0.132	0.093	1.81	77	-1.09	98	28.3	-0.2	119	463	84	71
25	3.207	0.129	0.090	1.79	78	-0.77	98	28.1	-0.2	120	469	84	72
26	3.337	0.130	0.076	1.81	78	-0.98	107	27.8	-0.3	120	474	84	71
27	3.470	0.133	0.075	1.79	78	-0.66	110	27.6	-0.2	121	479	84	71
28	3.599	0.129	0.095	1.80	79	-0.87	95	27.4	-0.2	122	484	84	71
29	3.730	0.131	0.093	1.79	79	-1.01	98	27.1	-0.3	122	488	84	72
30	3.863	0.133	0.093	1.81	79	-0.9	99	26.9	-0.2	122	490	84	72
31	3.993	0.130	0.086	1.79	80	-0.8	101	26.7	-0.2	122	490	84	72
32	4.123	0.130	0.083	1.75	80	-0.87	102	26.5	-0.2	122	493	84	72
33	4.254	0.131	0.088	1.74	81	-1.01	100	26.4	-0.1	122	488	84	73

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Englands' Stove Works
Model: 32-NC
Run #: 3

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/24/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
34	4.381	0.127	0.084	1.74	81	-1.02	99	26.0	-0.4	121	480	84	72
35	4.510	0.129	0.064	1.75	81	-0.8	115	25.8	-0.2	121	480	84	73
36	4.642	0.132	0.077	1.76	82	-0.83	108	25.6	-0.2	122	474	84	73
37	4.770	0.128	0.078	1.75	82	-0.9	103	25.4	-0.2	121	466	84	73
38	4.899	0.129	0.069	1.77	82	-1.2	111	25.2	-0.2	120	467	84	73
39	5.032	0.133	0.072	1.76	83	-0.94	112	25.1	-0.1	120	463	84	74
40	5.160	0.128	0.077	1.77	83	-0.95	104	24.9	-0.2	119	457	84	72
41	5.290	0.130	0.092	1.75	83	-1.11	96	24.7	-0.2	118	452	84	72
42	5.423	0.133	0.081	1.77	84	-1.03	105	24.6	-0.1	118	446	84	72
43	5.551	0.128	0.080	1.75	84	-0.9	102	24.4	-0.2	118	439	84	74
44	5.681	0.130	0.082	1.78	84	-0.98	102	24.3	-0.1	117	434	84	74
45	5.814	0.133	0.089	1.77	84	-0.93	100	24.1	-0.2	116	433	84	74
46	5.942	0.128	0.081	1.77	85	-1.2	101	24.0	-0.1	116	429	84	72
47	6.073	0.131	0.075	1.79	85	-0.88	107	23.8	-0.2	116	427	84	73
48	6.206	0.133	0.079	1.77	85	-1.17	106	23.6	-0.2	116	427	84	73
49	6.335	0.129	0.081	1.78	86	-1.2	101	23.5	-0.1	115	424	84	73
50	6.466	0.131	0.072	1.78	86	-0.93	109	23.4	-0.1	114	422	84	72
51	6.600	0.134	0.074	1.77	86	-0.77	110	23.2	-0.2	114	427	84	72
52	6.729	0.129	0.072	1.78	87	-1.01	107	23.1	-0.1	114	425	84	72
53	6.862	0.133	0.084	1.86	87	-0.82	102	23.1	0	114	424	82	73
54	6.996	0.134	0.093	1.82	87	-0.95	98	22.8	-0.3	113	417	82	72
55	7.128	0.132	0.085	1.82	87	-1.12	101	22.7	-0.1	113	416	83	72
56	7.261	0.133	0.088	1.82	88	-0.92	99	22.5	-0.2	113	416	84	72
57	7.396	0.135	0.083	1.84	88	-0.81	104	22.4	-0.1	112	415	84	73
58	7.526	0.130	0.084	1.84	88	-0.88	99	22.2	-0.2	113	416	84	74
59	7.662	0.136	0.087	1.82	88	-0.88	102	22.1	-0.1	112	409	84	73
60	7.794	0.132	0.088	1.82	89	-1.01	98	22.0	-0.1	111	394	84	74
61	7.926	0.132	0.092	1.82	89	-0.84	96	21.9	-0.1	110	380	84	74
62	8.062	0.136	0.077	1.83	89	-1.06	108	21.8	-0.1	109	369	84	73
63	8.194	0.132	0.073	1.80	89	-0.9	108	21.7	-0.1	109	364	84	73
64	8.327	0.133	0.089	1.83	90	-0.82	98	21.5	-0.2	109	355	84	72
65	8.461	0.134	0.085	1.80	90	-1.1	101	21.5	0	107	349	84	74
66	8.592	0.131	0.073	1.82	90	-0.88	106	21.3	-0.2	106	345	84	73
67	8.725	0.133	0.089	1.79	90	-0.87	98	21.3	0	105	342	84	72

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Englands' Stove Works
Model: 32-NC
Run #: 3

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/24/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
68	8.860	0.135	0.094	1.77	90	-1	97	21.2	-0.1	105	338	84	72
69	8.989	0.129	0.072	1.79	91	-0.96	105	21.0	-0.2	105	336	84	72
70	9.121	0.132	0.070	1.78	91	-1.13	109	20.9	-0.1	104	336	84	73
71	9.255	0.134	0.076	1.76	91	-1.21	106	20.8	-0.1	103	335	84	73
72	9.382	0.127	0.081	1.72	91	-0.98	98	20.7	-0.1	104	338	84	74
73	9.515	0.133	0.077	1.74	91	-1.03	105	20.6	-0.1	104	348	84	73
74	9.647	0.132	0.097	1.72	91	-0.78	93	20.4	-0.2	104	362	84	73
75	9.774	0.127	0.087	1.74	92	-1.21	94	20.4	0	105	370	84	73
76	9.906	0.132	0.069	1.74	92	-1.06	110	20.2	-0.2	105	386	84	72
77	10.037	0.131	0.084	1.73	92	-0.81	99	20.1	-0.1	106	393	84	73
78	10.163	0.126	0.089	1.71	92	-0.97	92	19.9	-0.2	106	400	84	73
79	10.294	0.131	0.083	1.71	92	-1.24	100	19.7	-0.2	107	403	84	73
80	10.426	0.132	0.092	1.72	93	-0.95	95	19.7	0	107	409	84	73
81	10.552	0.126	0.070	1.69	93	-1.21	104	19.5	-0.2	108	415	84	73
82	10.680	0.128	0.079	1.65	93	-1.02	100	19.4	-0.1	109	418	84	74
83	10.809	0.129	0.086	1.65	93	-1.27	96	19.2	-0.2	110	412	84	74
84	10.934	0.125	0.076	1.60	93	-1.01	99	19.1	-0.1	110	406	84	73
85	11.059	0.125	0.071	1.60	93	-1.26	103	18.9	-0.2	110	411	84	73
86	11.187	0.128	0.075	1.60	93	-1.16	102	18.8	-0.1	110	410	84	72
87	11.311	0.124	0.090	1.57	94	-1.21	90	18.6	-0.2	110	407	84	73
88	11.432	0.121	0.071	1.57	94	-1.12	99	18.5	-0.1	110	409	84	73
89	11.586	0.154	0.078	2.95	94	-1.91	121	18.2	-0.3	110	412	85	73
90	11.742	0.156	0.091	1.73	94	-1.37	113	18.2	0	111	412	84	73
91	11.874	0.132	0.075	1.73	94	-1.17	106	18.0	-0.2	112	414	84	74
92	12.003	0.129	0.070	1.73	94	-1.51	107	17.9	-0.1	111	415	84	73
93	12.133	0.130	0.088	1.71	94	-1.4	96	17.8	-0.1	111	413	84	74
94	12.265	0.132	0.074	1.69	95	-1.68	106	17.6	-0.2	111	409	84	73
95	12.393	0.128	0.087	1.71	95	-1.48	95	17.4	-0.2	110	408	84	73
96	12.523	0.130	0.081	1.72	95	-1.27	100	17.3	-0.1	111	413	84	73
97	12.655	0.132	0.076	1.74	95	-1.37	105	17.2	-0.1	110	420	84	73
98	12.783	0.128	0.075	1.72	95	-1.48	102	17.1	-0.1	110	420	84	73
99	12.913	0.130	0.076	1.71	95	-1.36	103	17.0	-0.1	110	407	84	73
100	13.045	0.132	0.076	1.68	95	-1.55	105	16.9	-0.1	110	405	84	73
101	13.173	0.128	0.091	1.70	95	-1.41	93	16.7	-0.2	110	408	84	73

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Englands' Stove Works
Model: 32-NC
Run #: 3

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/24/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
102	13.301	0.128	0.072	1.70	95	-1.16	104	16.6	-0.1	110	404	84	73
103	13.433	0.132	0.088	1.70	95	-1.4	97	16.5	-0.1	110	405	84	73
104	13.561	0.128	0.077	1.67	96	-1.29	101	16.3	-0.2	111	401	84	73
105	13.687	0.126	0.090	1.67	96	-1.47	92	16.2	-0.1	111	404	84	73
106	13.819	0.132	0.076	1.69	96	-1.29	104	16.1	-0.1	110	403	84	73
107	13.948	0.129	0.068	1.71	96	-1.45	108	16.0	-0.1	110	403	84	73
108	14.073	0.125	0.085	1.66	96	-1.36	93	15.9	-0.1	110	401	84	74
109	14.202	0.129	0.086	1.74	96	-1.43	96	15.7	-0.2	110	403	84	73
110	14.335	0.133	0.079	1.75	96	-1.52	103	15.6	-0.1	110	398	84	73
111	14.466	0.131	0.078	1.72	96	-1.53	102	15.5	-0.1	110	396	84	73
112	14.598	0.132	0.071	1.72	96	-1.52	108	15.4	-0.1	110	393	84	73
113	14.729	0.131	0.070	1.72	97	-1.21	108	15.2	-0.2	110	390	84	73
114	14.856	0.127	0.094	1.72	97	-1.38	90	15.1	-0.1	109	390	84	73
115	14.988	0.132	0.077	1.72	97	-1.44	103	14.9	-0.2	109	393	84	73
116	15.119	0.131	0.078	1.69	97	-1.48	102	14.9	0	109	389	84	74
117	15.245	0.126	0.084	1.70	97	-1.4	94	14.8	-0.1	108	391	84	74
118	15.375	0.130	0.090	1.68	97	-1.63	94	14.7	-0.1	108	389	84	73
119	15.507	0.132	0.075	1.70	97	-1.4	105	14.6	-0.1	108	388	84	73
120	15.634	0.127	0.082	1.70	97	-1.42	96	14.4	-0.2	108	387	84	73
121	15.763	0.129	0.093	1.69	97	-1.42	92	14.3	-0.1	107	384	84	74
122	15.894	0.131	0.087	1.73	97	-1.57	96	14.2	-0.1	107	386	84	73
123	16.023	0.129	0.075	1.72	97	-1.6	102	14.2	0	108	382	84	74
124	16.153	0.130	0.075	1.71	98	-1.68	103	14.0	-0.2	108	387	84	74
125	16.286	0.133	0.075	1.70	98	-1.83	105	13.9	-0.1	108	386	84	74
126	16.415	0.129	0.092	1.72	98	-1.85	92	13.8	-0.1	108	384	84	75
127	16.544	0.129	0.069	1.68	98	-1.65	106	13.7	-0.1	107	389	84	75
128	16.677	0.133	0.072	1.70	98	-1.71	107	13.5	-0.2	108	386	84	75
129	16.806	0.129	0.071	1.80	98	-1.57	105	13.5	0	108	391	84	74
130	16.940	0.134	0.091	1.80	98	-1.79	96	13.4	-0.1	108	386	84	74
131	17.075	0.135	0.088	1.78	98	-1.39	99	13.3	-0.1	108	388	84	73
132	17.204	0.129	0.074	1.77	98	-1.32	103	13.1	-0.2	107	386	84	74
133	17.340	0.136	0.080	1.80	98	-1.69	104	13.0	-0.1	107	382	84	74
134	17.472	0.132	0.093	1.79	98	-1.72	94	12.9	-0.1	107	380	84	75
135	17.604	0.132	0.091	1.78	98	-1.47	95	12.8	-0.1	107	377	84	75

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Englands' Stove Works
Model: 32-NC
Run #: 3

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/24/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
136	17.739	0.135	0.080	1.79	98	-1.55	103	12.7	-0.1	107	375	84	74
137	17.870	0.131	0.079	1.78	98	-1.54	101	12.6	-0.1	107	377	84	73
138	18.002	0.132	0.082	1.76	99	-1.63	100	12.4	-0.2	107	377	84	73
139	18.136	0.134	0.090	1.79	99	-1.62	97	12.4	0	107	382	84	74
140	18.268	0.132	0.090	1.75	99	-1.64	95	12.2	-0.2	107	386	84	75
141	18.400	0.132	0.077	1.77	99	-1.64	103	12.1	-0.1	108	384	84	75
142	18.535	0.135	0.079	1.79	99	-1.59	104	12.0	-0.1	108	385	84	75
143	18.665	0.130	0.090	1.75	99	-1.63	94	11.9	-0.1	108	387	84	76
144	18.799	0.134	0.090	1.77	99	-1.61	97	11.8	-0.1	108	384	84	76
145	18.933	0.134	0.078	1.78	99	-1.74	104	11.7	-0.1	109	386	84	74
146	19.062	0.129	0.083	1.79	99	-1.45	97	11.5	-0.2	108	389	84	75
147	19.199	0.137	0.079	1.78	99	-1.59	106	11.4	-0.1	108	392	84	75
148	19.330	0.131	0.080	1.77	99	-1.98	100	11.3	-0.1	109	393	84	74
149	19.462	0.132	0.075	1.77	99	-1.63	104	11.1	-0.2	109	399	84	75
150	19.596	0.134	0.080	1.76	99	-1.55	103	11.1	0	110	415	84	75
151	19.727	0.131	0.079	1.73	99	-1.86	101	11.0	-0.1	109	418	84	75
152	19.857	0.130	0.089	1.67	99	-1.67	94	10.8	-0.2	110	417	84	76
153	19.989	0.132	0.090	1.72	99	-1.75	95	10.7	-0.1	110	413	84	74
154	20.119	0.130	0.074	1.73	100	-1.71	103	10.6	-0.1	110	409	84	75
155	20.250	0.131	0.078	1.73	100	-1.7	102	10.5	-0.1	110	406	84	76
156	20.383	0.133	0.086	1.73	100	-1.67	98	10.3	-0.2	109	403	84	76
157	20.514	0.131	0.073	1.74	100	-1.65	105	10.3	0	110	399	84	75
158	20.645	0.131	0.087	1.72	100	-1.64	96	10.2	-0.1	109	398	84	74
159	20.780	0.135	0.079	1.75	100	-1.96	104	10.1	-0.1	109	397	84	74
160	20.911	0.131	0.089	1.77	100	-1.56	95	9.9	-0.2	109	399	84	75
161	21.043	0.132	0.086	1.76	100	-1.68	97	9.8	-0.1	109	396	84	75
162	21.179	0.136	0.088	1.73	100	-1.43	99	9.8	0	109	396	84	75
163	21.308	0.129	0.082	1.78	100	-1.53	97	9.7	-0.1	108	392	84	75
164	21.444	0.136	0.073	1.79	100	-1.83	109	9.6	-0.1	108	392	84	76
165	21.576	0.132	0.080	1.78	100	-1.6	101	9.5	-0.1	108	392	84	76
166	21.708	0.132	0.082	1.79	100	-1.62	100	9.5	0	108	395	84	76
167	21.844	0.136	0.073	1.79	100	-1.71	109	9.4	-0.1	109	387	84	76
168	21.976	0.132	0.080	1.78	100	-1.55	101	9.3	-0.1	108	384	84	76
169	22.109	0.133	0.074	1.80	100	-1.62	106	9.2	-0.1	109	384	84	76

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Englands' Stove Works
Model: 32-NC
Run #: 3

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/24/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
170	22.246	0.137	0.091	1.80	100	-1.78	98	9.1	-0.1	108	383	84	76
171	22.378	0.132	0.076	1.81	100	-1.51	103	9.0	-0.1	107	383	84	75
172	22.514	0.136	0.075	1.79	100	-1.52	107	9.0	0	107	381	84	76
173	22.649	0.135	0.090	1.82	100	-1.69	97	8.9	-0.1	108	382	84	76
174	22.782	0.133	0.071	1.80	100	-1.8	108	8.8	-0.1	107	385	84	76
175	22.918	0.136	0.082	1.75	100	-1.75	103	8.7	-0.1	107	383	84	75
176	23.047	0.129	0.088	1.71	100	-1.76	94	8.6	-0.1	107	379	84	76
177	23.176	0.129	0.070	1.69	100	-1.65	105	8.6	0	107	379	84	76
178	23.309	0.133	0.069	1.70	100	-1.76	109	8.4	-0.2	107	377	84	77
179	23.437	0.128	0.089	1.69	100	-1.85	93	8.3	-0.1	106	370	84	76
180	23.568	0.131	0.088	1.71	100	-1.87	95	8.4	0.1	106	365	84	76
181	23.702	0.134	0.089	1.72	100	-1.9	97	8.2	-0.2	106	358	84	76
182	23.832	0.130	0.073	1.75	100	-1.65	104	8.1	-0.1	105	352	84	76
183	23.964	0.132	0.085	1.73	100	-1.68	98	8.1	0	105	342	84	76
184	24.097	0.133	0.088	1.72	101	-1.91	97	8.1	0	106	339	84	76
185	24.228	0.131	0.083	1.73	101	-1.61	98	8.1	0	105	342	84	76
186	24.358	0.130	0.094	1.72	101	-1.74	91	8.0	-0.1	105	344	84	76
187	24.493	0.135	0.090	1.72	101	-1.78	97	8.0	0	104	342	84	76
188	24.623	0.130	0.090	1.74	101	-1.71	93	7.9	-0.1	104	342	84	76
189	24.754	0.131	0.088	1.71	101	-1.72	95	7.7	-0.2	104	345	84	76
190	24.888	0.134	0.078	1.71	101	-1.7	103	7.8	0.1	104	342	84	76
191	25.017	0.129	0.095	1.69	101	-1.88	90	7.7	-0.1	104	341	84	76
192	25.148	0.131	0.091	1.69	101	-1.83	93	7.6	-0.1	104	337	84	76
193	25.283	0.135	0.075	1.68	101	-1.78	106	7.5	-0.1	104	335	84	76
194	25.410	0.127	0.092	1.70	101	-1.48	90	7.6	0.1	104	334	84	76
195	25.543	0.133	0.075	1.65	101	-1.47	104	7.5	-0.1	103	331	84	76
196	25.676	0.133	0.075	1.69	101	-2	104	7.4	-0.1	103	329	84	76
197	25.802	0.126	0.088	1.64	101	-1.97	91	7.4	0	103	325	84	76
198	25.935	0.133	0.077	1.66	101	-1.64	103	7.3	-0.1	103	326	84	76
199	26.066	0.131	0.089	1.66	101	-1.66	94	7.3	0	103	324	84	76
200	26.192	0.126	0.073	1.67	101	-1.94	100	7.2	-0.1	102	322	84	76
201	26.321	0.129	0.095	1.66	101	-1.97	90	7.2	0	102	319	84	76
202	26.452	0.131	0.093	1.66	101	-1.89	92	7.1	-0.1	102	318	84	76
203	26.578	0.126	0.067	1.64	101	-2.02	104	7.0	-0.1	102	314	84	76

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Englands' Stove Works
Model: 32-NC
Run #: 3

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/24/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
204	26.706	0.128	0.064	1.63	101	-2.01	109	7.0	0	102	317	84	76
205	26.835	0.129	0.076	1.60	101	-1.66	100	7.0	0	101	314	84	77
206	26.961	0.126	0.082	1.61	101	-1.92	94	6.9	-0.1	102	312	84	76
207	27.087	0.126	0.087	1.63	101	-2.04	92	6.8	-0.1	101	314	84	76
208	27.217	0.130	0.074	1.66	101	-1.74	102	6.8	0	101	313	84	76
209	27.347	0.130	0.080	1.72	101	-1.89	99	6.8	0	101	312	84	76
210	27.478	0.131	0.090	1.75	101	-2.09	94	6.7	-0.1	101	311	84	76
211	27.612	0.134	0.083	1.76	101	-2.23	100	6.7	0	101	312	84	76
212	27.742	0.130	0.074	1.76	101	-2	102	6.6	-0.1	100	311	84	76
213	27.872	0.130	0.085	1.73	101	-2.27	95	6.5	-0.1	100	312	84	76
214	28.004	0.132	0.089	1.70	101	-1.86	95	6.5	0	100	310	84	76
215	28.133	0.129	0.080	1.65	101	-2.08	98	6.5	0	100	311	84	76
216	28.262	0.129	0.072	1.65	101	-2.05	103	6.4	-0.1	100	310	84	75
217	28.393	0.131	0.079	1.64	101	-1.96	100	6.3	-0.1	100	309	84	76
218	28.521	0.128	0.070	1.63	101	-2.41	104	6.3	0	99	306	84	76
219	28.649	0.128	0.073	1.63	101	-1.98	101	6.3	0	100	305	84	76
220	28.780	0.131	0.084	1.64	101	-2.25	97	6.2	-0.1	99	305	84	76
221	28.907	0.127	0.099	1.65	101	-2.3	86	6.1	-0.1	100	304	84	76
222	29.033	0.126	0.088	1.64	101	-2.09	91	6.2	0.1	99	303	84	76
223	29.164	0.131	0.085	1.63	101	-2.07	96	6.1	-0.1	99	303	84	76
224	29.292	0.128	0.080	1.62	102	-2.12	97	6.0	-0.1	99	302	84	76
225	29.416	0.124	0.089	1.58	101	-2.12	89	6.0	0	99	299	84	76
226	29.544	0.128	0.076	1.61	102	-2.49	99	6.0	0	99	298	84	76
227	29.674	0.130	0.085	1.61	102	-2.38	95	5.9	-0.1	99	299	84	76
228	29.799	0.125	0.082	1.59	102	-2.19	93	5.9	0	99	298	84	76
229	29.925	0.126	0.077	1.57	102	-2.38	97	5.8	-0.1	99	298	84	76
230	30.053	0.128	0.089	1.60	102	-2.56	92	5.8	0	99	300	84	76
231	30.182	0.129	0.084	1.81	102	-2.54	95	5.6	-0.2	99	303	84	76
232	30.317	0.135	0.069	1.84	102	-2.33	110	5.8	0.2	98	304	84	76
233	30.457	0.140	0.071	1.84	102	-2.12	112	5.6	-0.2	99	304	84	76
234	30.591	0.134	0.070	1.87	102	-2.11	108	5.6	0	99	306	83	76
235	30.721	0.130	0.086	1.76	102	-2.16	95	5.6	0	98	308	84	76
236	30.856	0.135	0.088	1.73	102	-2.05	97	5.5	-0.1	98	310	84	76
237	30.993	0.137	0.089	1.79	102	-0.84	98	5.4	-0.1	98	308	83	76

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Englands' Stove Works
Model: 32-NC
Run #: 3

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/24/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
238	31.130	0.137	0.083	1.82	102	-1	101	5.4	0	98	307	84	76
239	31.264	0.134	0.082	1.80	102	-1.07	100	5.4	0	98	307	85	76
240	31.399	0.135	0.073	1.78	102	-0.67	107	5.3	-0.1	98	305	85	76
241	31.535	0.136	0.075	1.76	102	-0.77	106	5.2	-0.1	98	306	85	75
242	31.666	0.131	0.086	1.76	102	-1.01	95	5.3	0.1	98	306	85	75
243	31.803	0.137	0.082	1.78	102	-0.9	102	5.2	-0.1	98	306	85	75
244	31.936	0.133	0.079	1.79	102	-0.93	101	5.1	-0.1	98	302	85	76
245	32.068	0.132	0.066	1.77	102	-0.87	110	5.1	0	98	300	85	76
246	32.204	0.136	0.089	1.76	102	-0.69	97	5.1	0	98	297	84	76
247	32.337	0.133	0.087	1.79	102	-1.13	96	5.0	-0.1	98	297	84	76
248	32.470	0.133	0.092	1.76	102	-0.7	94	5.0	0	98	295	84	76
249	32.607	0.137	0.088	1.78	102	-0.92	99	4.9	-0.1	98	296	84	76
250	32.737	0.130	0.073	1.79	102	-1.03	103	4.9	0	98	295	84	76
251	32.873	0.136	0.080	1.78	102	-1.12	103	4.9	0	98	293	84	76
252	33.007	0.134	0.086	1.78	102	-0.9	97	4.8	-0.1	97	292	84	76
253	33.139	0.132	0.069	1.79	102	-0.66	107	4.8	0	97	290	84	76
254	33.276	0.137	0.084	1.79	102	-1.18	101	4.8	0	97	290	84	76
255	33.408	0.132	0.080	1.78	102	-0.77	100	4.7	-0.1	97	291	84	76
256	33.541	0.133	0.074	1.79	102	-0.77	104	4.6	-0.1	97	290	84	76
257	33.677	0.136	0.093	1.78	102	-0.8	95	4.6	0	97	290	84	76
258	33.810	0.133	0.068	1.79	102	-0.78	109	4.6	0	97	290	84	76
259	33.943	0.133	0.077	1.79	102	-0.75	102	4.5	-0.1	97	289	84	76
260	34.079	0.136	0.092	1.79	102	-0.89	96	4.5	0	97	290	84	76
261	34.209	0.130	0.072	1.78	102	-0.78	103	4.4	-0.1	97	289	84	76
262	34.347	0.138	0.082	1.78	102	-0.87	103	4.4	0	97	286	84	76
263	34.478	0.131	0.091	1.76	102	-1.14	93	4.4	0	97	286	84	76
264	34.611	0.133	0.086	1.76	102	-1.01	97	4.4	0	97	285	84	76
265	34.747	0.136	0.087	1.80	102	-1.02	98	4.4	0	96	283	84	76
266	34.880	0.133	0.085	1.80	102	-0.76	97	4.3	-0.1	96	283	84	76
267	35.013	0.133	0.087	1.79	102	-1.1	96	4.3	0	96	283	84	76
268	35.150	0.137	0.068	1.81	102	-0.79	112	4.3	0	96	284	84	76
269	35.280	0.130	0.091	1.82	102	-1	92	4.3	0	96	282	84	76
270	35.417	0.137	0.090	1.79	102	-0.99	97	4.2	-0.1	96	283	84	76
271	35.549	0.132	0.084	1.79	102	-1.14	97	4.2	0	96	281	84	76

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Englands' Stove Works
Model: 32-NC
Run #: 3

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/24/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
272	35.682	0.133	0.072	1.78	102	-0.95	106	4.1	-0.1	96	280	84	76
273	35.818	0.136	0.085	1.81	102	-0.83	99	4.1	0	96	280	84	76
274	35.951	0.133	0.098	1.80	102	-0.67	91	4.1	0	96	279	84	76
275	36.084	0.133	0.076	1.80	102	-1.04	103	4.1	0	96	279	84	76
276	36.220	0.136	0.074	1.77	102	-0.84	106	4.0	-0.1	95	278	84	76
277	36.352	0.132	0.093	1.81	102	-0.94	92	4.0	0	95	279	84	76
278	36.485	0.133	0.078	1.81	102	-0.92	101	4.0	0	95	275	84	76
279	36.622	0.137	0.085	1.81	102	-1.02	100	3.9	-0.1	95	275	84	76
280	36.752	0.130	0.075	1.79	102	-1.06	101	3.9	0	95	275	84	76
281	36.890	0.138	0.072	1.80	102	-1.08	109	3.9	0	95	273	84	75
282	37.021	0.131	0.086	1.79	102	-0.84	95	3.9	0	95	273	84	75
283	37.155	0.134	0.070	1.79	102	-0.77	108	3.9	0	95	272	84	76
284	37.290	0.135	0.080	1.79	102	-0.67	102	3.8	-0.1	95	271	84	76
285	37.423	0.133	0.085	1.80	102	-0.84	97	3.8	0	94	270	84	76
286	37.556	0.133	0.082	1.80	102	-0.82	99	3.8	0	94	269	84	76
287	37.693	0.137	0.079	1.79	102	-0.98	104	3.8	0	94	268	84	75
288	37.823	0.130	0.087	1.79	102	-0.85	94	3.7	-0.1	94	268	84	75
289	37.960	0.137	0.085	1.79	102	-0.73	100	3.7	0	94	267	84	75
290	38.093	0.133	0.078	1.79	102	-0.81	101	3.7	0	94	267	84	75
291	38.225	0.132	0.073	1.78	102	-1	104	3.6	-0.1	94	267	84	75
292	38.362	0.137	0.084	1.80	102	-0.74	101	3.6	0	94	267	84	75
293	38.494	0.132	0.075	1.77	102	-0.73	102	3.6	0	94	269	84	75
294	38.627	0.133	0.070	1.75	102	-1.12	107	3.5	-0.1	94	269	84	75
295	38.764	0.137	0.072	1.81	102	-0.7	109	3.5	0	94	270	84	75
296	38.894	0.130	0.074	1.79	102	-0.83	102	3.5	0	94	271	84	75
297	39.030	0.136	0.091	1.79	102	-1.11	96	3.5	0	94	271	84	75
298	39.164	0.134	0.075	1.78	102	-1.1	104	3.4	-0.1	94	269	84	75
299	39.296	0.132	0.079	1.79	102	-0.95	100	3.4	0	94	268	84	75
300	39.433	0.137	0.082	1.79	102	-0.68	102	3.4	0	94	268	84	75
301	39.565	0.132	0.072	1.78	102	-0.66	105	3.3	-0.1	94	267	84	75
302	39.698	0.133	0.072	1.77	102	-0.89	105	3.4	0.1	94	267	84	75
303	39.834	0.136	0.084	1.80	102	-1.08	100	3.3	-0.1	94	267	84	75
304	39.966	0.132	0.081	1.79	102	-1	99	3.3	0	94	265	84	75
305	40.099	0.133	0.082	1.79	102	-1	99	3.2	-0.1	94	267	84	75

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Englands' Stove Works
Model: 32-NC
Run #: 3

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/24/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
306	40.236	0.137	0.089	1.79	102	-1.09	98	3.3	0.1	94	267	84	75
307	40.366	0.130	0.082	1.80	102	-0.76	97	3.3	0	94	266	84	75
308	40.504	0.138	0.073	1.82	102	-0.78	109	3.2	-0.1	94	266	84	75
309	40.636	0.132	0.092	1.80	102	-0.88	92	3.2	0	93	262	84	75
310	40.769	0.133	0.098	1.79	102	-0.91	90	3.2	0	94	263	84	75
311	40.905	0.136	0.081	1.78	102	-0.78	102	3.1	-0.1	93	262	84	75
312	41.037	0.132	0.075	1.82	102	-1.01	102	3.1	0	93	261	84	75
313	41.170	0.133	0.076	1.82	102	-1.01	102	3.0	-0.1	93	261	84	75
314	41.307	0.137	0.081	1.82	102	-0.94	102	3.0	0	93	260	84	75
315	41.438	0.131	0.090	1.82	102	-0.97	93	3.0	0	93	261	84	75
316	41.574	0.136	0.092	1.80	102	-1.03	95	3.0	0	93	261	84	75
317	41.707	0.133	0.078	1.80	102	-0.88	101	3.0	0	93	261	84	75
318	41.840	0.133	0.075	1.80	102	-0.81	103	3.0	0	93	259	84	75
319	41.976	0.136	0.069	1.79	102	-0.88	110	3.0	0	93	260	84	75
320	42.109	0.133	0.088	1.81	102	-0.67	95	2.9	-0.1	93	260	84	75
321	42.241	0.132	0.086	1.80	102	-0.93	96	2.9	0	93	259	84	75
322	42.378	0.137	0.094	1.80	102	-1.05	95	2.9	0	93	260	84	75
323	42.509	0.131	0.089	1.82	102	-1.15	93	2.9	0	93	260	84	75
324	42.644	0.135	0.093	1.79	102	-0.99	94	2.9	0	93	258	84	75
325	42.779	0.135	0.091	1.80	102	-0.88	95	2.7	-0.2	93	258	84	75
326	42.910	0.131	0.077	1.78	102	-0.9	100	2.8	0.1	93	259	84	75
327	43.048	0.138	0.082	1.78	102	-0.97	102	2.9	0.1	93	258	84	75
328	43.179	0.131	0.081	1.82	102	-1.12	98	2.8	-0.1	93	257	84	75
329	43.314	0.135	0.086	1.80	102	-1.06	98	2.8	0	93	259	84	75
330	43.449	0.135	0.081	1.79	102	-0.58	101	2.7	-0.1	92	257	84	75
331	43.582	0.133	0.078	1.79	102	-0.88	101	2.6	-0.1	92	256	84	75
332	43.715	0.133	0.085	1.80	102	-0.95	97	2.7	0.1	92	255	84	75
333	43.852	0.137	0.075	1.77	102	-1.03	106	2.7	0	92	255	84	75
334	43.981	0.129	0.069	1.81	102	-0.73	104	2.6	-0.1	92	255	84	75
335	44.119	0.138	0.082	1.77	102	-1.05	102	2.6	0	92	254	84	75
336	44.251	0.132	0.081	1.79	102	-0.75	98	2.5	-0.1	92	253	84	75
337	44.384	0.133	0.088	1.80	102	-0.84	95	2.7	0.2	92	253	84	75
338	44.520	0.136	0.078	1.79	102	-1.05	103	2.6	-0.1	92	252	84	75
339	44.653	0.133	0.086	1.79	102	-1.06	96	2.5	-0.1	92	253	84	75

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Englands' Stove Works
Model: 32-NC
Run #: 3

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/24/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
340	44.787	0.134	0.081	1.79	102	-1.03	100	2.5	0	92	253	84	75
341	44.923	0.136	0.079	1.78	102	-0.76	103	2.5	0	92	252	84	75
342	45.054	0.131	0.085	1.80	102	-1.06	95	2.5	0	92	252	84	75
343	45.190	0.136	0.077	1.78	102	-0.98	104	2.5	0	92	252	84	75
344	45.323	0.133	0.070	1.79	102	-1.03	107	2.4	-0.1	92	251	84	75
345	45.456	0.133	0.078	1.78	102	-0.92	101	2.4	0	92	251	84	75
346	45.591	0.135	0.070	1.79	102	-1.09	108	2.4	0	92	252	84	74
347	45.724	0.133	0.077	1.80	102	-1.13	102	2.4	0	91	250	84	75
348	45.857	0.133	0.090	1.79	102	-1.09	94	2.4	0	91	251	84	75
349	45.994	0.137	0.071	1.77	102	-0.86	109	2.3	-0.1	91	251	83	75
350	46.125	0.131	0.086	1.79	102	-0.88	95	2.3	0	91	249	84	75
351	46.261	0.136	0.070	1.77	102	-0.81	109	2.3	0	91	249	83	75
352	46.395	0.134	0.090	1.79	102	-0.94	95	2.3	0	91	248	83	75
353	46.527	0.132	0.082	1.76	102	-1.01	98	2.2	-0.1	91	247	83	75
354	46.664	0.137	0.073	1.76	102	-0.88	108	2.1	-0.1	91	248	83	74
355	46.796	0.132	0.077	1.77	102	-0.94	101	2.2	0.1	91	248	83	75
356	46.929	0.133	0.077	1.75	102	-0.77	102	2.1	-0.1	91	246	83	75
357	47.065	0.136	0.076	1.78	102	-1.18	105	2.2	0.1	91	246	84	74
358	47.198	0.133	0.090	1.77	102	-0.74	94	2.2	0	91	245	84	74
359	47.330	0.132	0.092	1.76	102	-0.91	92	2.1	-0.1	91	246	84	75
360	47.468	0.138	0.083	1.74	102	-0.68	102	2.1	0	91	246	83	74
361	47.597	0.129	0.088	1.77	102	-0.84	92	2.1	0	91	248	84	74
362	47.735	0.138	0.088	1.75	102	-0.96	99	2.1	0	91	246	84	75
363	47.867	0.132	0.092	1.75	102	-0.8	92	2.1	0	91	245	84	74
364	48.000	0.133	0.086	1.76	102	-0.77	96	2.0	-0.1	91	245	84	74
365	48.136	0.136	0.070	1.76	102	-0.76	109	2.0	0	91	244	84	74
366	48.269	0.133	0.084	1.75	102	-0.89	97	2.0	0	91	244	84	74
367	48.402	0.133	0.087	1.75	102	-0.8	96	2.0	0	91	243	84	74
368	48.539	0.137	0.087	1.78	102	-1.01	98	2.0	0	91	243	84	74
369	48.669	0.130	0.083	1.77	102	-1.04	96	1.8	-0.2	91	244	84	74
370	48.806	0.137	0.081	1.75	102	-0.68	102	1.9	0.1	91	243	84	74
371	48.939	0.133	0.073	1.72	102	-0.95	104	1.9	0	90	242	83	74
372	49.072	0.133	0.089	1.77	102	-0.88	94	1.8	-0.1	90	244	83	74
373	49.207	0.135	0.080	1.76	102	-0.99	101	1.9	0.1	90	243	84	74

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Englands' Stove Works
Model: 32-NC
Run #: 3

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/24/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
374	49.340	0.133	0.076	1.73	102	-0.73	102	1.7	-0.2	91	240	84	74
375	49.473	0.133	0.083	1.75	102	-0.74	98	1.8	0.1	91	241	84	74
376	49.610	0.137	0.079	1.76	102	-1.05	103	1.8	0	91	243	83	74
377	49.741	0.131	0.079	1.75	102	-0.92	99	1.8	0	90	242	83	74
378	49.876	0.135	0.079	1.75	102	-0.71	102	1.8	0	90	241	83	74
379	50.011	0.135	0.093	1.77	102	-1.14	94	1.7	-0.1	90	240	83	74
380	50.141	0.130	0.093	1.75	102	-1	90	1.7	0	90	239	84	74
381	50.279	0.138	0.091	1.75	102	-1.04	97	1.7	0	90	240	84	74
382	50.410	0.131	0.077	1.75	102	-1.19	100	1.7	0	90	240	84	74
383	50.544	0.134	0.071	1.76	102	-0.64	107	1.7	0	90	239	84	74
384	50.679	0.135	0.072	1.73	102	-0.92	107	1.7	0	90	239	84	74
385	50.812	0.133	0.076	1.74	102	-0.82	102	1.6	-0.1	90	240	84	74
386	50.945	0.133	0.087	1.74	102	-0.98	96	1.6	0	90	239	84	74
387	51.082	0.137	0.088	1.78	102	-0.9	98	1.6	0	90	237	84	74
388	51.212	0.130	0.077	1.76	102	-0.8	99	1.6	0	90	240	84	74
389	51.349	0.137	0.085	1.76	102	-0.92	100	1.7	0.1	90	239	84	74
390	51.482	0.133	0.078	1.74	102	-0.62	101	1.5	-0.2	90	238	84	74
391	51.614	0.132	0.086	1.77	102	-0.96	95	1.5	0	90	238	84	74
392	51.750	0.136	0.089	1.76	102	-1.06	97	1.5	0	90	238	84	74
393	51.883	0.133	0.090	1.75	102	-0.94	94	1.5	0	90	238	84	74
394	52.016	0.133	0.086	1.76	102	-0.71	96	1.5	0	90	238	84	74
395	52.152	0.136	0.075	1.76	102	-1.09	105	1.4	-0.1	90	238	84	74
396	52.283	0.131	0.072	1.76	102	-0.84	103	1.4	0	90	236	84	74
397	52.419	0.136	0.082	1.75	102	-0.98	101	1.4	0	90	235	84	74
398	52.553	0.134	0.086	1.77	102	-1.11	97	1.4	0	90	235	84	74
399	52.685	0.132	0.081	1.76	102	-0.85	98	1.4	0	90	237	84	74
400	52.821	0.136	0.081	1.76	102	-0.95	101	1.4	0	90	236	84	74
401	52.954	0.133	0.073	1.77	102	-0.78	104	1.4	0	90	236	83	74
402	53.087	0.133	0.089	1.77	102	-1.12	94	1.3	-0.1	90	235	84	74
403	53.223	0.136	0.085	1.76	102	-0.82	99	1.3	0	90	235	84	74
404	53.355	0.132	0.075	1.75	102	-1.03	102	1.3	0	90	235	84	74
405	53.488	0.133	0.079	1.76	102	-0.88	100	1.3	0	89	235	84	74
406	53.625	0.137	0.084	1.78	102	-0.81	100	1.2	-0.1	89	236	84	74
407	53.755	0.130	0.085	1.79	102	-0.86	94	1.1	-0.1	89	234	84	74

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Englands' Stove Works
Model: 32-NC
Run #: 3

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/24/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
408	53.892	0.137	0.091	1.75	102	-1.03	96	1.2	0.1	89	234	84	74
409	54.024	0.132	0.081	1.76	102	-0.79	98	1.2	0	89	233	84	74
410	54.157	0.133	0.068	1.77	102	-0.94	108	1.2	0	89	234	83	74
411	54.293	0.136	0.085	1.78	102	-0.84	99	1.2	0	89	233	83	74
412	54.426	0.133	0.087	1.77	102	-0.83	95	1.2	0	89	233	83	74
413	54.559	0.133	0.072	1.80	101	-0.98	105	1.2	0	89	231	83	74
414	54.696	0.137	0.090	1.77	101	-1.14	97	1.1	-0.1	89	232	83	74
415	54.826	0.130	0.081	1.80	101	-1.07	97	1.1	0	89	232	84	74
416	54.962	0.136	0.087	1.80	101	-0.8	98	1.1	0	89	231	83	74
417	55.095	0.133	0.075	1.77	102	-0.84	103	1.1	0	89	231	84	74
418	55.228	0.133	0.092	1.77	102	-0.87	93	1.1	0	89	231	84	74
419	55.364	0.136	0.077	1.78	101	-0.98	104	1.0	-0.1	89	230	83	74
420	55.497	0.133	0.089	1.79	101	-0.81	95	1.0	0	89	229	84	74
421	55.629	0.132	0.077	1.79	101	-0.71	101	1.0	0	89	229	83	74
422	55.766	0.137	0.085	1.77	101	-0.93	100	1.0	0	89	230	84	74
423	55.897	0.131	0.078	1.78	101	-0.89	99	1.0	0	89	228	83	74
424	56.032	0.135	0.084	1.76	101	-0.74	99	0.9	-0.1	89	231	84	74
425	56.167	0.135	0.087	1.76	101	-1.07	97	0.9	0	89	229	84	74
426	56.297	0.130	0.082	1.77	101	-0.89	96	0.9	0	89	228	84	74
427	56.435	0.138	0.081	1.81	101	-1	103	0.9	0	89	229	84	74
428	56.567	0.132	0.092	1.80	101	-0.83	92	0.9	0	89	228	84	74
429	56.701	0.134	0.079	1.78	101	-0.87	101	0.9	0	89	228	84	74
430	56.836	0.135	0.077	1.78	101	-1.08	103	0.8	-0.1	89	227	84	74
431	56.968	0.132	0.071	1.76	101	-1.1	105	0.8	0	88	227	84	74
432	57.102	0.134	0.091	1.76	101	-0.8	94	0.8	0	88	226	83	74
433	57.238	0.136	0.082	1.79	101	-1	101	0.8	0	88	225	84	74
434	57.368	0.130	0.073	1.76	101	-0.7	102	0.8	0	88	227	83	74
435	57.505	0.137	0.077	1.78	101	-0.81	105	0.7	-0.1	88	227	84	74
436	57.638	0.133	0.085	1.79	101	-1.3	97	0.8	0.1	88	226	84	74
437	57.771	0.133	0.085	1.77	101	-0.82	97	0.7	-0.1	88	225	84	74
438	57.907	0.136	0.084	1.78	101	-1.02	99	0.7	0	88	226	84	74
439	58.039	0.132	0.092	1.76	101	-1.21	92	0.7	0	88	228	83	74
440	58.172	0.133	0.082	1.74	101	-0.81	98	0.7	0	88	228	83	74
441	58.308	0.136	0.074	1.75	101	-0.79	106	0.7	0	88	227	83	74

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Englands' Stove Works
Model: 32-NC
Run #: 3

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/24/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
442	58.439	0.131	0.077	1.77	101	-0.99	100	0.7	0	88	227	84	74
443	58.575	0.136	0.078	1.77	101	-0.91	103	0.6	-0.1	88	225	84	74
444	58.709	0.134	0.073	1.76	101	-0.74	105	0.6	0	88	225	83	74
445	58.840	0.131	0.078	1.77	101	-0.9	99	0.6	0	88	224	84	74
446	58.977	0.137	0.073	1.76	101	-0.86	107	0.6	0	88	225	83	74
447	59.109	0.132	0.089	1.76	101	-0.86	94	0.6	0	88	225	83	74
448	59.243	0.134	0.074	1.78	101	-1.07	104	0.7	0.1	88	225	83	74
449	59.377	0.134	0.088	1.76	101	-0.87	96	0.5	-0.2	88	224	83	74
450	59.510	0.133	0.069	1.75	101	-1.11	107	0.5	0	88	224	83	74
451	59.643	0.133	0.092	1.76	101	-1.02	93	0.5	0	88	225	83	74
452	59.780	0.137	0.073	1.76	101	-0.85	107	0.5	0	88	224	83	74
453	59.910	0.130	0.082	1.74	101	-1.07	96	0.5	0	88	223	83	74
454	60.047	0.137	0.083	1.74	101	-0.69	101	0.5	0	88	223	83	74
455	60.179	0.132	0.072	1.77	101	-1.11	104	0.4	-0.1	88	224	83	74
456	60.312	0.133	0.074	1.76	101	-0.97	104	0.4	0	88	223	83	74
457	60.448	0.136	0.076	1.76	101	-1.07	105	0.5	0.1	88	223	83	74
458	60.580	0.132	0.083	1.78	101	-0.75	97	0.4	-0.1	88	223	83	74
459	60.713	0.133	0.086	1.78	101	-0.94	96	0.4	0	88	221	83	74
460	60.849	0.136	0.090	1.76	101	-0.8	96	0.4	0	88	222	83	74
461	60.980	0.131	0.092	1.77	101	-1.05	92	0.4	0	88	222	83	74
462	61.115	0.135	0.092	1.78	101	-0.81	94	0.3	-0.1	88	223	83	74
463	61.250	0.135	0.086	1.76	101	-0.7	98	0.3	0	88	222	83	74
464	61.381	0.131	0.086	1.74	101	-0.88	95	0.3	0	88	223	83	74
465	61.518	0.137	0.085	1.79	101	-0.93	100	0.3	0	88	222	83	74
466	61.650	0.132	0.078	1.80	101	-0.88	100	0.3	0	88	222	83	74
467	61.783	0.133	0.077	1.81	101	-0.98	102	0.3	0	88	221	83	74
468	61.918	0.135	0.076	1.76	101	-0.81	104	0.3	0	88	221	83	74
469	62.051	0.133	0.090	1.76	101	-0.84	94	0.2	-0.1	88	221	83	74
470	62.184	0.133	0.089	1.78	101	-1.06	94	0.2	0	88	221	83	73
471	62.321	0.137	0.072	1.78	101	-0.94	108	0.2	0	88	222	83	74
472	62.451	0.130	0.078	1.79	101	-0.76	99	0.2	0	88	221	83	73
473	62.588	0.137	0.083	1.79	101	-0.77	101	0.2	0	88	221	83	74
474	62.721	0.133	0.092	1.77	101	-0.69	93	0.1	-0.1	88	221	83	74
475	62.853	0.132	0.079	1.79	101	-1.06	99	0.1	0	88	219	83	74

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: Englands' Stove Works
Model: 32-NC
Run #: 3

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/24/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
476	62.989	0.136	0.074	1.80	101	-0.95	106	0.1	0	87	220	83	73
477	63.122	0.133	0.082	1.79	101	-0.98	98	0.1	0	87	220	83	73
478	63.254	0.132	0.089	1.76	101	-1	94	0.1	0	87	220	83	73
479	63.390	0.136	0.083	1.77	101	-1.06	100	0.1	0	87	219	83	74
480	63.521	0.131	0.071	1.79	101	-0.57	104	0.1	0	87	220	83	73
481	63.656	0.135	0.075	1.77	101	-1.01	104	0.0	-0.1	87	219	83	74
Avg/Tot	63.656	0.132	0.082	1.76	98	-1.17	100			100	319	84	74.2

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Englands' Stove Works
Model: 32-NC
Run #: 3

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/24/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
0	0.000		0.00	73	-1		84	0.000	6.79	0.20
1	0.107	0.107	1.72	73	-0.64	92	84	0.000	7.33	0.17
2	0.236	0.129	1.77	73	-2.58	107	85	0.000	4.57	0.24
3	0.365	0.129	1.77	73	-2.54	102	85	0.000	7.02	0.61
4	0.490	0.125	1.75	73	-0.31	102	85	0.000	11.11	0.40
5	0.617	0.127	1.75	73	-2.05	102	85	-0.010	11.93	0.56
6	0.748	0.131	1.75	73	-2.95	102	85	-0.010	11.42	0.55
7	0.874	0.126	1.75	73	-3.08	97	85	0.000	9.27	0.36
8	1.001	0.127	1.76	73	-3.05	101	85	0.000	9.64	0.34
9	1.130	0.129	1.75	73	-2.91	109	85	-0.010	9.88	0.34
10	1.256	0.126	1.76	74	-0.29	111	85	0.000	10.13	0.33
11	1.383	0.127	1.76	74	-1.77	109	84	0.000	10.82	0.28
12	1.513	0.130	1.77	74	-2.74	105	84	0.000	10.97	0.39
13	1.640	0.127	1.77	74	-2.69	113	84	0.000	9.69	0.38
14	1.765	0.125	1.75	74	-0.9	106	84	0.000	8.78	0.29
15	1.895	0.130	1.74	75	-2.12	101	84	0.000	8.97	0.31
16	2.024	0.129	1.75	75	-2.19	96	84	-0.010	9.32	0.30
17	2.150	0.126	1.75	75	-2.99	100	85	0.000	9.41	0.31
18	2.277	0.127	1.76	75	-0.73	102	85	0.000	9.19	0.31
19	2.408	0.131	1.75	76	-2.87	102	85	0.000	9.01	0.36
20	2.535	0.127	1.76	76	-0.75	96	85	0.000	8.94	0.33
21	2.662	0.127	1.77	76	-2	97	85	0.000	9.26	0.34
22	2.792	0.130	1.76	76	-2.16	106	85	-0.010	9.67	0.32
23	2.920	0.128	1.77	77	-3.14	97	85	0.000	10.67	0.46
24	3.047	0.127	1.77	77	-2.65	96	85	0.000	10.28	0.47
25	3.178	0.131	1.77	77	-2.83	100	85	0.000	10.26	0.49
26	3.305	0.127	1.75	78	-0.28	106	85	0.000	10.83	0.69
27	3.433	0.128	1.76	78	-0.62	107	85	0.000	11.20	0.72
28	3.563	0.130	1.77	79	-2.74	97	84	-0.010	11.38	0.72
29	3.692	0.129	1.78	79	-0.87	97	84	0.000	11.66	0.67
30	3.818	0.126	1.76	79	-0.27	95	84	0.000	11.82	0.60
31	3.949	0.131	1.75	80	-0.2	102	84	0.000	12.11	0.53
32	4.080	0.131	1.78	80	-2.97	104	84	0.000	12.07	0.59

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Englands' Stove Works
Model: 32-NC
Run #: 3

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/24/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
33	4.206	0.126	1.76	80	-0.16	97	84	0.000	11.98	0.52
34	4.335	0.129	1.77	81	-0.21	102	84	0.000	11.73	0.48
35	4.466	0.131	1.77	81	-1.11	118	84	-0.010	11.59	0.45
36	4.594	0.128	1.76	81	-1.72	105	84	0.010	11.32	0.38
37	4.722	0.128	1.77	82	-1.17	104	84	0.000	11.07	0.34
38	4.854	0.132	1.77	82	-0.27	114	84	0.000	10.83	0.33
39	4.983	0.129	1.77	83	-2.12	109	84	-0.010	10.56	0.30
40	5.111	0.128	1.77	83	-2.67	105	84	-0.010	10.29	0.28
41	5.243	0.132	1.77	83	-3	99	84	-0.010	9.97	0.24
42	5.372	0.129	1.76	84	-2.69	103	84	0.010	9.71	0.28
43	5.501	0.129	1.76	84	-0.27	103	84	-0.010	9.38	0.30
44	5.633	0.132	1.77	84	-0.66	104	84	0.000	9.15	0.31
45	5.762	0.129	1.78	85	-3.11	98	84	0.000	8.90	0.33
46	5.891	0.129	1.76	85	-0.15	102	84	0.000	8.63	0.37
47	6.023	0.132	1.77	85	-2.83	109	84	0.010	8.46	0.42
48	6.153	0.130	1.79	86	-0.18	104	84	0.000	8.34	0.41
49	6.282	0.129	1.77	86	-0.29	102	84	0.000	8.39	0.40
50	6.414	0.132	1.78	86	-0.16	111	84	0.000	8.26	0.43
51	6.544	0.130	1.78	87	-0.22	107	84	0.000	8.26	0.39
52	6.673	0.129	1.76	87	-0.3	108	84	-0.010	8.08	0.44
53	6.806	0.133	1.78	87	-1.48	103	84	0.000	8.00	0.43
54	6.936	0.130	1.77	88	-0.18	95	84	0.000	7.96	0.42
55	7.065	0.129	1.79	88	-3.04	99	84	0.000	8.04	0.43
56	7.198	0.133	1.78	88	-3	100	84	0.000	8.04	0.39
57	7.328	0.130	1.79	89	-0.23	101	84	0.000	8.15	0.37
58	7.458	0.130	1.77	89	-0.72	100	84	0.000	8.06	0.37
59	7.591	0.133	1.77	89	-3.1	101	84	0.000	8.16	0.37
60	7.721	0.130	1.78	89	-0.58	98	84	-0.010	8.12	0.32
61	7.850	0.129	1.77	90	-0.17	95	84	-0.010	8.02	0.43
62	7.984	0.134	1.77	90	-0.42	107	85	0.000	7.61	0.54
63	8.112	0.128	1.77	90	-0.31	105	84	0.000	7.03	0.65
64	8.242	0.130	1.75	90	-3.25	97	84	0.000	6.27	0.82
65	8.375	0.133	1.75	91	-0.29	101	84	0.000	5.77	0.88

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Englands' Stove Works
Model: 32-NC
Run #: 3

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/24/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
66	8.503	0.128	1.75	91	-1.38	105	84	0.000	5.52	0.86
67	8.631	0.128	1.73	91	-2.19	95	84	0.010	5.26	0.86
68	8.763	0.132	1.72	91	-0.81	95	84	-0.010	5.19	0.88
69	8.891	0.128	1.71	92	-0.72	105	84	-0.010	5.05	0.88
70	9.018	0.127	1.70	92	-1.46	106	84	0.000	5.02	0.88
71	9.149	0.131	1.70	92	-0.28	105	84	-0.010	5.08	0.89
72	9.277	0.128	1.69	92	-1.55	99	84	0.000	5.01	0.91
73	9.407	0.130	1.80	92	-1.09	103	84	0.000	5.16	0.94
74	9.540	0.133	1.78	93	-3.36	94	84	0.000	5.26	0.95
75	9.672	0.132	1.79	93	-1.41	99	84	0.000	5.67	0.94
76	9.802	0.130	1.78	93	-3.15	109	84	0.000	6.07	0.89
77	9.936	0.134	1.77	93	-3.39	102	84	0.010	7.09	0.77
78	10.066	0.130	1.74	93	-0.56	96	84	0.000	7.73	0.67
79	10.195	0.129	1.74	94	-1.5	99	84	-0.010	8.23	0.56
80	10.327	0.132	1.72	94	-0.51	96	84	0.010	8.37	0.52
81	10.455	0.128	1.66	94	-1.18	107	84	0.000	8.52	0.48
82	10.580	0.125	1.60	94	-3.46	98	84	0.000	8.65	0.46
83	10.705	0.125	1.55	94	-0.96	94	84	0.000	8.71	0.44
84	10.827	0.122	1.51	94	-3.68	98	84	0.000	8.93	0.47
85	10.946	0.119	1.46	95	-2.63	98	84	-0.010	8.95	0.42
86	11.063	0.117	1.41	95	-3.99	94	84	0.010	8.97	0.40
87	11.180	0.117	1.37	95	-1.32	86	84	0.000	8.94	0.41
88	11.295	0.115	1.33	95	-1.82	95	84	0.000	8.98	0.40
89	11.433	0.138	2.41	95	-4.17	109	84	-0.010	9.05	0.41
90	11.581	0.148	1.79	95	-1.71	108	85	0.010	9.04	0.41
91	11.711	0.130	1.77	96	-2.92	105	84	0.000	9.17	0.37
92	11.841	0.130	1.76	96	-1.73	108	84	0.000	9.30	0.32
93	11.973	0.132	1.73	96	-3.59	98	84	0.000	9.41	0.29
94	12.102	0.129	1.71	96	-1.96	104	84	-0.010	9.50	0.29
95	12.230	0.128	1.72	96	-2.01	96	84	-0.010	9.25	0.28
96	12.360	0.130	1.70	96	-4.61	101	84	0.000	9.20	0.31
97	12.489	0.129	1.71	96	-1.95	103	85	0.010	8.95	0.32
98	12.615	0.126	1.68	97	-1.98	101	85	0.000	8.82	0.31

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Englands' Stove Works
Model: 32-NC
Run #: 3

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/24/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
99	12.745	0.130	1.66	97	-2.56	104	85	0.000	8.61	0.31
100	12.873	0.128	1.64	97	-2.33	102	84	0.000	8.51	0.30
101	12.998	0.125	1.62	97	-2.18	91	85	0.000	8.50	0.30
102	13.122	0.124	1.59	97	-2.74	102	84	0.000	8.35	0.33
103	13.248	0.126	1.57	97	-2.16	93	84	-0.010	8.17	0.34
104	13.372	0.124	1.55	97	-4.53	98	84	0.000	8.23	0.33
105	13.493	0.121	1.54	97	-3.16	89	84	-0.010	8.22	0.38
106	13.616	0.123	1.51	98	-2.58	98	84	-0.010	8.18	0.34
107	13.738	0.122	1.49	98	-4.94	103	84	-0.010	8.29	0.34
108	13.858	0.120	1.47	98	-2.96	90	85	0.000	8.34	0.34
109	13.978	0.120	1.68	98	-3.22	90	85	-0.010	8.24	0.36
110	14.108	0.130	1.76	98	-4.05	101	85	-0.010	8.20	0.38
111	14.244	0.136	1.75	98	-3.44	107	84	0.000	8.20	0.36
112	14.392	0.148	2.87	98	-3.06	122	83	0.000	8.21	0.37
113	14.539	0.147	1.79	98	-3.23	122	84	0.000	8.31	0.35
114	14.668	0.129	1.78	98	-3.51	92	85	-0.010	8.09	0.36
115	14.802	0.134	1.77	99	0	106	85	0.000	8.17	0.36
116	14.935	0.133	1.77	99	0	104	85	-0.020	8.16	0.34
117	15.065	0.130	1.77	99	0	98	85	-0.010	7.98	0.35
118	15.199	0.134	1.78	99	-2.45	98	85	0.000	7.99	0.37
119	15.330	0.131	1.77	99	0	105	85	0.000	7.94	0.37
120	15.462	0.132	1.78	99	-0.8	101	85	0.010	7.90	0.37
121	15.595	0.133	1.79	99	-3.44	95	84	0.000	7.86	0.37
122	15.727	0.132	1.78	99	-0.41	98	84	0.000	7.78	0.36
123	15.858	0.131	1.77	99	-3.32	105	84	0.000	7.71	0.39
124	15.991	0.133	1.77	99	-0.03	106	84	0.000	7.73	0.36
125	16.123	0.132	1.78	99	0	105	84	0.000	7.72	0.37
126	16.254	0.131	1.78	100	-2.59	94	84	0.000	7.81	0.38
127	16.389	0.135	1.77	100	0	112	84	-0.010	7.83	0.38
128	16.519	0.130	1.77	100	-1.31	106	84	-0.010	7.82	0.37
129	16.650	0.131	1.76	100	-0.29	107	84	0.000	7.84	0.36
130	16.785	0.135	1.76	100	-2.94	98	84	-0.010	7.78	0.35
131	16.915	0.130	1.76	100	-0.45	96	84	0.000	7.87	0.36

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Englands' Stove Works
Model: 32-NC
Run #: 3

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/24/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
132	17.048	0.133	1.78	100	-2.46	107	84	-0.010	7.97	0.35
133	17.181	0.133	1.77	100	-3.17	103	84	0.000	7.88	0.33
134	17.311	0.130	1.77	100	-1.64	93	84	0.000	8.03	0.32
135	17.446	0.135	1.79	100	-0.5	98	84	0.000	7.98	0.34
136	17.577	0.131	1.78	100	-0.23	101	84	-0.010	7.92	0.33
137	17.708	0.131	1.79	100	-0.45	102	84	-0.010	7.99	0.35
138	17.842	0.134	1.76	100	0	102	84	-0.010	8.08	0.33
139	17.974	0.132	1.79	100	0	96	84	0.000	8.17	0.33
140	18.105	0.131	1.77	101	-0.42	95	85	0.000	8.26	0.33
141	18.238	0.133	1.78	101	0	104	85	0.000	8.40	0.31
142	18.371	0.133	1.79	101	-3.5	103	85	-0.010	8.33	0.31
143	18.502	0.131	1.78	101	0	95	85	-0.020	8.40	0.34
144	18.636	0.134	1.77	101	-3.53	97	85	-0.010	8.46	0.36
145	18.767	0.131	1.79	101	0	102	84	-0.010	8.38	0.31
146	18.898	0.131	1.76	101	-3.55	99	84	-0.010	8.44	0.33
147	19.034	0.136	1.76	101	-3.46	105	84	0.010	8.35	0.33
148	19.163	0.129	1.76	101	-2.84	99	84	0.000	8.32	0.31
149	19.297	0.134	1.78	101	-0.73	107	84	0.000	8.32	0.30
150	19.429	0.132	1.78	101	-0.63	102	84	0.000	8.37	0.32
151	19.560	0.131	1.78	101	-3.2	102	84	-0.010	8.47	0.28
152	19.695	0.135	1.77	101	0	99	84	-0.010	8.51	0.28
153	19.826	0.131	1.77	101	-3.4	95	84	0.000	8.65	0.26
154	19.957	0.131	1.78	101	-3.46	105	84	0.000	8.70	0.27
155	20.091	0.134	1.77	101	-0.01	105	84	0.000	8.94	0.25
156	20.223	0.132	1.77	101	0	98	84	-0.010	8.91	0.30
157	20.354	0.131	1.78	101	-0.51	106	84	0.000	8.87	0.31
158	20.488	0.134	1.77	101	-3.2	99	84	-0.010	8.94	0.27
159	20.620	0.132	1.78	101	-3.1	102	84	0.000	8.87	0.27
160	20.751	0.131	1.78	101	-2.47	96	84	-0.010	8.65	0.27
161	20.886	0.135	1.78	102	-3.42	100	84	0.000	8.58	0.25
162	21.016	0.130	1.77	102	-0.66	95	84	-0.010	8.42	0.27
163	21.148	0.132	1.79	102	-2.98	100	84	-0.020	8.34	0.26
164	21.283	0.135	1.79	102	-2.09	109	84	0.000	8.22	0.24

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Englands' Stove Works
Model: 32-NC
Run #: 3

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/24/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
165	21.412	0.129	1.77	102	-0.68	99	84	0.000	8.18	0.23
166	21.546	0.134	1.78	102	0	102	84	-0.010	8.14	0.25
167	21.678	0.132	1.77	102	-2.48	106	84	-0.010	8.07	0.26
168	21.809	0.131	1.78	102	-3.61	101	84	-0.010	8.18	0.25
169	21.944	0.135	1.78	102	0	108	84	-0.010	8.03	0.24
170	22.075	0.131	1.78	102	0	94	84	0.000	8.04	0.24
171	22.206	0.131	1.78	102	-0.56	103	84	-0.010	8.08	0.25
172	22.340	0.134	1.78	102	-3.1	106	84	0.000	8.01	0.25
173	22.472	0.132	1.78	102	-3.34	96	84	-0.010	7.86	0.24
174	22.603	0.131	1.78	102	-0.48	107	84	0.000	7.77	0.23
175	22.737	0.134	1.76	102	-0.22	102	84	-0.010	7.63	0.24
176	22.870	0.133	1.78	102	-3.08	97	84	0.000	7.53	0.23
177	23.000	0.130	1.76	102	-3.55	107	85	-0.010	7.43	0.25
178	23.135	0.135	1.78	102	-0.85	112	85	0.000	1.38	0.05
179	23.265	0.130	1.77	102	0	95	85	0.000	7.03	0.23
180	23.398	0.133	1.77	102	-0.02	97	85	0.000	6.69	0.29
181	23.532	0.134	1.77	102	-0.11	97	85	0.000	2.49	0.13
182	23.661	0.129	1.78	102	-3.39	104	84	0.000	6.19	0.50
183	23.796	0.135	1.77	102	0	100	85	0.000	5.87	0.65
184	23.928	0.132	1.78	102	-2.81	97	85	0.010	5.91	0.66
185	24.059	0.131	1.77	102	-0.27	99	85	0.000	6.17	0.56
186	24.193	0.134	1.76	102	0	95	85	0.000	6.17	0.56
187	24.325	0.132	1.76	102	-0.71	95	84	0.000	6.21	0.54
188	24.457	0.132	1.78	102	0	95	84	0.000	6.22	0.53
189	24.590	0.133	1.76	102	0	97	84	-0.010	6.32	0.51
190	24.723	0.133	1.77	102	0	103	84	0.000	6.36	0.49
191	24.853	0.130	1.76	102	-2.52	91	84	0.000	6.54	0.50
192	24.988	0.135	1.76	103	-2.24	97	84	0.000	6.43	0.48
193	25.119	0.131	1.77	103	-3.35	103	84	0.000	6.41	0.49
194	25.250	0.131	1.78	103	-3.21	93	84	-0.010	6.39	0.49
195	25.386	0.136	1.78	103	0	107	84	-0.020	6.28	0.49
196	25.516	0.130	1.79	103	-0.93	103	84	-0.010	6.34	0.51
197	25.649	0.133	1.77	103	-3.44	97	84	0.010	6.33	0.52

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Englands' Stove Works
Model: 32-NC
Run #: 3

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/24/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
198	25.782	0.133	1.78	103	0	104	84	0.000	6.23	0.54
199	25.912	0.130	1.77	103	0	94	84	0.000	6.31	0.53
200	26.048	0.136	1.79	103	-2.23	109	84	-0.010	6.16	0.58
201	26.179	0.131	1.77	103	-0.18	92	84	-0.010	6.10	0.59
202	26.310	0.131	1.76	103	0	93	84	0.000	6.06	0.61
203	26.444	0.134	1.74	103	0	112	84	-0.010	6.04	0.62
204	26.576	0.132	1.77	103	-2.03	113	84	-0.020	6.02	0.64
205	26.708	0.132	1.77	103	-2.88	103	84	-0.010	6.06	0.66
206	26.841	0.133	1.76	103	-3.37	100	84	-0.010	6.25	0.64
207	26.973	0.132	1.77	103	0	97	84	0.000	6.32	0.64
208	27.105	0.132	1.77	103	-3.1	105	84	-0.010	6.19	0.63
209	27.239	0.134	1.76	103	-0.37	102	84	0.000	6.32	0.65
210	27.370	0.131	1.77	103	-1.48	94	84	0.000	6.27	0.67
211	27.502	0.132	1.78	103	-3.18	99	84	0.000	6.27	0.66
212	27.637	0.135	1.77	103	-3.38	107	84	-0.010	6.15	0.66
213	27.766	0.129	1.76	103	-2.56	95	84	0.000	6.18	0.68
214	27.900	0.134	1.76	103	-1.07	97	84	-0.010	6.14	0.69
215	28.033	0.133	1.75	103	-0.33	101	84	0.000	6.14	0.68
216	28.163	0.130	1.76	103	0	104	84	0.000	6.03	0.70
217	28.297	0.134	1.76	103	-3.6	103	84	0.000	6.07	0.68
218	28.428	0.131	1.77	103	0	107	84	0.000	6.14	0.70
219	28.560	0.132	1.76	103	-3.29	105	84	0.000	6.18	0.69
220	28.694	0.134	1.78	103	-3.44	100	84	-0.010	6.26	0.72
221	28.826	0.132	1.76	103	-0.32	90	84	0.000	6.31	0.63
222	28.957	0.131	1.78	103	-0.48	95	84	0.000	6.34	0.62
223	29.091	0.134	1.76	103	-0.77	99	84	0.000	6.33	0.64
224	29.223	0.132	1.77	103	0	100	84	-0.010	6.23	0.64
225	29.354	0.131	1.76	103	-3.5	95	84	0.010	6.32	0.62
226	29.489	0.135	1.76	103	0	105	84	0.000	6.18	0.65
227	29.619	0.130	1.76	103	-2.55	96	84	0.000	6.33	0.63
228	29.752	0.133	1.77	103	-0.71	100	84	0.000	6.13	0.64
229	29.886	0.134	1.78	103	-3.07	104	84	0.000	6.19	0.64
230	30.015	0.129	1.76	103	-3.12	93	84	0.000	6.12	0.63

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Englands' Stove Works
Model: 32-NC
Run #: 3

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/24/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
231	30.150	0.135	1.78	103	0	100	84	-0.010	6.30	0.61
232	30.282	0.132	1.77	103	-0.56	108	84	-0.010	6.22	0.62
233	30.413	0.131	1.77	103	0	106	84	0.000	6.30	0.61
234	30.547	0.134	1.78	103	-1.2	109	84	-0.010	6.23	0.60
235	30.679	0.132	1.76	103	0	97	84	0.000	6.25	0.60
236	30.811	0.132	1.77	103	-1.77	96	84	0.000	6.37	0.58
237	30.944	0.133	1.76	103	0	96	84	0.000	6.24	0.58
238	31.076	0.132	1.77	103	-2.26	99	84	-0.010	6.26	0.59
239	31.206	0.130	1.77	103	-3.01	98	84	0.000	6.32	0.56
240	31.342	0.136	1.76	103	-3.47	108	84	0.000	6.21	0.58
241	31.473	0.131	1.76	103	0	103	84	0.010	6.24	0.57
242	31.604	0.131	1.77	103	0	96	84	0.000	6.30	0.59
243	31.739	0.135	1.77	103	-0.15	101	84	0.000	6.10	0.59
244	31.869	0.130	1.77	103	-3.55	99	84	-0.020	5.96	0.64
245	32.002	0.133	1.76	104	-3.27	111	84	-0.010	5.95	0.65
246	32.135	0.133	1.77	104	0	96	84	0.000	5.83	0.65
247	32.265	0.130	1.75	104	-0.46	95	84	0.000	5.80	0.66
248	32.400	0.135	1.73	104	-2.08	96	85	-0.010	5.79	0.64
249	32.531	0.131	1.77	104	-0.2	95	85	-0.010	5.77	0.66
250	32.663	0.132	1.78	104	-3.48	105	85	0.000	5.68	0.73
251	32.796	0.133	1.77	104	0	101	85	-0.010	5.86	0.72
252	32.928	0.132	1.77	104	-2.38	97	85	-0.010	5.70	0.74
253	33.060	0.132	1.76	104	-3.19	108	85	-0.010	5.74	0.71
254	33.193	0.133	1.76	104	-0.26	98	84	0.000	5.78	0.77
255	33.325	0.132	1.76	104	-1.12	100	84	0.000	5.74	0.74
256	33.455	0.130	1.74	104	-0.04	103	84	0.000	5.70	0.73
257	33.590	0.135	1.75	104	-3.52	95	85	0.000	5.82	0.68
258	33.721	0.131	1.77	104	-3.13	108	84	0.000	5.83	0.71
259	33.852	0.131	1.76	104	-1.98	101	84	-0.010	5.82	0.70
260	33.987	0.135	1.75	104	-0.37	95	84	0.000	5.81	0.67
261	34.117	0.130	1.76	104	0	104	84	0.000	5.75	0.72
262	34.250	0.133	1.77	104	-3.35	100	84	0.000	5.57	0.74
263	34.383	0.133	1.76	104	0	95	84	0.000	5.45	0.78

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Englands' Stove Works
Model: 32-NC
Run #: 3

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/24/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
264	34.512	0.129	1.75	104	-0.66	94	84	0.000	5.51	0.80
265	34.647	0.135	1.75	104	-0.53	98	84	0.000	5.45	0.79
266	34.779	0.132	1.76	104	-0.51	97	84	-0.010	5.56	0.79
267	34.910	0.131	1.77	104	-3.16	95	84	0.000	5.47	0.78
268	35.043	0.133	1.78	104	-1.53	109	84	-0.010	5.53	0.80
269	35.175	0.132	1.75	104	-3.41	94	84	0.000	5.44	0.79
270	35.307	0.132	1.76	104	-2.94	94	84	-0.020	5.62	0.81
271	35.440	0.133	1.76	104	-0.11	98	84	-0.010	5.51	0.80
272	35.572	0.132	1.76	104	0	105	84	-0.010	5.58	0.80
273	35.702	0.130	1.77	104	-2.09	96	84	-0.010	5.59	0.78
274	35.837	0.135	1.77	104	-3.54	92	84	-0.010	5.47	0.75
275	35.969	0.132	1.77	104	-2.39	103	84	0.000	5.41	0.77
276	36.099	0.130	1.77	104	-2.99	102	84	-0.010	5.42	0.77
277	36.234	0.135	1.76	104	-2.21	95	84	0.000	5.46	0.74
278	36.364	0.130	1.76	104	-0.99	100	84	-0.010	5.43	0.68
279	36.497	0.133	1.76	104	-0.29	98	84	-0.010	5.43	0.74
280	36.631	0.134	1.76	104	-0.45	105	84	0.000	5.55	0.72
281	36.760	0.129	1.76	104	-3.56	103	84	-0.010	5.37	0.77
282	36.894	0.134	1.76	104	-2.29	98	84	0.010	5.46	0.75
283	37.027	0.133	1.76	104	-0.34	108	84	-0.010	5.39	0.79
284	37.158	0.131	1.76	104	-3.4	99	84	-0.010	5.37	0.75
285	37.291	0.133	1.76	104	-3.36	98	84	0.000	5.35	0.74
286	37.423	0.132	1.76	104	0	99	84	0.000	5.47	0.73
287	37.555	0.132	1.76	104	-2.82	100	84	0.000	5.43	0.72
288	37.688	0.133	1.77	104	-3.35	96	84	0.000	5.42	0.74
289	37.820	0.132	1.77	104	-1.02	97	84	0.000	5.46	0.71
290	37.951	0.131	1.77	104	-1.24	100	84	-0.010	5.45	0.72
291	38.086	0.135	1.77	104	-0.6	107	84	0.000	5.48	0.71
292	38.217	0.131	1.75	104	-1.18	97	84	0.000	5.46	0.71
293	38.348	0.131	1.76	104	0	102	84	-0.010	5.53	0.70
294	38.482	0.134	1.76	104	-2.58	108	84	0.000	5.57	0.69
295	38.613	0.131	1.77	104	-2.47	104	84	0.000	5.40	0.68
296	38.746	0.133	1.76	104	-2.52	105	84	0.000	5.41	0.68

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Englands' Stove Works
Model: 32-NC
Run #: 3

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/24/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
297	38.879	0.133	1.76	104	-3.2	94	84	0.000	5.50	0.65
298	39.009	0.130	1.75	104	-3.42	102	84	0.000	5.58	0.67
299	39.143	0.134	1.75	104	0	102	84	0.000	5.58	0.64
300	39.276	0.133	1.75	104	-3.53	99	84	0.000	5.44	0.66
301	39.406	0.130	1.77	104	-2.71	104	84	-0.010	5.44	0.63
302	39.540	0.134	1.76	104	-2.37	107	84	0.000	5.34	0.61
303	39.672	0.132	1.76	104	-0.11	97	84	-0.010	5.17	0.62
304	39.804	0.132	1.78	104	0	99	84	-0.010	5.25	0.64
305	39.937	0.133	1.76	104	-0.52	99	84	-0.020	5.14	0.65
306	40.069	0.132	1.75	104	-2.71	95	84	0.000	5.20	0.61
307	40.199	0.130	1.75	104	0	97	84	-0.010	5.12	0.63
308	40.334	0.135	1.77	104	0	107	84	0.000	5.19	0.62
309	40.465	0.131	1.75	104	-2.12	92	84	-0.010	5.10	0.63
310	40.596	0.131	1.76	104	-3.35	90	84	0.000	5.28	0.60
311	40.731	0.135	1.77	104	-0.4	101	84	-0.010	5.14	0.64
312	40.862	0.131	1.76	104	-3.02	102	84	-0.010	5.15	0.64
313	40.995	0.133	1.76	104	0	103	84	0.000	5.12	0.65
314	41.128	0.133	1.77	104	-3.23	100	84	-0.010	5.13	0.68
315	41.258	0.130	1.75	104	-0.32	93	84	0.000	5.07	0.66
316	41.393	0.135	1.74	104	-1.15	95	84	-0.010	5.10	0.64
317	41.524	0.131	1.75	104	-0.74	100	84	0.000	5.24	0.62
318	41.655	0.131	1.75	104	-0.56	102	84	0.000	5.12	0.61
319	41.789	0.134	1.76	104	-0.72	109	84	0.010	5.14	0.62
320	41.921	0.132	1.76	104	-3.1	95	84	0.000	4.90	0.66
321	42.053	0.132	1.75	104	0	96	84	0.000	4.99	0.63
322	42.186	0.133	1.77	104	-3.58	93	84	0.000	5.03	0.62
323	42.318	0.132	1.76	104	-0.53	95	84	0.010	4.95	0.62
324	42.449	0.131	1.77	104	-3.57	92	84	0.000	4.86	0.63
325	42.583	0.134	1.75	104	-3.39	95	84	-0.010	4.90	0.57
326	42.714	0.131	1.76	104	-3.31	101	84	-0.010	4.87	0.62
327	42.846	0.132	1.75	104	-1.82	99	84	0.000	4.94	0.60
328	42.981	0.135	1.76	104	-2.97	101	84	-0.010	4.86	0.60
329	43.111	0.130	1.76	104	-3.01	95	84	0.000	4.99	0.57

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Englands' Stove Works
Model: 32-NC
Run #: 3

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/24/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
330	43.244	0.133	1.77	104	0	100	84	0.010	4.92	0.58
331	43.377	0.133	1.76	104	-2.69	102	84	0.000	4.96	0.59
332	43.508	0.131	1.77	104	-1.15	96	84	0.000	4.92	0.58
333	43.642	0.134	1.76	104	-2.97	104	84	0.000	4.90	0.57
334	43.773	0.131	1.77	104	-1.67	107	84	-0.010	4.85	0.55
335	43.905	0.132	1.76	104	-2.56	98	85	-0.010	4.77	0.55
336	44.038	0.133	1.74	104	-1.07	100	85	-0.010	4.83	0.56
337	44.171	0.133	1.75	104	-1.11	96	85	0.000	4.85	0.57
338	44.302	0.131	1.77	104	-3.1	100	85	-0.010	4.81	0.56
339	44.435	0.133	1.77	104	-2.28	97	85	0.000	4.73	0.57
340	44.567	0.132	1.77	104	-0.74	99	85	-0.010	4.75	0.60
341	44.698	0.131	1.77	104	-2.53	100	84	0.000	4.75	0.58
342	44.833	0.135	1.76	104	-3.5	99	84	-0.010	4.83	0.58
343	44.963	0.130	1.76	104	-3.63	100	84	0.000	4.80	0.59
344	45.095	0.132	1.75	104	0	107	84	0.000	4.70	0.58
345	45.230	0.135	1.77	104	-0.94	103	84	0.010	4.86	0.57
346	45.359	0.129	1.77	104	-3.31	104	84	-0.010	4.84	0.56
347	45.493	0.134	1.75	104	-0.38	103	84	0.000	4.74	0.58
348	45.626	0.133	1.78	104	-0.59	95	84	0.000	4.83	0.57
349	45.756	0.130	1.76	104	-2.72	104	84	0.000	4.71	0.56
350	45.891	0.135	1.76	104	-3.55	98	85	-0.010	4.70	0.57
351	46.022	0.131	1.77	104	-2.87	106	85	0.010	4.82	0.56
352	46.153	0.131	1.76	104	-3.23	93	85	0.000	4.67	0.57
353	46.287	0.134	1.76	104	-2.74	100	85	-0.010	4.66	0.57
354	46.419	0.132	1.76	104	-2.72	104	84	-0.010	4.66	0.56
355	46.550	0.131	1.78	104	-3.34	101	84	0.000	4.68	0.58
356	46.684	0.134	1.75	104	0	103	84	-0.010	4.72	0.54
357	46.816	0.132	1.75	104	-0.01	102	84	0.000	4.62	0.55
358	46.947	0.131	1.77	104	0	93	84	0.000	4.66	0.55
359	47.082	0.135	1.75	104	-0.04	95	84	0.000	4.59	0.55
360	47.212	0.130	1.76	104	0	96	84	0.000	4.63	0.56
361	47.345	0.133	1.77	104	0	96	84	-0.010	4.64	0.59
362	47.479	0.134	1.75	104	0	96	84	0.000	4.55	0.60

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Englands' Stove Works
Model: 32-NC
Run #: 3

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/24/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
363	47.608	0.129	1.75	104	-2.19	91	84	0.000	4.52	0.56
364	47.742	0.134	1.77	104	0	97	84	0.000	4.54	0.55
365	47.875	0.133	1.76	104	-2.36	107	84	-0.020	4.45	0.55
366	48.005	0.130	1.77	104	0	96	84	0.000	4.48	0.57
367	48.140	0.135	1.76	104	-1.74	98	84	0.000	4.53	0.52
368	48.271	0.131	1.77	104	0	95	84	0.000	4.57	0.54
369	48.403	0.132	1.76	104	-3.53	98	84	0.000	4.58	0.56
370	48.537	0.134	1.77	104	-3.44	100	84	-0.010	4.48	0.54
371	48.668	0.131	1.75	104	-2.97	103	84	0.000	4.54	0.54
372	48.799	0.131	1.76	104	-0.3	94	84	0.000	4.49	0.56
373	48.933	0.134	1.76	104	-2.33	101	84	-0.010	4.51	0.56
374	49.066	0.133	1.77	104	-3.54	103	84	0.000	4.42	0.57
375	49.196	0.130	1.77	104	-0.57	96	84	0.000	4.47	0.55
376	49.331	0.135	1.78	104	-0.73	102	84	-0.010	4.43	0.59
377	49.461	0.130	1.76	104	-0.63	99	84	-0.010	4.45	0.56
378	49.594	0.133	1.77	104	0	101	84	-0.010	4.42	0.54
379	49.728	0.134	1.76	104	-0.23	94	84	0.000	4.38	0.57
380	49.857	0.129	1.76	104	0	90	84	-0.010	4.42	0.54
381	49.992	0.135	1.77	104	-3.54	95	84	0.000	4.43	0.55
382	50.124	0.132	1.77	104	-0.84	101	84	0.000	4.42	0.54
383	50.255	0.131	1.76	104	-2.1	105	84	0.000	4.46	0.55
384	50.389	0.134	1.76	104	-3.6	106	84	0.010	4.41	0.55
385	50.520	0.131	1.75	104	-3.41	101	84	-0.010	4.38	0.56
386	50.652	0.132	1.75	104	-1.98	95	84	-0.010	4.42	0.55
387	50.785	0.133	1.76	104	-0.5	96	84	-0.010	4.37	0.55
388	50.918	0.133	1.76	104	-3.3	102	84	-0.010	4.33	0.59
389	51.048	0.130	1.77	104	-3.05	95	84	-0.020	4.50	0.58
390	51.183	0.135	1.77	104	-3.48	103	84	0.000	4.40	0.58
391	51.315	0.132	1.76	104	-3.57	96	84	0.010	4.37	0.60
392	51.445	0.130	1.76	104	-3.53	93	84	-0.010	4.39	0.59
393	51.580	0.135	1.76	104	-1.34	96	84	-0.010	4.34	0.59
394	51.710	0.130	1.75	104	-3.54	95	84	0.010	4.37	0.58
395	51.843	0.133	1.75	104	-0.63	104	84	0.000	4.33	0.60

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Englands' Stove Works
Model: 32-NC
Run #: 3

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/24/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
396	51.977	0.134	1.76	104	-2.97	106	84	0.000	4.27	0.57
397	52.106	0.129	1.75	104	-3.43	96	84	-0.010	4.30	0.57
398	52.241	0.135	1.75	104	-3.44	98	84	0.000	4.34	0.58
399	52.373	0.132	1.76	104	-0.54	99	84	0.000	4.34	0.56
400	52.504	0.131	1.76	104	-2.43	98	84	-0.010	4.36	0.57
401	52.638	0.134	1.76	104	0	106	84	0.000	4.39	0.55
402	52.769	0.131	1.76	104	-3.18	94	84	-0.010	4.10	0.55
403	52.902	0.133	1.77	104	-2.91	97	84	0.000	4.13	0.55
404	53.034	0.132	1.77	103	-1.57	103	84	-0.010	4.08	0.55
405	53.167	0.133	1.77	103	-3.49	101	84	0.010	4.07	0.53
406	53.297	0.130	1.75	103	-0.4	96	84	0.000	4.02	0.55
407	53.432	0.135	1.77	103	-3.34	99	84	0.000	4.09	0.55
408	53.563	0.131	1.76	103	-0.21	93	84	0.000	4.08	0.54
409	53.694	0.131	1.76	103	-2.7	98	84	-0.010	4.12	0.52
410	53.829	0.135	1.76	103	0	110	84	-0.010	4.04	0.53
411	53.959	0.130	1.77	103	-2.15	95	84	-0.010	4.04	0.55
412	54.093	0.134	1.75	103	-2.38	97	84	0.000	4.10	0.53
413	54.226	0.133	1.77	103	-0.61	106	84	0.000	4.07	0.55
414	54.355	0.129	1.75	103	-3.48	92	84	-0.010	4.07	0.53
415	54.490	0.135	1.77	103	-3.46	101	84	-0.010	4.04	0.53
416	54.622	0.132	1.77	103	-3.54	95	84	0.000	4.08	0.53
417	54.753	0.131	1.75	103	0	102	84	0.000	4.06	0.53
418	54.887	0.134	1.77	103	-0.51	94	84	0.000	4.06	0.53
419	55.019	0.132	1.77	103	-3.33	101	84	-0.010	4.04	0.52
420	55.150	0.131	1.77	103	-3.45	94	84	-0.010	4.10	0.54
421	55.283	0.133	1.77	103	-3.45	102	84	0.010	4.04	0.53
422	55.416	0.133	1.75	103	0	97	84	0.000	4.04	0.53
423	55.546	0.130	1.76	103	-0.1	99	84	-0.010	3.95	0.53
424	55.681	0.135	1.76	103	0	99	84	0.000	4.08	0.53
425	55.812	0.131	1.76	103	-2.52	95	84	-0.010	3.98	0.55
426	55.943	0.131	1.76	103	-2.59	98	84	0.010	4.01	0.53
427	56.078	0.135	1.77	103	-0.62	101	84	0.000	4.12	0.54
428	56.208	0.130	1.76	103	-2.94	91	84	-0.010	3.99	0.57

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Englands' Stove Works
Model: 32-NC
Run #: 3

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/24/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
429	56.342	0.134	1.75	103	-0.7	102	84	-0.010	4.11	0.55
430	56.474	0.132	1.78	103	0	101	84	0.000	4.05	0.55
431	56.604	0.130	1.77	103	-0.92	104	84	-0.010	4.05	0.56
432	56.740	0.136	1.76	103	-0.61	96	84	0.000	4.03	0.56
433	56.871	0.131	1.76	103	-0.47	98	84	0.000	4.06	0.54
434	57.002	0.131	1.76	103	-0.23	103	84	0.000	4.10	0.53
435	57.135	0.133	1.76	103	-0.09	102	84	0.010	4.12	0.54
436	57.268	0.133	1.76	103	-2.02	97	84	0.000	4.05	0.52
437	57.399	0.131	1.76	103	0	96	84	-0.010	4.11	0.51
438	57.532	0.133	1.77	103	0	98	85	0.000	4.03	0.52
439	57.664	0.132	1.76	103	-1.78	93	84	0.000	4.00	0.54
440	57.796	0.132	1.77	103	0	98	84	-0.020	4.11	0.53
441	57.930	0.134	1.75	103	-3.2	105	84	-0.010	4.02	0.51
442	58.061	0.131	1.77	103	-2.39	101	84	0.000	3.98	0.52
443	58.192	0.131	1.75	103	-3.38	100	84	-0.010	3.88	0.52
444	58.327	0.135	1.75	103	-3.45	107	84	0.000	4.05	0.52
445	58.457	0.130	1.76	103	0	99	84	-0.010	3.96	0.52
446	58.591	0.134	1.77	103	-3.15	106	84	0.000	3.95	0.52
447	58.723	0.132	1.77	103	-0.25	94	84	-0.010	3.98	0.51
448	58.854	0.131	1.78	103	-3.6	103	84	0.000	3.91	0.52
449	58.988	0.134	1.79	103	-1.56	96	84	-0.010	3.90	0.50
450	59.119	0.131	1.77	103	-0.68	106	84	-0.010	3.86	0.53
451	59.251	0.132	1.77	103	-2.34	93	84	-0.010	3.90	0.53
452	59.384	0.133	1.75	103	-0.98	105	84	0.000	3.91	0.51
453	59.516	0.132	1.76	103	-1.05	98	84	-0.010	3.94	0.51
454	59.648	0.132	1.75	103	-1.52	98	84	0.000	3.89	0.50
455	59.781	0.133	1.75	103	-2.32	106	84	0.000	3.88	0.50
456	59.913	0.132	1.77	103	-3.33	103	84	0.000	3.88	0.49
457	60.044	0.131	1.76	103	-3.53	101	84	0.010	3.80	0.50
458	60.179	0.135	1.75	103	0	100	84	0.000	3.81	0.51
459	60.309	0.130	1.78	103	-1.11	94	84	-0.010	3.92	0.52
460	60.441	0.132	1.76	103	0	94	84	-0.010	3.89	0.52
461	60.576	0.135	1.74	103	-3.23	95	84	0.000	3.88	0.52

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: Englands' Stove Works
Model: 32-NC
Run #: 3

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/24/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
462	60.705	0.129	1.77	103	-2.74	91	84	-0.010	3.84	0.51
463	60.839	0.134	1.76	103	-3.22	97	84	-0.010	3.85	0.49
464	60.971	0.132	1.77	103	-2.34	96	84	-0.010	3.87	0.50
465	61.102	0.131	1.77	103	-3.5	96	84	0.000	3.83	0.51
466	61.237	0.135	1.76	103	0	103	84	0.000	3.87	0.51
467	61.368	0.131	1.76	103	0	101	84	-0.010	3.90	0.50
468	61.499	0.131	1.76	103	-2.54	101	84	0.000	3.91	0.51
469	61.633	0.134	1.75	103	-3.64	95	84	-0.010	3.90	0.52
470	61.765	0.132	1.76	103	-3.31	94	84	0.000	3.90	0.48
471	61.896	0.131	1.76	103	0	104	84	0.000	3.88	0.49
472	62.029	0.133	1.76	103	0	102	84	-0.010	3.80	0.51
473	62.162	0.133	1.77	103	0	98	84	-0.010	3.76	0.52
474	62.292	0.130	1.77	103	-3.21	91	84	-0.010	3.76	0.49
475	62.427	0.135	1.76	103	-1.8	102	84	0.010	3.80	0.51
476	62.557	0.130	1.75	103	-2.91	102	84	-0.010	3.79	0.48
477	62.689	0.132	1.76	103	-3.48	98	84	-0.010	3.87	0.48
478	62.824	0.135	1.73	103	-3.47	96	84	0.000	3.74	0.49
479	62.953	0.129	1.76	103	-2.08	95	84	0.000	3.86	0.49
480	63.087	0.134	1.76	103	0	107	84	0.000	3.73	0.47
481	63.219	0.132	1.76	103	0	103	84	-0.010	3.75	0.49
Avg/Tot	63.219	0.131	1.75	99	-1.71	100	84	-0.003	6.29	0.52

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Englands' Stove Works
Model: 32-NC
Run #: 3

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/24/2020

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
0	431	469	361	495	224	396.0	N/A
1	431	469	361	479	224	392.8	N/A
2	428	464	362	483	225	392.4	N/A
3	424	460	359	509	224	395.2	N/A
4	419	455	355	544	223	399.2	N/A
5	415	453	350	572	224	402.8	N/A
6	410	452	345	587	224	403.6	N/A
7	405	450	341	598	224	403.6	N/A
8	401	449	336	608	225	403.8	N/A
9	396	448	332	613	225	402.8	N/A
10	392	448	328	621	225	402.8	N/A
11	388	448	324	632	225	403.4	N/A
12	386	447	321	636	225	403.0	N/A
13	384	446	318	636	226	402.0	N/A
14	382	444	315	638	226	401.0	N/A
15	378	442	312	640	226	399.6	N/A
16	374	441	311	644	226	399.2	N/A
17	370	440	308	645	226	397.8	N/A
18	367	441	308	645	226	397.4	N/A
19	363	441	308	643	226	396.2	N/A
20	360	440	307	642	226	395.0	N/A
21	356	440	306	643	226	394.2	N/A
22	354	440	305	638	226	392.6	N/A
23	355	441	305	632	226	391.8	N/A
24	356	440	304	630	226	391.2	N/A
25	358	439	303	634	225	391.8	N/A
26	360	438	302	641	225	393.2	N/A
27	362	438	301	648	225	394.8	N/A
28	365	440	300	654	225	396.8	N/A
29	367	443	300	657	224	398.2	N/A
30	369	447	299	658	225	399.6	N/A
31	371	452	298	659	224	400.8	N/A
32	373	457	297	658	224	401.8	N/A
33	374	462	298	657	224	403.0	N/A
34	375	466	298	655	223	403.4	N/A
35	376	470	299	653	223	404.2	N/A
36	378	473	299	651	222	404.6	N/A
37	379	475	299	647	222	404.4	N/A
38	379	477	298	644	222	404.0	N/A
39	380	477	296	640	221	402.8	N/A
40	380	478	296	635	221	402.0	N/A
41	380	476	296	629	220	400.2	N/A
42	379	475	296	624	220	398.8	N/A
43	378	472	295	618	220	396.6	N/A
44	377	469	294	614	219	394.6	N/A
45	376	465	292	609	219	392.2	N/A
46	375	461	291	605	218	390.0	N/A
47	374	457	291	601	218	388.2	N/A
48	373	454	289	597	217	386.0	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Englands' Stove Works
Model: 32-NC
Run #: 3

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/24/2020

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
49	374	450	288	593	217	384.4	N/A
50	373	448	286	588	216	382.2	N/A
51	372	445	286	584	216	380.6	N/A
52	372	442	285	580	216	379.0	N/A
53	372	440	284	577	215	377.6	N/A
54	371	438	283	573	215	376.0	N/A
55	370	437	282	571	214	374.8	N/A
56	370	436	280	568	214	373.6	N/A
57	370	435	279	566	213	372.6	N/A
58	370	435	278	564	213	372.0	N/A
59	369	434	277	560	212	370.4	N/A
60	368	433	276	554	212	368.6	N/A
61	365	430	276	544	211	365.2	N/A
62	363	426	275	535	211	362.0	N/A
63	359	423	275	525	210	358.4	N/A
64	356	419	275	515	210	355.0	N/A
65	353	415	274	506	209	351.4	N/A
66	349	411	273	497	209	347.8	N/A
67	346	407	272	488	208	344.2	N/A
68	343	404	271	480	208	341.2	N/A
69	341	401	270	473	207	338.4	N/A
70	338	397	269	467	207	335.6	N/A
71	335	394	268	462	207	333.2	N/A
72	333	391	268	459	206	331.4	N/A
73	330	388	268	458	206	330.0	N/A
74	329	386	267	465	205	330.4	N/A
75	329	385	266	473	205	331.6	N/A
76	330	385	265	480	204	332.8	N/A
77	332	385	265	488	204	334.8	N/A
78	335	386	265	496	203	337.0	N/A
79	337	388	264	503	203	339.0	N/A
80	340	389	264	511	202	341.2	N/A
81	342	392	264	519	202	343.8	N/A
82	345	394	263	528	201	346.2	N/A
83	347	396	264	534	201	348.4	N/A
84	348	400	264	538	200	350.0	N/A
85	350	404	265	542	200	352.2	N/A
86	352	408	266	545	200	354.2	N/A
87	354	411	266	548	199	355.6	N/A
88	356	415	267	551	199	357.6	N/A
89	357	420	268	553	198	359.2	N/A
90	359	425	269	556	198	361.4	N/A
91	361	429	270	558	198	363.2	N/A
92	362	434	270	559	197	364.4	N/A
93	364	438	271	560	197	366.0	N/A
94	365	441	273	560	197	367.2	N/A
95	366	443	274	560	196	367.8	N/A
96	367	445	275	560	196	368.6	N/A
97	369	446	276	560	196	369.4	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Englands' Stove Works
Model: 32-NC
Run #: 3

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/24/2020

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
98	370	447	277	559	195	369.6	N/A
99	371	446	278	559	195	369.8	N/A
100	373	444	278	560	195	370.0	N/A
101	374	442	278	561	194	369.8	N/A
102	376	441	278	562	194	370.2	N/A
103	377	439	279	562	194	370.2	N/A
104	379	437	278	562	193	369.8	N/A
105	381	436	279	562	193	370.2	N/A
106	382	435	278	561	193	369.8	N/A
107	383	434	278	560	193	369.6	N/A
108	384	434	278	559	193	369.6	N/A
109	385	433	278	559	192	369.4	N/A
110	386	432	278	558	192	369.2	N/A
111	387	432	279	556	192	369.2	N/A
112	388	432	279	554	192	369.0	N/A
113	388	431	280	552	192	368.6	N/A
114	389	431	280	549	192	368.2	N/A
115	389	431	280	547	191	367.6	N/A
116	388	430	280	546	191	367.0	N/A
117	388	430	280	545	191	366.8	N/A
118	388	429	280	543	191	366.2	N/A
119	388	429	280	541	191	365.8	N/A
120	388	428	280	539	191	365.2	N/A
121	388	428	280	538	191	365.0	N/A
122	388	428	280	537	191	364.8	N/A
123	388	427	281	535	191	364.4	N/A
124	388	427	281	533	191	364.0	N/A
125	389	426	281	533	191	364.0	N/A
126	390	427	281	532	191	364.2	N/A
127	390	427	282	531	191	364.2	N/A
128	391	427	282	531	191	364.4	N/A
129	391	427	283	530	191	364.4	N/A
130	392	427	283	530	191	364.6	N/A
131	392	428	282	529	191	364.4	N/A
132	393	428	282	527	191	364.2	N/A
133	394	432	282	525	191	364.8	N/A
134	393	438	283	522	191	365.4	N/A
135	393	444	283	520	190	366.0	N/A
136	393	449	284	519	190	367.0	N/A
137	394	453	284	518	190	367.8	N/A
138	394	458	285	517	191	369.0	N/A
139	394	461	286	518	191	370.0	N/A
140	395	465	287	520	190	371.4	N/A
141	396	468	287	521	190	372.4	N/A
142	398	470	288	522	190	373.6	N/A
143	399	473	289	523	190	374.8	N/A
144	400	475	290	523	190	375.6	N/A
145	400	477	289	525	190	376.2	N/A
146	402	480	288	526	190	377.2	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Englands' Stove Works
Model: 32-NC
Run #: 3

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/24/2020

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
147	403	482	287	528	190	378.0	N/A
148	403	484	288	530	190	379.0	N/A
149	404	486	290	533	190	380.6	N/A
150	404	488	291	537	190	382.0	N/A
151	404	490	293	540	190	383.4	N/A
152	405	493	294	542	190	384.8	N/A
153	405	495	295	545	190	386.0	N/A
154	405	496	295	546	190	386.4	N/A
155	405	497	296	546	190	386.8	N/A
156	404	498	297	546	190	387.0	N/A
157	404	498	299	545	190	387.2	N/A
158	404	499	299	544	190	387.2	N/A
159	403	500	301	543	190	387.4	N/A
160	403	500	301	542	190	387.2	N/A
161	404	501	302	541	190	387.6	N/A
162	404	501	304	539	190	387.6	N/A
163	404	501	305	537	190	387.4	N/A
164	404	502	305	535	190	387.2	N/A
165	404	502	306	533	190	387.0	N/A
166	404	502	306	531	190	386.6	N/A
167	404	502	305	529	190	386.0	N/A
168	404	502	305	526	190	385.4	N/A
169	404	502	306	524	190	385.2	N/A
170	404	502	307	521	190	384.8	N/A
171	404	503	306	519	190	384.4	N/A
172	404	503	306	516	190	383.8	N/A
173	404	503	306	513	190	383.2	N/A
174	404	503	307	511	190	383.0	N/A
175	403	504	308	510	190	383.0	N/A
176	404	505	310	509	190	383.6	N/A
177	403	505	310	508	190	383.2	N/A
178	403	506	311	506	190	383.2	N/A
179	403	506	311	504	190	382.8	N/A
180	403	504	312	500	190	381.8	N/A
181	402	502	312	495	190	380.2	N/A
182	402	499	313	491	190	379.0	N/A
183	401	496	312	485	190	376.8	N/A
184	400	493	313	480	191	375.4	N/A
185	400	489	313	476	191	373.8	N/A
186	399	486	313	473	191	372.4	N/A
187	398	482	312	469	191	370.4	N/A
188	397	478	312	466	191	368.8	N/A
189	398	475	311	463	191	367.6	N/A
190	398	472	311	460	192	366.6	N/A
191	398	470	311	457	192	365.6	N/A
192	399	468	310	455	192	364.8	N/A
193	399	466	310	453	192	364.0	N/A
194	400	464	309	451	193	363.4	N/A
195	401	462	307	448	193	362.2	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Englands' Stove Works
Model: 32-NC
Run #: 3

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/24/2020

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
196	402	460	306	446	193	361.4	N/A
197	403	459	304	444	193	360.6	N/A
198	403	457	303	441	194	359.6	N/A
199	404	455	302	438	194	358.6	N/A
200	404	454	301	436	194	357.8	N/A
201	404	452	302	433	195	357.2	N/A
202	405	450	303	431	195	356.8	N/A
203	405	448	304	428	195	356.0	N/A
204	405	447	304	425	196	355.4	N/A
205	406	445	304	423	196	354.8	N/A
206	407	444	305	420	196	354.4	N/A
207	407	443	305	418	197	354.0	N/A
208	408	441	304	416	197	353.2	N/A
209	409	441	305	414	197	353.2	N/A
210	410	440	305	412	198	353.0	N/A
211	412	439	305	411	198	353.0	N/A
212	413	438	305	409	198	352.6	N/A
213	414	437	304	407	199	352.2	N/A
214	416	436	303	405	199	351.8	N/A
215	417	435	301	404	199	351.2	N/A
216	418	434	300	401	200	350.6	N/A
217	419	434	300	400	200	350.6	N/A
218	420	434	299	399	200	350.4	N/A
219	421	432	300	398	201	350.4	N/A
220	423	432	300	396	201	350.4	N/A
221	423	432	300	396	202	350.6	N/A
222	424	431	299	395	202	350.2	N/A
223	425	431	299	394	203	350.4	N/A
224	427	431	299	394	203	350.8	N/A
225	428	431	298	393	204	350.8	N/A
226	430	431	299	392	204	351.2	N/A
227	430	430	300	391	204	351.0	N/A
228	431	430	302	391	205	351.8	N/A
229	433	430	303	390	205	352.2	N/A
230	434	429	303	390	206	352.4	N/A
231	434	429	303	390	206	352.4	N/A
232	435	429	303	390	206	352.6	N/A
233	436	429	304	390	207	353.2	N/A
234	436	430	305	390	207	353.6	N/A
235	436	430	305	390	207	353.6	N/A
236	435	429	306	390	207	353.4	N/A
237	437	429	307	390	208	354.2	N/A
238	436	430	308	391	208	354.6	N/A
239	436	431	309	392	209	355.4	N/A
240	436	430	310	392	209	355.4	N/A
241	436	431	311	392	209	355.8	N/A
242	435	430	312	393	210	356.0	N/A
243	435	431	313	392	210	356.2	N/A
244	435	431	313	391	211	356.2	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Englands' Stove Works
Model: 32-NC
Run #: 3

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/24/2020

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
245	435	431	313	390	211	356.0	N/A
246	434	431	313	389	211	355.6	N/A
247	434	431	313	388	212	355.6	N/A
248	433	431	312	386	212	354.8	N/A
249	433	430	312	385	213	354.6	N/A
250	431	429	312	384	213	353.8	N/A
251	431	429	312	382	213	353.4	N/A
252	429	428	314	381	214	353.2	N/A
253	428	427	314	380	214	352.6	N/A
254	426	427	316	378	214	352.2	N/A
255	425	427	316	377	215	352.0	N/A
256	423	426	316	376	215	351.2	N/A
257	422	425	316	375	215	350.6	N/A
258	421	424	316	375	216	350.4	N/A
259	420	424	316	374	216	350.0	N/A
260	419	424	316	373	216	349.6	N/A
261	419	423	318	373	217	350.0	N/A
262	417	423	319	372	217	349.6	N/A
263	416	422	321	370	217	349.2	N/A
264	415	421	322	369	218	349.0	N/A
265	413	421	322	368	218	348.4	N/A
266	411	421	322	367	219	348.0	N/A
267	410	420	321	366	219	347.2	N/A
268	408	419	320	365	219	346.2	N/A
269	407	419	320	364	219	345.8	N/A
270	406	418	319	363	219	345.0	N/A
271	405	417	321	362	220	345.0	N/A
272	404	416	322	361	220	344.6	N/A
273	403	416	323	360	220	344.4	N/A
274	402	416	323	359	220	344.0	N/A
275	401	415	324	359	220	343.8	N/A
276	402	414	323	358	221	343.6	N/A
277	401	415	323	357	221	343.4	N/A
278	400	414	324	356	221	343.0	N/A
279	399	413	325	355	221	342.6	N/A
280	399	412	326	354	221	342.4	N/A
281	398	411	325	354	221	341.8	N/A
282	398	411	326	353	222	342.0	N/A
283	397	411	325	352	222	341.4	N/A
284	397	410	325	351	222	341.0	N/A
285	396	410	324	350	222	340.4	N/A
286	396	409	324	349	222	340.0	N/A
287	396	409	325	348	222	340.0	N/A
288	395	409	326	348	222	340.0	N/A
289	395	409	326	347	222	339.8	N/A
290	394	408	326	346	222	339.2	N/A
291	393	408	326	346	222	339.0	N/A
292	394	408	326	345	223	339.2	N/A
293	393	407	327	345	223	339.0	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Englands' Stove Works
Model: 32-NC
Run #: 3

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/24/2020

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
294	393	407	327	345	223	339.0	N/A
295	393	407	327	345	223	339.0	N/A
296	393	407	327	344	223	338.8	N/A
297	393	406	328	344	223	338.8	N/A
298	393	406	328	344	223	338.8	N/A
299	393	406	329	343	223	338.8	N/A
300	393	406	329	343	224	339.0	N/A
301	393	405	329	343	224	338.8	N/A
302	393	405	329	342	224	338.6	N/A
303	393	405	329	341	224	338.4	N/A
304	392	404	330	341	224	338.2	N/A
305	392	405	330	341	224	338.4	N/A
306	392	405	331	340	224	338.4	N/A
307	392	404	331	339	224	338.0	N/A
308	392	403	331	339	224	337.8	N/A
309	392	403	331	338	224	337.6	N/A
310	391	403	331	337	224	337.2	N/A
311	392	402	332	337	224	337.4	N/A
312	391	402	332	336	224	337.0	N/A
313	391	402	332	335	224	336.8	N/A
314	390	402	332	334	224	336.4	N/A
315	390	401	332	334	224	336.2	N/A
316	389	401	332	333	224	335.8	N/A
317	389	401	333	333	224	336.0	N/A
318	389	399	333	332	224	335.4	N/A
319	389	399	333	332	224	335.4	N/A
320	389	399	333	331	224	335.2	N/A
321	389	399	332	331	224	335.0	N/A
322	389	398	333	330	224	334.8	N/A
323	387	398	332	330	224	334.2	N/A
324	388	398	332	329	224	334.2	N/A
325	387	397	333	329	224	334.0	N/A
326	387	396	333	328	224	333.6	N/A
327	386	397	332	327	224	333.2	N/A
328	386	396	332	327	223	332.8	N/A
329	386	396	332	326	223	332.6	N/A
330	386	394	332	326	223	332.2	N/A
331	385	394	332	325	223	331.8	N/A
332	384	394	332	324	223	331.4	N/A
333	384	394	332	324	223	331.4	N/A
334	384	392	332	323	223	330.8	N/A
335	385	393	332	323	223	331.2	N/A
336	383	392	332	322	223	330.4	N/A
337	384	391	332	321	222	330.0	N/A
338	382	392	331	321	222	329.6	N/A
339	382	391	331	321	222	329.4	N/A
340	382	391	331	320	222	329.2	N/A
341	381	390	331	319	222	328.6	N/A
342	381	389	331	319	222	328.4	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Englands' Stove Works
Model: 32-NC
Run #: 3

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/24/2020

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
343	381	388	331	318	222	328.0	N/A
344	380	387	331	317	222	327.4	N/A
345	381	388	331	317	222	327.8	N/A
346	380	387	331	316	221	327.0	N/A
347	381	386	331	315	221	326.8	N/A
348	380	386	331	315	221	326.6	N/A
349	380	385	331	315	221	326.4	N/A
350	380	386	330	314	221	326.2	N/A
351	380	385	331	313	220	325.8	N/A
352	381	384	331	313	220	325.8	N/A
353	380	384	331	312	220	325.4	N/A
354	380	383	331	311	220	325.0	N/A
355	380	383	331	311	220	325.0	N/A
356	381	382	331	310	220	324.8	N/A
357	381	381	331	310	219	324.4	N/A
358	380	381	331	309	219	324.0	N/A
359	380	380	331	309	219	323.8	N/A
360	380	382	331	308	219	324.0	N/A
361	380	381	330	308	218	323.4	N/A
362	380	381	330	308	218	323.4	N/A
363	381	379	330	307	218	323.0	N/A
364	380	380	330	307	218	323.0	N/A
365	380	380	330	306	218	322.8	N/A
366	380	380	330	306	218	322.8	N/A
367	380	378	330	305	217	322.0	N/A
368	380	379	330	305	217	322.2	N/A
369	380	378	329	305	217	321.8	N/A
370	380	379	330	304	217	322.0	N/A
371	380	377	329	304	216	321.2	N/A
372	381	377	329	303	216	321.2	N/A
373	380	376	329	303	216	320.8	N/A
374	381	376	329	302	216	320.8	N/A
375	381	375	330	302	216	320.8	N/A
376	380	376	330	301	215	320.4	N/A
377	379	375	330	301	215	320.0	N/A
378	380	374	330	300	215	319.8	N/A
379	380	375	330	300	215	320.0	N/A
380	379	374	331	299	214	319.4	N/A
381	378	374	331	299	214	319.2	N/A
382	379	373	331	299	214	319.2	N/A
383	377	373	331	298	214	318.6	N/A
384	378	373	331	298	213	318.6	N/A
385	377	372	331	298	213	318.2	N/A
386	377	371	331	297	213	317.8	N/A
387	377	371	331	297	213	317.8	N/A
388	376	371	330	297	212	317.2	N/A
389	376	370	331	297	212	317.2	N/A
390	375	371	331	296	212	317.0	N/A
391	376	370	331	296	211	316.8	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Englands' Stove Works
Model: 32-NC
Run #: 3

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/24/2020

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
392	375	369	330	296	211	316.2	N/A
393	375	369	331	296	211	316.4	N/A
394	374	368	331	296	211	316.0	N/A
395	374	369	331	295	210	315.8	N/A
396	373	368	330	295	210	315.2	N/A
397	373	368	331	294	210	315.2	N/A
398	373	367	331	294	209	314.8	N/A
399	373	367	331	294	209	314.8	N/A
400	372	367	331	294	209	314.6	N/A
401	372	367	330	294	209	314.4	N/A
402	371	367	330	293	208	313.8	N/A
403	371	366	330	293	208	313.6	N/A
404	370	367	330	293	208	313.6	N/A
405	371	365	329	292	207	312.8	N/A
406	370	366	329	292	207	312.8	N/A
407	370	366	329	292	206	312.6	N/A
408	369	366	329	291	207	312.4	N/A
409	369	364	328	291	206	311.6	N/A
410	369	364	328	290	206	311.4	N/A
411	369	364	328	290	206	311.4	N/A
412	369	363	328	289	205	310.8	N/A
413	368	363	328	289	205	310.6	N/A
414	368	361	327	288	205	309.8	N/A
415	369	362	327	288	204	310.0	N/A
416	368	362	327	287	204	309.6	N/A
417	369	362	327	287	204	309.8	N/A
418	369	360	326	287	203	309.0	N/A
419	369	360	326	286	203	308.8	N/A
420	370	359	326	286	203	308.8	N/A
421	368	359	325	285	202	307.8	N/A
422	369	358	325	285	202	307.8	N/A
423	369	357	325	284	202	307.4	N/A
424	369	357	325	284	201	307.2	N/A
425	369	356	324	284	201	306.8	N/A
426	369	356	325	283	201	306.8	N/A
427	370	356	324	283	200	306.6	N/A
428	370	355	324	283	200	306.4	N/A
429	371	354	323	282	200	306.0	N/A
430	371	353	324	282	199	305.8	N/A
431	371	352	324	281	199	305.4	N/A
432	371	352	324	281	199	305.4	N/A
433	372	352	324	281	198	305.4	N/A
434	372	352	324	280	198	305.2	N/A
435	372	353	324	280	198	305.4	N/A
436	373	351	325	280	197	305.2	N/A
437	373	351	325	280	197	305.2	N/A
438	373	351	325	280	197	305.2	N/A
439	373	351	325	279	196	304.8	N/A
440	373	351	325	279	196	304.8	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: Englands' Stove Works
Model: 32-NC
Run #: 3

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/24/2020

	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
441	372	351	325	279	196	304.6	N/A
442	373	350	325	279	195	304.4	N/A
443	373	349	325	278	195	304.0	N/A
444	373	348	325	278	195	303.8	N/A
445	372	348	325	278	195	303.6	N/A
446	372	348	325	278	194	303.4	N/A
447	371	348	325	278	194	303.2	N/A
448	371	347	325	277	194	302.8	N/A
449	371	347	325	277	193	302.6	N/A
450	370	347	325	277	193	302.4	N/A
451	370	347	325	276	193	302.2	N/A
452	369	347	324	276	192	301.6	N/A
453	369	345	324	276	192	301.2	N/A
454	369	345	324	276	192	301.2	N/A
455	367	345	325	275	192	300.8	N/A
456	368	345	324	275	192	300.8	N/A
457	367	344	324	275	191	300.2	N/A
458	367	344	323	275	191	300.0	N/A
459	365	343	323	274	191	299.2	N/A
460	365	343	323	274	190	299.0	N/A
461	364	343	323	274	190	298.8	N/A
462	364	342	323	273	190	298.4	N/A
463	364	343	323	273	190	298.6	N/A
464	364	342	323	273	189	298.2	N/A
465	363	341	324	273	189	298.0	N/A
466	362	341	323	273	189	297.6	N/A
467	362	341	323	272	189	297.4	N/A
468	361	341	324	272	188	297.2	N/A
469	360	340	323	272	188	296.6	N/A
470	361	340	323	272	188	296.8	N/A
471	360	340	323	271	188	296.4	N/A
472	360	339	323	271	187	296.0	N/A
473	358	339	323	271	187	295.6	N/A
474	359	340	323	271	187	296.0	N/A
475	358	339	322	271	187	295.4	N/A
476	358	340	322	271	186	295.4	N/A
477	358	339	322	270	186	295.0	N/A
478	356	339	322	270	186	294.6	N/A
479	356	338	322	270	186	294.4	N/A
480	356	338	323	270	185	294.4	N/A
481	355	338	321	269	185	293.6	N/A
Average	387	415	311	419	207	348	N/A

LAB SAMPLE DATA - ASTM E2515

Client: Englands' Stove Works
Model: 32-NC
Run #: 3

Job #: 19-471
Tracking #: 67
Technician: AK
Date: 4/24/2020

	Sample ID	Tare, mg	Total, mg	Final, mg	Catch, mg
Train A Filters - First Hour	T455	96.7	96.7	99.5	2.8
Train A Filters - Remainder	T456	97.5	291.9	299.9	8.0
	T457	97.0			
	T458	97.4			
Train A Probe	13A	117455.9	117455.9	117456.5	0.6
Train A O-Rings	13A	3558.9	3558.9	3359.0	0.0*
Train B Filters	T459	96.9	387.2	396.8	9.6
	T460	96.6			
	T461	96.9			
	T462	96.8			
Train B Probe	13B	117054.9	117054.9	117055.3	0.4
Train B O-Rings	13B	3443.5	3443.5	3445.6	2.1
Background Filter			0.0	0.0	

**Negative value corrected to zero*

Placed in Dessicator on:	

Train A Filters - First Hour	99.4	4/26 8:44	99.5	4/27 8:11				
Train A Filters - Remainder	299.8	4/26 8:45	299.9	4/27 8:11				
Train A Probe	117456.5	4/26 8:47	117456.5	4/27 8:07				
Train A O-Rings	3358.9	4/26 8:42	3359.0	4/27 8:08				
Train B Filters	396.7	4/26 8:46	396.8	4/27 8:11				
Train B Probe	117055.2	4/26 8:47	117055.3	4/27 8:06				
Train B O-Rings	3445.7	4/26 8:42	3445.6	4/27 8:08				
Background Filter								

1st hour Sub-Total, mg:	2.8
Remainder Sub-Total, mg:	8.6
Train 1 Aggregate, mg:	**11.4**
Train 2 Aggregate, mg:	**12.1**
Ambient Aggregate, mg:	0.0

ASTM E3053 Wood Heater Run Sheets

Client: England's Stove Works Job Number: 19-471 Tracking #: 67
Model: 32-NC Run Number: 3 Test Date: 4/24/20

Wood Heater Run Notes

Pre-Test Notes
Pre-Test Start Time: 8:43
Air Control Setting: Fully open

Time	Notes
0-60 sec	Torch Ignition
4:00	Closed door
21:00	Loaded test fuel
23:00	Closed Door

Test Notes
Test Burn Start Time: 11:45
Air Control Setting: 7/8" open

Time	Notes
0:45	Fuel loaded
3:10	Closed door, air set to fully open
5:00	Air adjusted to 2/3 open
7:00	Air adjusted to 1/3 open
10:00	Air adjusted to test setting
60:00	Changed filter A
88:00	Changed filter B *(note: only one change performed despite 4 filters shown in the test data for train B. Due to technician error, 2 filters were placed together in the rear filter housing for the entire duration of the test. This does not affect results)*
114:00	Changed Filter A

Test Burn End Time: 19"46

Flue Gas Concentration Measurement

Calibration Gas Values: Span Gas CO_2 (%): 16.90 CO (%): 4.18
Mid Gas CO_2 (%): 10.00 CO (%): 2.51

Calibration Results:

	Pre Test			Post Test		
	Zero	Mid	Span	Zero	Mid	Span
Time	4/23 10:15	-	4/23 10:17	4/25 12:10	4/25 12:14	4/25 12:16
CO_2	0.00	-	16.90	0.00	9.92	16.88
CO	0.000	-	4.180	0.002	2.433	4.176

Flue Gas Probe Leak Check: Initial: No Leakage Final: No Leakage

Technician Signature: Date: 5/20/2020

ASTM E3053 Wood Heater Run Sheets

Client: England's Stove Works Job Number: 19-471 Tracking #: 67
Model: 32-NC Run Number: 3 Test Date: 4/24/20

Test Photos

Kindling Fuel Load

Start-up Fuel Load

High Fire Fuel Load

Kindling Ignition

Technician Signature: _____ Date: 5/20/2020

ASTM E3053 Wood Heater Run Sheets

Client: England's Stove Works Job Number: 19-471 Tracking #: 67
Model: 32-NC Run Number: 3 Test Date: 4/24/20

High Fire Fuel Loaded

Residual High Fire Load Coal Bed

Medium Fire Fuel Load

Medium Fire Fuel Loaded

Technician Signature: _____ Date: 5/20/2020

ASTM E2515 - TX Filters

Sample	Weight 1	Weight 2	Weigth 3	Weight 4	Initial	Project	Run
T431	~~96.9~~						
T432	96.8	97.0	-	-		20-592	#2
T433	93.5	93.5	-	-			
T434	94.3	94.2	-	-			
T435	93.1	93.3	-	-			
T436	93.5	93.4	-	-			
T437	93.6	93.6	-	-		20-592	#3
T438	92.8	92.6	-	-			
T439	93.7	93.7	-	-			
T440	95.7	95.8	-	-			
T441	96.7	96.6	-	-			
T442	97.0	96.9	-	-		19-471	#1
~~T443~~	~~97.3~~	~~97.3~~	~~-~~	~~-~~			
T444	96.7	96.6	-	-		19-471	
T445	96.9	96.8	-	-			
T446	96.7	96.9	-	-			
T447	96.9	96.9	-	-			
T448	94.2	94.4	-	-			#2

Weight 1 Date/Time:
3/15 - 15:00
Weight 2 Date/Time:
3/20 15:00
Weight 3 Date/Time:
Weight 4 Date/Time:

Sample	Weight 1	Weight 2	Weigth 3	Weight 4	Initial	Project	Run
T449	94.6	94.8	-	-		19-471	#2
T450	94.3	94.3	-	-			~~#1~~ #1
T451	94.1	94.1	-	-			~~#2~~ #2
T452	93.8	93.9	-	-			#2
T453	94.2	94.2	-	-			#2
T454	94.0	14.2	-	-			#2
T455	96.6	96.7	-	-		19-471	#3
T456	97.4	17.5	-	-			#3
T457	96.9	17.6	-	-			#3
T458	97.6	97.4	-	-			#3
T459	96.8	96.9	-	-			#3
T460	96.7	96.6	-	-			#3
T461	96.9	96.9	-	-			#3
T462	96.8	96.8	-	-			#3
T463	94.9	94.7	-	-		20-601	#1
T464	94.7	94.7	-	-			
T465	95.2	15.1	-	-			
T466	95.3	95.3	-	-			

Weight 1 Date/Time:
3/30 15:00
Weight 2 Date/Time:
4/21 16:45
Weight 3 Date/Time:
Weight 4 Date/Time:

ASTM E2515 - Probes

Sample	Weight 1	Weight 2	Weigth 3	Weight 4	Initial	Project	Run
1A	115627.7	115627.5	–	–	SB	20-585	sample blank
1B	115900.5	115900.5	–	–	SB		
2A	116239.8	116239.3	116239.5	–	SB	20-585	#1
2B	116329.0	116329.6	116328.8	–	SB		
3A	116074.3	116074.0	116074.1	–	SB	20-585	#2
3B	116339.5	116338.9	116339.1	–	SB		
4A	116183.2	116183.1	–	–	SB	20-585	#3
4B	116366.3	116366.5	116366.7	–	SB		
5A	116767.0	116766.5	116767.0	116766.9	SB	20-583	#1
5B	116874.7	116874.1	116879.9	–	SB		

Sample	Weight 1	Weight 2	Weigth 3	Weight 4	Initial	Project	Run
6A	116543.7	116543.6	–	–	A	20-583	#2
6B	116118.2	116118.1	–	–	A		
7A	116739.4	116739.3	–	–	A	20-583	#3
7B	117286.7	117286.5	–	–	A		
8A	116829.5	116286.6	–	–	A	20-592	#1
8B	116826.3	116826.3	–	–	A		
9A	116713.6	116713.8	–	–	A	20-592	#2
9B	117919.3	117919.3	–	–	A		
10A	116819.6	116819.6	–	–	A	20-592	#3
10B	117903.5	117903.6	–	–	A		

Sample	Weight 1	Weight 2	Weigth 3	Weight 4	Initial	Project	Run
11A	117035.6	117035.8	–	–	A	19-471	#1
11B	117489.5	117489.7	–	–	A		
12A	116889.1	116889.3	–	–	A	19-471	#2
12B	117941.5	117941.7	–	–	A		
13A	117455.8	117455.9	–	–	A	19-471	#3
13B	117054.9	117054.9	–	–	A		
14A	116818.0	116818.0	–	–	A	20-597	#1
14B	116771.8	116771.8	–	–	A		
15A	117418.0	117418.0	–	–	A	20-597	#2
15B	116904.8	116905.0	–	–	A		

Sample	Weight 1	Weight 2	Weigth 3	Weight 4	Initial	Project	Run
16A	116537.5	116537.3	–	–	A	20-597	#3
16B	116034.1	116034.0	–	–	A		
17A	116810.5	116810.5	–	–	A	20-597	#4
17B	117130.0	117138.9	–	–	A		
18A	117496.9	117496.5	–	–	A	20-565	#1
18B	117329.6	117329.5	–	–	A		
19A	117025.3	117025.1	–	–	A	20-565	#2
19B	117011.9	117011.7	–	–	A		
20A	115625.7	115625.5	–	–	A	20-565	#3
20B	115964.9	115964.7	–	–	A		

Weight 1 Date/Time:
2/27 - 15:30
Weight 2 Date/Time:
2/28 - 8:00
Weight 3 Date/Time:
2/28 - 15:30
Weight 4 Date/Time:
3/26 - 15:00

Weight 1 Date/Time:
3/26 - 15:00
Weight 2 Date/Time:
3/30 15:30
Weight 3 Date/Time:
Weight 4 Date/Time:

Weight 1 Date/Time:
4/20 17:00
Weight 2 Date/Time:
4/21 16:30
Weight 3 Date/Time:
Weight 4 Date/Time:

Weight 1 Date/Time:
4/22 17:00
Weight 2 Date/Time:
4/24 0830
Weight 3 Date/Time:
Weight 4 Date/Time:

ASTM E2515 - O-Rings

Sample	Weight 1	Weight 2	Weigth 3	Weight 4	Initial	Project	Run
1A	3564.3	3564.5	-	-	SB	20-585	sample blank
1B	3553.1	3553.2	-	-	SB		
2A	3550.1	3550.3	-	-	SB	20-585	#1
2B	3569.1	3569.2	-	-	SB		
3A	3577.8	3577.9	-	-	SB	20-585	#2
3B	3565.9	3566.1	-	-	SB		
4A	3621.1	3621.3	-	-	SB	20-585	#3
4B	3578.1	3578.2	-	-	SB		
5A	3533.0	3533.6	3533.8	-	SB	20-583	#1
5B	3529.2	3529.8	3529.8	-	SB		

Weight 1 Date/Time:
2/28 - 8:00
Weight 2 Date/Time:
2/28 - 15:30
Weight 3 Date/Time:
3/26 - 15:00
Weight 4 Date/Time:

Sample	Weight 1	Weight 2	Weigth 3	Weight 4	Initial	Project	Run
6A	3613.8	3613.9	3614.0	3614.1	SB	20-583	#2
6B	3393.8	3394.8	3394.3	3394.3	SB		
7A	3571.6	3571.8	3571.9	3571.9	SB	20-583	#3
7B	3520.8	352	3521.3	3521.4	SB		
8A	3550.3		3550.4	3550.5	SB	20-592	#1
8B	3584.1		3584.4	3584.5	SB		
9A	3579.8		3580.1	3580.2	SB	20-592	#2
9B	3522.8		3523.2	3523.2	SB		
10A	3428.5		3429.3	3429.4	SB	20-592	#3
10B	3569.4		3569.6	3569.6	SB		

Weight 1 Date/Time:
3/26 - 15:00
Weight 2 Date/Time:
3/31 - 15:00
Weight 3 Date/Time:
4/2 - 9:00
Weight 4 Date/Time:

Sample	Weight 1	Weight 2	Weigth 3	Weight 4	Initial	Project	Run
11A	3422.1	3422.3	-	-	[illegible]	19-471	#1
11B	4232.9	4233.1	-	-	[illegible]		
12A	3393.6	3393.8	-	-	[illegible]	19-471	#2
12B	3404.0	3404.1	-	-	[illegible]		
13A	3358.8	3358.9	-	-	[illegible]	19-471	#3
13B	3443.3	3443.5	-	-	[illegible]		
14A	3365.3	3365.5	-	-	[illegible]	20-597	#1
14B	3339.8	3340.0	-	-	[illegible]		
15A	3569.1	3569.0	-	-	[illegible]	20-597	#2
15B	3569.6	3569.7	-	-	[illegible]		

Weight 1 Date/Time:
4/20 17:00
Weight 2 Date/Time:
4/21 16:30
Weight 3 Date/Time:
Weight 4 Date/Time:

Sample	Weight 1	Weight 2	Weigth 3	Weight 4	Initial	Project	Run
16A	3573.0	3573.1	-	-	[illegible]	20-597	#3
16B	3638.0	3638.8	-	-	[illegible]		
17A	3612.1	3612.2	-	-	[illegible]	20-597	#4
17B	3568.4	3568.5	-	-	[illegible]		
18A	3395.9	3396.1	-	-	[illegible]	20-565	#1
18B	3367.5	3367.7	-	-	[illegible]		
19A	3365.8	3366.0	-	-	[illegible]	20-565	#2
19B	3438.6	3438.8	-	-	[illegible]		
20A	3392.2	3392.4	-	-	[illegible]	20-565	#3
20B	3425.2	3425.4	-	-	[illegible]		

Weight 1 Date/Time:
4/20 17:00
Weight 2 Date/Time:
4/21 16:30
Weight 3 Date/Time:
Weight 4 Date/Time:

Sample Calculations – ASTM E3053 & E2515

Client: Englands' Stove Works
Model: 32-NC
Run: 2

Equations used to calculate the parameters listed below are described in this appendix. Sample calculations are provided for each equation. The raw data and printout results from a sample run are also provided for comparison to the sample calculations.

M_{Fldb} – Weight of test fuel load, dry basis, lb (kg)

M_{SUdb} – Weight of start-up fuel, dry basis, lb (kg)

M_{Kdb} - Weight of kindling, dry basis, lb (kg)

M_{FREHdb} - Total weight of all remaining fuel at end of high fire test run, lb (kg)

M_{TFBHdb} - Total weight of all fuel burned during high fire test run, lb (kg), dry basis

BR_H – Dry burn rate for high fire test run, from time when test fuel load is added to end of test run, lb/h (kg/h)

M_{TFBdb} - Total weight of fuel burned during low or medium fire test run, lb (kg), dry basis

BR - Dry burn rate for low and medium fire test runs, lb/h (kg/h)

V_s – Average gas velocity in the dilution tunnel, ft/sec

Q_{sd} – Average gas flow rate in dilution tunnel, dscf/hr

$V_{m(std)}$ – Volume of gas sampled, corrected to dry standard conditions, dscf

m_n – Total particulate matter collected, mg

C_s - Concentration of particulate matter in tunnel gas, dry basis, corrected to STP, g/dscf

E_T – Total particulate emissions, g

PR - Proportional rate variation

PM_{RH} - Particulate emission rate for high fire test run, g/hr

PM_{FH} - Particulate emission factor for high fire test run, g/dry kg of fuel burned

PM_R – Particulate emission rate for low or medium fire test run, g/hr

PM_F – Particulate emission factor for low or medium fire test run, g/dry kg of fuel burned

M_{Fldb} – Weight of test fuel load, dry basis, lb (kg)
ASTM E3053 equation (1)

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

Where,

M_{FLnwb} = Weight of each test fuel piece, n, in test fuel load per 8.4.1, wet basis, lb (kg)

MC_{FLn} = Average fuel moisture of test fuel piece, n, in test fuel load, % dry basis

n = individual test fuel pieces that comprise the test fuel load, as applicable.

Sample Calculation:

n	M_{FLnwb}	MC_{FLn}	$(M_{FLnwb})(100/(100 + MC_{FLn}))$		
1	5.84	18.7	5.84 (100) / (100+ 18.7)) =	4.92	
2	6.60	19.3	6.6 (100) / (100+ 19.3)) =	5.53	
3	5.30	23.8	5.3 (100) / (100+ 23.8)) =	4.28	
4	7.80	19.8	7.8 (100) / (100+ 19.8)) =	6.51	
5	4.37	21.6	4.37 (100) / (100+ 21.6)) =	3.59	
6	3.85	19.7	3.85 (100) / (100+ 19.7)) =	3.22	
7	0.00		N/A	-	
			SUM	28.05	lbs

M_{Fldb} = **28.05** lbs

M_{Fldb} = **12.72** kg

M_{SUdb} –
ASTM E

Where,

Sample

- Weight of start-up fuel, dry basis, lb (kg)
E3053 equation (2)

$M_{SUdb} = (M_{SUwb})(100/(100 + MC_{SU}))$

Where,

M_{SUwb}	=	Total weight of start-up fuel pieces, wet basis, lb (kg)
MC_{SU}	=	Average fuel moisture of the piece(s) from which start-up fuel was split, % dry basis

Calculation:

M_{SUwb} = N/A - Applicable to High Fire Tests Only
MC_{SU} = N/A - Applicable to High Fire Tests Only

M_{SUdb} = N/A (100/(100+ N/A)
M_{SUdb} = **N/A** lbs
= **N/A** kg

M_{Kdb} - Wei
ASTM E30

Sample cal

ght of kindling, dry basis, lb (kg)
53 equation (3)

$M_{Kdb} = (M_{Kwb})(100/(100 + MC_K))$

M_{Kwb} = Weight of kindling per 8.5.6, wet basis, lb (kg);
MC_K = Average moisture of kindling (may be assumed 10%), % dry basis.

culation:

M_{Kwb} = N/A - Applicable to High Fire Tests Only
MC_K = N/A - Applicable to High Fire Tests Only

M_{Kdb} = N/A (100/(100+ N/A)

M_{Kdb} = **N/A** lbs
= **N/A** kgs

M_{FREHdb} - Total weight of all remaining fuel at end of high fire test run, lb (kg)
ASTM E3053 equation (4)

$$M_{FREHdb} = M_{RSUBdb} + M_{FLEHdb}$$

Where,

M_{RSUBdb} = Weight of residual start-up fuel bed when high fire test load added, lb (kg)

M_{FLEHdb} = Weight of unburned portion of test fuel load at the end of the high fire test run, lb (kg)

Sample calculation:

M_{RSUBdb} = N/A - Applicable to High Fire Tests Only

M_{FLEHdb} = N/A - Applicable to High Fire Tests Only

M_{FREHdb} = N/A + N/A

M_{FREHdb} = **N/A** lbs

= **N/A** kg

M_{TFBHdb} - Total weight of all fuel burned during high fire test run, lb (kg), dry basis

ASTM E3053 equation (5)

$$M_{TFBHdb} = M_{Kdb} + M_{SUdb} + M_{FLdb} - M_{FREHdb}$$

Sample Calculation:

M_{Kdb} = N/A

M_{SUdb} = N/A

M_{FLdb} = N/A

M_{FREHdb} = N/A

M_{TFBHdb} = N/A + N/A + N/A - N/A

= **N/A** lbs

= **N/A** kg

BR_H – Dry burn rate for high fire test run, from time when test fuel load is added to end of test run, lb/h (kg/h)

ASTM E3053 equation (6)

$$BR_H = 60 (M_{FLdb} - M_{FLEHdb})/\theta_{H1}$$

Where,

θ_{H1} = Total duration of high fire test run, from time when test fuel load is added to end of test run, min.

Sample calculation:

M_{FLdb} = N/A - Applicable to High Fire Tests Only

M_{FLEHdb} = N/A - Applicable to High Fire Tests Only

θ_{H1} = N/A - Applicable to High Fire Tests Only

$$BR_H = \frac{60 (\text{N/A} - \text{N/A})}{\text{N/A}}$$

BR_H = **N/A** lb/hr

= **N/A** kg/hr

M_{TFBdb} - Total weight of fuel burned during low or medium fire test run, lb (kg), dry basis
ASTM E3053 equation (7)

$$M_{TFBdb} = M_{FLdb} - M_{FREdb}$$

Where,

M_{FLdb} = Total weight of fuel burned during low or medium fire test run, lb (kg), dry basis

M_{FREdb} = Weight of remaining fuel at end of low or medium fire test run, lb (kg)

Sample Calculation:

M_{FLdb} = 28.05

M_{FREdb} = 0.00

M_{TFBdb} = 28.05 - 0.00

= **28.05** lbs

= **12.72** kg

BR - Dry burn rate for low and medium fire test runs, lb/h (kg/h)
ASTM E3053 equation (8)

$$BR = \frac{60\ M_{TFBdb}}{\theta}$$

Where,

θ = Total test run duration for low or medium fire test run, min.

Sample Calculation:

M_{TFBdb} = 28.05
θ = 629

$$BR = \frac{60 \times 28.05}{629}$$

BR = **2.68** lb/hr
= **1.21** kg/hr

V_s – Average gas velocity in the dilution tunnel, ft/sec
ASTM E2515 equation (9)

$$v_s = F_P \times k_p \times C_p \times (\sqrt{\Delta P})_{avg} \times \sqrt{\frac{T_{s(avg)}}{P_s \times M_s}}$$

Where:

F_p = Adjustment factor for pitot tube center point reading = $\frac{V_{strav}}{V_{scent}}$, ASTM E2515 Equation (1)

v_{scent} = Dilution tunnel velocity calculated after the multi-point pitot traverse at the center, ft/sec

v_{strav} = Dilution tunnel velocity calculated after the multi-point pitot traverse, ft/sec

k_p = Pitot tube constant, 85.49

C_p = Pitot tube coefficient: 0.99, unitless

ΔP* = Velocity pressure in the dilution tunnel, in H_2O

T_s = Absolute average gas temperature in the dilution tunnel, °R; (°R = °F + 460)

P_s = Absolute average gas static pressure in dilution tunnel, = $P_{bar} + P_g$, in Hg

P_{bar} = Barometric pressure at test site, in. Hg

P_g = Static pressure of tunnel, in. H_20; (in Hg = in H_20/13.6)

M_s = **The dilution tunnel wet molecular weight; M_s = 28.78 assuming a dry weight of 29 lb/lb-mole

Sample calculation:

$$Fp = \frac{15.02}{18.71} = 0.803$$

$$V_s = 0.803 \times 85.49 \times 0.99 \times 0.286 \times \left(\frac{94.2 + 460}{\left(30.23 + \frac{-0.24}{13.6} \right) \times 28.78} \right)^{1/2}$$

V_s = **15.53** ft/s

*The ASTM test standard mistakenly has the square root of the average delta p instead of the average of the square root of delta p. The current EPA Method 2 is also incorrect. This was verified by Mike Toney at EPA.

**The ASTM test standard mistakenly identifies Ms as the dry molecular weight. It should be the wet molecular weight as indicated in EPA Method 2.

Q_{sd} – Average gas flow rate in dilution tunnel, dscf/hr
ASTM E2515 equation (3)

$$Q_{sd} = 3600 \times (1 - B_{ws}) \times v_s \times A \times \frac{T_{std}}{T_{s(avg)}} \times \frac{P_s}{P_{std}}$$

Where:

3600	=	Conversion from seconds to hours (ASTM method uses 60 to convert in minutes)
B_{ws}	=	Water vapor in gas stream, proportion by volume; assume 2%
A	=	Cross sectional area of dilution tunnel, ft^2
T_{std}	=	Standard absolute temperature, 528 °R
P_s	=	Absolute average gas static pressure in dilution tunnel, = P_{bar} + P_g , in Hg
$T_{s(avg)}$	=	Absolute average gas temperature in the dilution tunnel, °R; (°R = °F + 460)
P_{std}	=	Standard absolute pressure, 29.92 in Hg

Sample calculation:

$$Q_{sd} = 3600 \times (1 - 0.02) \times 15.53 \times 0.1963 \times \frac{528}{94.2 + 460} \times \frac{30.23 + \frac{-0.24}{13.6}}{29.92}$$

Q_{sd} = **10349.5** dscf/hr

$V_{m(std)}$ – Volume of Gas Sampled Corrected to Dry Standard Conditions, dscf
ASTM E2515 equation (6)

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

Where:

K_1	=	17.64 °R/in. Hg
V_m	=	Volume of gas sample measured at the dry gas meter, dcf
Y	=	Dry gas meter calibration factor, dimensionless
P_{bar}	=	Barometric pressure at the testing site, in. Hg
ΔH	=	Average pressure differential across the orifice meter, in. H_2O
T_m	=	Absolute average dry gas meter temperature, °R

Sample Calculation:

Using equation for Train 1:

$$V_{m(std)} = 17.64 \times 82.760 \times 1.012 \times \frac{\left(30.23 + \frac{1.73}{13.6}\right)}{(99.1 + 460)}$$

$V_{m(std)}$ = **80.208** dscf

Using equation for Train 2:

$$V_{m(std)} = 17.64 \times 82.172 \times 1.008 \times \frac{\left(30.23 + \frac{1.73}{13.6}\right)}{(\#\#\#\#\# + 460)}$$

$V_{m(std)}$ = **79.022** dscf

Using equation for ambient train:

$$V_{m(std)} = 17.64 \times 0.00 \times 0 \times \frac{\left(30.23 + \frac{0.00}{13.6}\right)}{(72.2 + 460)}$$

$V_{m(std)}$ = **0** dscf

m_n – Total Particulate Matter Collected, mg
ASTM E2515 Equation (12)

$$m_n = m_p + m_f + m_g$$

Where:

m_p = mass of particulate matter from probe, mg
m_f = mass of particulate matter from filters, mg
m_g = mass of particulate matter from filter seals, mg

Sample Calculation:

Using equation for Train A (first hour):

m_n = 0.0 + 6.4 + 0.0

m_n = 6.4 mg

Using equation for Train A (post-first hour):

m_n = 0.9 + 5.4 + 1.7

m_n = 8.0 mg

Train A aggregate:

m_n = 6.4 + 8.0
m_n = **14.4** mg

Using equation for Train B:

m_n = 1.8 + 11.3 + 0.3

m_n = **13.4** mg

C_s - Concentration of particulate matter in tunnel gas, dry basis, corrected to STP, g/dscf
ASTM E2515 equation (13)

$$C_s = K_2 \times \frac{m_n}{V_{m(std)}}$$

Where:

K_2	=	Constant, 0.001 g/mg
m_n	=	Total mass of particulate matter collected in the sampling train, mg
$V_{m(std)}$	=	Volume of gas sampled corrected to dry standard conditions, dscf

Sample calculation:

For Train 1:

$$C_s = 0.001 \times \frac{14.4}{80.21}$$

C_s = **0.00018** g/dscf

For Train 2

$$C_s = 0.001 \times \frac{13.4}{79.02}$$

C_s = **0.00017** g/dscf

For Ambient Train

$$C_r = 0.001 \times \frac{}{0}$$

C_r = **0** g/dscf

E_T – Total Particulate Emissions, g
ASTM E2515 equation (15)

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

Where:

C_s	=	Concentration of particulate matter in tunnel gas, g/dscf
C_r	=	Concentration particulate matter room air, g/dscf
Q_{std}	=	Average dilution tunnel gas flow rate, dscf/hr
θ	=	Total time of test run, minutes

Sample calculation:

For Train 1

E_T = (0.000180 - 0) x 10349.5 x 629 /60

E_T = **19.48** g

For Train 2

E_T = (0.000170 - 0) x 10349.5 x 629 /60

E_T = **18.40** g

Average

E = **18.94** g

Total emission values shall not differ by more than 7.5% from the total average emissions

7.5% of the average =	1.42
Train 1 difference =	0.54
Train 2 difference =	0.54

PR - Proportional Rate Variation

ASTM E2515 equation (16)

$$PR = \left[\frac{\theta \times V_{mi} \times V_s \times T_m \times T_{si}}{\theta_i \times V_m \times V_{si} \times T_{mi} \times T_s} \right] \times 100$$

Where:

θ	=	Total sampling time, min
θ_i	=	Length of recording interval, min
V_{mi}	=	Volume of gas sample measured by the dry gas meter during the “ith” time interval, dcf
V_m	=	Volume of gas sample as measured by dry gas meter, dcf
V_{si}	=	Average gas velocity in the dilution tunnel during the "ith" time interval, ft/sec
V_s	=	Average gas velocity in the dilution tunnel, ft/sec
T_{mi}	=	Absolute average dry gas meter temperature during the "ith" time interval, ^oR
T_m	=	Absolute average dry gas meter temperature, ^oR
T_{si}	=	Absolute average gas temperature in the dilution tunnel during the "ith" time interval, ^oR
T_s	=	Absolute average gas temperature in the dilution tunnel, ^oR

Sample calculation (for the first 1 minute interval of Train 1):

$$PR = \left(\frac{629 \times 0.09 \times 15.53 \times (123.0 + 460) \times (99.1 + 460)}{1 \times 82.76 \times 15.02 \times (94.2 + 460) \times (94.0 + 460)} \right) \times 100$$

PR = **75** %

PM_{RH} - Particulate emission rate for high fire test run, g/hr;
ASTM E3053 equation (9)

$$PM_{RH} = 60(E_{TH}/\theta_{H2})$$

Where,

E_{TH} = Total particulate emissions for high fire test run including kindling and start-up, g

θ_{H2} = Total duration of high fire test run, from ignition of kindling to end of test run, min.

Sample Calculation:

E_{TH} = N/A - Applicable to High Fire Tests Only

θ_{H2} = N/A - Applicable to High Fire Tests Only

PM_{RH} = 60(N/A / N/A)

PM_{RH} = **N/A** g/hr

PM_{FH} - Particulate emission factor for high fire test run, g/dry kg of fuel burned.

ASTM E3053 equation (10)

$$PM_{FH} = E_{TH}/M_{TFBHdb}$$

Sample Calculation:

E_{TH} = N/A - Applicable to High Fire Tests Only

M_{TFBHdb} = N/A - Applicable to High Fire Tests Only

PM_{FH} = N/A / N/A

= **N/A** g/kg

Particulate emission rate for low or medium fire test runs, g/hr
E3053 equation (12)

$PM_R = 60(E_T/\theta)$

E_T = Total particulate emissions for low or medium fire test runs from Test Method E2515, g

Calculation:

E_T = 18.94
θ = 629

PM_R = 60(18.94 / 629)

PM_{RH} = **1.81** g/hr

Particulate emission factor for high fire test run, g/dry kg of fuel burned.
E3053 equation (13)

$PM_F = E_T/M_{TFBdb}$

Calculation:

E_T = 18.94
M_{TFBdb} = 12.72

PM_{FH} = 18.94 / 12.72
= **1.49** g/kg

Sample Calculations – ASTM E3053 & E2515

Client: Englands' Stove Works
Model: 32-NC
Run: 1

Equations used to calculate the parameters listed below are described in this appendix. Sample calculations are provided for each equation. The raw data and printout results from a sample run are also provided for comparison to the sample calculations.

M_{Fldb} – Weight of test fuel load, dry basis, lb (kg)

M_{SUdb} – Weight of start-up fuel, dry basis, lb (kg)

M_{Kdb} - Weight of kindling, dry basis, lb (kg)

M_{FREHdb} - Total weight of all remaining fuel at end of high fire test run, lb (kg)

M_{TFBHdb} - Total weight of all fuel burned during high fire test run, lb (kg), dry basis

BR_H – Dry burn rate for high fire test run, from time when test fuel load is added to end of test run, lb/h (kg/h)

M_{TFBdb} - Total weight of fuel burned during low or medium fire test run, lb (kg), dry basis

BR - Dry burn rate for low and medium fire test runs, lb/h (kg/h)

V_s – Average gas velocity in the dilution tunnel, ft/sec

Q_{sd} – Average gas flow rate in dilution tunnel, dscf/hr

$V_{m(std)}$ – Volume of gas sampled, corrected to dry standard conditions, dscf

m_n – Total particulate matter collected, mg

C_s - Concentration of particulate matter in tunnel gas, dry basis, corrected to STP, g/dscf

E_T – Total particulate emissions, g

PR - Proportional rate variation

PM_{RH} - Particulate emission rate for high fire test run, g/hr

PM_{FH} - Particulate emission factor for high fire test run, g/dry kg of fuel burned

PM_R – Particulate emission rate for low or medium fire test run, g/hr

PM_F – Particulate emission factor for low or medium fire test run, g/dry kg of fuel burned

M_{Fldb} – Weight of test fuel load, dry basis, lb (kg)
ASTM E3053 equation (1)

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

Where,

M_{FLnwb} = Weight of each test fuel piece, n, in test fuel load per 8.4.1, wet basis, lb (kg)

MC_{FLn} = Average fuel moisture of test fuel piece, n, in test fuel load, % dry basis

n = individual test fuel pieces that comprise the test fuel load, as applicable.

Sample Calculation:

n	M_{FLnwb}	MC_{FLn}	$(M_{FLnwb})(100/(100 + MC_{FLn}))$		
1	5.52	21.1	5.52 (100) / (100+ 21.1)) =	4.56	
2	6.60	19.3	6.6 (100) / (100+ 19.3)) =	5.53	
3	5.55	21.1	5.55 (100) / (100+ 21.1)) =	4.58	
4	7.39	25.4	7.39 (100) / (100+ 25.4)) =	5.89	
5	4.54	23.9	4.54 (100) / (100+ 23.9)) =	3.66	
6	0.00	NA	N/A	-	
7	N/A	N/A	N/A	-	
			SUM	24.23	lbs

M_{Fldb} = **24.23** lbs

M_{Fldb} = **10.99** kg

- Weight of start-up fuel, dry basis, lb (kg)
E3053 equation (2)

M_{Kdb} - Wei
ASTM E30

$M_{SUdb} = (M_{SUwb})(100/(100 + MC_{SU}))$

Where,

M_{SUwb}	=	Total weight of start-up fuel pieces, wet basis, lb (kg)
MC_{SU}	=	Average fuel moisture of the piece(s) from which start-up fuel was split, % dry basis

Sample cal

Calculation:

M_{SUwb} = 8.34
MC_{SU} = 20.1

M_{SUdb} = 8.3 (100/(100+ 20.1)
M_{SUdb} = **6.95** lbs
= **3.15** kg

ght of kindling, dry basis, lb (kg)
53 equation (3)

$M_{Kdb} = (M_{Kwb})(100/(100 + MC_K))$

M_{Kwb} = Weight of kindling per 8.5.6, wet basis, lb (kg);
MC_K = Average moisture of kindling (may be assumed 10%), % dry basis.

culation:

M_{Kwb} = 3.88
MC_K = 10.0

M_{Kdb} = 3.88 (100/(100+ 10.0)

M_{Kdb} = **3.53** lbs
= **1.60** kgs

M_{FREHdb} - Total weight of all remaining fuel at end of high fire test run, lb (kg)
ASTM E3053 equation (4)

$$M_{FREHdb} = M_{RSUBdb} + M_{FLEHdb}$$

Where,

M_{RSUBdb} = Weight of residual start-up fuel bed when high fire test load added, lb (kg)

M_{FLEHdb} = Weight of unburned portion of test fuel load at the end of the high fire test run, lb (kg)

Sample calculation:

M_{RSUBdb} = 4

M_{FLEHdb} = 2.7

M_{FREHdb} = 4.00 + 2.7

M_{FREHdb} = **6.70** lbs

= **3.04** kg

M_{TFBHdb} - Total weight of all fuel burned during high fire test run, lb (kg), dry basis

ASTM E3053 equation (5)

$$M_{TFBHdb} = M_{Kdb} + M_{SUdb} + M_{FLdb} - M_{FREHdb}$$

Sample Calculation:

M_{Kdb} = 3.53

M_{SUdb} = 6.95

M_{FLdb} = 24.23

M_{FREHdb} = 6.70

M_{TFBHdb} = 3.53 + 6.95 + 24.23 - 6.70

= **28.00** lbs

= **12.70** kg

BR_H – Dry burn rate for high fire test run, from time when test fuel load is added to end of test run, lb/h (kg/h)

ASTM E3053 equation (6)

$$BR_H = 60\ (M_{FLdb} - M_{FLEHdb})/\theta_{H1}$$

Where,

θ_{H1} = Total duration of high fire test run, from time when test fuel load is added to end of test run, min.

Sample calculation:

M_{FLdb} = 24.23

M_{FLEHdb} = 2.70

θ_{H1} = 193

$$BR_H = \frac{60\ (\ 24.23\ -\ 2.70\ )}{193}$$

BR_H = **6.69** lb/hr

= **3.04** kg/hr

M_{TFBdb} - Total weight of fuel burned during low or medium fire test run, lb (kg), dry basis
ASTM E3053 equation (7)

$$M_{TFBdb} = M_{FLdb} - M_{FREdb}$$

Where,

M_{FLdb} = Total weight of fuel burned during low or medium fire test run, lb (kg), dry basis

M_{FREdb} = Weight of remaining fuel at end of low or medium fire test run, lb (kg)

Sample Calculation:

M_{FLdb} = N/A - Applicable to Low/Medium Fire Tests Only

M_{FREdb} = N/A - Applicable to Low/Medium Fire Tests Only

M_{TFBdb} = N/A - N/A

= **N/A** lbs

= **N/A** kg

BR - Dry burn rate for low and medium fire test runs, lb/h (kg/h)
ASTM E3053 equation (8)

$$BR = \frac{60\ M_{TFBdb}}{\theta}$$

Where,

θ = Total test run duration for low or medium fire test run, min.

Sample Calculation:

M_{TFBdb} = N/A - Applicable to Low/Medium Fire Tests Only
θ = N/A - Applicable to Low/Medium Fire Tests Only

$$BR = \frac{60 \text{ x } \text{N/A}}{\text{N/A}}$$

BR = **N/A** lb/hr
= **N/A** kg/hr

V_s – Average gas velocity in the dilution tunnel, ft/sec
ASTM E2515 equation (9)

$$v_s = F_P \times k_p \times C_p \times (\sqrt{\Delta P})_{avg} \times \sqrt{\frac{T_{s(avg)}}{P_s \times M_s}}$$

Where:

F_p = Adjustment factor for pitot tube center point reading = $\frac{V_{strav}}{V_{scent}}$, ASTM E2515 Equation (1)

v_{scent} = Dilution tunnel velocity calculated after the multi-point pitot traverse at the center, ft/sec

v_{strav} = Dilution tunnel velocity calculated after the multi-point pitot traverse, ft/sec

k_p = Pitot tube constant, 85.49

C_p = Pitot tube coefficient: 0.99, unitless

ΔP* = Velocity pressure in the dilution tunnel, in H_2O

T_s = Absolute average gas temperature in the dilution tunnel, °R; (°R = °F + 460)

P_s = Absolute average gas static pressure in dilution tunnel, = $P_{bar} + P_g$, in Hg

P_{bar} = Barometric pressure at test site, in. Hg

P_g = Static pressure of tunnel, in. H_20; (in Hg = in H_20/13.6)

M_s = **The dilution tunnel wet molecular weight; M_s = 28.78 assuming a dry weight of 29 lb/lb-mole

Sample calculation:

$$Fp = \frac{15.03}{18.71} = 0.803$$

$$V_s = 0.803 \times 85.49 \times 0.99 \times 0.279 \times \left(\frac{119.7 + 460}{\left(30.22 + \frac{-0.24}{13.6} \right) \times 28.78} \right)^{1/2}$$

V_s = **15.50** ft/s

*The ASTM test standard mistakenly has the square root of the average delta p instead of the average of the square root of delta p. The current EPA Method 2 is also incorrect. This was verified by Mike Toney at EPA.

**The ASTM test standard mistakenly identifies Ms as the dry molecular weight. It should be the wet molecular weight as indicated in EPA Method 2.

Q_{sd} – Average gas flow rate in dilution tunnel, dscf/hr
ASTM E2515 equation (3)

$$Q_{sd} = 3600 \times (1 - B_{ws}) \times v_s \times A \times \frac{T_{std}}{T_{s(avg)}} \times \frac{P_s}{P_{std}}$$

Where:

3600	=	Conversion from seconds to hours (ASTM method uses 60 to convert in minutes)
B_{ws}	=	Water vapor in gas stream, proportion by volume; assume 2%
A	=	Cross sectional area of dilution tunnel, ft^2
T_{std}	=	Standard absolute temperature, 528 °R
P_s	=	Absolute average gas static pressure in dilution tunnel, = P_{bar} + P_g , in Hg
$T_{s(avg)}$	=	Absolute average gas temperature in the dilution tunnel, °R; (°R = °F + 460)
P_{std}	=	Standard absolute pressure, 29.92 in Hg

Sample calculation:

$$Q_{sd} = 3600 \times (1 - 0.02) \times 15.50 \times 0.1963 \times \frac{528}{119.7 + 460} \times \frac{30.22 + \frac{-0.24}{13.6}}{29.92}$$

Q_{sd} = **9874.8** dscf/hr

$V_{m(std)}$ – Volume of Gas Sampled Corrected to Dry Standard Conditions, dscf
ASTM E2515 equation (6)

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

Where:

K_1	=	17.64 °R/in. Hg
V_m	=	Volume of gas sample measured at the dry gas meter, dcf
Y	=	Dry gas meter calibration factor, dimensionless
P_{bar}	=	Barometric pressure at the testing site, in. Hg
ΔH	=	Average pressure differential across the orifice meter, in. H_2O
T_m	=	Absolute average dry gas meter temperature, °R

Sample Calculation:

Using equation for Train 1:

$$V_{m(std)} = 17.64 \times 31.153 \times 1.012 \times \frac{\left(30.22 + \frac{1.73}{13.6}\right)}{(97.2 + 460)}$$

$V_{m(std)}$ = **30.286** dscf

Using equation for Train 2:

$$V_{m(std)} = 17.64 \times 31.268 \times 1.008 \times \frac{\left(30.22 + \frac{1.75}{13.6}\right)}{(98.7 + 460)}$$

$V_{m(std)}$ = **30.203** dscf

Using equation for ambient train:

$$V_{m(std)} = 17.64 \times 0.00 \times 0 \times \frac{\left(30.22 + \frac{0.00}{13.6}\right)}{(74.2 + 460)}$$

$V_{m(std)}$ = **0** dscf

m_n – Total Particulate Matter Collected, mg
ASTM E2515 Equation (12)

$$m_n = m_p + m_f + m_g$$

Where:

m_p = mass of particulate matter from probe, mg
m_f = mass of particulate matter from filters, mg
m_g = mass of particulate matter from filter seals, mg

Sample Calculation:

Using equation for Train A (first hour):

m_n = 0.0 + 0.6 + 0.0

m_n = 0.6 mg

Using equation for Train A (post-first hour):

m_n = 1.0 + 4.5 + 0.3

m_n = 5.8 mg

Train A aggregate:

m_n = 0.6 + 5.8
m_n = **6.4** mg

Using equation for Train B:

m_n = 0.2 + 3.7 + 3.8

m_n = **7.7** mg

C_s - Concentration of particulate matter in tunnel gas, dry basis, corrected to STP, g/dscf
ASTM E2515 equation (13)

$$C_s = K_2 \times \frac{m_n}{V_{m(std)}}$$

Where:

K_2	=	Constant, 0.001 g/mg
m_n	=	Total mass of particulate matter collected in the sampling train, mg
$V_{m(std)}$	=	Volume of gas sampled corrected to dry standard conditions, dscf

Sample calculation:

For Train 1:

$$C_s = 0.001 \times \frac{6.4}{30.29}$$

C_s = **0.00021** g/dscf

For Train 2

$$C_s = 0.001 \times \frac{7.7}{30.20}$$

C_s = **0.00025** g/dscf

For Ambient Train

$$C_r = 0.001 \times \frac{}{0}$$

C_r = **0** g/dscf

E_T – Total Particulate Emissions, g
ASTM E2515 equation (15)

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

Where:

C_s	=	Concentration of particulate matter in tunnel gas, g/dscf
C_r	=	Concentration particulate matter room air, g/dscf
Q_{std}	=	Average dilution tunnel gas flow rate, dscf/hr
θ	=	Total time of test run, minutes

Sample calculation:

For Train 1

E_T = (0.000211 - 0) x 9874.8 x 238 /60

E_T = **8.28** g

For Train 2

E_T = (0.000255 - 0) x 9874.8 x 238 /60

E_T = **9.99** g

Average

E = **9.13** g

Total emission values shall not differ by more than 7.5% from the total average emissions

7.5% of the average =	0.68
Train 1 difference =	0.85
Train 2 difference =	0.85

PR - Proportional Rate Variation

ASTM E2515 equation (16)

$$PR = \left[\frac{\theta \times V_{mi} \times V_s \times T_m \times T_{si}}{\theta_i \times V_m \times V_{si} \times T_{mi} \times T_s} \right] \times 100$$

Where:

θ	=	Total sampling time, min
θ_i	=	Length of recording interval, min
V_{mi}	=	Volume of gas sample measured by the dry gas meter during the “ith” time interval, dcf
V_m	=	Volume of gas sample as measured by dry gas meter, dcf
V_{si}	=	Average gas velocity in the dilution tunnel during the "ith" time interval, ft/sec
V_s	=	Average gas velocity in the dilution tunnel, ft/sec
T_{mi}	=	Absolute average dry gas meter temperature during the "ith" time interval, ^oR
T_m	=	Absolute average dry gas meter temperature, ^oR
T_{si}	=	Absolute average gas temperature in the dilution tunnel during the "ith" time interval, ^oR
T_s	=	Absolute average gas temperature in the dilution tunnel, ^oR

Sample calculation (for the first 1 minute interval of Train 1):

$$PR = \left(\frac{238 \times 0.124 \times 15.50 \times (75.0 + 460) \times (97.2 + 460)}{1 \times 31.153 \times 14.89 \times (119.7 + 460) \times (87.0 + 460)} \right) \times 100$$

PR = **93** %

PM_{RH} - Particulate emission rate for high fire test run, g/hr;
ASTM E3053 equation (9)

$$PM_{RH} = 60(E_{TH}/\theta_{H2})$$

Where,

E_{TH} = Total particulate emissions for high fire test run including kindling and start-up, g

θ_{H2} = Total duration of high fire test run, from ignition of kindling to end of test run, min.

Sample Calculation:

E_{TH} = 9.13

θ_{H2} = 238

PM_{RH} = 60(9.13 / 238)

PM_{RH} = **2.30** g/hr

PM_{FH} - Particulate emission factor for high fire test run, g/dry kg of fuel burned.
ASTM E3053 equation (10)

$$PM_{FH} = E_{TH}/M_{TFBHdb}$$

Sample Calculation:

E_{TH} = 9.13

M_{TFBHdb} = 12.70

PM_{FH} = 9.13 / 12.70

= **0.72** g/kg

Particulate emission rate for low or medium fire test runs, g/hr
E3053 equation (12)

$PM_R = 60(E_T/\theta)$

E_T = Total particulate emissions for low or medium fire test runs from Test Method E2515, g

Calculation:

E_T = N/A - Applicable to Low/Medium Fire Tests Only
θ = N/A - Applicable to Low/Medium Fire Tests Only

PM_R = 60(N/A / N/A)

PM_{RH} = **N/A** g/hr

Particulate emission factor for high fire test run, g/dry kg of fuel burned.
E3053 equation (13)

$PM_F = E_T/M_{TFBdb}$

Calculation:

E_T = N/A - Applicable to Low/Medium Fire Tests Only
M_{TFBdb} = N/A - Applicable to Low/Medium Fire Tests Only

PM_{FH} = N/A / N/A
= **N/A** g/kg

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
RESEARCH TRIANGLE PARK, NC 27711

FEB 2 8 2018

OFFICE OF
AIR QUALITY PLANNING
AND STANDARDS

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

Dear Mr. White,

I am writing in response to your letter dated January 12, 2018, regarding wood heaters manufactured by Hearthstone QHPP, Inc. (Hearthstone). This response, dated February 28, 2018, supercedes our previous response (dated February 26, 2018) to correct an inaccuracy regarding required changes to ASTM E3053-17.

You are requesting to use an alternative test method, using cord wood, as referenced in section 60.532(c) of 40 CFR part 60, Subpart AAA, Standards of Performance for New Residential Wood Heaters (Subpart AAA) to meet the 2020 cord wood alternative compliance option. The 2020 cord wood alternative compliance option states that each affected wood heater manufactured or sold at retail for use in the United States on or after May 15, 2020, must not discharge into the atmosphere any gases that contain particulate matter in excess of 2.5 g/hr. Compliance must be determined by a cord wood test method approved by the Administrator along with the procedures in 40 CFR 60.534. You have requested approval to use the procedures and specifications found in ASTM Method E3053-17, a cord wood test method titled, "Standard Test Method for Determining Particulate Matter Emissions from Wood Heaters using Cordwood Test Fuel," in conjunction with ASTM E2515-11 and Canadian Standards Administration (CSA) Method CSA-B415.1-10, which are specified in 40 CFR 60.534.

We understand that Hearthstone is also requesting that the alternative method proposed above be approved to apply broadly to all wood heaters manufactured by Hearthstone meeting the requirements of Subpart AAA, from the approval date of this request until such time that Subpart AAA is revised or replaced to require a different cord wood certification method, providing all requirements of section 60.533 of Subpart AAA are met.

With the caveats set forth below, we approve your alternative test method request for certifying wood heaters using ASTM E3053-17 in conjunction with section 60.534 of Subpart AAA to meet the 2020 cord wood compliance option until such time that Subpart AAA is revised or replaced to require a different cord wood certification method. We also approve application of this alternative method to all wood heaters manufactured by Hearthstone meeting the requirements of Subpart AAA.

As required in Subpart AAA, section 60.354(d), you or your approved test laboratory must also measure the first hour of particulate matter emissions for each test run using a separate filter in one of the two parallel sampling trains. These results must be reported separately and also included in the total particulate matter emissions per run. Also, as required by Subpart AAA, section 60.534(e), you must have your approved laboratory measure the efficiency, heat output, and carbon monoxide emissions of the tested wood heater using CSA-B415.1-10. For measurement of particulate matter emission concentrations, ASTM 2515-11 must be used.

The following change to ASTM E3053-17 must be followed:

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

The following changes to ASTM E2515-11 must be followed:

1. The filter temperature must be maintained between 80 and 90 degrees F during testing.

2. Filters must be weighed in pairs to reduce weighing error propagation; see ASTM 2515-11, Section 10.2.1 Analytical Procedure.

3. Sample filters must be Pall TX-40 or equivalent Teflon-coated glass fiber, and of 47 mm, 90 mm, 100 mm, or 110 mm in diameter.

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

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

It is reasonable that this alternative test method approval be broadly applicable to all wood heaters subject to the requirements of 40 CFR part 60, Subpart AAA. For this reason, we will post this letter as ALT-125 on our website at *http://www3.epa.gov/ttn/emc/approalt.html* for use by other interested parties. As noted earlier in this letter, this alternative method approval is valid until such time that Subpart AAA is revised or replaced to require a different cord wood certification method, and at such time, this alternative will be reconsidered and possibly withdrawn.

If you have additional questions regarding this approval, please contact Michael Toney of my staff at 919-541-5247 or toney.mike@epa.gov.

Sincerely,

Steffan M. Johnson, Group Leader
Measurement Technology Group

cc: Amanda Aldridge, EPA/OAQPS/OID
Adam Baumgart-Getz, EPA/OAQPS/OID
Rafael Sanchez, EPA/OECA
Michael Toney, EPA/OAQPS/AQAD

Modèles ☐ 32-NC ☐50-SNC32 ☐50-TNC32
Appareil de chauffage à combustible solide; modèle autoportant
<< ADAPTÉ POUR L'INSTALLATION DANS UNE MAISON MOBILE >>
Certifié à UL-1482 et ULC-627-00, EPA METHOD 28R, ASTM E3053-17, EPA Alt 125, CSA B415.1-10

W/N# ____

NUMÉRO DE SÉRIE	
DATE DE FABRICATION	

Fabriqué par :
England's Stove Works, Inc.
589 S. Five Forks Rd.
Monroe, VA 24574, États-Unis

N'ENLEVEZ PAS ET NE COUVREZ PAS CETTE ÉTIQUETTE

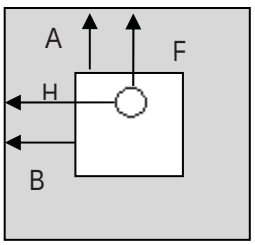
- PRÉVENEZ LES RISQUES D'INCENDIE DOMESTIQUES – INSTALLEZ ET UTILISEZ CET APPAREIL UNIQUEMENT CONFORMÉMENT AU MANUEL D'UTILISATION QUI L'ACCOMPAGNE.
- COMMUNIQUEZ AVEC LES AUTORITÉS LOCALES EN MATIÈRE DE CONSTRUCTION OU LE SERVICE D'INCENDIE POUR EN SAVOIR PLUS À PROPOS DES RESTRICTIONS ET DES INSPECTIONS D'INSTALLATION DANS VOTRE RÉGION.

EXIGENCES RELATIVES À L'INSTALLATION

- NE RACCORDEZ PAS CE POÊLE À UN CONDUIT DE FUMÉE DÉJÀ UTILISÉ POUR UN AUTRE APPAREIL.
- UTILISEZ UNE CHEMINÉE EN MAÇONNERIE DE TYPE RÉSIDENTIEL OU UNE CHEMINÉE FABRIQUÉE EN USINE HOMOLOGUÉE ULC-629 (CANADA) ET UL-103 HT (ÉTATS-UNIS).
- UTILISEZ UN RACCORD DE CHEMINÉE NOIR À PAROI SIMPLE DE CALIBRE 24 MSG OU UN RACCORD DE CHEMINÉE À PAROI DOUBLE HOMOLOGUÉ.
- CONSULTEZ LES CODES LOCAUX ET LES INSTRUCTIONS DU FABRICANT DE LA CHEMINÉE POUR CONNAÎTRE LES PRÉCAUTIONS NÉCESSAIRES SI VOUS FAITES PASSER UNE CHEMINÉE À TRAVERS UN MUR OU UN PLAFOND COMBUSTIBLE.
- POUR LES ÉTATS-UNIS : PLACEZ L'APPAREIL SUR UN PROTECTEUR DE PLANCHER AVEC UN FACTEUR R NON INFÉRIEUR À 1 INCOMBUSTIBLE CONFORME À LA NORME UL, QUI DÉPASSE DE ____ MM À L'AVANT ET DE ____ MM DE CHAQUE CÔTÉ DE L'OUVERTURE POUR L'ALIMENTATION EN COMBUSTIBLE.
- POUR LE CANADA : PLACEZ L'APPAREIL SUR UN PROTECTEUR DE PLANCHER AVEC UN FACTEUR R NON INFÉRIEUR À 1 INCOMBUSTIBLE CONFORME À LA NORME ULC , QUI DÉPASSE DE ___ MM À L'AVANT ET DE ___ MM DE CHAQUE CÔTÉ DE L'OUVERTURE POUR L'ALIMENTATION EN COMBUSTIBLE.
- RESPECTEZ LES DISTANCES MINIMALES INDIQUÉES DES COMBUSTIBLES LORSQUE VOUS UTILISEZ UN RACCORD DE CHEMINÉE À PAROI SIMPLE. CONSULTEZ LE MANUEL D'UTILISATION POUR EN SAVOIR PLUS SUR LES DISTANCES MINIMALES.
- UTILISEZ CET APPAREIL SEULEMENT LORSQUE LA PORTE EST FERMÉE ET BIEN VERROUILLÉE.
- LA PORTE DE CHARGEMENT PRINCIPALE EST MUNIE D'UNE FENÊTRE EN CÉRAMIQUE. NE CLAQUEZ JAMAIS LA PORTE ET NE FRAPPEZ JAMAIS CETTE FENÊTRE.
- TAUX D'ÉMISSION : 2.0 G/H
- SI LE VERRE EST FISSURÉ OU BRISÉ, REMPLACEZ-LE AVEC UN VERRE EN VITROCÉRAMIQUE SEULEMENT.
- CERTIFIÉ CONFORME AUX NORMES DE 2020 SUR L'ÉMISSION DE PARTICULES LORS DE L'UTILISATION DE CORD WOOD PAR L'ENVIRONMENTAL PROTECTION AGENCY DES ÉTATS-UNIS.
- PIÈCES EN OPTION – ÉCRANS THERMIQUES LATÉRAUX, NUMÉRO DE PIÈCE AC-30SHSB (ESW INC.).
- REPORTEZ-VOUS AU RÉPERTOIRE DES PRODUITS DE CONSTRUCTION D'PFS TECO POUR DES INFORMATIONS DÉTAILLÉES (HTTP://PFSTECO.COM/BUILDING-PRODUCTS).

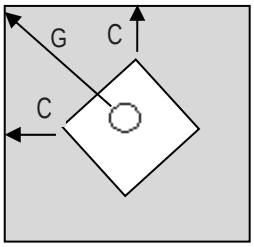
EXIGENCES RELATIVES À L'UTILISATION : UTILISEZ SEULEMENT AVEC DES COMBUSTIBLES SOLIDES (BOIS). ÉVITEZ L'EMBALLEMENT DE CET APPAREIL. SI LE RACCORD DE L'APPAREIL DE CHAUFFAGE OU DE LA CHEMINÉE COMMENCE À ROUGEOYER, IL Y A EMBALLEMENT. INSPECTEZ ET NETTOYEZ FRÉQUEMMENT LA CHEMINÉE. DANS CERTAINES CONDITIONS D'UTILISATION, UNE ACCUMULATION DE CRÉOSOTE PEUT SE PRODUIRE RAPIDEMENT. VOUS NE DEVEZ PAS UTILISER DE GRILLE NI SURÉLEVER LE FEU. INSTALLEZ LE BOIS DIRECTEMENT SUR L'ÂTRE. RISQUE D'ÉCHAPPEMENT DE FUMÉE OU DE FLAMMES – UTILISEZ L'APPAREIL SEULEMENT LORSQUE LA PORTE EST COMPLÈTEMENT FERMÉE.

Paroi arrière et paroi latérale



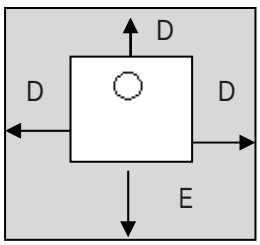
A = ____ mm (___ po)
D = ___ mm (_ po)
G = ____ mm (__ po)

Coin



B = ____ mm (___ po)
E = ___ mm (___po)
H = ____ mm (__ po)

Protection de plancher



C = ____ mm (___ po)
F = ____ mm (__ po)

ATTENTION – CET APPAREIL DEVIENT CHAUD LORSQU'IL EST EN MARCHE. N'Y TOUCHEZ PAS. MAINTENEZ–LE À BONNE DISTANCE DES MEUBLES ET DES VÊTEMENTS ET HORS DE PORTÉE DES ENFANTS. LE CONTACT AVEC L'APPAREIL PEUT BRÛLER LA PEAU. CONSULTEZ LA PLAQUE SIGNALÉTIQUE ET LES INSTRUCTIONS.

Model ☐32-NC ☐50-SNC32 ☐50-TNC32
Solid Fuel Burning Room Heater; Free Standing Model "SUITABLE FOR MOBILE-HOME INSTALLATION "
Certified to UL-1482 & ULC-627-00, EPA METHOD 28R, ASTM E3053-17, EPA Alt 125, CSA B415.1-10

W/N# _____

SERIAL NO.	
MFG. DATE	

Manufactured by:
England's Stove Works, Inc.
589 S. Five Forks Rd.
Monroe, VA 24574

DO NOT REMOVE OR COVER THIS LABEL

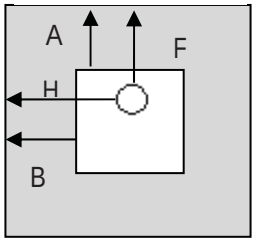
- PREVENT HOUSE FIRES – INSTALL AND USE ONLY IN ACCORDANCE WITH THE OWNER'S MANUAL PROVIDED WITH THIS APPLIANCE.
- CONTACT LOCAL BUILDING OR FIRE OFFICIALS ABOUT RESTRICTIONS AND INSTALLATION INSPECTIONS IN YOUR AREA.

INSTALLATION REQUIREMENTS

- DO NOT CONNECT THIS UNIT TO A CHIMNEY FLUE SERVING ANOTHER APPLIANCE.
- USE A RESIDENTIAL TYPE MASONRY OR FACTORY BUILT CHIMNEY LISTED TO UL-103 HT (US) AND ULC-629 (CANADA).
- USE 24 GAUGE MSG BLACK SINGLE WALL CHIMNEY CONNECTOR OR LISTED DOUBLE WALL CHIMNEY CONNECTOR.
- REFER TO LOCAL CODES AND THE CHIMNEY MANUFACTURER'S INSTRUCTIONS FOR PRECAUTIONS REQUIRED FOR PASSING A CHIMNEY THROUGH A COMBUSTIBLE WALL OR CEILING.
- FOR THE US: PLACE ON A NON-COMBUSTIBLE TYPE FLOOR PROTECTOR WITH A R VALUE OF AT LEAST 1.0, WHICH EXTENDS ____ IN. TO THE FRONT AND ___ IN. TO EACH SIDE OF THE FUEL LOADING OPENING.
- FOR CANADA: PLACE ON A NON-COMBUSTIBLE TYPE FLOOR PROTECTOR WITH A R FACTOR OF AT LEAST 1.0, WHICH EXTENDS _____ MM. TO THE FRONT AND _____ MM. TO EACH SIDE OF THE FUEL LOADING OPENING.
- ADHERE TO THE LISTED MINIMUM CLEARANCES TO COMBUSTIBLES WHEN USING SINGLE WALL CHIMNEY CONNECTOR. SEE THE OWNER'S MANUAL FOR ADDITIONAL CLEARANCE INFORMATION.
- ONLY OPERATE THIS UNIT WITH THE DOOR CLOSED AND LATCHED TIGHTLY.
- THE MAIN LOADING DOOR CONTAINS A CERAMIC VIEWING WINDOW; DO NOT SLAM THE DOOR OR STRIKE THIS VIEWING WINDOW AT ANY TIME.
- IF THE GLASS IS CRACKED OR BROKEN, REPLACE WITH CERAMIC GLASS ONLY.
- EMISSION VALUE – 2.0 GRAMS/HR
- U.S. ENVIRONMENTAL PROTECTION AGENCY CERTIFIED TO COMPLY WITH 2020 PARTICULATE EMISSION STANDARDS USING CORD WOOD.
- OPTIONAL PARTS- SIDE HEAT SHIELDS PART NUMBER AC-30SHSB (ESW INC.)
- REFER TO PFS TECO'S DIRECTORY OF BUILDING PRODUCTS (HTTP://WWW.PFSTECO.COM/BUILDING-PRODUCTS) FOR DETAILED INFORMATION.

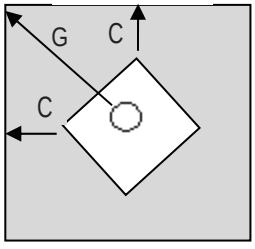
OPERATION REQUIREMENTS: FOR USE WITH SOLID WOOD FUEL ONLY. DO NOT OVER-FIRE, IF HEATER OR CHIMNEY CONNECTOR GLOWS YOU ARE OVER-FIRING. INSPECT AND CLEAN CHIMNEY FREQUENTLY, UNDER CERTAIN CONDITIONS OF USE, CREOSOTE BUILDUP MAY OCCUR RAPIDLY. DO NOT USE A GRATE OR ELEVATE THE FIRE, BURN WOOD FIRE DIRECTLY ON THE HEARTH. RISK OF SMOKE AND FLAME SPILLAGE, OPERATE ONLY WITH DOOR FULLY CLOSED.
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.

Back wall/Sidewall



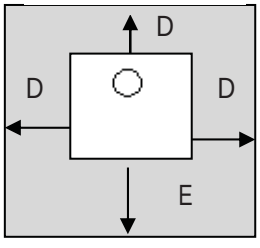
A = ___ inches (____ mm)
D = ___ inches (____ mm)
G = ___ inches (____ mm)

Corner



B = ___ inches (____ mm)
E = ___ inches (____ mm)
H = ___ inches (____ mm)

Floor Protection



C = ___ inches (____ mm)
F = ___ inches (____ mm)

CAUTION - HOT WHILE IN OPERATION. DO NOT TOUCH. KEEP CHILDREN, CLOTHING, AND FURNITURE AWAY. CONTACT MAY CAUSE SKIN BURNS. SEE NAMEPLATE AND INSTRUCTIONS.

MODELS 32-NC, 50-SNC32, 50-TNC32
INSTALLATION & OPERATION MANUAL

Manufactured By:
England's Stove Works, Inc.
PO Box 206
Monroe, VA 24574
www.heatredefined.com
(800) 245-6489

Rev. 5/2020

CAUTION

Please read this entire manual before installation and use of this wood fuel-burning appliance. Keep children, furniture, fixtures and all combustibles away from any heating appliance.

SAVE THESE INSTRUCTIONS

SAFETY NOTICE

Failure to follow these instructions can result in property damage, bodily injury or even death. For your safety and protection, follow the installation instructions outlined in this manual. Contact your local building or fire officials about restrictions and installation inspection requirements (including permits) in your area.

IMPORTANT: IF YOU HAVE A PROBLEM WITH THIS UNIT, DO NOT RETURN IT TO THE DEALER. CONTACT TECHNICAL SUPPORT @ 1-800-245-6489

Mobile Home Use:
This freestanding wood unit is approved for mobile home or doublewide installation with the outside combustion air hook-up. See the "Installation" section of this manual for details pertaining to mobile home installations. Mobile home installation must be in accordance with the Manufactured Home and Safety Standard (HUD), CFR 3280, Part 24.

Retain for your files

Model Number_____
Date of Purchase_____
Date of Manufacture_____
Serial Number_____

* This information can be found on the safety tag attached to the rear of the unit. Have this information on hand if you phone the factory or your dealer regarding this product.

CAUTION

- Keep children away.
- Supervise children in the same room as this appliance.
- Alert children and adults to the hazards of high temperatures.
- Do NOT operate with protective barriers open or removed.
- Hot while in operation! Keep clothing, furniture, draperies and other combustibles away. Contact may cause skin burns!
- Installation MUST comply with local, regional, state and national codes and regulations.
- Consult local building, fire officials or authorities having jurisdiction about restrictions, installation inspection, and permits.

WELCOME!

NOTE: CLEARANCES MAY ONLY BE REDUCED BY MEANS APPROVED BY THE REGULATORY AUTHORITY HAVING JURISDICTION

DO NOT CONNECT TO ANY AIR DISTRIBUTION DUCT OR SYSTEM.

DO NOT BURN GARBAGE OR FLAMMABLE FLUIDS SUCH AS GASOLINE, NAPHTHA OR ENGINE OIL.

DO NOT USE CHEMICALS OR FLUIDS TO START THE FIRE.

***Thank you* for purchasing this fine product from England's Stove Works!**

England's Stove Works was started, and is still owned by, a family that believes strongly in a "Do It Yourself" spirit – that's one reason you found this product at your favorite "Do It Yourself" store.

We intentionally design and build our stoves so that any homeowner can maintain his or her unit with basic tools, and we're always more than happy to show you how to do the job as easily and as inexpensively as possible.

From our free, downloadable service sheets to our "wizard-style," click-through Troubleshooting guide on our web site, we have always tried to help our customers stay "heat-ready," especially when oil and electricity prices continue to skyrocket.

Please look at our vast Help section on our web site and call our Technical Support department at (800) 245-6489 if you need any help with your unit. We are nearly always able to help "walk you through" any repairs, problems or questions you may have.

PLEASE NOTE: While information obtained on our web site and through our 800 number is always free of charge, there will be a service charge incurred with any "on-site" repairs or maintenance that we may arrange.

Wishing you years of efficient, quality and "comfy" heating,
England's Stove Works
Technical Support Department

www.HeatRedefined.com
(800) 245-6489

CAUTION: Stove is heavy.
In addition, when handling any sheet metal products, be aware that there may be sharp edges or burrs. Although we make every effort to eliminate any sharp edges, please use caution when handling any metal parts.

PLEASE NOTE: If you purchased this model from certain stores, their model number may end in "L" "LC" "H" "CT", etc. This manual does apply to those models as well.

Heating Specifications

- Maximum Burn Time** ..... 10 hours
- Approximate Square Footage Heated*** ..... 2400 sq. ft.
- Firebox Capacity..... ___ pounds
- Flue Collar ..... 6.0 in. round

Dimensions (Inches)

**Specifications are approximate. Be sure to locate your stove in the installation area before installing pipe, etc.*

EPA and Safety Compliance Specifications

- EPA Compliance Status ..... Certified to comply with 2020 particulate emission standards using cord wood.
- U.S. Test Standard: US EPA 40 CFR Part 60, Subpart 60.536
- Particulate Emissions ..... 2.0 grams/hr
- CO Emissions ..... 2.3 grams/min
- Heat Output Range ..... 15900 – 39600 Btu/hr
- Efficiency..... ..... 70% (HHV)
- Tested To EPA Test Method 28R, ASTM E3053-17, EPA Alt 125, CSA B415.1-10

Notes for this unit: Product may vary slightly from diagrams. Clearances are the minimum for **this unit** and may need to be increased to have proper vent clearances. **Follow all venting manufacturer clearances and local codes.**

*** - The maximum heating capacity of this unit can vary greatly based on climate, construction style, insulation and a myriad of other factors. Use this information in conjunction with a BTU loss calculation for your home to determine if this unit will be sufficient for your needs.

INSTALLATION

Installation Overview

When choosing a location for your new stove, there are a multitude of factors that should be taken into account before beginning the installation.

1. Traffic Patterns – To help prevent accidents, the stove should be placed in a location where it is out of the way of normal travel through the home.

2. Heat Flow – When deciding on a location for the stove, consider the way heat moves throughout your home. Install the stove where you need the heat; basement installations often do not allow sufficient heat to flow to the upper floors and a top floor installation will not allow any heat to reach the floors below. Always consider that heat rises and will take the path of least resistance while it is still hot.

3. Exhaust Location – The engine which drives a wood stove is the chimney system, so it is important to consider precisely how the chimney system will be integrated into the stove installation. Ideally, a wood stove chimney will run completely vertical from the flue collar of the unit all the way to the termination point above the roof line. Keeping the entire chimney system inside the heated envelope of the home will ensure a strong, easy to initiate draft in the chimney. Although exterior chimney systems often function properly, they are more likely to suffer from cold down drafts at start up or provide weak draft to the unit. Also, consider the cross-sectional area of the chimney; although existing masonry chimneys can often be used, a large external masonry chimney will result in a unit that is difficult or impossible to operate properly. In that case, an insulated chimney liner will often be required to supply the necessary draft.

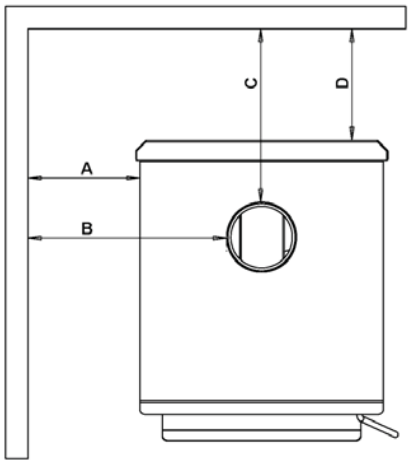
4. Wall Construction – Locating the stove so that the exhaust system can pass between studs will simplify the installation and eliminate the need to reframe any sections of the wall or ceiling to accommodate the wall thimble or ceiling box.

WARNING

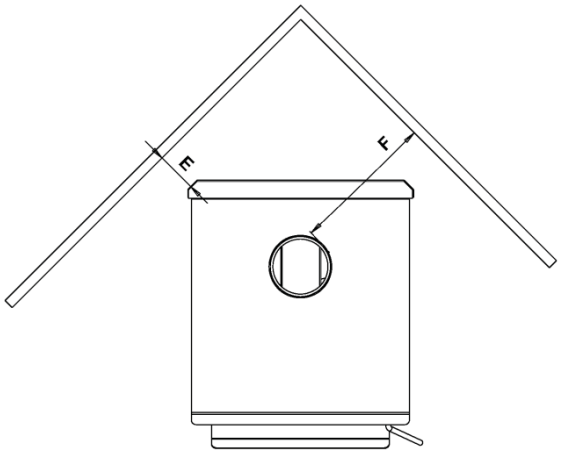
- Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance.
- Do Not Over-fire – If any external part starts to glow, you are over-firing. Reduce intake air supply. Over-firing will void your warranty.
- Comply with all minimum clearances to combustibles as specified. Failure to comply may result in a house fire.
- Tested and approved for **cordwood only**. Burning any other fuel will void your warranty.

INSTALLATION

Clearances to Combustibles



Parallel Wall Installation



Corner Installation

WARNING - INSTALL VENT AT CLEARANCES SPECIFIED BY THE VENT MANUFACTURER

	Unit to Side Wall *	Chimney Connector to Side Wall	Chimney Connector to Rear Wall	Unit to Rear Wall	Unit to Corner	Chimney Connector to Corner
	A	B	C	D	E	F
	in. (cm.)	in. (cm.)	in. (cm.)	in. (cm.)	in. (cm.)	in. (cm.)
Single Wall Chimney Connector Unprotected Surface	26 (66.04)	34.5 (87.63)	15 (38.1)	11 (27.94)	____ (_____)	____ (_____)
Single Wall Chimney Connector Unprotected Surface with side shields.	____ (_____)	____ (_____)	____ (_____)	____ (_____)	____ (_____)	____ (_____)

***Unit not tested for Double Wall Chimney Connector**

INSTALLATION

Venting Introduction

This wood stove operates on a natural draft system, in which the chimney system pulls air through the stove. This unit must be installed in accordance with the following detailed descriptions of venting techniques; not installing the stove in accordance with the details listed here can result in poor stove performance, property damage, bodily injury or death. Avoid make-shift compromises when installing the venting system. England's Stove Works is not responsible for any damage incurred due to a poor or unsafe installation.

Be certain that all aspects of the venting system are installed to the venting manufacturer's instructions, particularly the required clearances to combustibles. Also, be certain to use an attic radiation shield to prevent insulation from contacting a chimney which passes through an attic.

The chimney system is the "engine" which drives a wood stove, so it is imperative for proper unit function that the venting system be installed exactly as described in the following section.

If questions arise pertaining to the safe installation of the stove, our Technical Support line (800-245-6489) is available. Contact your local code official to be certain your installation meets local and national fire codes, and if you're uncertain about how to safely install the stove, we strongly recommend contacting a local NFI certified installer to perform the installation.

Venting Guidelines

- **ALWAYS** install vent pipe in strict adherence to the instructions and clearances included with your venting system.
- **DO NOT** connect this wood stove to a chimney flue which also serves another appliance.
- **DO NOT** install a flue pipe damper or any other restrictive device in the exhaust venting system of this unit.
- **USE** an approved wall thimble when passing through a wall and a ceiling support/fire stop when passing through a ceiling.
- **INSTALL** three sheet metal screws at every chimney connector joint.
- **AVOID** excessive horizontal runs and elbows, as both will reduce the draft of the venting system and will result in poor stove performance.
- **INSPECT** your venting system often, to be certain it is clear of creosote, fly-ash and other restrictions.
- **CLEAN** the venting system as detailed in the maintenance section of this manual.
- **ADHERE** to the 10-3-2 rule regarding chimney terminations.
- **INSTALL** single wall chimney connector with the male end **down** to prevent creosote leakage. Follow double wall chimney connector manufacturer's instructions regarding proper pipe installation.

WARNING: Venting system surfaces get HOT, and can cause burns if touched. Noncombustible shielding or guards may be required.

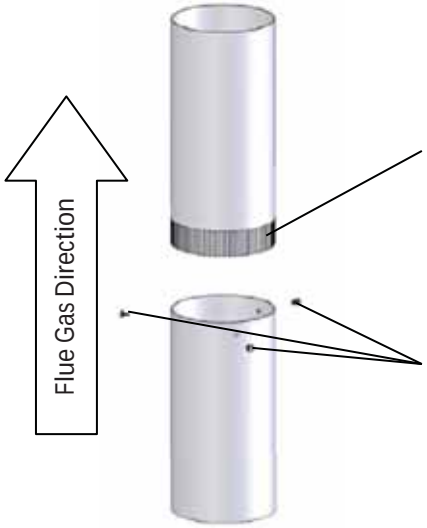
INSTALLATION

Additional Venting Information

- Do not mix and match components from different pipe manufacturers when assembling your venting system (i.e. Do **NOT** use venting pipe from one manufacturer and a thimble from another).
- We **require** a minimum chimney height of 15.0 ft. Chimney systems shorter than this may not create the amount of draft which is required to operate this wood burning unit.
- Do not use makeshift compromises when installing the venting system; have existing chimney systems inspected before use and be certain all new chimney systems are installed to the manufacturer's specifications and with only UL listed components (ULC if Canada).
- Prefabricated venting systems used for this stove must be listed to ULC S629 (Canada) and UL 103HT (US).
- Never install a draft inducer or any other system which increases the natural draft of the chimney; similarly, do not install a barometric or stovepipe damper with this unit.
- Never use single wall or double chimney connector as a chimney system; never pass either type of chimney connector through a combustible wall without carefully following the manufacturer's instructions and those listed in the following page on Wall Pass-Throughs. NEVER pass chimney connector through an attic, floor, closet or roof.
- Only use 24 gauge MSG black single wall chimney connector or UL Listed (ULC if Canada) double wall chimney connector.

Single Wall Chimney Connector Installation

The male end of single wall chimney connector is installed facing down so that any liquid creosote in the flue will run into the unit instead of onto the outside of the pipe (the natural draft in the chimney system will prevent smoke leakage at the joints).



Crimped or male end of single wall chimney connector must face down.

Fasten each single wall chimney connector joint with three sheet metal screws.

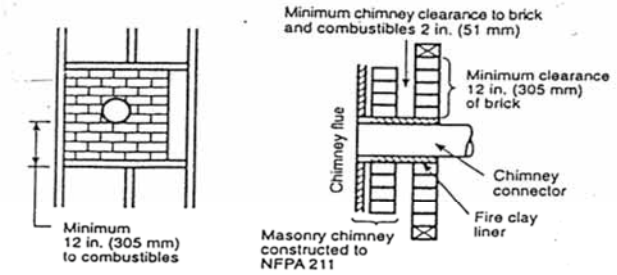
WARNING

- **INSTALL VENT AT CLEARANCES SPECIFIED BY THE VENT MANUFACTURER**.
- HOT! Do not touch! Severe burns or clothing ignition may result.
- Glass and other surfaces are hot during operation.

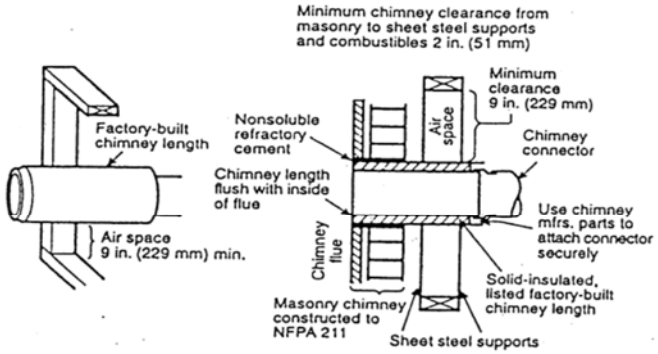
INSTALLATION

Wall Pass-Throughs

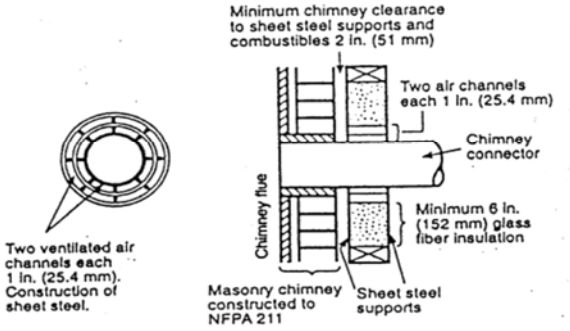
Chimney Connector Systems and Clearances from Combustible Walls for Residential Heating Appliances



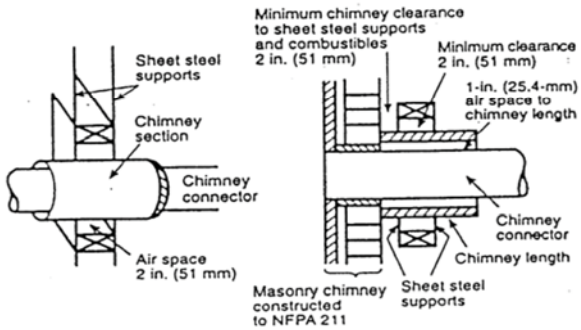
A Minimum 3.5-in thick brick masonry all framed into combustible wall with a minimum of 12-in brick separation from clay liner to combustibles. The fireclay liner shall run from outer surface of brick wall to, but not beyond, the inner surface of chimney flue liner and shall be firmly cemented in place.



B Solid-insulated, listed factory-built chimney length of the same inside diameter as the chimney connector and having 1-in. or more of insulation with a minimum 9-in. air space between the outer wall of the chimney length and combustibles.



C Sheet steel chimney connector, minimum 24 gauge in thickness, with a ventilated thimble, minimum 24 gauge in thickness, having two 1-in. air channels, separated from combustibles by a minimum of 6-in. of glass fiber insulation. Opening shall be covered, and thimble supported with a sheet steel support, minimum 24 gauge in thickness.

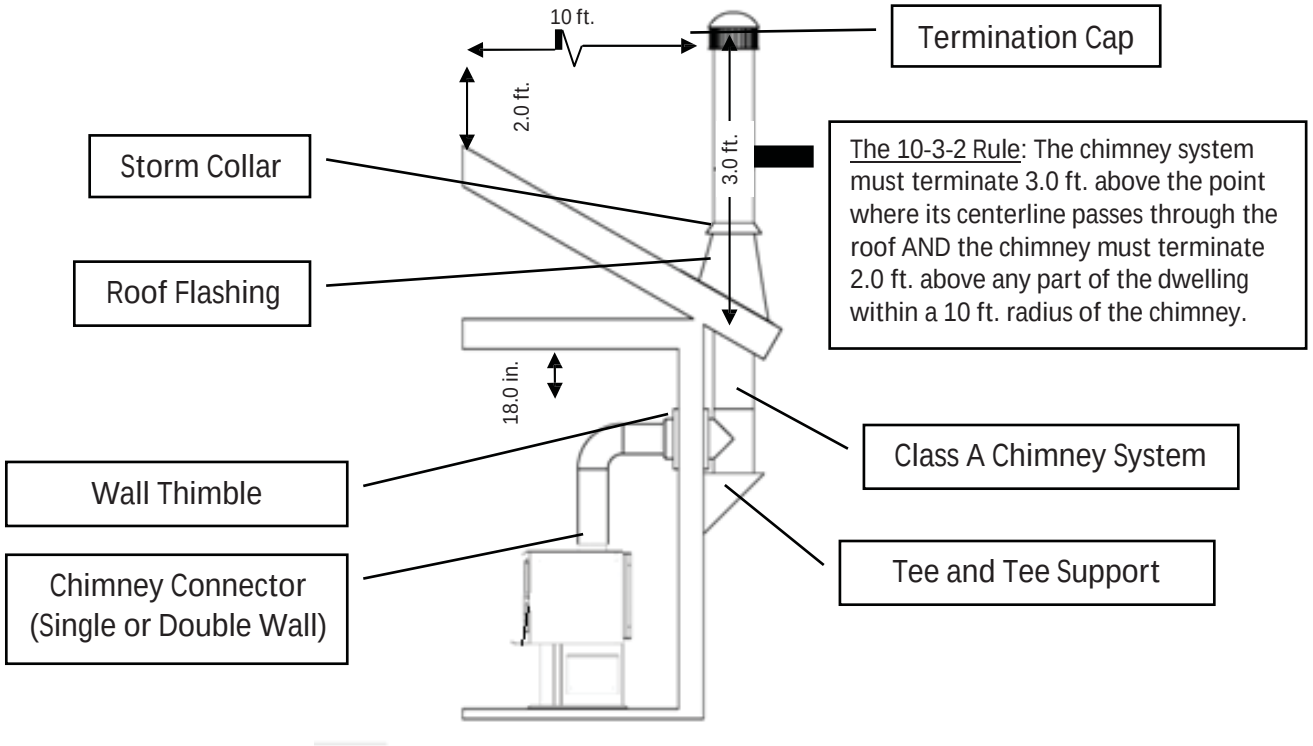


D Solid insulated, listed factory-built chimney length with an inside diameter 2-in. larger than the chimney connector and having 1-in. or more of insulation, serving as a pass-through for a single wall sheet steel chimney connector of minimum 24 gauge thickness, with a minimum 2-in. air space between the outer wall of chimney section and combustibles. Minimum length of chimney section shall be 12-in. chimney section spaced 1-in. away from connector using sheet steel support plates on both ends of chimney section. Opening shall be covered, and chimney section supported on both sides with sheet steel supports securely fastened to wall surfaces of minimum 24 gauge thickness. Fasteners used to secure chimney section shall not penetrate chimney flue liner.

In Canada, the installation must conform to CAN/CSA-8365 when passing through combustible construction.

INSTALLATION

Approved Venting Method 1: Through the Wall Factory Built Chimney

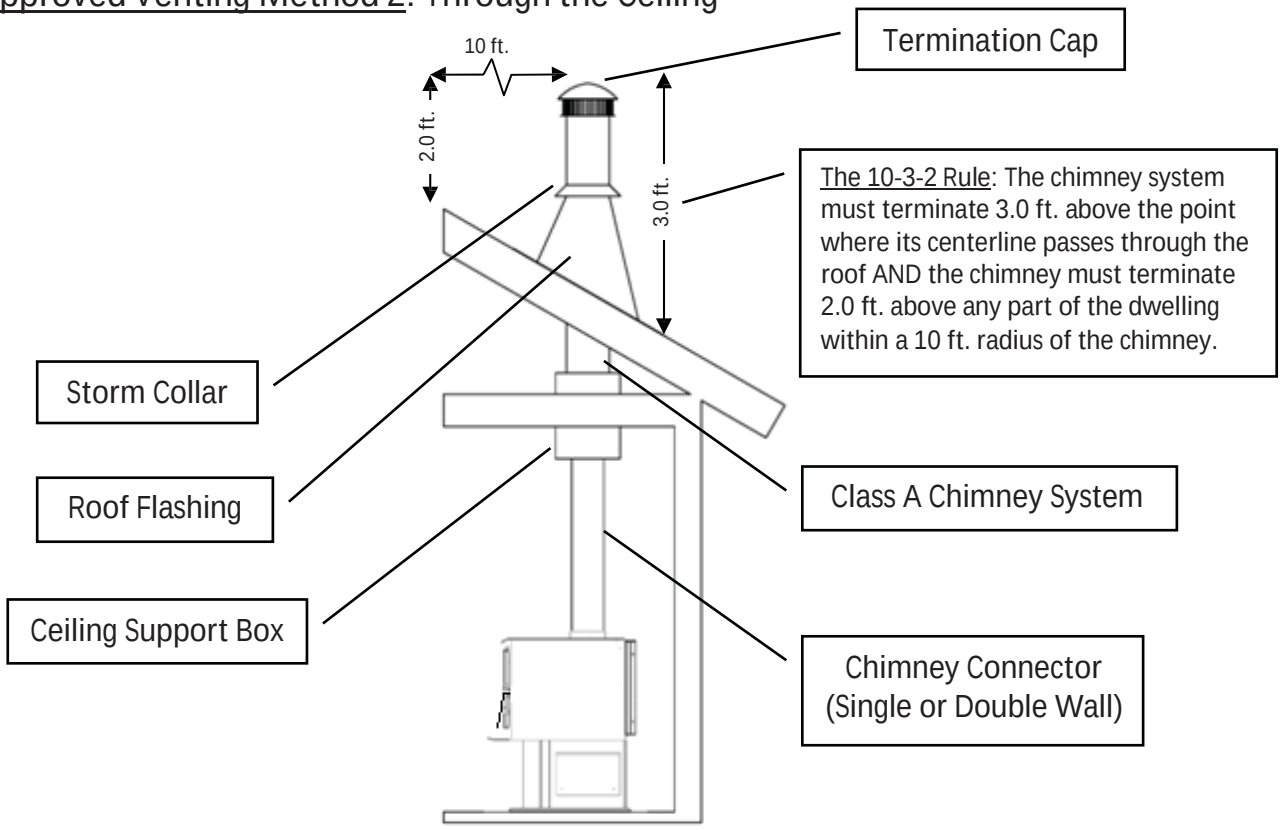


- Prefabricated chimney systems must conform to UL-103HT (2100 °F) for the U.S. and ULC-S629 (650°C) for Canada.
- This wood burning unit is only listed for installation with 6.0" diameter chimney connector and chimney systems. Installing this unit on prefabricated chimneys larger than 6.0" diameter will result in decreased draft and the potential for poor unit performance.
- Follow all venting system manufacturer's installation requirements and required clearances.
- Use three sheet metal screws at each single wall chimney connector joint (check manufacturer's recommendations when double wall chimney connector is used).
- Drill three holes in the flue collar of the unit and attach the chimney connector to the unit using sheet metal screws (holes should be pre-drilled in flue collar from factory).
- Properly attach the prefabricated chimney system to the home in strict accordance with the prefabricated chimney system manufacturer's instructions.
- Avoid numerous elbows and excessive horizontal runs as both will lead to poor draft and increased creosote accumulation. Horizontal runs of chimney connector must never exceed 4.0 ft. and the overall length of the chimney connector must not exceed 8.0 ft.
- Special adapters and slip connectors are available to eliminate the need to cut single wall chimney connector. Double wall chimney connector must be used with these slip connectors, as it cannot be trimmed to length.

Please Note: Installation diagrams are for reference purposes only and are not drawn to scale, nor meant to be used as plans for each individual installation. Please follow all venting system requirements, maintain the required clearances to combustibles, and follow all local codes.

INSTALLATION

Approved Venting Method 2: Through the Ceiling

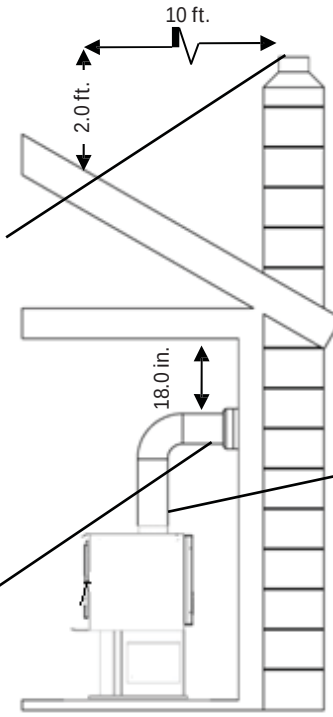


- Prefabricated chimney systems must conform to UL-103HT (2100 °F) for the U.S. and ULC-S629 (650°C) for Canada.
- This wood burning unit is only listed for installation with 6.0" diameter chimney connector and chimney systems. Installing this unit on prefabricated chimneys larger than 6.0" diameter will result in decreased draft and the potential for poor unit performance.
- Follow all venting system manufacturer's installation requirements and required clearances.
- Use three sheet metal screws at each single wall chimney connector joint (check manufacturer's recommendations when double wall chimney connector is used).
- Drill three holes in the flue collar of the unit and attach the chimney connector to the unit using sheet metal screws (holes should be pre-drilled in flue collar from factory).
- Properly attach the prefabricated chimney system to the home in strict accordance with the prefabricated chimney system manufacturer's instructions.
- The overall length of the chimney connector must not exceed 8.0 ft. In the case of cathedral ceilings, the prefabricated chimney system should extend to 8.0 ft. from the top of the unit.
- Special adapters and slip connectors are available to eliminate the need to cut single wall chimney connector. Double wall chimney connector must be used with these slip connectors, as it cannot be trimmed to length.

Please Note: Installation diagrams are for reference purposes only and are not drawn to scale, nor meant to be used as plans for each individual installation. Please follow all venting system requirements, maintain the required clearances to combustibles, and follow all local codes

INSTALLATION

Approved Venting Method 3: Internal or External Masonry Chimney System



Chimney liner cross-sectional area (Length x Width) must be no larger than twice the cross-sectional area of the flue collar (2 x 28.27 in^2 = 56.55 in^2). If chimney liner is larger than 56.55 in^2, relining with a 5.5" or 6.0" liner is required

The 10-3-2 Rule: The chimney system must terminate 3.0 ft. above the point where its centerline passes through the roof AND the chimney must terminate 2.0 ft. above any part of the dwelling within a 10 ft. radius of the chimney.

Chimney Connector (Single or Double Wall)

Masonry Thimble with proper clearance to combustibles

Ash Cleanouts must have an airtight seal to prevent weak draft.

- Follow the rules listed above concerning maximum permissible flue liner size; installing this unit on masonry chimneys exceeding 56.55 in^2 in cross-sectional area will result in decreased draft and the potential for poor unit performance.
- Use three sheet metal screws at each single wall chimney connector joint (check manufacturer's recommendations when double wall chimney connector is used).
- Drill three holes in the flue collar of the unit and attach the chimney connector to the unit using sheet metal screws (holes should be pre-drilled in flue collar from factory).
- Avoid numerous elbows and excessive horizontal runs as both will lead to poor draft and increased creosote accumulation. Horizontal runs of chimney connector must never exceed 4.0 ft. and the overall length of the chimney connector must not exceed 8.0 ft.
- A tight seal at the thimble is crucial for proper unit performance and to create a safe installation. Use the proper adapter designed for connecting single or double wall chimney connector to a masonry thimble.
- Have existing masonry chimneys inspected for safety and proper clearances to combustibles before putting them into service; a qualified chimney sweep can perform this inspection.
- External masonry chimneys often suffer cold downdrafts and poor draft performance even when they meet the cross-sectional area rules. In this case, a 6.0" insulated liner may be necessary.

Please Note: Installation diagrams are for reference purposes only and are not drawn to scale, nor meant to be used as plans for each individual installation. Please follow all venting system requirements, maintain the required clearances to combustibles, and follow all local codes.

INSTALLATION

INSTALLATION INTO A MASONRY FIREPLACE

Preparation
Measure your hearth to ensure it is large enough to accept the unit.

Unit must have a 36” clearance from the top of the stove to a mantel in accordance with NFPA 211

For the USA: Hearth must extend at least 16 in. from the front of the fuel opening.

For Canada: Hearth must extend at least 18 in (450.0 mm) from the front of the fuel opening.

Inspect your hearth to be sure it is constructed of a noncombustible material such as brick or stone. Do **not** install this stove on a hearth that is constructed of wood framework that is covered by brick or stone and do **not** install this unit in a zero (0) clearance fireplace. The manufacturer will not be held responsible for an accident resulting from this stove being installed on a hearth constructed of a combustible material.

Inspect your fireplace to ensure it is in proper working order and free of any obstructions.

Prior to installation, remove the existing damper or wire it to fasten it open.

Venting Your Stove - Direct Connect
When this unit is direct connected it will require six inch (6”) diameter 24 gauge pipe from the stove through the damper opening. (**NOTE: The chimney connector must be attached to the appliance with a minimum of three (3) screws, and 3 screws should be used to attach each adjoining section.)**
We highly recommend having the chimney fully lined with a 6 inch liner to ensure proper draft. This will make it necessary to block off the open area on both sides of the pipe that passes through the damper opening, which can be done with sheet metal or by packing flame retardant fiberglass insulation in the open areas (no paper or combustibles). You must be sure the draft from the chimney is being pulled through the stove, and not around the connector pipe. .

We highly recommend you have this done by a professional. You should also contact your local authorities to be sure you are following all codes.

INSTALLATION

WARNING
DO NOT INSTALL IN A SLEEPING ROOM.

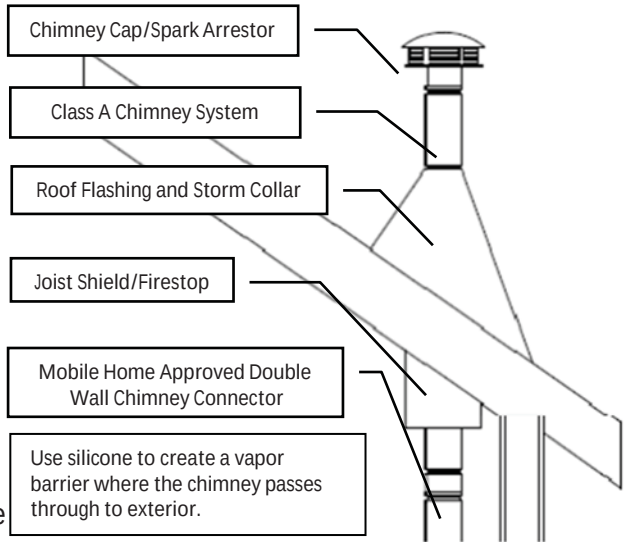
CAUTION

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

Caution
NEVER draw outside combustion air from:
Wall, floor or ceiling cavity or
enclosed space such as an attic, garage or crawl space.

Mobile Home Installation

- The wood stove **MUST** be secured to the floor of the mobile home using lag bolts and the holes provided in the bottom of the unit for this purpose. Outdoor-aired space heaters must be attached to the structure. Use a #8 copper wire to ground stove to frame of mobile home.
- The wood stove must be connected to the chimney system with double wall chimney connector which is UL listed for use in mobile and manufactured homes.
- Carefully follow all clearances listed in the appropriate section of this manual AND follow the venting manufacturer's minimum clearance requirements. Similarly, be certain the venting system used is approved for mobile home use.



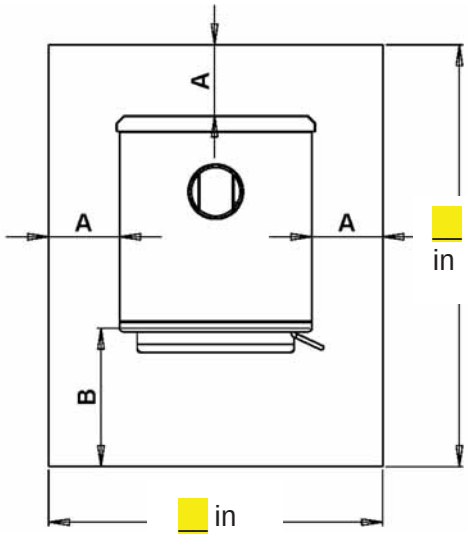
- Installation must be in accordance with Manufacturers Home & Safety Standard (HUD) CFR 3280, Part 24 as well as any applicable local codes.

Outside Combustion Air

- The use of outside combustion air is **mandatory** when installing this wood stove in a mobile or manufactured home.
- The outside air connection pipe protrudes from the bottom center of the stove; a kit is available from England's Stove Works, Inc. designed for connecting this unit to outside combustion air. [Part No. AC-OAK3]
- If it is not feasible to use the AC-OAK3 outside air hookup kit in your stove installation, other materials may be used, provided the following rules are followed:
  - The pipe used for outside air hookup must be metal, with a minimum thickness of .0209in. (25 gauge mild steel) or greater and an inside diameter of approximately 2.75 in.
  - Keep pipe runs short and use a mechanical fastener at each pipe joint.
  - A screen or other protection device must be fitted over the outside air termination point to prevent rain, debris and nuisance animals from entering the piping system. Inspect the outside combustion air inlet for block and debris monthly.

FLOOR PROTECTION

- This wood stove requires a U.L. listed (ULC if Canada) floor protector with a R factor of no less than 1.0, if the stove is to be installed on a combustible floor. If the floor the stove is to be installed on is already non-combustible (i.e. a concrete floor in a basement), no floor protection is needed (although a decorative floor protector can still be used for aesthetic reasons).
- When using any floor protector, consider that this stove is not only heavy but will induce heating and cooling cycles on the floor protector which can damage tile and loosen mortar and grout joints located near the stove.
- The floor protector should be UL rated and listed, or equivalent (ULC if Canada) and must be noncombustible. A hearth rug is NOT an approved substitute for a proper hearth pad.
- For the US: The floor protector must extend at least ___ in. from the front of the fuel opening, ___ in. from the sides of the door opening and ___ in. from the rear of the unit.
- For Canada: The floor protector must extend at least _____ mm from the front of the fuel opening, _____ mm from the sides of the door opening and _____ mm from the rear of the unit.



A: US ___ in CAN ___ in / ___ mm
B: US ___ in CAN ___ in / ___ mm

- The floor protector must extend 2 in. (50.8 mm.) on either side of any horizontal venting runs and extend directly underneath any vertical venting pipe.

CAUTION

NEVER USE GASOLINE, GASOLINE-TYPE LANTERN FUEL, KEROSENE, CHARCOAL LIGHTER FLUID, OR SIMILAR LIQUIDS TO START OR "FRESHEN UP" A FIRE IN THIS HEATER. KEEP ALL SUCH LIQUIDS WELL AWAY FROM THE HEATER WHILE IN USE. ADDITIONALLY, NEVER APPLY FIRE-STARTER TO ANY HOT SURFACE OR EMBERS IN THE STOVE.

OPERATION

Break-In Fires

- This wood burning unit is constructed of heavy gauge steel and cast iron and is built to last a long time. However, in order to ensure no excessive thermal stresses are induced on the metal during the first fire, three break-in fires should be burned, each one slightly hotter than the last. These break-in fires will not only help the stove body acclimate to the high temperatures of the fire, but will also slowly cure the high temperature stove paint, which will ensure the high quality finish lasts for years.
    - WE HIGHLY RECOMMEND burning your break-in fires outdoors, as the paint and manufacturing oils will 'burn off' the stove exterior somewhat during this time. If you do burn them indoors with your flue system, open doors and windows to ventilate.
- This stove has a single air control rod which regulates the wood burn rate; when the primary air control slide is pushed all the way into the unit, the stove will burn more slowly and put out heat over a longer time period. Conversely, when the air control slide is pulled all the way out, the unit will burn more quickly and put out a larger amount of heat over a relatively shorter time period. Do not attempt to modify the range of air control adjustment for any reason.
- The first break-in fire should be just a large kindling fire, getting the stove to about 300°F as measured by a magnetic thermometer on the right or left side of the stove, above the door. Once this temperature has been reached, allow the fire to die out with the air control open. The second and third break-in fires should be a bit larger, with some small dry splits added to the kindling load. The temperature goal during these fires is about 350°F – 450°F; don't let the fire get hotter than that.

Creosote – Formation and Need for Removal

When wood is burned slowly, it produces tar and other organic vapors, which combine with expelled moisture to form creosote. The creosote vapors condense in the relatively cool chimney flue of a slow-burning fire. As a result, creosote residue accumulates on the flue lining. When ignited, this creosote makes an extremely hot fire. The chimney and chimney connector should be inspected at least once every two months during the heating season to determine if a creosote buildup has occurred. If creosote has accumulated, it should be removed to reduce the risk of chimney fire.

DO NOT USE GRATE OR ELEVATE FIRE – BUILD WOOD FIRE DIRECTLY ON HEARTH
DO NOT OPERATE WITH THE MAIN DOOR OPEN – OPERATING THE STOVE WITH THE MAIN DOOR OPEN WILL CREATE AN OVER-FIRE

In the event of a creosote or soot fire (chimney fire), close the air control on the stove, contact the local fire department and get out! Do not throw water on the fire! Contact your local fire authority for more information on how to handle a chimney fire and develop a safe evacuation plan for you and your family in the event of a chimney fire.

OPERATION

Continuous Operation – Daily Operation after your Break-In Fires

Start-up

- Load the firebox with 6-9 lb of startup wood, split to moderate (1/4 to ½ lb) size.
- On top of the startup wood, add 3-5 lb of dry kindling.
- Start-up: Ignite the kindling until an aggressive flame is established and reaches the secondary tubes at the top of the firebox.
- Close the door and set air to maximum

High Burn

- Load on to a coal bed with minimal large chunks of wood, if practical
- Load wood parallel to the sides of the firebox
- Place wood pieces as far back in the firebox as possible.
- Avoid loading arrangements that result in tightly packed wood pieces. Select orientations that result in gaps between wood pieces and/or wood pieces sitting higher in the firebox.
- Any bark should face up to facilitate quick ignition
- Once visible flame reaches the secondary tubes, close the door and set air to maximum

Low and Medium Burn

- Allow the stove to burn at its intended Medium or Low setting for at least 15 minutes prior to loading. This can be done by burning on High until down to the top of the coal bed range, then setting the air and allowing 15 minutes to elapse.
- Leave the door closed for the 15-minute period – rake the coal bed prior.
- As with the high burn:
    - *Load wood parallel to the sides of the firebox*
    - *Place wood pieces as far back in the firebox as possible.*
    - *Avoid loading arrangements that result in tightly packed wood pieces. Select orientations that result in gaps between wood pieces and/or wood pieces sitting higher in the firebox.*
    - *Any bark should face up to facilitate quick ignition*
    - *Once visible flame reaches the secondary tubes, close the door and set air to maximum*
- When visible secondary combustion is established (the flames are 'rolling' up near the tubes), begin to slowly reduce the air setting over at least 5 minutes. Ensure that secondary combustion is maintained as air is reduced.

Magnetic Thermometer

- England's Stove Works, Inc. always recommends the use of a magnetic stove thermometer, so that the temperature of the unit can be monitored. When using a magnetic stove thermometer, locate the thermometer above the door on either the left or right side of the stove and use the following temperatures as rough guidelines to determine the burn rate and heat output level of the stove:
    - Normal wood stove operation should occur between 350°F (177°C) and 550°F (288°C), with 350°F (177°C) to 450°F (232°C) being a low to medium heat output level and 450°F (232°C) to 550°F (288°C) being a medium to high heat output level. Operating the stove at 600°F (316°C) would be considered the maximum continuous operating temperature permissible and unit damage may result from operating at that high of a burn rate for extended time periods. Allowing the unit to reach 650°F (343°C) or higher is defined as over-firing and will result in unit damage.

DO NOT STORE FUEL CLOSER THAN SPECIFIED CLEARANCES TO COMBUSTIBLES OR WITHIN THE SPACE NEEDED FOR LOADING THE STOVE AND FOR ASH REMOVAL.

OPERATION

Additional Safety Guidelines

- The installation of smoke detectors is highly recommended when installing this or any other solid fuel burning appliance. Smoke detectors should be located near or in every room of the home, particularly sleeping rooms.
- A smoke detector can be installed in the same room as this cordwood burning unit; installing the smoke detector too close to the unit can lead to nuisance alarms due to slight wisps of smoke emitted during the fire starting or reloading process. Due to this, the smoke detector in the same room as the unit will be most useful if it is located as far from the unit as the room will permit.
- This stove is designed to burn natural wood only. Higher efficiencies and lower emissions generally result when burning air dried, seasoned hardwoods, as compared to soft woods or to green or freshly-cut hardwoods. DO NOT BURN **garbage, lawn clippings or yard waste, materials containing rubber, including tires; Materials containing plastic: Waster petroleum products, paints or paint thinners, or asphalt products; Materials containing asbestos; Construction or demolition debris; Railroad ties or pressure-treated wood; Manure or animal remains; Salt water driftwood or previously salt water saturated materials; Paper products, cardboard, plywood, or particleboard. The prohibition against burning these materials does <u>not</u> prohibit the use of fire starters made from paper, cardboard, saw dust, wax and similar substances for the purpose of starting a fire in an affected wood heater. Burning these materials may result in release of toxic fumes or render the heater ineffective and cause smoke.**
- Burning fuels other than cordwood, particularly coal and charcoal, can result in hazardous concentrations of carbon monoxide being emitted into the dwelling. For these reasons, NEVER burn coal or charcoal in this cordwood stove. Installing a carbon monoxide detector and being aware of the symptoms of carbon monoxide poisoning can help reduce the risk of carbon monoxide related issues.
- This unit was designed for operation only with the loading door closed and tightly latched. Operating this unit with the loading door latched loosely or open will allow excessive combustion air to reach the fire and will result in dangerously high unit temperatures. High unit temperatures can damage the unit, void the warranty or ignite creosote deposited in the chimney system by previous, slow burning fires.
- The natural draft that pulls air through this unit and allows the fire to burn uses the indoor air of the dwelling for combustion, unless the unit is connected to an outside combustion air source. Kitchen range vent hoods, furnaces and other air movement appliances in the home are often also removing air from the dwelling; if the amount of air filtration or leakage back into the home is exceeded by the air being removed, negative pressure may be created in the home.
- Since this is a natural draft appliance, it will often be the first appliance to have problems related to negative pressure. If smoke is forced out the chimney connector joints or out of the air induction system of the unit, the unit is likely fighting negative pressure in the dwelling. Cracking a window or door near the appliance can help equalize the negative pressure; ultimately, an unrestricted source of outside combustion may be necessary for proper unit function.

- If the unit is connected to outside air, be certain to monitor the exterior inlet to the combustion system for icing or snow accumulation. Allowing the outside air connection to become restricted will result in air starvation to the unit.

Safe Wood-Burning Practices

Once your wood-burning appliance is properly installed, follow these guidelines for safe operation:

- Keep all flammable household items-drapes, furniture, newspapers, and books-far away from the appliance.

  Start fires only with newspaper, dry kindling and all natural or organic fire starters. Never start a fire with gasoline, kerosene, or charcoal starter.

  Do not burn wet or green (unseasoned) logs.

Do not use logs made from wax and sawdust in your wood stove-they are made for open hearth fireplaces. If you use manufactured logs, choose from those made from 100 percent compressed saw dust.

Build hot fires. For most appliances, a smoldering fire is not a safe or efficient fire.

Keep the doors to your wood-burning appliance closed unless loading or stoking the live fire. Harmful chemicals, like carbon monoxide, can be released into your home.

Regularly remove ashes from your wood-burning appliance into a metal container with a cover. Store the container of ashes outdoors on a cement or brick slab (not on a wood deck or near wood). See ash removal instructions in your owner's manual.
Keep a fire extinguisher handy.
Remember to check your local air quality forecast before you burn.

MAINTENANCE

Daily Maintenance

- Inspect the firebox for ash accumulation; remove excess ash and follow instructions below regarding disposal. Ash should not be allowed to excessively accumulate in the stove.

Monthly Maintenance

- Check the door handle for proper operation and to be certain an airtight seal is still being made by the door.
- Inspect the chimney system and chimney connector and sweep if necessary. Although cleaning may be required less than monthly, ALWAYS inspect the venting system monthly to decrease the chance of a chimney fire.
- Visually inspect the ceramic fiber insulating boards in the firebox for cracks and/or breakage. Slight surface cracks will not affect the performance of the boards, but cracked or crumbling boards should be replaced immediately.
- Visually inspect the secondary combustion tubes for cracks, warping and corrosion. Although these tubes are constructed from stainless steel, they operate at very high temperatures and can eventually wear out from normal use.

Yearly Maintenance

- Check all gaskets (window and door) for wear and to be certain they still maintain an airtight seal. See the following page for instructions.
- Thoroughly clean the chimney system and the chimney connector system. Since the chimney connector is generally exposed to high exhaust temperatures, inspect it carefully for leaks and weak spots; replace any questionable pieces. [In the case of straight through the roof chimney system, be certain to remove the ceramic fiber baffles **before** pushing the chimney sweeping brush down into the firebox. Forcefully hitting the top of the baffle with a cleaning brush or rod can damage or destroy the baffle.]
- Remove all ash from the stove, including the ash which accumulates on the top of the firebox baffles. Leave the air control open during the non-heating months to allow some air to flow through the stove to help prevent corrosion. A small open container of cat litter in the stove can help prevent corrosion during the humid summer months; be certain to remove it before building a fire in the fall.

IMPROPER GASKET MAINTENANCE, INCLUDING FAILURE TO REPLACE GASKETS, CAN CAUSE AIR LEAKS RESULTING IN AN UNCONTROLLABLE FIRE IN THE UNIT.

Disposal of Ashes – Ashes should be placed in a metal container with a tight fitting lid. The closed container of ashes should be placed on a noncombustible floor or on the ground, well away from all combustible materials, pending final disposal. If the ashes are disposed of by burial in soil or otherwise locally dispersed, they should be retained in the closed container until all cinders have been thoroughly cooled.

MAINTENANCE

Inspecting Gaskets

An airtight seal at the door opening is crucial to proper stove performance. Any air leakage at this area can cause an over-fire situation and is therefore a serious safety threat. Because of this, gaskets should always be maintained in good condition. Gasket tightness can be checked using the "dollar-bill" method:

- Place a dollar bill between the gasket and the stove body (at the location where the gasket meets the stove).
- Close and tighten the door then attempt to pull the dollar bill out. If the dollar bill slides in and out easily, the gasket needs to be replaced. This test should be repeated around the entire gasket perimeter, as gaskets will sometimes seal tightly on one side, but will be worn and seal poorly on another side.
- Perform this test around the entire perimeter of the door, and visually inspect the window gasket for any leaks. Leaks in the window gasket can generally be located by following the prevailing soot trails left on the window after burning the unit.
- If any area fails the test, the entire gasket should be replaced.
- Gaskets should only be replaced with equivalent fiberglass gaskets purchased from England's Stove Works ® specifically for this unit.

Gaskets

1. Door - This unit comes with a $^{5}/_{8}$" rope gasket around the door that should be replaced at least every year. To replace the door gasket (Part # AC-DGKNC), the old gasket must first be removed entirely — prior to adding the new adhesive, you may have to scrape the old cement from the door channel. Once the cement and gasket have been added, the door should be closed and latched for twenty-four hours to allow the cement to harden.
2. Window - If you are replacing the window gasket (Part # AC-GGK), the new gasket will already have adhesive on one side. First, remove the old gasket. Next, remove the paper on the adhesive side and place the gasket around the outside edge of the glass, centered over the edge. Fold the gasket edges over on the glass, forming a "U" shape.

Finish

This new unit has been painted with High-Temperature Paint that should retain its original look for years. If the unit should get wet and rust spots appear, the spots can be sanded with fine steel wool and repainted. It is crucial that only High-Temperature Spray Paint is used (Part # AC-MBSP), as others may not adhere to the surface or withstand the high temperatures. Similarly, some brands of paint will not adhere to different brands of paint, so we highly recommend using our proprietary High-Temperature Spray Paint.

REPLACING COMPONENTS

Glass

This unit has a ceramic glass panel (Part No. AC-G30) in the viewing door; self adhesive window gasket is included with replacement windows purchased directly from England's Stove Works. Never replace ceramic glass with tempered or any other type of glass and never operate this unit with cracked or broken glass.

- Glass Size: 11.25 in. (285.75 mm) x 15.125 in. (384.18 mm)
- Glass Type: 5mm Ceramic Glass (Keralite Pyroceram)
- Glass Manufacturer: Eurokera

Glass Precautions

1. Never replace ceramic glass with tempered or any other type of glass.
2. Never operate this unit with cracked or broken glass.
3. Do not slam the door or strike the glass with any objects.
4. Do not build the fire directly against the glass.

Glass Cleaning

1. Be certain the stove **and** the glass are completely cool.
2. The build-up on the glass will generally be light and water is normally sufficient to remove the deposits. If stubborn soot persists, use a cleaner made specifically for this purpose. Do not scrape the glass or use abrasive cleaners.
3. Rinse the glass with clean water and dry the glass before resuming normal operation.

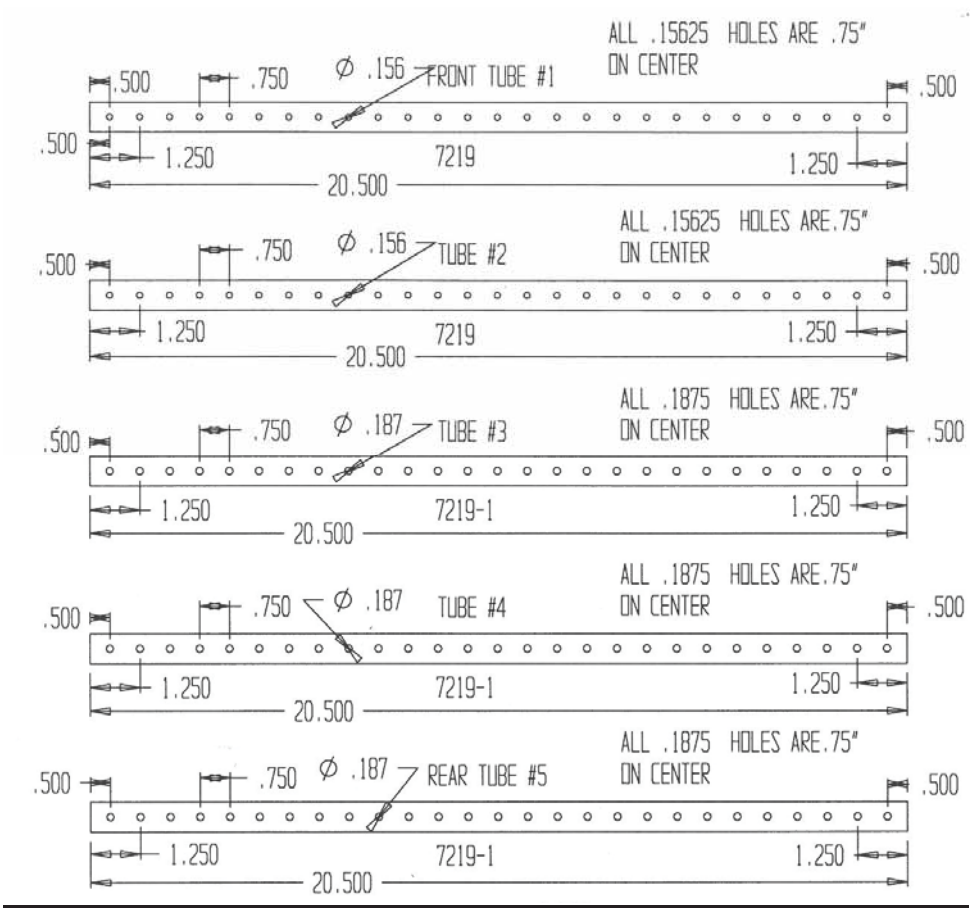
Glass Replacement

1. Remove the door from the stove and rest it face down on a firm work surface.
2. Using a 5/16" wrench, remove the window bracket retaining screws.
3. Remove the window retainers from the door. Take extra care to avoid shards of glass if the glass window has been broken.
4. Lift the old glass panel out of the door and discard.
5. The glass panel must be wrapped with a self-adhesive fiberglass tape gasket (AC-GGK). If you purchased a new glass, it will come already wrapped. If reusing the same piece of glass, remove old gasket, scrape off old adhesive and wrapped with the AC-GGK. This gasket serves to cushion the glass from the cast iron door.
6. Reinstall the window retainers using the screws previously removed. Do **not** over-tighten the screws.

REPLACING COMPONENTS

Burner tube replacement

There are five different burner tubes in the top of the stove. To replace a tube, first be sure that you order the correct tube you need to replace. Then using a 5/16" socket or open end wrench, remove the screw located on the left side of the tube. Be sure to keep the screw. Push the tube to the right then remove the tube (pulling the tube back to the left after that side has been removed from the hole). To replace, reverse the above procedure...make sure to install the tubes in the correct order. (Front to Back)



Front (Door Side) of Unit

30-BT4

30-BT4

30-BT2

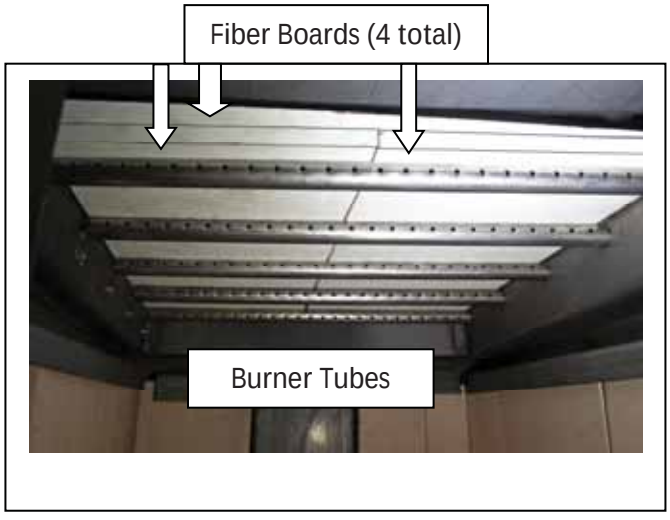
30-BT2

30-BT2

Rear of Unit

Ceramic fiberboard replacement

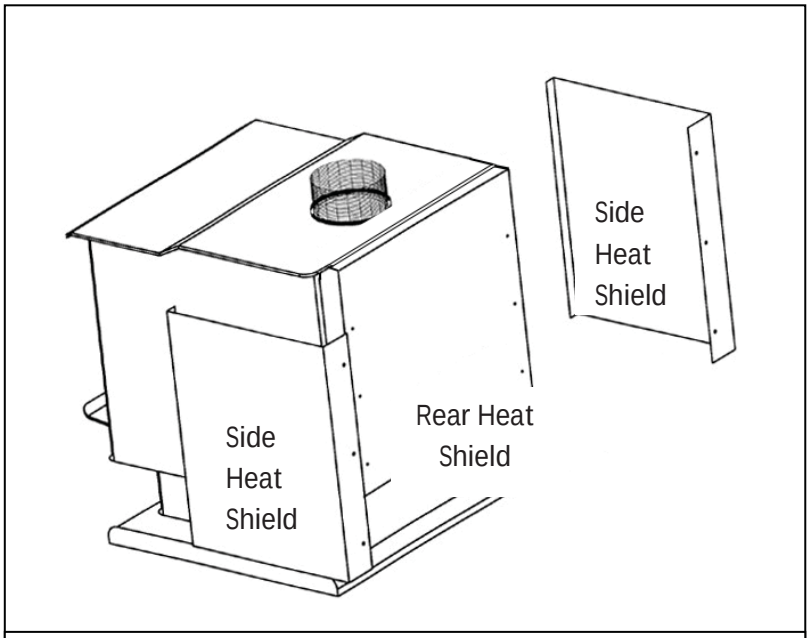
There are four fiber boards located in the top of this stove, in two layers. While the bottom layer is oriented 'North/South' as shown, the top layer is oriented 'East/West'. To replace a cracked or broken board, first remove the front burner tube. Then remove the board you need to replace. Install the new board (two boards on each layer should sit flush on the tubes side by side). Replace the tube previously removed.



Side Heat Shields

This accessory item comes with the hardware (six (6) mounting screws) necessary to install it on the rear of the stove. This is a two-piece heat shield, but is installed one piece at a time. There are three pre-punched holes on each side of the Rear Heat Shield; while holding each piece of the Side Heat Shield in place, align the pre-punched holes in the Side Heat Shield with the existing holes in the Rear Heat Shield, and fasten with the screws provided.

See Page 7 for clearances with and without side heat shields.



Side Heat Shield Installation

Brick Layout

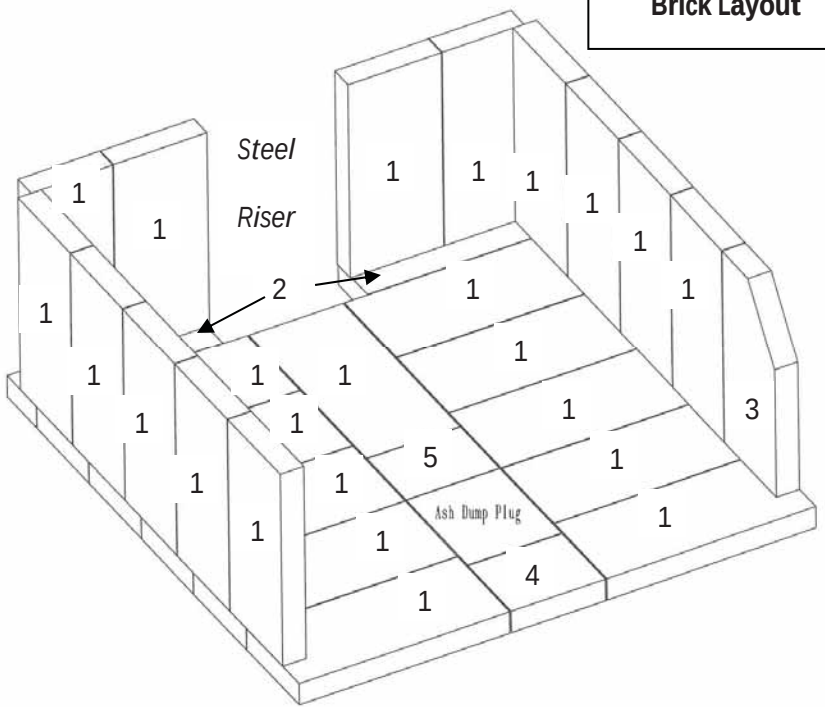


Diagram Number	Brick Size	Part Number	Quantity per Stove
1	9" x 4" x 1.25"	AC-SB	24
2	8" x 2" x 1.25"	AC-SB8X2X1.25	2
3	9" x 4" x 1.25" with 1" x 3" Notch	AC-SBN1X3	1
4	4" x 3.75" x 1.25"	AC-SB4X3.75X1.25	1
5	4" x 2.5" x 1.25"	AC-SB2.5	1

TROUBLESHOOTING

Issue	Cause	Solution(s)
Stove smokes into room	1. Weak Draft	1.1 Be certain chimney is sufficiently tall to meet the 10-3-2 rule.
		1.2 Add additional height to the chimney.
	2. Negative Pressure in the Home	2.1 Add an outside combustion air hookup to the unit.
Fire is hard to start	3. Weak Draft	3.1 Be certain chimney is sufficiently tall to meet 10-3-2 rule.
		3.2 Add additional height to the chimney system.
	4. Cold Chimney	4.1 Heat the flue first by burning crumbled newspaper in the stove.
		4.2 Install an insulated chase around external chimneys.
	5. Downdraft in Chimney	5.1 Be certain chimney is sufficiently tall to meet 10-3-2 rule.
		5.2 Try heating the flue with a hair-dryer to correct the draft.
Glass is dirty	6. Wet or Green Wood	6.1 Only burn wood that is seasoned for at least one year and that is dry and free of ice and snow.
	7. Operating Stove at Low Burn Rate	7.1 Operate the stove at higher burn rates to allow the air-wash system to keep the glass clean.
	8. Wood Loaded Too Close to Glass	8.1 Never load wood so that it is touching the ceramic glass viewing window.
Coals build up in firebox	9. Operating Stove at High Burn Rates	9.1 Reduce combustion air control and allow coals to burn down before reloading.
Fire burns out of control	10. Excessive Draft	10.1 Reduce chimney height.
	11. Air Leakage	11.1 Inspect window and door gaskets and replace if necessary.
	12. Burning Excessively Dry Wood	12.1 Only burn seasoned cord wood. Do not burn kiln dried wood or pallet wood.
Excessive smoke from stack	13. Operating Stove at Low Burn Rate	13.1 Operate the stove at a higher burn rate which will create secondary combustion.
	14. Wet or Green Wood	14.1 Only burn wood that is seasoned for at least one year and that is dry and free of ice and snow.
	15. Not Charring Fresh Wood Load	15.1 Char the fresh wood load until it is completely ignited and active secondary combustion is present in the firebox.

REPLACEMENT PARTS LIST

	Door and Window Components
AC-G30	Door Glass Kit with Gasket
AC-GGK	Glass Gasket Kit (gasket only)
AC-DGKNC	Door Gasket Kit (Hi-Density Rope)
AC-SHN	Nickel Spring Handle for Door
	Firebox Components
AC-30BT4	Front tubes 1st and 2nd position
AC-30BT2	Rear Tubes 3rd,4th, and 5th position
AC-30CFB	Ceramic Fiber Board (4 total needed)
	More
AC-03BN	Nickel Ash Pan Knob
AC-MBSP	Hi Temp Black spray paint
AC-30SHSB	Side Heat Shield System

FOR BRICK LAYOUT AND PART NUMBERS PLEASE SEE PAGE 25.

Model ☐32-NC ☐50-SNC32 ☐50-TNC32
Solid Fuel Burning Room Heater; Free Standing Model "SUITABLE FOR MOBILE-HOME INSTALLATION "
Certified to UL-1482 & ULC-627-00, EPA METHOD 28R, ASTM E3053-17, EPA Alt 125, CSA B415.1-10

W/N# _____

SERIAL NO.	
MFG. DATE	

Manufactured by:
England's Stove Works, Inc.
589 S. Five Forks Rd.
Monroe, VA 24574

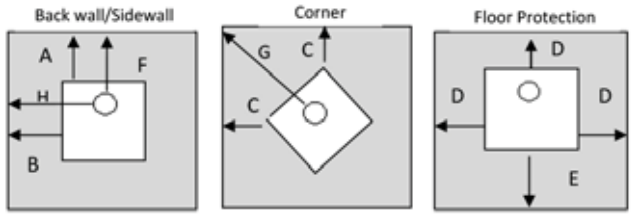
DO NOT REMOVE OR COVER THIS LABEL

- PREVENT HOUSE FIRES – INSTALL AND USE ONLY IN ACCORDANCE WITH THE OWNER'S MANUAL PROVIDED WITH THIS APPLIANCE.
- CONTACT LOCAL BUILDING OR FIRE OFFICIALS ABOUT RESTRICTIONS AND INSTALLATION INSPECTIONS IN YOUR AREA.

INSTALLATION REQUIREMENTS

- DO NOT CONNECT THIS UNIT TO A CHIMNEY FLUE SERVING ANOTHER APPLIANCE.
- USE A RESIDENTIAL TYPE MASONRY OR FACTORY BUILT CHIMNEY LISTED TO UL-103 HT (US) AND ULC-629 (CANADA).
- USE 24 GAUGE MSG BLACK SINGLE WALL CHIMNEY CONNECTOR OR LISTED DOUBLE WALL CHIMNEY CONNECTOR.
- REFER TO LOCAL CODES AND THE CHIMNEY MANUFACTURER'S INSTRUCTIONS FOR PRECAUTIONS REQUIRED FOR PASSING A CHIMNEY THROUGH A COMBUSTIBLE WALL OR CEILING.
- FOR THE US: PLACE ON A NON-COMBUSTIBLE TYPE FLOOR PROTECTOR WITH A R VALUE OF AT LEAST 1.0, WHICH EXTENDS ____ IN. TO THE FRONT AND ___ IN. TO EACH SIDE OF THE FUEL LOADING OPENING.
- FOR CANADA: PLACE ON A NON-COMBUSTIBLE TYPE FLOOR PROTECTOR WITH A R FACTOR OF AT LEAST 1.0, WHICH EXTENDS _____ MM. TO THE FRONT AND _____ MM. TO EACH SIDE OF THE FUEL LOADING OPENING.
- ADHERE TO THE LISTED MINIMUM CLEARANCES TO COMBUSTIBLES WHEN USING SINGLE WALL CHIMNEY CONNECTOR. SEE THE OWNER'S MANUAL FOR ADDITIONAL CLEARANCE INFORMATION.
- ONLY OPERATE THIS UNIT WITH THE DOOR CLOSED AND LATCHED TIGHTLY.
- THE MAIN LOADING DOOR CONTAINS A CERAMIC VIEWING WINDOW; DO NOT SLAM THE DOOR OR STRIKE THIS VIEWING WINDOW AT ANY TIME.
- IF THE GLASS IS CRACKED OR BROKEN, REPLACE WITH CERAMIC GLASS ONLY.
- Emission value – 2.0 grams/hr
- U.S. ENVIRONMENTAL PROTECTION AGENCY Certified to comply with 2020 particulate emission standards using cord wood.
- OPTIONAL PARTS- SIDE HEAT SHIELDS PART NUMBER AC-30SHSB (ESW INC.)
- Refer to PFS TECO's Directory of Building Products (HTTP://WWW.PFSTECO.COM/BUILDING-PRODUCTS) for detailed information.

OPERATION REQUIREMENTS: FOR USE WITH SOLID WOOD FUEL ONLY. DO NOT OVER-FIRE, IF HEATER OR CHIMNEY CONNECTOR GLOWS YOU ARE OVER-FIRING. INSPECT AND CLEAN CHIMNEY FREQUENTLY, UNDER CERTAIN CONDITIONS OF USE, CREOSOTE BUILDUP MAY OCCUR RAPIDLY. DO NOT USE A GRATE OR ELEVATE THE FIRE, BURN WOOD FIRE DIRECTLY ON THE HEARTH. RISK OF SMOKE AND FLAME SPILLAGE, OPERATE ONLY WITH DOOR FULLY CLOSED.
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.



A = ___ inches (____ mm)
B = ___ inches (____ mm)
C = ___ inches (____ mm)
D = ___ inches (____ mm)
E = ___ inches (____ mm)
F = ___ inches (____ mm)
G = ___ inches (____ mm)
H = ___ inches (____ mm)

CAUTION - HOT WHILE IN OPERATION. DO NOT TOUCH. KEEP CHILDREN, CLOTHING, AND FURNITURE AWAY. CONTACT MAY CAUSE SKIN BURNS. SEE NAMEPLATE AND INSTRUCTIONS.

You may write your unit's Manufacture Date and Serial Number in the blank spaces on this sample tag, for future reference. This sample tag also shows the safety info. such as UL (ULC) testing standard, etc. for your local officials, or anyone else who may need reference information.

LIMITED FIVE (5) YEAR WARRANTY

From the date of purchase to the original owner

The manufacturer extends the following warranties:

Five Year Period:

1. Carbon steel and welded seams in the firebox are covered for five (5) years against splitting.
2. The cast iron door and hinges are covered for five (5) years against cracking.

One Year Period:

1. Electrical components, accessory items, glass and the painted surface of the stove are covered for one (1) year from the date of purchase.

Conditions and Exclusions

1. Damage resulting from over-firing will void your warranty.
2. This warranty does not apply if damage occurs because of an accident, improper handling, improper installation, improper operation, abuse or unauthorized repair made or attempted to be made.
3. The manufacturer is not liable for indirect, incidental, or consequential damages in connection with the product including any cost or expense, providing substitute equipment or service during periods of malfunction or non-use.*
4. All liability for any consequential damage for breach of any written or implied warranty is disclaimed and excluded.
5. This warranty does not cover internal wear parts of the combustion system, including the firebrick lining and gaskets.

****Some states do not allow the exclusion of limitations of incidental or consequential damages, so the above may not apply to you.****

Procedure

Purchaser must give notice of claim of defect within the warranty period and pay transportation to and from a service center designated by the manufacturer. The dealer from which the unit was purchased or the factory, at our option, will perform the warranty service.

Other Rights

This warranty gives you specific legal rights; you may also have other rights, which may vary from state to state.

Please Note: This warranty is null and void if the attached warranty registration AND a copy of the sales receipt is not returned within thirty (30) days from the date of purchase.

Warranty is not transferable.

Important Notice

This registration information **MUST** be on file for this warranty to be valid. Please mail this information within thirty (30) days from the original date of purchase.

Use any of these three easy ways to send your warranty information in!

Mailing Address

England's Stove Works, Inc.
Technical Support Department
P.O. Box 206
Monroe, Virginia 24574

Fax Number

(434) 929-4810 – Twenty-four hours a day.

Online Registration

Visit our warranty registration website at:

http://www.heatredefined.com

(WARRANTY CARD LOCATED ON NEXT PAGE)

For parts, warranty replacement procedures may be found at our parts store site at heatredefined.com

WARRANTY REGISTRATION for England's Stove Works®

Purchaser Information

I. Purchased By (Name) _____

II. Address _____

III. City_____State_____Zip Code _____

IV. Telephone Number_____

V. Email Address _____

Dealer Information

VI. Purchased From _____

VII. Address _____

VIII. City_____State_____Zip Code _____

Unit Information

*Refer to the sticker on the back of the manual or box to complete this section.

IX. Model Number_____Purchase Date _____

X. Purchase Price_____

XI. Serial Number_____Mfg. Date_____

Purchase Questions

How did you first hear about our product? (Please check one)

Word of Mouth ____ Burn Trailer Demonstration____ Internet____

Other: _____

Where did you receive information about our product?

Via Telephone____ Dealer (Name of dealer) _____ Internet____

Other: _____

EPA Certified to comply with 2020 particulate emission standards using cord wood.

PLEASE NOTE:

EPA INFORMATION

The following additions to your owner's manual will enable you to achieve optimal emissions performance from your stove. Important safety tips are also included.

- *Proper Installation* – Please refer to the Installation section of your owner's manual and follow the guidelines listed therein for safety and for optimal emissions performance.

Additional information:

Venting Introduction:

Draft: Draft is the force which moves air from the appliance up through the chimney. The amount of draft in your chimney depends on the length of the chimney, local geography, nearby obstructions and other factors. Too much draft may cause excessive temperatures in the appliance and may damage the catalytic combustor. Inadequate draft may cause backpuffing into the room and 'plugging' of the chimney.
Inadequate draft will cause the appliance to leak smoke into the room through appliance and chimney connector joints.
An uncontrollable burn or excessive temperature indicates excessive draft.
Please be mindful of installation location: Inversion and other air quality issues can arise in valleys or if unit is installed close to neighboring homes.

This wood stove operates on a natural draft system, in which the chimney system pulls air through the stove. This unit must be installed in accordance with the following detailed descriptions of venting techniques; not installing the stove in accordance with the details listed here can result in poor stove performance, property damage, bodily injury or death. Avoid make-shift compromises when installing the venting system. England's Stove Works is not responsible for any damage incurred due to a poor or unsafe installation.

Be certain that all aspects of the venting system are installed to the venting manufacturer's instructions, particularly the required clearances to combustibles. Also, be certain to use an attic radiation shield to prevent insulation from contacting a chimney which passes through an attic.

The chimney system is the "engine" which drives a wood stove, so it is imperative for proper unit function that the venting system be installed exactly as described in the following section.

If questions arise pertaining to the safe installation of the stove, our Technical Support line (800-245-6489) is available. Contact your local code official to be certain your installation

meets local and national fire codes, and if you're uncertain about how to safely install the stove, we strongly recommend contacting a local NFI certified installer to perform the installation.

Venting Guidelines:

ALWAYS install vent pipe in strict adherence to the instructions and clearances included with your venting system.

- **DO NOT** connect this wood stove to a chimney flue which also serves another appliance.
- **DO NOT** install a flue pipe damper

  or any other restrictive device in the exhaust venting system of this unit.
- **USE** an approved wall thimble when passing through a wall and a ceiling support/fire stop when passing through a ceiling.
- **INSTALL** three sheet metal screws at every chimney connector joint.
- **AVOID** excessive horizontal runs and elbows, as both will reduce the draft of the venting system and will result in poor stove performance.
- **INSPECT** your venting system often, to be certain it is clear of creosote, fly-ash and other restrictions.
- **CLEAN** the venting system as detailed in the maintenance section of this manual.
- **ADHERE** to the 10-3-2 rule regarding chimney terminations.
- **INSTALL** single wall chimney connector with the male end **down** to prevent creosote leakage.

Follow double wall chimney connector manufacturer's instructions regarding proper pipe installation.

WARNING: Venting system surfaces get HOT, and can cause burns if touched. Noncombustible shielding or guards may be required

The 10-3-2 Rule: The chimney system must terminate 3.0 ft above the point where it's centerline passes through the roof AND the chimney must terminate 2.0 ft. above part of the dwelling within a 10 ft. radius of the chimney.

- *Operation and Maintenance* – Please refer to the 'Operation' (Operating Instructions) and Maintenance (including Ash Removal/Disposal) sections of your owner's manual and follow the guidelines listed therein for safety *and* for optimal emissions performance.

Additional Information:

Following the instructions in your owner's manual for Building a Fire will ensure a proper fire, as well as helping minimize visible emissions.

More:

- *Fuel loading and re-loading:* Practical Tips for Building a Fire – See your owner's manual for information on loading (and re-loading) your fuel, as well as for fire-starting procedures (i.e. 'Building a Fire').
- *Top-Down Fires:* The US EPA recognizes 'the effectiveness of the top-down approach for starting fires.' A good tutorial for this approach may be found at http://woodheat.org/top-down-steps.html . When building top-down fires, be sure to follow the instructions found in your owner's manual and contact our Technical Support if you have any questions.
- *Fuel Selection:* Once your wood-burning appliance is properly installed, building an effective fire requires good firewood (using the right wood in the right amount) and good fire building practices. The following practical steps will help you obtain the best efficiency from your wood stove or fireplace.

- Season wood outdoors through the summer for at least 6 months before burning it. Properly seasoned wood is darker, has cracks in the end grain, and sounds hollow when smacked against another piece of wood.
- Store wood outdoors, stacked neatly off the ground with the top covered.
- Burn only dry, well-seasoned wood that has been split properly.
- Start fires with newspaper and dry kindling as discussed earlier in the manual.
- Burn hot fires.
- To maintain proper airflow, regularly remove ashes from your wood-burning appliance into a metal container with a cover and store outdoors.

Moisture Meter Information

- Firewood is ready at 10-25% moisture content.
- Newly-cut logs can have a moisture content (MC) of 80% or more, depending on species. Since wood shrinks, and can also split, twist or otherwise change shape as it dries, most wood is dried before being used. Air drying, or 'seasoning,' is the most common method used for cord wood. In most parts of the United States, the minimum moisture content that can be generally obtained in air drying is about 12 to 15 percent. Most air-dried material is usually closer to 20 percent moisture content when used

- To test your firewood, simply push the pins into the wood and wait for a reading. Remember, **don't just stick the meter into the ends of your firewood**. To get the most accurate reading, split the wood and test the center. The center of the log will contain the most moisture.

How Far Should I Drive Non-Insulated Pins into Wood?

- To full depth if possible. However, at moisture levels below 10%, it is usually sufficient to make good, positive contact with the wood. At higher levels of moisture and especially if you have a steep gradient, full penetration is a must.

- *WHAT FUELS NOT TO USE:*

CAUTION

- **NEVER USE GASOLINE, GASOLINE-TYPE LANTERN FUEL, KEROSENE, CHARCOAL LIGHTER FLUID, OR SIMILAR LIQUIDS TO START OR "FRESHEN UP" A FIRE IN THIS HEATER. KEEP ALL SUCH LIQUIDS WELL AWAY FROM THE HEATER WHILE IN USE. ADDITIONALLY, NEVER APPLY FIRE-STARTER TO ANY HOT SURFACE OR EMBERS IN THE STOVE. DO NOT USE CHEMICALS OR FLUIDS**
  - **TO START THE FIRE.**
- **DO NOT BURN FLAMMABLE FLUIDS SUCH AS GASOLINE, NAPHTHA OR ENGINE OIL.**
- **DO NOT BURN GARBAGE; LAWN CLIPPINGS OR YARD WASTE; MATERIALS CONTAINING RUBBER, INCLUDING TIRES; MATERIALS CONTAINING PLASTIC; WASTE PETROLEUM PRODUCTS, PAINT OR PAINT THINNERS, OR ASPHALT PRODUCTS; MATERIALS CONTAINING ASBESTOS; CONSTRUCTION OR DEMOLITION DEBRIS; RAILROAD TIES OR PRESSURE-TREATED WOOD; MANURE OR ANIMAL REMAINS; SALT WATER DRIFTWOOD OR OTHER PREVIOUSLY SALT WATER SATURATED MATERIALS; UNSEASONED WOOD; PAPER PRODUCTS, CARDBOARD, PLYWOOD OR PARTICLEBOARD. THE PROHIBITION AGAINST BURNING THESE MATERIALS DOES NOT PROHIBIT THE USE OF FIRESTARTERS MADE FROM PAPER, CARDBOARD, SAWDUST, WAX AND SIMILAR SUBSTANCES FOR THE PURPOSE OF STARTING A FIRE IN AN AFFECTED WOOD HEATER. BURNING THESE MATERIALS MAY RESULT IN RELEASE OF TOXIC FUMES OR RENDER THE HEATER INEFFECTIVE AND CAUSE SMOKE.**

- **Safe Wood-burning Practices**

Once your wood-burning appliance is properly installed, follow these guidelines for safe operation:

- Keep all flammable household items—drapes, furniture, newspapers, and books—far away from the appliance.
- Start fires only with newspaper, dry kindling and all natural or organic fire starters. Never start a fire with gasoline, kerosene, or charcoal starter.

- Do not burn wet or green (unseasoned) logs.
- Do not use logs made from wax and sawdust in your wood stove – they are made for open hearth fireplaces. If you use manufactured logs, choose those made from 100 percent compressed sawdust.
- Build hot fires. For most appliances, a smoldering fire is not a safe or efficient fire.
- Keep the doors of your wood-burning appliance closed unless loading or stoking the live fire. Harmful chemicals, like carbon monoxide, can be released into your home.
- Regularly remove ashes from your wood-burning appliance into a metal container with a cover. Store the container of ashes outdoors on a cement or brick slab (not on a wood deck or near wood). See ash removal instructions in your owner's manual.
- Keep a fire extinguisher handy.
- Remember to check your local air quality forecast before you burn.

- *Air Controls:* SEE YOUR OWNER'S MANUAL for information on the Proper Use of Air Controls (in the Operation section).
- *ASH REMOVAL* – Follow your Owner's manual's instructions regarding removal and disposal of ashes.
- *REPLACEMENT of parts that are critical to emissions performance* – Follow your Owner's manual's instructions regarding replacement of gaskets and other parts that are critical to emissions performance.

Remember: "This wood heater needs periodic inspection and repair for proper operation. It is against federal regulations to operate this wood heater in a manner inconsistent with operating instructions in this manual."

More: Burner Tubes – To replace a tube, first be sure that you order the correct tube you need to replace. Then using a 5/16" socket or open end wrench, remove the screw located on the left side of the tube. Be sure to keep the screw. Push the tube to the right then remove the tube (pulling the tube back to the left after that side has been removed from the hole). To replace, reverse the above procedure…make sure to install the tubes in the correct order. (Front to Back)

- **Smoke Detectors**

England's Stove Works, Inc. highly recommends the use of smoke detectors in every room of the house. However, locating a smoke detector directly above this unit can result in nuisance alarms.

CAUTION

This unit is meant to operate only with door closed. Smoke spillage and an inefficient, lazy burn will result from attempting to operate the stove with the door open.

Additionally, using prohibited fuels can create an unsafe situation and can also generate excess carbon monoxide. Carbon monoxide is an odorless, colorless gas which can be deadly.

The use of a carbon monoxide detector is strongly recommended.

- *Compliance:* EPA Certified to comply with 2020 particulate emission standards using cord wood.

- *Tamper Warning:* "This wood heater has a manufacturer-set minimum low burn rate that must not be altered. It is against federal regulations to alter this setting or otherwise operate this wood heater in a manner inconsistent with operating instructions in this manual."

- *Warranty:* See your Owner's manual for a Warranty Registration instruction page, as well as instructions for warranty procedures. For parts, warranty replacement procedures may be found at our parts store site: www.heatredefined.com

Questions? Besoin de pièces ou d'options? **www.heatredefined.com**
Pour un service en Français –
Courriel :
infoenfrancais@englanderstoves.com
Telephone (844) 411-2654

DES MODÈLES 32-NC, 50-SNC32, 50-TNC32
GUIDE D'INSTALLATION ET D'UTILISATION

Fabriqué par :
England's Stove Works, Inc.
P.O. Box 206
Monroe, VA 24574, États-Unis

Rév. 5/2020

ATTENTION

Veuillez lire l'intégralité du présent guide avant d'installer et d'utiliser cet appareil de chauffage au bois. Gardez tout appareil de chauffage hors de portée des enfants, et à bonne distance des meubles et des matières combustibles.

CONSERVEZ CES INSTRUCTIONS

AVIS DE SÉCURITÉ

Le non-respect de ces instructions peut causer des dommages matériels, des blessures ou même la mort. Pour votre sécurité et votre protection, suivez les instructions pour l'installation décrites dans ce guide. Communiquez avec les autorités locales en matière de construction ou le service d'incendie afin de connaître les restrictions et les exigences d'inspection des installations (y compris l'obtention de permis) de votre région.

IMPORTANT : EN CAS DE PROBLÈME AVEC CET APPAREIL, NE LE RETOURNEZ PAS AU DÉTAILLANT. COMMUNIQUEZ AVEC LE SERVICE DE SOUTIEN TECHNIQUE AU 1 800 245-6489.

Utilisation dans une maison mobile:
Cet appareil de chauffage au bois autoportant est approuvé pour une utilisation dans une maison mobile ou pour une installation en double largeur avec le raccordement d'air comburant extérieur. Consultez la section « Installation » du présent guide pour connaître les détails relatifs à l'installation dans une maison mobile. L'installation dans une maison mobile doit être conforme à la norme Manufactured Home and Safety Standard (HUD), CFR 3280, partie 24, des États-Unis.

Conservez dans vos dossiers

Numéro de modèle_____
Date d'achat_____
Date de fabrication_____
Numéro de série_____

* Ces renseignements sont inscrits sur l'étiquette de sécurité fixée à l'arrière de l'appareil. Ayez ces renseignements à portée de la main si vous appelez le fabricant ou votre détaillant au sujet de ce produit.

ATTENTION

- Gardez les enfants à l'écart.
- Surveillez les enfants qui se trouvent dans la même pièce que cet appareil.
- Prévenez les enfants et les adultes des risques que représentent les températures élevées.
- N'utilisez PAS l'appareil si les barrières de protection sont ouvertes ou retirées.
- Cet appareil est chaud lorsqu'il est en marche! Tenez les vêtements, les meubles, les rideaux et les autres matières combustibles à bonne distance. Le contact avec l'appareil peut brûler la peau!
- L'installation DOIT être conforme aux codes et aux règlements municipaux, régionaux, provinciaux et nationaux.
- Consultez les autorités locales en matière de construction, le service d'incendie ou les organismes de contrôle locaux à propos des restrictions, de l'inspection des installations et de l'obtention de permis.

BIENVENUE!

(Renseignements sur l'epa suivent)

REMARQUE : LES DISTANCES MINIMALES NE PEUVENT ÊTRE RÉDUITES QUE PAR DES MÉTHODES APPROUVÉES PAR LES AUTORITÉS RÉGLEMENTAIRES COMPÉTENTES.

NE RACCORDEZ PAS L'APPAREIL À UN CONDUIT NI À UN SYSTÈME DE DISTRIBUTION DE L'AIR.

NE FAITES PAS BRÛLER DE DÉTRITUS NI DE LIQUIDES INFLAMMABLES COMME DE L'ESSENCE, DU NAPHTA OU DE L'HUILE POUR MOTEUR.

N'UTILISEZ PAS DE PRODUITS CHIMIQUES NI DE FLUIDES POUR ALLUMER LE FEU.

<u>Merci</u> d'avoir acheté cet excellent produit de la gamme England's Stove Works.

La famille qui a fondé et possède encore England's Stove Works croit fermement que les travaux que l'on réalise soi-même sont les plus satisfaisants; voilà pourquoi vous avez trouvé ce poêle auprès de votre magasin préféré de produits prêts à assembler.

Nous concevons et fabriquons nos poêles expressément pour que n'importe quel propriétaire soit en mesure de les entretenir avec des outils de base. De plus, nous sommes toujours disposés à vous montrer comment procéder de la façon la plus simple et la plus économique qui soit.

En offrant des fiches d'entretien téléchargeables <u>gratuitement</u> et un guide de dépannage intelligent sur notre site Web, nous tentons d'aider nos clients à être prêts à utiliser leur appareil de chauffage en tout temps, d'autant plus que le prix du mazout et de l'électricité ne cesse d'augmenter.

Si vous avez besoin d'aide au sujet de votre appareil, veuillez consulter la vaste section d'aide de notre site Web ou appeler notre service de soutien technique au 1 800 245-6489. Nous sommes presque <u>toujours</u> en mesure de vous guider en cas de réparation à effectuer ou de problème, ou encore de répondre à vos questions.

<u>REMARQUE</u> : Les renseignements obtenus sur notre site Web ou en composant notre numéro sans frais sont gratuits en tout temps. Cependant, les réparations ou l'entretien que nous offrons sur place occasionnent des frais.

Nous vous souhaitons des années de chauffage agréable, efficace et de qualité.

Service de soutien technique d'England's Stove Works

www.HeatRedefined.com (800) 245-6489 (EN) (844) 411-2654 (FR)

ATTENTION : Le poêle est lourd.

De plus, lorsque vous manipulez des tôles, rappelez-vous qu'il peut y avoir des bords coupants ou des bavures. Bien que nous fassions tous les efforts possibles pour éliminer les bords coupants, veuillez faire preuve de prudence lorsque vous manipulez des pièces de métal.

<u>REMARQUE</u> : Si vous avez acheté ce modèle, en fonction des magasins, le numéro de modèle peut se terminer par « L », « LC », « H », « CT », etc. Ce guide concerne ces modèles également.

CARACTÉRISTIQUES TECHNIQUES

Caractéristiques de chauffage

- Durée maximale de combustion** ..... 10 heures
- Superficie approximative chauffée*** ..... 222,97 m²
- Capacité de la chambre de combustion ..... __,__ kg (__ lb)
- Buse ..... 15,24 cm, ronde

Dimensions (cm)

60,96 cm de large

79,38 cm de profondeur

76,2 cm de haut

** Les spécifications sont approximatives. Assurez-vous de localiser votre poêle dans la zone d'installation avant d'installer le tuyau, etc.*

Conformité aux normes de sécurité et aux normes de l'EPA

- Statut de conformité EPA..... Certifié conforme aux normes de 2020 sur l'émission de particules lors de l'utilisation de cord wood par l'ENVIRONMENTAL PROTECTION AGENCY des États-Unis.
  - Norme de test pour les USA: US EPA 40 CFR Part 60, Subpart 60.536
  - Taux d'émission..... 2.0 grams/hr
  - Emissions de monoxyde de carbone ..... 2.3 grams/min
  - Gamme de production de chaleur ..... 15900 – 39600 Btu/hr
  - Efficacité ... . 70% (HHV)
  - Testé pour EPA Test Method 28R, ASTM E3053-17, EPA Alt 125, CSA B415.1-10

** – La durée maximale de combustion dépend fortement du type de bois brûlé dans le poêle; ces valeurs peuvent donc varier.

*** – La capacité maximale de chauffage de cet appareil peut varier considérablement selon le climat, le type de construction, l'isolation et de nombreux autres facteurs. Combinez les renseignements exposés dans le présent guide aux résultats d'un calcul de déperdition thermique pour votre maison afin de déterminer si cet appareil suffira à combler vos besoins..

INSTALLATION

Vue d'ensemble de l'installation

Lorsque vous choisissez l'emplacement de votre nouveau poêle, vous devrez tenir compte d'un grand nombre de facteurs avant de commencer l'installation.

1. Habitudes de passage – Afin de prévenir les accidents, le poêle doit être installé à un endroit où il n'encombre pas le passage habituel dans la maison.

2. Flux de chaleur – Tenez compte de la façon dont la chaleur circule dans votre maison pour décider de l'endroit où vous installerez votre poêle. Installez le poêle à l'endroit que vous avez besoin de chauffer. Souvent, une installation en sous-sol ne permet pas qu'une chaleur suffisante atteigne les étages supérieurs, alors qu'une installation au dernier étage ne permet pas que la chaleur se rende aux étages inférieurs. N'oubliez pas que, tant qu'il est chaud, l'air monte et emprunte le chemin offrant le moins de résistance.

3. Emplacement de l'évacuation – Le moteur d'un poêle à bois est le système de cheminée; il est donc important d'examiner avec précision la méthode d'intégration du système de cheminée lors de l'installation du poêle. Idéalement, la cheminée d'un poêle à bois devrait être en position complètement verticale à partir de la buse de l'appareil jusqu'à l'extrémité se terminant au-dessus de la ligne de toiture. Un système de cheminée situé complètement à l'intérieur de l'enveloppe chauffée de la maison assurera un tirage fort et facile à amorcer dans la cheminée. Bien que les systèmes de cheminée extérieurs fonctionnent souvent de façon adéquate, ils subissent plus souvent le contre-tirage d'air froid à l'allumage ou sont fréquemment la cause d'un tirage faible de l'appareil. Tenez compte également de la section transversale de la cheminée. Même si les cheminées en maçonnerie existantes peuvent souvent être utilisées, il sera difficile voire impossible de faire fonctionner correctement l'appareil avec une grande cheminée en maçonnerie extérieure. Dans un tel cas, il sera souvent nécessaire d'utiliser une doublure de cheminée isolante afin de fournir le tirage nécessaire.

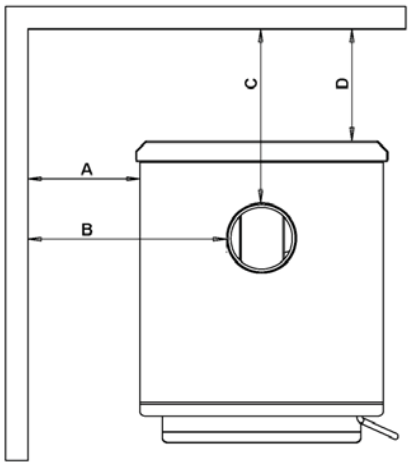
4. Construction du mur – Le fait de disposer le poêle de sorte que le système d'évacuation passe entre les montants d'une cloison simplifie l'installation et élimine la nécessité de restructurer les sections de mur ou de plafond pour y poser le manchon d'emboîtement mural ou la boîte d'encastrement de plafond.

AVERTISSEMENT

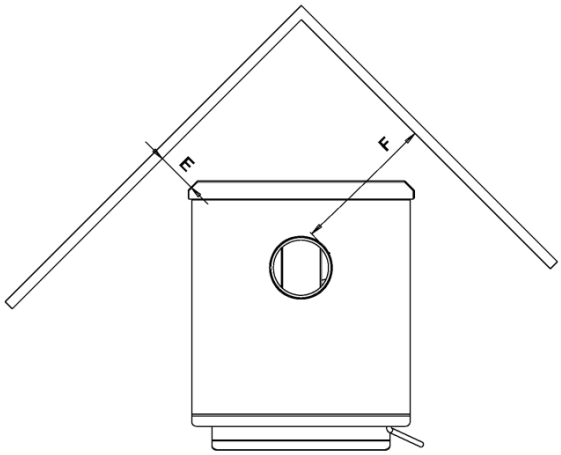
- Ne stockez pas et n'utilisez pas d'essence ni toute autre vapeur ou liquide inflammable à proximité de cet appareil ou de tout autre appareil.
- Évitez l'emballement du poêle. Si des pièces extérieures commencent à rougeoyer, il y a emballement. Réduisez l'alimentation en air. L'emballement annulera votre garantie.
- Respectez les indications relatives aux distances minimales avec les matières combustibles. Le non-respect de ces exigences pourrait provoquer l'incendie de la maison.
- Testé et approuvé pour **du bois enstéré seulement**. L'utilisation de tout autre combustible annulera votre garantie.

INSTALLATION

Distances minimales avec les matières combustibles



Installation parallèle au mur



Installation en coin

INSTALLEZ L'ÉVENT EN RESPECTANT LES DÉGAGEMENTS INDIQUÉS PAR LE FABRICANT DE L'ÉVENT.

	De l'appareil au mur latéral *	Du raccord de cheminée au mur latéral	Du raccord de cheminée au mur arrière	De l'appareil au mur arrière	De l'appareil au coin	Du raccord de cheminée au coin
	A	B	C	D	E	F
	cm (po)	cm (po)	cm (po)	cm (po)	cm (po)	cm (po)
Raccord de cheminée à paroi simple sur une surface non protégée	66.04 (26)	87.63 (34.5)	38.1 (15)	27.94 (11)	____ (____)	____ (____)
Raccord de cheminée à paroi simple sur une surface non protégée avec écrans latéraux	____ (____)	____ (____)	____ (____)	____ (____)	____ (____)	____ (____)

*** Unité non testée pour le connecteur de cheminée à paroi double**

Notes pour cette unité: Le produit peut différer légèrement des diagrammes. Les dégagements sont le minimum pour cette unité et peuvent devoir être augmentés pour avoir des dégagements de ventilation appropriés. Respectez tous les dégagements du fabricant de ventilation et les codes locaux..

INSTALLATION

Généralités sur la ventilation

Ce poêle à bois utilise un système de tirage naturel dans lequel le système de cheminée tire l'air dans le poêle. Cet appareil doit être installé conformément aux techniques de ventilation décrites en détail ci-après. Le non-respect des détails mentionnés pourrait réduire son rendement et causer des dommages matériels, des blessures ou la mort. Évitez d'avoir recours à des expédients lors de l'installation du système de ventilation. England's Stove Works n'est pas responsable des dommages causés par une installation incorrecte ou non sécuritaire.

Assurez-vous de bien suivre toutes les instructions du fabricant relatives au système de ventilation, surtout par rapport aux distances minimales nécessaires avec les matières combustibles. Assurez-vous également d'utiliser un écran antirayonnement de grenier afin d'éviter que l'isolant entre en contact avec une cheminée qui traverse un grenier.

Le système de cheminée est le « moteur » du poêle à bois. Il est donc essentiel que le système de ventilation soit installé exactement selon la description indiquée dans la section suivante afin d'assurer un fonctionnement adéquat de l'appareil.

Pour toute question relative à l'installation sécuritaire du poêle, appelez notre service de soutien technique au 1 800 245-6489. Communiquez avec un agent responsable local afin de vous assurer que l'installation est conforme aux exigences municipales et nationales en matière de prévention des incendies. Si vous n'êtes pas certain de pouvoir installer le poêle de façon sécuritaire, nous vous suggérons fortement de faire appel à un installateur local certifié par le NFI (National Fireplace Institute des États-Unis).

Consignes pour la ventilation

- Installez **TOUJOURS** le tuyau de ventilation en respectant rigoureusement les instructions et les indications sur les dégagements qui accompagnent le système de ventilation.
- Ne raccordez **PAS** le poêle à bois à un conduit de fumée déjà utilisé pour un autre appareil.
- N'installez **PAS** de registre de tirage, ni aucun autre dispositif de réglage dans le système d'évacuation par ventilation de cet appareil.
- **UTILISEZ** un manchon d'emboîtement mural homologué pour traverser un mur et un support de plafond ou un coupe-feu pour traverser un plafond.
- **INSTALLEZ** trois vis à tôle sur chaque joint de raccord de cheminée.
- **ÉVITEZ** de trop nombreux coudes et parcours horizontaux, car ils réduiront le tirage du système de ventilation, ce qui nuira au rendement du poêle.
- **INSPECTEZ** souvent le système de ventilation afin de vous assurer qu'il ne contient pas de créosote, de cendres volantes ou d'autres obstructions.
- **NETTOYEZ** le système de ventilation comme il est décrit dans la section sur l'entretien du présent guide.
- **RESPECTEZ** la règle 10-3-2 concernant les raccordements de la cheminée.
- **INSTALLEZ** le raccord de cheminée à paroi simple avec l'extrémité mâle **vers le bas** pour éviter les fuites de créosote. Suivez les instructions du fabricant de raccords de cheminée à paroi double concernant l'installation adéquate des tuyaux.

AVERTISSEMENT : Les surfaces du système de ventilation deviennent CHAUDES et peuvent causer des brûlures si vous les touchez. Il peut être nécessaire d'utiliser un revêtement ou des grilles de protection incombustibles.

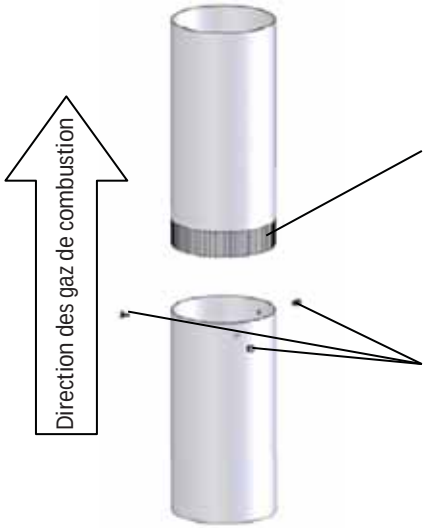
INSTALLATION

Renseignements supplémentaires sur la ventilation

- Ne mélangez pas et n'appariez pas de composants provenant de différents fabricants de tuyaux lorsque vous installez le système de ventilation (par exemple, n'utilisez **PAS** un tuyau de ventilation d'un fabricant et un manchon d'emboîtement d'un autre fabricant).
- Nous **exigeons** une hauteur minimale de cheminée de 4,57 m. Des systèmes de cheminée plus courts pourraient ne pas assurer le tirage nécessaire au fonctionnement adéquat de ce poêle à bois.
- N'ayez pas recours à des expédients lors de l'installation du système de ventilation. Faites inspecter le système de cheminée existant avant de l'utiliser et assurez-vous que tout nouveau système de cheminée est installé selon les spécifications du fabricant et seulement avec les composants homologués UL (ULC au Canada).
- Les systèmes de ventilation préfabriqués utilisés pour ce poêle doivent être homologués ULC S629 (Canada) et UL 103HT (États-Unis).
- N'installez jamais de système de tirage par aspiration ou tout autre système qui augmente le tirage naturel de la cheminée. De plus, n'installez pas de registre barométrique ou de registre de tirage sur cet appareil.
- N'utilisez jamais de raccord de cheminée à paroi simple ou double comme système de cheminée. Ne faites jamais passer un raccord de cheminée dans un mur combustible sans respecter à la lettre les instructions du fabricant et celles indiquées à la page suivante concernant les traversées de mur. Ne faites JAMAIS passer un raccord de cheminée à travers un grenier, un plancher, un placard ou un toit.
- Utilisez uniquement un raccord de cheminée noir à paroi simple de calibre 24 MSG ou un raccord de cheminée à paroi double homologué UL (ULC au Canada).

Installation d'un raccord de cheminée à paroi simple

L'extrémité mâle du raccord de cheminée à paroi simple doit être orientée vers le bas pour que la créosote liquide dans la buse puisse s'écouler dans l'appareil plutôt qu'à l'extérieur du tuyau (le tirage naturel dans le système de cheminée empêchera la fuite de fumée par les joints).



L'extrémité sertie ou mâle du raccord de cheminée à paroi simple doit être orientée vers le bas.

Fixez chaque joint de raccord de cheminée à paroi simple à l'aide de trois vis à tôle.

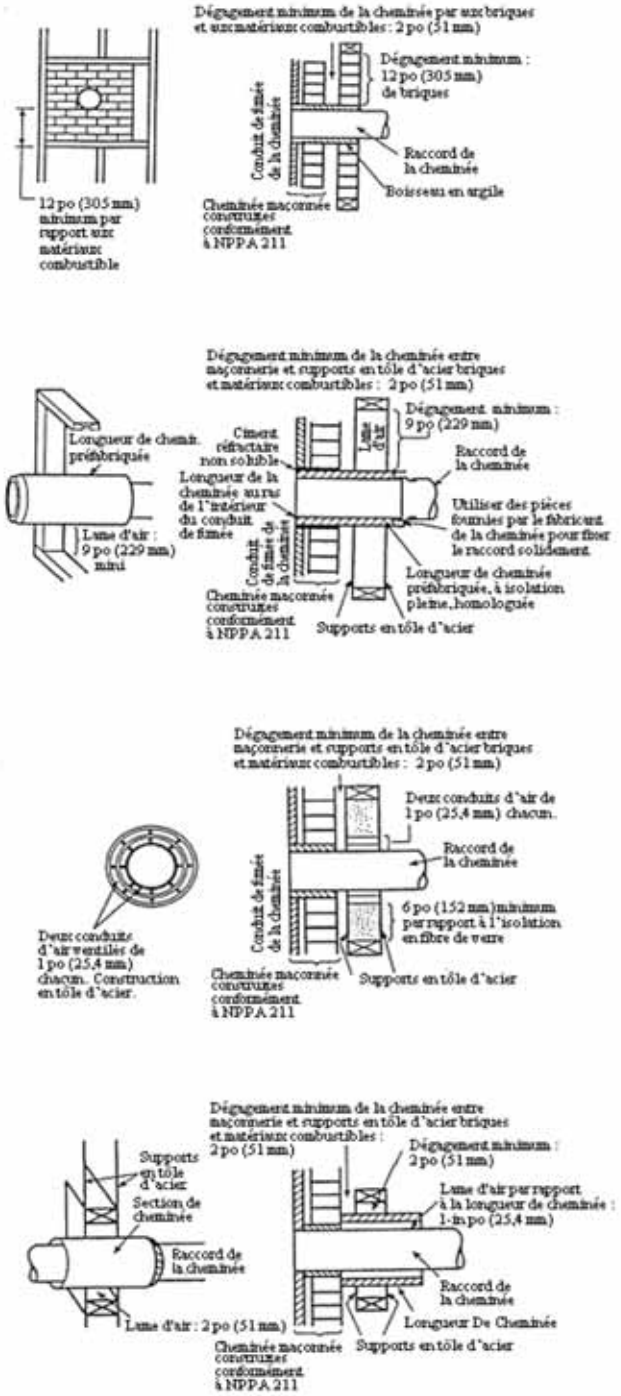
AVERTISSEMENT

- INSTALLEZ L'ÉVENT EN RESPECTANT LES DÉGAGEMENTS INDIQUÉS PAR LE FABRICANT DE L'ÉVENT.
- CHAUD! N'y touchez pas! Cela pourrait entraîner de graves brûlures ou l'inflammation des vêtements.
- La vitre et les autres surfaces sont chaudes durant le fonctionnement.

INSTALLATION

Traversées de mur

Raccords de cheminée et dégagements par rapport aux murs combustibles pour les appareils de chauffage résidentiels



A En brique maçonnées ayant une épaisseur minimale de 3,5 po entièrement encastrée dans le mur avec un cadre et ayant une séparation minimale de 12 po par des briques entre le boisseau en argile et les matériaux combustibles. Le boisseau en argile doit aller de la surface extérieure du mur en briques jusqu'à la surface intérieure de la gaine de la cheminée; il doit être cimenté fermement en place.

B Longueur de cheminée préfabriquée, à isolation pleine, homologuée, ayant le même diamètre intérieur que le raccord et ayant au moins 1 po de revêtement isolant avec une lame d'air minimale de 9 po entre le mur extérieur de la longueur de cheminée et les matériaux combustibles.

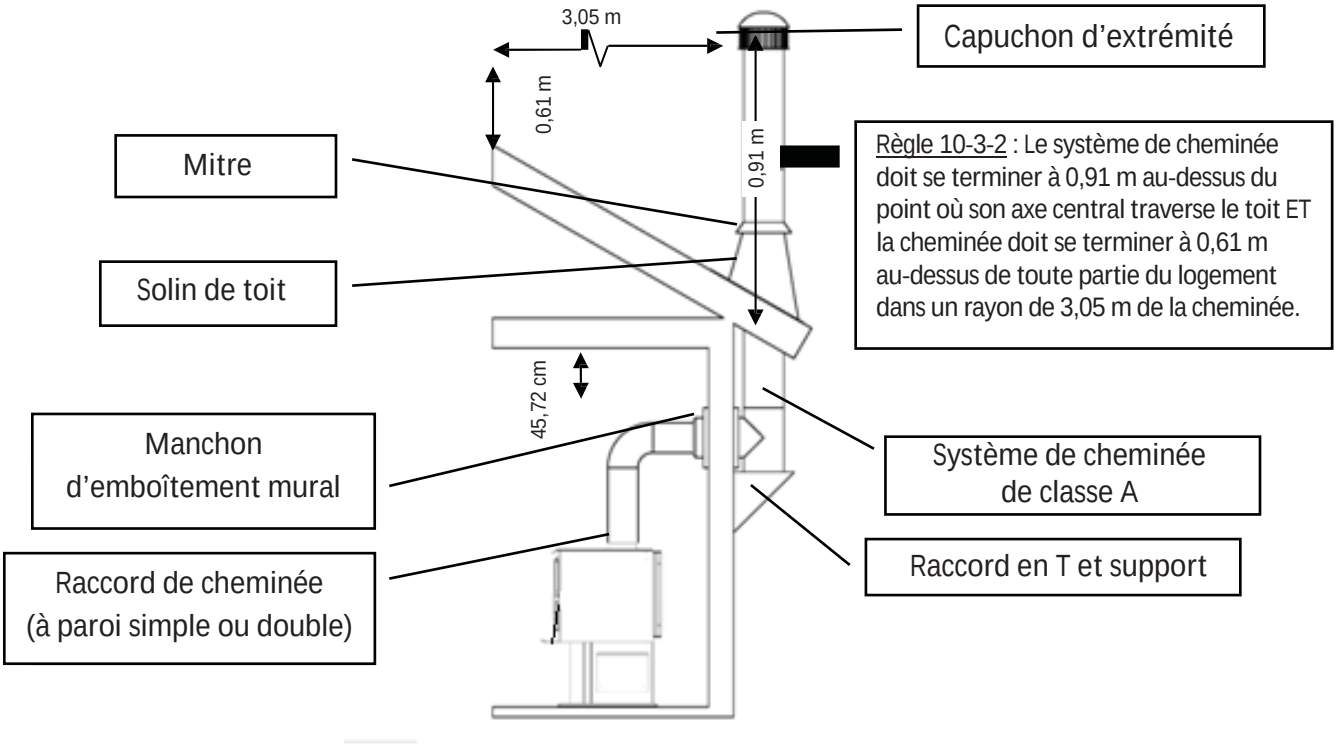
C Raccord de cheminée en tôle d'acier, d'épaisseur n° 24 au minimum, avec un manchon d'emboîtement ventilé, d'épaisseur n° 24 au minimum, ayant deux conduits d'air de 1 po, séparé des matériaux combustibles par de l'isolant en fibre de verre d'une épaisseur minimale de 6 po. L'ouverture doit obligatoirement être couvert, et le manchon d'emboîtement soutenu par un support en tôle d'acier d'épaisseur n° 24 au minimum.

D Longueur de cheminée préfabriquée, à isolation pleine, homologuée, ayant un diamètre intérieur 2 po plus grand que le raccord et ayant au moins 1 po de revêtement isolant, pour servir de gaine à un raccord à paroi simple en tôle d'acier, d'épaisseur n° 24 au minimum, avec une lame d'air minimale de 2 po entre le mur extérieur de la section de cheminée et les matériaux combustibles. La longueur minimale de la section de cheminée doit obligatoirement être une section de cheminée de 12 po espacée de 1 po du raccord au moyen de plaques support en tôle d'acier aux deux extrémités de la section de cheminée. L'ouverture doit obligatoirement être couverte, et la section de cheminée soutenue des deux côtés avec des supports en tôle d'acier solidement fixés aux surfaces des murs, d'épaisseur n° 24 au minimum. Les éléments servant à la fixation de la section de cheminée ne devront pas pénétrer la chemise de la cheminée.

Au Canada, l'installation doit respecter la norme CAN/CSA-8365 en cas de traversée de matériaux de construction combustibles.

INSTALLATION

Méthode de ventilation approuvée 1 : À travers le mur avec une cheminée préfabriquée

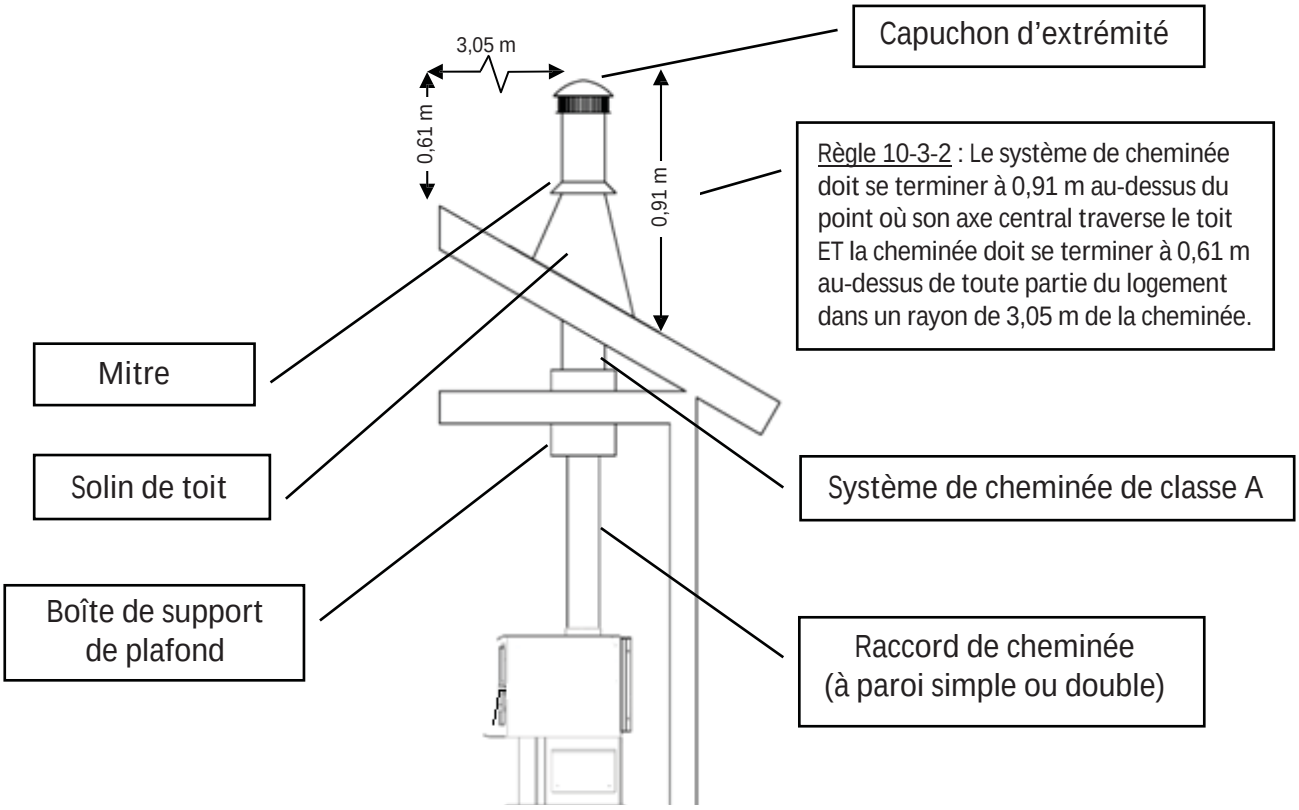


- Les systèmes de cheminée préfabriqués doivent respecter les normes ULC-S629 (650 °C) pour le Canada et UL-103HT (2100 °F) pour les États-Unis.
- Ce poêle à bois est homologué seulement pour une installation avec un raccord de cheminée de 15,24 cm de diamètre et un système de cheminée. L'installation de cet appareil sur une cheminée préfabriquée ayant un diamètre supérieur à 15,24 cm diminuera le tirage et pourrait entraîner un rendement insuffisant de l'appareil.
- Respectez toutes les exigences du fabricant concernant l'installation du système de ventilation et les distances minimales nécessaires.
- Utilisez trois vis à tôle pour chaque joint de raccord de cheminée à paroi simple (vérifiez les recommandations du fabricant lors de l'utilisation d'un raccord de cheminée à paroi double).
- Percez trois trous dans la buse de l'appareil et fixez le raccord de cheminée à l'appareil au moyen de vis à tôle (les trous devraient généralement être prépercés dans la buse à l'usine).
- Fixez correctement le système de cheminée préfabriqué à la maison en respectant précisément les instructions du fabricant du système de cheminée préfabriqué.
- Évitez de trop nombreux coudes et parcours horizontaux, car ils réduiront le tirage et entraîneront une accumulation accrue de créosote. Les parcours horizontaux d'un raccord de cheminée ne doivent jamais dépasser 1,22 m et la longueur totale du raccord de cheminée ne doit pas dépasser 2,44 m.
- Des adaptateurs spéciaux et des raccords à glissement sont offerts pour éviter d'avoir à couper le raccord de cheminée à paroi simple. Un raccord de cheminée à paroi double doit être utilisé avec ces raccords à glissement, car il ne peut pas être coupé en longueur.

Veuillez noter : Les schémas d'installation sont fournis à titre de référence uniquement et ne sont pas à l'échelle. Ils ne sont pas destinés à être utilisés comme des plans universels d'installation. Veuillez respecter toutes les exigences relatives au système de ventilation et aux distances minimales nécessaires avec les matières combustibles, et suivre tous les codes locaux.

INSTALLATION

Méthode de ventilation approuvée 2 : À travers le plafond

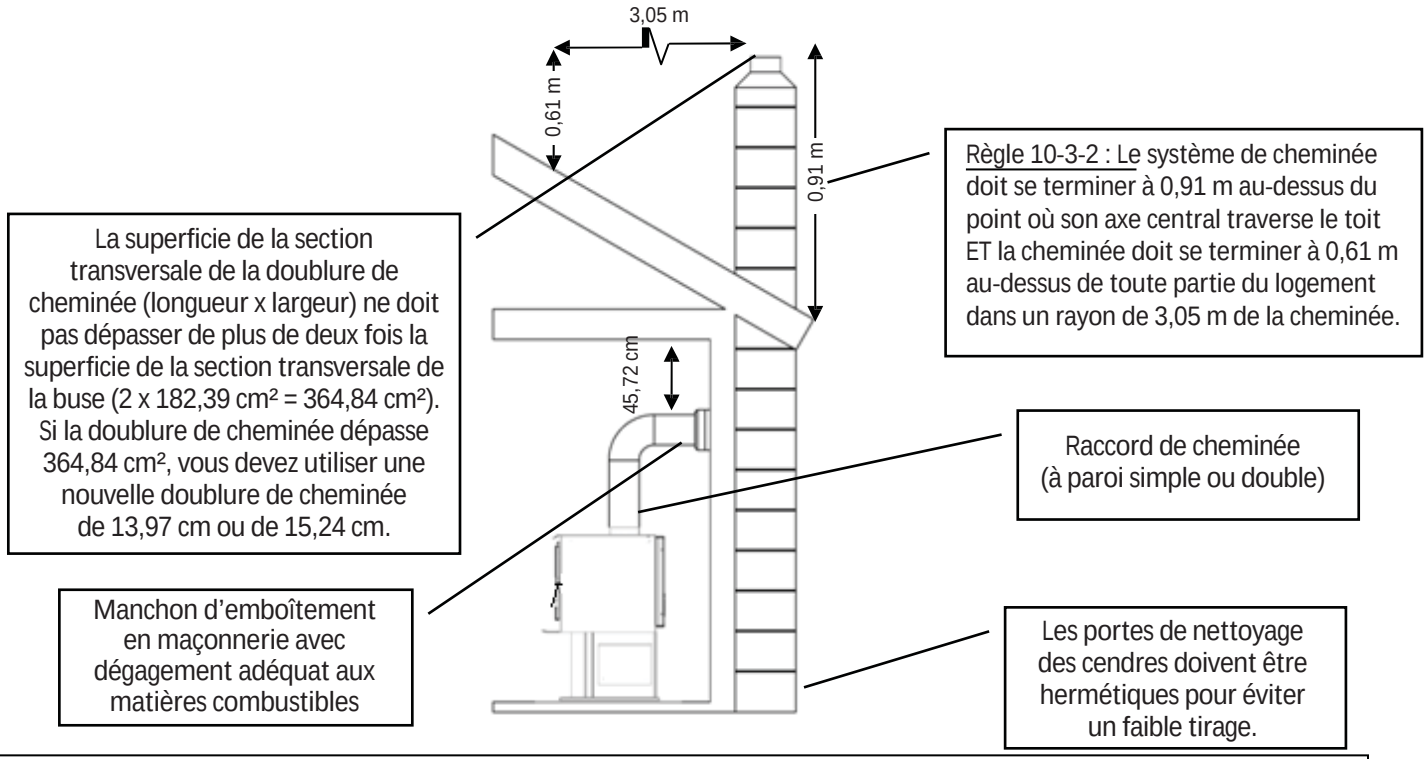


- Les systèmes de cheminée préfabriqués doivent respecter les normes ULC-S629 (650 °C) pour le Canada et UL-103HT (2100 °F) pour les États-Unis.
- Ce poêle à bois est homologué seulement pour une installation avec un raccord de cheminée de 15,24 cm de diamètre et un système de cheminée. L'installation de cet appareil sur une cheminée préfabriquée ayant un diamètre supérieur à 15,24 cm diminuera le tirage et pourrait entraîner un rendement insuffisant de l'appareil.
- Respectez toutes les exigences du fabricant concernant l'installation du système de ventilation et les distances minimales nécessaires.
- Utilisez trois vis à tôle pour chaque joint de raccord de cheminée à paroi simple (vérifiez les recommandations du fabricant lors de l'utilisation d'un raccord de cheminée à paroi double).
- Percez trois trous dans la buse de l'appareil et fixez le raccord de cheminée à l'appareil au moyen de vis à tôle (les trous devraient généralement être prépercés dans la buse à l'usine).
- Fixez correctement le système de cheminée préfabriqué à la maison en respectant précisément les instructions du fabricant du système de cheminée préfabriqué.
- La longueur totale du raccord de cheminée ne doit pas dépasser 2,44 m. Dans le cas d'un plafond cathédrale, le système de cheminée préfabriqué peut dépasser de 2,44 m à partir du dessus de l'appareil.
- Des adaptateurs spéciaux et des raccords à glissement sont offerts pour éviter d'avoir à couper le raccord de cheminée à paroi simple. Un raccord de cheminée à paroi double doit être utilisé avec ces raccords à glissement, car il ne peut pas être coupé en longueur.

Veuillez noter : Les schémas d'installation sont fournis à titre de référence uniquement et ne sont pas à l'échelle. Ils ne sont pas destinés à être utilisés comme des plans universels d'installation. Veuillez respecter toutes les exigences relatives au système de ventilation et aux distances minimales nécessaires avec les matières combustibles, et suivre tous les codes locaux.

INSTALLATION

Méthode de ventilation approuvée 3 : Système de cheminée en maçonnerie intérieur ou extérieur



- Observez les règles indiquées ci-dessus concernant la dimension maximale admissible de la doublure de cheminée. L'installation de cet appareil sur une cheminée en maçonnerie dont la superficie de la section transversale dépasse 364,84 cm^2 diminuera le tirage et pourrait entraîner un rendement insuffisant de l'appareil.
- Utilisez trois vis à tôle pour chaque joint de raccord de cheminée à paroi simple (vérifiez les recommandations du fabricant lors de l'utilisation d'un raccord de cheminée à paroi double).
- Percez trois trous dans la buse de l'appareil et fixez le raccord de cheminée à l'appareil au moyen de vis à tôle (les trous devraient généralement être prépercés dans la buse à l'usine).
- Évitez de trop nombreux coudes et parcours horizontaux, car ils réduiront le tirage et entraîneront une accumulation accrue de créosote. Les parcours horizontaux d'un raccord de cheminée ne doivent jamais dépasser 1,22 m et la longueur totale du raccord de cheminée ne doit pas dépasser 2,44 m.
- Un manchon d'emboîtement hermétique est essentiel pour obtenir un rendement adéquat de l'appareil et rendre l'installation sécuritaire. Utilisez un adaptateur de conception adéquate pour relier le raccord de cheminée à paroi simple ou double au manchon d'emboîtement en maçonnerie.
- Avant d'utiliser l'appareil, faites inspecter la cheminée en maçonnerie existante afin de vous assurer que son utilisation est sécuritaire et que les distances minimales avec les matériaux combustibles sont respectées. Un ramoneur compétent peut effectuer cette inspection.
- Les cheminées en maçonnerie extérieures subissent souvent le contre-tirage d'air froid et ont un faible tirage même si elles respectent les règles de superficie de la section transversale. Dans ce cas, il peut être nécessaire d'utiliser une doublure isolée de 15,24 cm.

Veuillez noter : Les schémas d'installation sont fournis à titre de référence uniquement et ne sont pas à l'échelle. Ils ne sont pas destinés à être utilisés comme des plans universels d'installation. Veuillez respecter toutes les exigences relatives au système de ventilation et aux distances minimales nécessaires avec les matières combustibles, et observer tous les codes locaux.

INSTALLATION

INSTALLATION DANS UN FOYER EN MAÇONNERIE

Préparation
Mesurez l'âtre pour vous assurer qu'il est d'une largeur suffisante pour loger l'appareil.

L'appareil doit avoir un dégagement de 91,44 cm entre la partie supérieure du poêle et le manteau de cheminée selon la norme 211 de la NFPA.

Pour les États-Unis : L'âtre doit dépasser d'au moins 406,4 mm à l'avant de l'ouverture pour le combustible.

Pour le Canada : L'âtre doit dépasser d'au moins 450 mm à l'avant de l'ouverture pour le combustible.

Inspectez l'âtre pour vous assurer qu'il est fabriqué d'un matériau incombustible comme la brique ou la pierre. N'installez **pas** ce poêle sur un âtre fabriqué d'une charpente en bois couverte de briques ou de pierres et n'installez **pas** cet appareil dans un foyer dont le dégagement est nul (0). Le fabricant ne sera pas tenu responsable d'un accident causé par l'installation de ce poêle sur un âtre fabriqué avec un matériau combustible.

Inspectez votre foyer pour vous assurer qu'il est en bon état de fonctionnement et qu'il est exempt d'obstructions.

Avant l'installation, retirez le registre existant ou fixez-le à l'aide d'un câble pour le maintenir ouvert de façon sécuritaire.

Ventilation du poêle – raccordement direct
Lorsque cet appareil est raccordé directement, un tuyau de calibre 24 d'un diamètre de 15,24 cm doit être utilisé à partir du poêle jusqu'à l'ouverture du registre. (**REMARQUE : Le raccord de cheminée doit être fixé à l'appareil avec au moins trois (3) vis, et trois vis doivent être utilisées pour fixer chaque section adjacente.)**
Nous recommandons fortement l'utilisation d'une doublure de 15,24 cm sur l'ensemble de la cheminée pour assurer un tirage approprié. Il sera ainsi nécessaire d'obturer la zone ouverte des deux côtés du tuyau traversant l'ouverture du registre au moyen d'une tôle ou d'un isolant en fibre de verre à l'épreuve du feu dans les zones ouvertes (ni papier ni combustible). Vous devez vous assurer que le tirage de la cheminée s'effectue par le poêle et non autour du tuyau de raccord.

Nous vous recommandons fortement que cette opération soit effectuée par un professionnel. Communiquez également avec les autorités locales pour vous assurer que tous les codes sont observés.

INSTALLATION

AVERTISSEMENT
N'INSTALLEZ PAS CET APPAREIL DANS UNE CHAMBRE À COUCHER.

ATTENTION

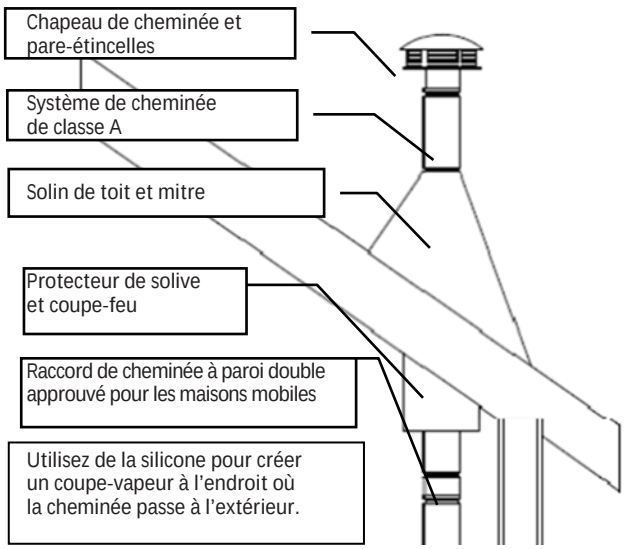
L'INTÉGRITÉ STRUCTURELLE DU PLANCHER, DES MURS, DU PLAFOND ET DU TOIT DE LA MAISON PRÉFABRIQUÉE DOIT ÊTRE PRÉSERVÉE.

Attention

NE TIREZ JAMAIS l'air comburant extérieur : d'une cavité d'un mur, d'un plancher ou d'un plafond, ou d'un espace clos comme un grenier, un garage ou un vide sanitaire.

Installation dans une maison mobile

- Le poêle à granules DOIT être fixé au sol de la maison transportable à l'aide de tire-fonds disposés dans les trous prévus à cet effet dans la partie inférieure de sa base. Les systèmes de chauffage ventilés à l'air extérieur doivent être fixés à la structure dans laquelle ils se trouvent. Le poêle à granules DOIT être mis à la terre à l'aide d'un fil de mise à la terre en cuivre massif de calibre 8 AWG ou l'équivalent, dont chaque extrémité est munie d'un dispositif avec mise à la terre approuvé par le code national de l'électricité.
- Le poêle à bois doit être raccordé au système de cheminée à l'aide d'un raccord de cheminée à paroi double homologué UL pour l'utilisation dans une maison mobile ou préfabriquée.
- Observez attentivement toutes les indications relatives au dégagement mentionnées à la section appropriée du présent guide ET respectez les exigences du fabricant du système de ventilation concernant les distances minimales. De plus, assurez-vous que le système de ventilation est approuvé pour une utilisation dans une maison mobile.
- L'installation doit être conforme à la norme Manufacturers Home & Safety Standard (HUD) CFR 3280, partie 24, des États-Unis ainsi qu'aux codes locaux en vigueur.

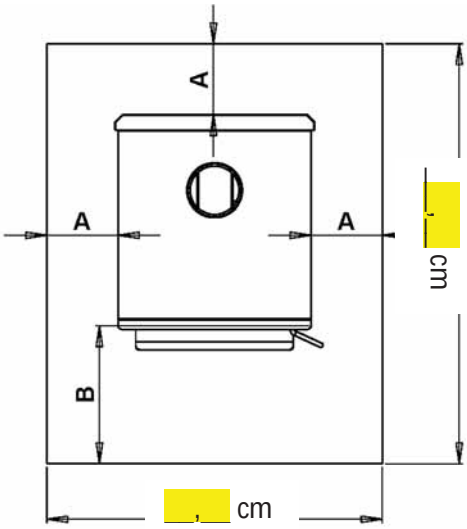


Air comburant extérieur

- L'utilisation de l'air comburant extérieur est **obligatoire** lors de l'installation de ce poêle à bois dans une maison mobile ou préfabriquée.
- Le tuyau de raccordement d'air extérieur dépasse de la partie inférieure centrale du poêle; une trousse est offerte par England's Stove Works, Inc. conçue pour raccorder cet appareil à l'air comburant extérieur. (N° de pièce AC-OAK3)
- S'il n'est pas possible d'utiliser la trousse de raccordement d'air extérieur AC-OAK3 pour l'installation de votre poêle, vous pouvez utiliser d'autres matériaux à condition d'observer les règles suivantes :
    - Le tuyau utilisé pour le raccordement d'air extérieur doit être en métal et avoir une épaisseur minimale de 0,53 mm. (acier doux de calibre 25) et un diamètre intérieur d'environ 7 cm.
    - Conservez la longueur de tuyau courte et utilisez une fixation sur chaque joint de tuyau.
    - Un écran ou un autre dispositif de protection doit être placé au point d'extrémité d'air extérieur afin d'éviter que la pluie, les débris ou les animaux nuisibles ne pénètrent dans le système de tuyauterie. Inspectez l'admission d'air comburant extérieur tous les mois pour éviter les blocages et l'accumulation de débris.

PROTECTION DU PLANCHER

- Dans le cas où le poêle à bois est installé sur un plancher combustible, il est nécessaire d'utiliser un protecteur de plancher avec un facteur R non inférieur à 1 conforme à la norme UL (ULC au Canada) . Si le plancher sur lequel le poêle doit être installé est déjà incombustible (par exemple, le plancher en béton d'un sous-sol), aucun protecteur de plancher n'est requis (vous pouvez toutefois installer un protecteur de plancher décoratif).
- Lorsque vous utilisez un protecteur de plancher, n'oubliez pas que le poêle est non seulement lourd, mais qu'il impose également des écarts de température au protecteur de plancher, ce qui peut endommager les carreaux et détacher les joints de mortier et de coulis situés près du poêle.
- Le protecteur de plancher doit être homologué UL ou l'équivalent (ULC au Canada) et doit être incombustible. Un tapis pour âtre n'est PAS approuvé pour remplacer un protecteur d'âtre approprié.
- Pour les États-Unis : Le protecteur de plancher doit dépasser d'au moins _____ cm à l'avant de l'ouverture pour le combustible, de _____ cm sur les côtés de l'ouverture de porte et de _____ cm à l'arrière de l'appareil.
- Pour le Canada : Le protecteur de plancher doit dépasser d'au moins ___ mm à l'avant de l'ouverture pour le combustible, de ___ mm sur les côtés de l'ouverture de porte et de ___ mm à l'arrière de l'appareil.



A : É.-U. __ po
CA __ mm/__ po

B : É.-U. __ po
CA ___ mm/__ po

- Le protecteur de plancher doit dépasser de 50,8 mm (2 po) de chaque côté des parcours de ventilation horizontaux et directement sous un tuyau de ventilation vertical.

ATTENTION

N'UTILISEZ JAMAIS D'ESSENCE, DE COMBUSTIBLE POUR LAMPE APPARENTÉ À L'ESSENCE, DE KÉROSÈNE, DE LIQUIDE D'ALLUMAGE POUR CHARBON, NI AUCUN LIQUIDE SIMILAIRE POUR ALLUMER OU RAVIVER UN FEU DANS CET APPAREIL DE CHAUFFAGE. CONSERVEZ DE TELS LIQUIDES ÉLOIGNÉS DE L'APPAREIL DE CHAUFFAGE LORSQUE CELUI-CI FONCTIONNE. DE PLUS, NE DISPOSEZ JAMAIS D'ALLUME-FEUX SUR UNE SURFACE CHAUDE NI SUR DES TISONS DANS LE POÊLE.

UTILISATION

Premiers feux

- Ce poêle à bois, conçu pour durer longtemps, est fabriqué en acier épais et en fonte. Cependant, pour éviter qu'une tension thermique excessive soit induite au métal pendant le premier feu, il faut trois petits feux de rodage, en s'assurant que chaque feu soit légèrement plus chaud que le précédent. Ces feux de rodage ne serviront pas seulement à acclimater le poêle aux températures élevées, mais ils aideront aussi à faire durcir lentement la peinture pour poêle résistant aux hautes températures, ce qui permettra au fini de qualité supérieure de durer plusieurs années.
  - NOUS RECOMMANDONS FORTEMENT de brûler vos incendies à l'extérieur, car la peinture et les huiles de fabrication «brûleront» quelque peu l'extérieur du poêle pendant ce temps. Si vous les brûlez à l'intérieur avec votre système de cheminée, ouvrez les portes et les fenêtres pour ventiler.
- Ce poêle est muni d'une seule tige de commande d'air qui régularise le taux de combustion du bois. Lorsque le dispositif coulissant de commande d'air primaire est enfoncé complètement vers l'intérieur, le poêle chauffe plus lentement et fournit de la chaleur plus longtemps. À l'inverse, lorsque le dispositif coulissant de commande d'air est tiré complètement vers l'extérieur de l'appareil, l'appareil chauffe plus vite et fournit une chaleur plus intense sur une période relativement plus courte. N'essayez pas de modifier le réglage de commande d'air peu importe la raison.
- Le premier feu de rodage devrait être un grand feu de bois d'allumage permettant au poêle d'atteindre une température de 148,9 °C mesurée par un thermomètre magnétique du côté gauche ou droit du poêle, au-dessus de la porte. Une fois cette température atteinte, laissez le feu s'éteindre en gardant la commande d'air ouverte. Les deuxième et troisième feux de rodage devraient être un peu plus importants en ajoutant quelques petits morceaux secs au bois d'allumage. La température à atteindre pendant ces feux se situe entre 176,7 °C et 232,2 °C environ; ne laissez pas le feu dépasser cette température.

Créosote – Formation et importance du retrait

Lorsque le bois brûle lentement, il produit du goudron et d'autres vapeurs organiques qui se combinent à l'humidité évacuée pour former la créosote. Les vapeurs de créosote se condensent dans le conduit de fumée relativement froid lorsque le feu se consume lentement. Par conséquent, des résidus de créosote s'accumulent sur le conduit de fumée. Lorsqu'elle s'enflamme, cette créosote produit un feu extrêmement chaud. La cheminée et le raccord de cheminée doivent être inspectés au moins tous les deux mois pendant la saison de chauffage afin de vérifier si une accumulation de créosote s'est produite. En cas d'accumulation de créosote, celle-ci doit être retirée afin de réduire le risque de feu dans la cheminée.

VOUS NE DEVEZ PAS UTILISER DE GRILLE NI SURÉLEVER LE FEU – INSTALLEZ LE BOIS DIRECTEMENT SUR L'ÂTRE
N'UTILISEZ PAS L'APPAREIL AVEC LA PORTE PRINCIPALE OUVERTE – VOUS RISQUERIEZ DE PROVOQUER UN EMBALLEMENT

En cas de feu causé par une accumulation de créosote ou de suie (feu de cheminée), fermez la commande d'air située sur le poêle, communiquez avec le service d'incendie local et quittez les lieux! Ne versez pas d'eau sur le feu! Communiquez avec le service d'incendie local pour obtenir de plus amples renseignements sur la procédure à suivre et sur la méthode à utiliser relative à un plan d'évacuation sécuritaire pour vous et votre famille dans le cas d'un feu de cheminée.

UTILISATION

Fonctionnement continu - Fonctionnement quotidien après votre premier feu

Allumage

- Chargez la chambre de combustion avec 6 à 9 lb de bois de démarrage fendu (1/4 à ½ lb).
- Sur le bois de démarrage, ajoutez 3 à 5 lb de bois d'allumage sec.
- Démarrage: allumez le petit bois jusqu'à ce qu'une flamme agressive s'établisse et atteigne les tubes secondaires en haut de la chambre de combustion.
- Fermez la porte et réglez l'air au maximum

Feu élevée

- Charger avec un minimum de gros morceaux de bois sur un lit de charbon
- Chargez le bois dans le foyer en parallèle avec les côtés.
- Placez les morceaux de bois le plus au fond possible dans le foyer.
- Évitez de surcharger le foyer de bois. Orientez-les avec des écarts entre les morceaux de bois et / ou les morceaux de bois situés plus haut dans la chambre de combustion.
- Toute écorce doit être orientée vers le haut pour faciliter un allumage rapide.
- Une fois que la flamme visible atteint les tubes secondaires, fermez la porte et réglez l'air au maximum

Feu faible et moyen

- Laisser le poêle brûler au réglage moyen ou bas désiré pendant au moins 15 minutes avant le chargement. Cela peut être fait en brûlant à puissance élevée jusqu'au le lit de charbon se forme, puis en réglant l'air et en laissant s'écouler 15 minutes.
- Laissez la porte fermée pendant 15 minutes - ratissez le lit de charbon avant.
- Comme pour le feu élevée:
    - Chargez le bois en parallèle avec les côtés du foyer
    - Placez les morceaux de bois le plus au fond possible dans le foyer.
    - Évitez de surcharger le foyer de bois. Orientez-les avec des écarts entre les morceaux de bois et / ou les morceaux de bois situés plus haut dans la chambre de combustion.
    - Toute écorce doit être orientée vers le haut pour faciliter un allumage rapide.
    - Une fois que la flamme visible atteint les tubes secondaires, fermez la porte et réglez l'air au maximum
- Lorsqu'une combustion secondaire visible est établie (les flammes «s'enroulent» près des tubes), commencez à réduire lentement le réglage de l'air pendant au moins 5 minutes. Assurez-vous que la combustion secondaire est maintenue lorsque l'air est réduit.

England's Stove Works, Inc. recommande toujours l'utilisation d'un thermomètre de poêle magnétique afin de surveiller la température de l'appareil. Lors de l'utilisation d'un thermomètre de poêle magnétique, installez-le au-dessus de la porte du côté gauche ou droit du poêle et utilisez les températures suivantes comme guide pour déterminer le taux de combustion et le degré de chaleur émise par le poêle :

- Le fonctionnement normal du poêle à bois se situe entre 176,7 °C (350 °F) et 287,8 °C (550 °F). De 176,7 °C (350 °F) à 232,2 °C (450 °F), le degré de chaleur sera de faible à moyen et de 232,2 °C (450 °F) à 287,8 °C (550 °F), le degré de chaleur sera de moyen à élevé. Le fonctionnement du poêle à 315,6 °C (600 °F) serait la température maximale admissible pour une utilisation continue. L'utilisation du poêle à cette température avec un taux de combustion élevé pour de longues périodes pourrait l'endommager. Le fonctionnement de l'appareil à une température égale ou supérieure à 343,3 °C (650 °F) est considéré comme un emballement et endommagera l'appareil.

N'ENTREPOSEZ PAS DE COMBUSTIBLES PLUS PRÈS QUE LES DÉGAGEMENTS SPÉCIFIÉS OU DANS L'ESPACE NÉCESSAIRE AU CHARGEMENT DU POÊLE ET AU RETRAIT DES CENDRES.

FONCTIONNEMENT

Consignes de sécurité supplémentaires

- L'installation de détecteurs de fumée est fortement recommandée lorsque vous installez cet appareil ou tout autre type d'appareil à combustible solide. Les détecteurs de fumée doivent être installés près de chaque pièce de la maison, voire dans celles-ci, plus particulièrement pour les chambres à coucher.
- Un détecteur de fumée peut être installé dans la même pièce que le poêle à bois enstéré. Toutefois, s'il est trop près de l'appareil, il pourrait émettre de fausses alarmes à cause des filets de fumée qui peuvent s'échapper à l'allumage du feu ou pendant le processus de rechargement. Pour cette raison, le détecteur de fumée installé dans la même pièce que l'appareil devrait être placé aussi loin de l'appareil que la pièce le permet.
- Ce poêle est uniquement conçu pour brûler du bois naturel. La combustion d'un bois dur séché à l'air, plutôt qu'un bois résineux ou un bois dur fraîchement coupé, accroît le rendement du poêle en plus de réduire les émissions au minimum. NE FAITES PAS BRÛLER **des déchets, du gazon coupé ou des résidus de jardinage, des matériaux contenant du caoutchouc, y compris des pneus, des matériaux contenant du plastique, des déchets de produits pétroliers, de la peinture ou du diluant à peinture, des produits bitumineux, des matériaux contenant de l'amiante, des déblais ou des débris de construction, des traverses de chemin de fer ou du bois traité sous pression, du fumier ou des restes d'animaux, du bois de grève imprégné d'eau salée ou des matériaux préalablement saturés en eau salée, des produits de papier, du carton, du contreplaqué ou des panneaux de particules. L'interdiction de brûler ces matériaux ne vous empêche pas d'utiliser des allume-feu à base de papier, de carton, de sciure, de cire ou d'autres substances semblables pour allumer un feu dans le poêle à bois. La combustion de ces matériaux peut compromettre l'efficacité du poêle et produire de la fumée et des vapeurs toxiques.**
- Le fait de brûler d'autres combustibles que le bois enstéré, plus particulièrement du charbon et du charbon de bois, peut entraîner des émanations à fortes concentrations en monoxyde de carbone dans l'habitation. Pour ces raisons, ne faites JAMAIS brûler du charbon ni du charbon de bois dans ce poêle à bois enstéré. L'installation d'un détecteur de monoxyde de carbone et la connaissance des symptômes d'un empoisonnement au monoxyde de carbone peuvent réduire les risques liés au monoxyde de carbone.
- Cet appareil est conçu pour fonctionner uniquement lorsque la porte de chargement est fermée et bien verrouillée. Le fonctionnement de cet appareil avec la porte de chargement ouverte ou mal verrouillée entraînera l'acheminement vers le feu d'une quantité excessive d'air comburant, ce qui fera augmenter dangereusement la température de l'appareil. Une température élevée peut endommager l'appareil, entraîner l'annulation de la garantie et enflammer la créosote accumulée dans le système de cheminée durant les feux à combustion lente précédents.
- Le tirage naturel qui tire l'air dans l'appareil et permet au feu de brûler utilise l'air intérieur du logement pour assurer la combustion, à moins que l'appareil ne soit raccordé à une source d'air comburant extérieur. Les hottes à évacuation de cuisinière, les fournaises et les autres appareils de circulation d'air dans la maison retirent aussi de l'air du logement. Si la quantité d'air filtré ou d'air entrant dans la maison est inférieure à celle retirée de la maison, une pression négative peut se produire.
- Étant donné que cet appareil fonctionne avec un tirage naturel, ce sera souvent le premier appareil

touché par une pression négative. Si de la fumée est expulsée hors des joints de raccord de cheminée ou du système d'induction d'air de l'appareil, c'est probablement parce que le poêle combat la pression négative du logement. L'ouverture partielle d'une fenêtre ou d'une porte près de l'appareil peut aider à égaliser la pression. Finalement, il pourrait être nécessaire d'ajouter une source d'air comburant extérieur dégagée pour assurer le fonctionnement adéquat de l'appareil.

- Si l'appareil est raccordé à l'air extérieur, assurez-vous de surveiller les accumulations de glace ou de neige pouvant bloquer l'entrée d'air extérieur du système de combustion. Pour éviter un manque d'air pour l'appareil, le raccord d'air extérieur ne doit pas être obstrué.

Pratiques de chauffage au bois sécuritaires

Une fois que votre appareil de chauffage au bois est correctement installé, suivez ces directives pour assurer un fonctionnement sécuritaire :

- Tenez tous les articles de maison inflammables (draps, meubles, journaux et livres) loin de l'appareil.

  Pour allumer un feu, utilisez uniquement du papier journal, du bois d'allumage et un allume-feu entièrement naturel ou biologique. N'utilisez jamais d'essence, de kérosène ou d'allumoir à charbon pour allumer un feu.

  Ne brûlez pas de bûches humides ou vertes (non séchées).

N'utilisez pas de bûches faites de cire ou de sciure de bois dans votre poêle à bois, car elles sont conçues pour des foyers ouverts. Si vous utilisez des bûches fabriquées, prenez celles qui sont faites de sciure de bois compressée à 100 %.

Faites des feux chauds. Pour la plupart des appareils de chauffage au bois, un feu qui couve n'est ni sécuritaire ni efficace.

Gardez fermées les portes de votre appareil de chauffage au bois sauf pour ajouter des bûches ou alimenter le feu. Des produits chimiques nocifs, comme le monoxyde de carbone, peuvent être libérés dans votre domicile.

Retirez régulièrement les cendres de votre appareil de chauffage au bois dans un récipient en métal doté d'un couvercle. Rangez le récipient contenant les cendres à l'extérieur, sur une dalle de ciment ou de brique (et non pas sur une terrasse en bois ni à proximité de bois). Consultez les instructions sur le retrait des cendres dans le guide d'utilisation.
Gardez un extincteur d'incendie à portée de la main.
N'oubliez pas de consulter les prévisions locales sur la qualité de l'air avant d'utiliser votre poêle à bois.

ENTRETIEN

Entretien quotidien

- Vérifiez l'accumulation de cendres dans la chambre de combustion. Retirez l'excès de cendres et suivez les instructions indiquées ci-dessous concernant l'élimination des cendres. Les cendres ne devraient pas s'accumuler excessivement dans le poêle.

Entretien mensuel

- Vérifiez le bon fonctionnement de la poignée de porte et assurez-vous que la porte se ferme hermétiquement.
- Inspectez le système de cheminée et le raccord de cheminée, puis effectuez le ramonage au besoin. Même si le nettoyage n'est pas nécessaire tous les mois, inspectez TOUJOURS le système d'évacuation chaque mois pour réduire la possibilité d'un feu de cheminée.
- Faites une inspection visuelle des panneaux d'isolation en fibres de céramique de la chambre de combustion pour vérifier la présence de fissures ou de bris. Des fissures superficielles légères ne nuiront pas au rendement des panneaux, mais des panneaux fissurés ou effrités doivent être remplacés immédiatement.
- Faites une inspection visuelle des tubes de combustion secondaires pour vous assurer qu'ils ne sont pas fissurés, déformés ou corrodés. Même si ces tubes sont fabriqués en acier inoxydable, ils fonctionnent à des températures très élevées et peuvent finir par s'user lors d'une utilisation normale.

Entretien annuel

- Vérifiez la présence d'usure sur tous les joints d'étanchéité (fenêtre et porte) et assurez-vous qu'ils continuent de fournir une fermeture hermétique. Consultez la page suivante pour les instructions.
- Nettoyez à fond le système de cheminée et le système de raccord de cheminée. Étant donné que le raccord de cheminée est généralement soumis à des températures d'évacuation élevées, vérifiez la présence de fuites et de points faibles, puis remplacez les pièces dont l'état est douteux. (Dans le cas d'un système de cheminée complètement droit jusqu'au toit, assurez-vous de retirer les déflecteurs en fibres de céramique **avant** de pousser la brosse de ramonage dans la chambre de combustion. Le fait de frapper avec force sur la partie supérieure du déflecteur avec une brosse ou une tige de nettoyage peut endommager le déflecteur ou le détruire.)
- Retirez toute la cendre accumulée dans le poêle y compris celle accumulée sur la partie supérieure des déflecteurs de la chambre de combustion. Laissez le régulateur d'admission d'air ouvert pendant les mois sans chauffage pour permettre une circulation d'air dans le poêle afin d'aider à prévenir la corrosion. Un petit contenant ouvert rempli de litière pour chat placé dans le poêle peut aider à prévenir la corrosion pendant les mois humides de l'été. Pensez à retirer le contenant avant de faire un feu à l'automne.

L'ENTRETIEN INADÉQUAT DES JOINTS, Y COMPRIS LE NON-REMPLACEMENT DES JOINTS, PEUT ENTRAÎNER DES FUITES D'AIR CAUSANT UN FEU NON MAÎTRISÉ DANS L'APPAREIL.

Élimination des cendres – Les cendres doivent être placées dans un contenant métallique avec un couvercle hermétique. Le contenant fermé rempli de cendres doit être placé sur un plancher incombustible ou sur le sol, loin de tous les matériaux combustibles, en attendant l'élimination finale. Si vous vous débarrassez des cendres en les enterrant ou en les dispersant, vous devez d'abord les conserver dans un contenant fermé jusqu'à ce que toutes les cendres soient complètement refroidies.

ENTRETIEN

Inspection des joints d'étanchéité

Il est essentiel que le joint de l'ouverture de porte soit étanche à l'air pour assurer le rendement adéquat du poêle. Toute fuite d'air dans cette zone peut entraîner un emballement et donc un risque grave pour la sécurité. Pour cette raison, vous devez toujours maintenir les joints d'étanchéité en bon état. Vous pouvez vérifier l'étanchéité des joints à l'aide de la méthode du « billet de banque » :

- Placez un billet de banque entre le joint d'étanchéité et le corps du poêle (à l'endroit où le joint touche le poêle).
- Fermez la porte et serrez-la, puis essayez de retirer le billet de banque. Si le billet de banque entre et sort facilement, vous devez remplacer le joint d'étanchéité. Répétez ce test sur tout le périmètre du joint d'étanchéité, car il peut être en bon état d'un côté, mais en mauvais état de l'autre.
- Effectuez ce test tout autour du périmètre de la porte et faites une inspection visuelle du joint d'étanchéité de la vitre pour vérifier la présence de fuites. Les fuites du joint d'étanchéité de la vitre peuvent généralement être détectées en suivant les traces de suie qui se déposent sur la vitre après un feu.
- Si le test est un échec pour l'une des zones, le joint d'étanchéité en entier doit être remplacé.
- Les joints d'étanchéité doivent être remplacés uniquement par des joints d'étanchéité équivalents en fibres de verre, spécialement conçus pour cet appareil par England's Stove Works®.

Joints d'étanchéité

1. Porte – Cet appareil est muni d'un joint d'étanchéité cordé de 15,88 mm autour de la porte, qui doit être remplacé au moins tous les ans. Pour remplacer le joint d'étanchéité de la porte (n° de pièce AC-DGKNC), retirez d'abord le vieux joint en entier. Avant d'ajouter le nouvel adhésif, vous devrez peut-être gratter la vieille colle du montant de porte. Après avoir ajouté la colle et installé le joint, fermez et verrouillez la porte, puis laissez-la ainsi pendant 24 heures pour que la colle durcisse.
2. Fenêtre – Si vous remplacez le joint d'étanchéité de la fenêtre (n° de pièce AC-GGK), un des côtés du nouveau joint d'étanchéité sera déjà enduit de colle. Retirez d'abord le vieux joint d'étanchéité. Retirez ensuite le papier du côté adhésif et placez le joint d'étanchéité autour du bord extérieur de la vitre, centré sur le bord. Repliez les bords du joint d'étanchéité sur la vitre en formant un « U ».

Fini

Ce nouvel appareil a été peint avec une peinture résistant aux hautes températures qui devrait conserver son aspect d'origine pendant des années. Si l'appareil est mouillé et que des taches de rouille apparaissent, vous pouvez les poncer avec de la laine d'acier fine et repeindre l'appareil. Il est important de n'utiliser qu'une peinture en aérosol résistant aux hautes températures (n° pièce AC-MBSP), car les autres types de peinture pourraient ne pas adhérer à la surface ou ne pas supporter les températures élevées. De même, certaines marques de peinture n'adhèrent pas à certaines autres marques de peinture; par conséquent, nous vous recommandons fortement d'utiliser notre peinture en aérosol résistant aux hautes températures exclusive.

REMPLACEMENT DES COMPOSANTS

Vitre

Cet appareil comporte un panneau en vitrocéramique (n° de pièce AC-G30) dans la porte vitrée. Un joint d'étanchéité de fenêtre autoadhésif est inclus avec les fenêtres de rechange achetées directement chez England's Stove Works. Ne remplacez jamais un composant en vitrocéramique par une vitre en verre trempé ou tout autre type de verre et ne faites jamais fonctionner cet appareil lorsque la vitre est fissurée ou brisée.

- Dimensions de la vitre : 285,75 mm x 384,18 mm (11,25 po x 15,125 po)
- Type de verre : Vitrocéramique de 5 mm (Keralite Pyroceram)
- Fabricant du verre : Eurokera

Précautions relatives à la vitre

1. Ne remplacez jamais la vitre en vitrocéramique par une vitre en verre trempé ou tout autre type de verre.
2. Ne faites jamais fonctionner cet appareil lorsque la vitre est fissurée ou brisée.
3. Ne claquez pas la porte et ne frappez pas la vitre avec un objet.
4. Ne faites pas le feu directement contre la vitre.

Nettoyage de la vitre

1. Assurez-vous que le poêle **et** la vitre sont complètement refroidis.
2. Il y a généralement peu de dépôts sur la vitre et ils peuvent habituellement être nettoyés avec de l'eau. Si de la suie tenace persiste, utilisez un nettoyant spécialement conçu pour l'enlever. Vous ne devez pas gratter la vitre ni la nettoyer avec un produit abrasif.
3. Rincez la vitre avec de l'eau propre et séchez-la avant de faire fonctionner le poêle à nouveau.

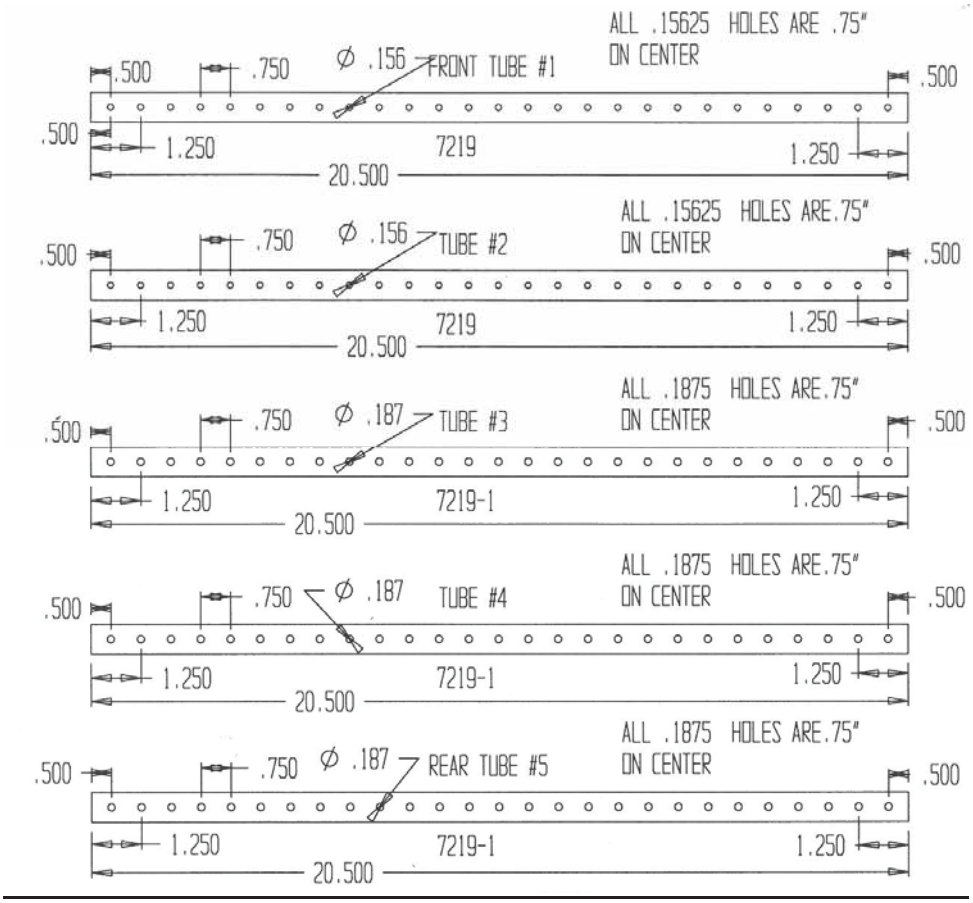
Remplacement de la vitre

1. Retirez la porte du poêle et placez-la sur une surface de travail solide, face vers le bas.
2. À l'aide d'une clé de 5/16 po, retirez les vis de fixation du support de fenêtre.
3. Retirez les arrêtoirs de fenêtre de la porte. Faites très attention pour éviter les éclats de verre si la fenêtre de verre est brisée.
4. Soulevez le vieux panneau de verre en le retirant de la porte, puis jetez-le.
5. L'emballage du panneau de verre doit contenir un joint d'étanchéité autoadhésif en fibre de verre (AC-GGK). Si vous avez acheté un nouveau verre, le joint d'étanchéité est déjà fourni avec l'emballage. Si vous réutilisez la même pièce de verre, retirez le vieux joint d'étanchéité et enlevez l'ancien adhésif d'enrobage de la pièce AC-GGK. Ce joint sert de coussin entre la vitre et la porte en fonte.
6. Réinstallez les arrêtoirs de fenêtre à l'aide des quatre vis retirées précédemment. Ne serrez pas trop les vis.

REMPLACEMENT DES COMPOSANTS

Remplacement du tube de brûleur

Cinq tubes différents de brûleur se trouvent dans la partie supérieure du poêle. Pour remplacer un tube, assurez-vous de commander le tube qui correspond à celui que vous devez remplacer. Retirez ensuite la vis située du côté gauche du tube à l'aide d'une douille ou d'une clé à fourches de 5/16 po. Assurez-vous de conserver la vis. Poussez le tube vers la droite, puis retirez-le (en tirant le tube vers l'arrière et vers la gauche après avoir retiré le tube de ce côté de l'orifice). Pour remplacer le tube, inversez la procédure indiquée ci-dessus. Assurez-vous d'installer les tubes dans l'ordre adéquat. (De l'avant à l'arrière)



PARTIE AVANT DU POÊLE

30-BT4

30-BT4

30-BT2

30-BT2

30-BT2

PARTIE ARRIÈRE DU POÊLE

Remplacement du panneau en fibres de céramique

Il y a quatre panneaux de fibres situés en haut de ce poêle, en deux couches. Alors que la couche inférieure est orientée «Nord / Sud» comme indiqué, la couche supérieure est orientée «Est / Ouest».

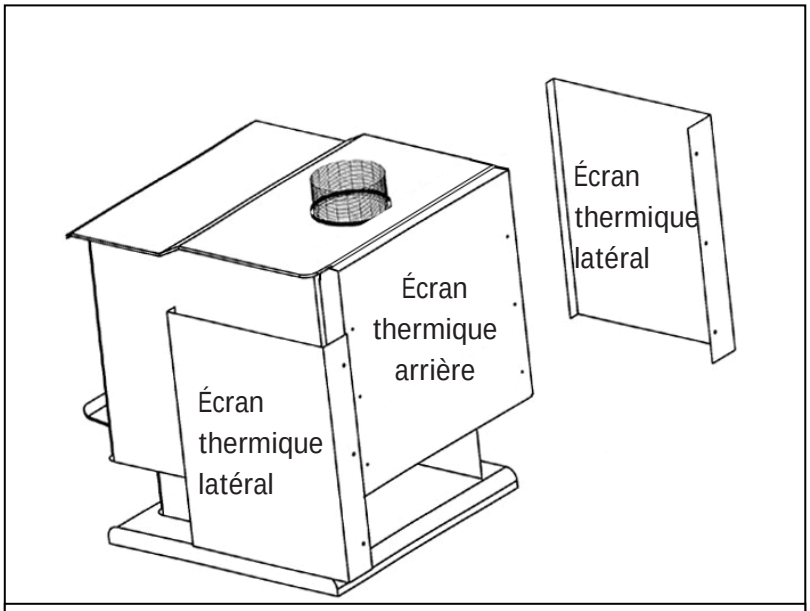
Pour remplacer un panneau fissuré ou brisé, retirez d'abord le tube de brûleur avant. Retirez ensuite le panneau que vous devez remplacer. Installez le nouveau panneau (les deux panneaux sur chaque couche doivent être placés directement sur les tubes de bord à bord). Remplacez le tube retiré précédemment.

PANNEAUX EN FIBRES DE CERAMIQUE (4 au total)

Écrans thermiques latéraux

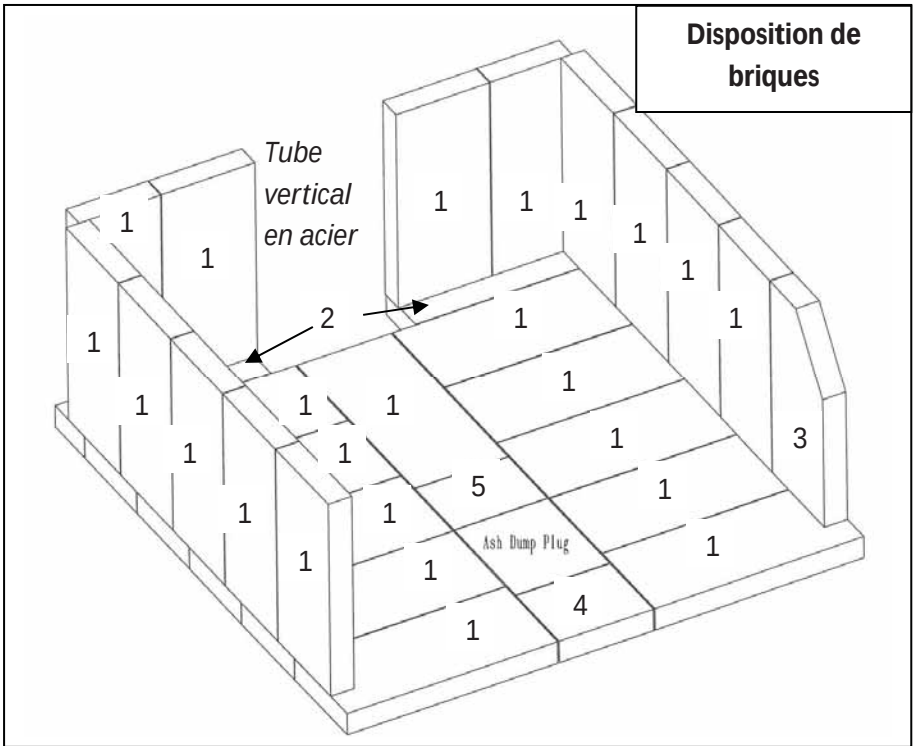
Cet accessoire est livré avec la quincaillerie (six (6) vis) nécessaire pour l'installer à l'arrière du poêle. Il s'agit d'un écran thermique en deux morceaux, mais il s'installe une partie à la fois. Il y a trois trous pré-percés de chaque côté de l'écran thermique arrière; tout en maintenant chaque morceau d'écran thermique latéral en place, alignez les trous pré-percés de l'écran latéral avec les trous existants dans l'écran thermique arrière, et fixez-les à l'aide des vis fournies.

Voir page 7 pour les dégagement avec et sans écrans thermiques latéraux.



Installation de l'écran thermique latéral

Disposition de briques



NOMBRE	DIMENSIONS DES BRIQUES	NUMÉRO DE PIÈCE	QUANTITÉ PAR POÊLE
1	9 x 4 x 1.25 po / 22,86 x 10,16 x 3,18 cm	AC-SB	24
2	8 x 2 x 1.25 po / 20,32 x 5,08 x 3,18 cm	AC-SB8X2X1.25	2
3	9 x 4 x 1.25 po / 22,86 x 10,16 x 3,18 cm avec encoche	AC-SBN1X3	1
4	4 x 3.75 x 1.25 po / 10,16 x 9,52 x 3,18 cm	AC-SB4X3.75X1.25	1
5	4 x 2.5 x 1.25 po / 10,16 x 6,35 x 3,18 cm	AC-SB2.5	1

DÉPANNAGE

Problème	Cause	Solutions
Le poêle émet de la fumée dans la pièce.	1. Tirage faible	1.1 Assurez-vous que la longueur de la cheminée est suffisante pour respecter la règle 10-3-2.
		1.2 Augmentez la hauteur de la cheminée.
	2. Pression négative dans le logement	2.1 Ajoutez un raccordement d'air comburant extérieur à l'appareil.
Le feu est difficile à démarrer.	3. Tirage faible	3.1 Assurez-vous que la longueur de la cheminée est suffisante pour respecter la règle 10-3-2.
		3.2 Augmentez la hauteur du système de cheminée.
	4. Cheminée froide	4.1 Chauffez la buse en premier en brûlant du papier journal chiffonné dans le poêle.
		4.2 Installez une chasse isolée autour des cheminées extérieures.
	5. Contre-tirage dans la cheminée	5.1 Assurez-vous que la longueur de la cheminée est suffisante pour respecter la règle 10-3-2.
		5.2 Essayez de chauffer la buse avec un séchoir à cheveux pour corriger le tirage.
La vitre est sale.	6. Bois humide ou vert	6.1 Brûlez seulement du bois qui a séché au moins un an et qui est sec, exempt de glace et de neige.
	7. Utilisation du poêle à un taux de combustion bas	7.1 Faites fonctionner le poêle à un taux de combustion plus élevé afin de permettre au système autonettoyant de conserver la vitre propre.
	8. Le bois chargé est trop près de la vitre.	8.1 Ne chargez jamais le bois de sorte qu'il touche à la fenêtre en verre vitrocéramique.
Accumulation de braises dans la chambre de combustion.	9. Utilisation du poêle à un taux de combustion élevé	9.1 Réduisez l'admission d'air comburant et permettez aux braises de brûler avant de rajouter du bois.
Le feu est hors contrôle.	10. Tirage excessif	10.1 Réduisez la hauteur de la cheminée.
	11. Fuite d'air	11.1 Inspectez les joints d'étanchéité de la fenêtre et de la porte et remplacez-les au besoin.
	12. Bois de chauffage trop sec	12.1 Brûlez seulement du bois enstéré sec. Ne faites pas brûler du bois séché au séchoir ou du bois à palettes.
La cheminée dégage une fumée excessive.	13. Utilisation du poêle à un taux de combustion bas	13.1 Faites fonctionner le poêle à un taux de combustion plus élevé pour activer la combustion secondaire.
	14. Bois humide ou vert	14.1 Brûlez seulement du bois qui a séché au moins un an et qui est sec, exempt de glace et de neige.
	15. Nouvelle charge de bois qui ne s'enflamme pas	15.1 Faites carboniser la nouvelle charge de bois jusqu'à ce qu'elle s'enflamme complètement et que la combustion secondaire active se produise dans la chambre de combustion.

LISTE DES PIÈCES DE RECHANGE

	Composants de portes et fenêtres
AC-G30	Verre de porte avec joint d'étanchéité
AC-GGK	Trousse de joint d'étanchéité de vitre
AC-DGKNC	Trousse de joint d'étanchéité de porte, haute densité
AC-SHN	Grosse poignée à ressort (nickel)
	Composants du foyer
AC-30BT4	Tubes de brûleur avant, première et deuxième position
AC-30BT2	Tubes de brûleur arrière, troisième, quatrième et cinquième position
AC-30CFB	Panneau en fibres de céramique (4 au total nécessaires)
	Plus
AC-03BN	Bouton de cendrier, nickel
AC-MBSP	Peinture noire haute-température
AC-30SHSB	Système d'écrans thermiques latéraux

POUR LA DISPOSITION DES BRIQUES ET LES NUMÉROS DE PIÈCE, CONSULTEZ LA PAGE 26.

Modèles ☐ 32-NC ☐50-SNC32 ☐50-TNC32
Appareil de chauffage à combustible solide; modèle autoportant
« ADAPTÉ POUR L'INSTALLATION DANS UNE MAISON MOBILE »
Certifié à UL-1482 et ULC-627-00, EPA METHOD 28R, ASTM E3053-17, EPA Alt 125, CSA B415.1-10

W/N# ____

NUMÉRO DE SÉRIE	
DATE DE FABRICATION	

Fabriqué par :
England's Stove Works, Inc.
589 S. Five Forks Rd.
Monroe, VA 24574, États-Unis

N'ENLEVEZ PAS ET NE COUVREZ PAS CETTE ÉTIQUETTE

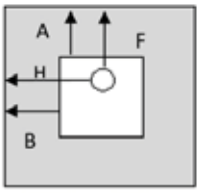
- PRÉVENEZ LES RISQUES D'INCENDIE DOMESTIQUES – INSTALLEZ ET UTILISEZ CET APPAREIL UNIQUEMENT CONFORMÉMENT AU MANUEL D'UTILISATION QUI L'ACCOMPAGNE.
- COMMUNIQUEZ AVEC LES AUTORITÉS LOCALES EN MATIÈRE DE CONSTRUCTION OU LE SERVICE D'INCENDIE POUR EN SAVOIR PLUS À PROPOS DES RESTRICTIONS ET DES INSPECTIONS D'INSTALLATION DANS VOTRE RÉGION.

EXIGENCES RELATIVES À L'INSTALLATION

- NE RACCORDEZ PAS CE POÊLE À UN CONDUIT DE FUMÉE DÉJÀ UTILISÉ POUR UN AUTRE APPAREIL.
- UTILISEZ UNE CHEMINÉE EN MAÇONNERIE DE TYPE RÉSIDENTIEL OU UNE CHEMINÉE FABRIQUÉE EN USINE HOMOLOGUÉE ULC-629 (CANADA) ET UL-103 HT (ÉTATS-UNIS).
- UTILISEZ UN RACCORD DE CHEMINÉE NOIR À PAROI SIMPLE DE CALIBRE 24 MSG OU UN RACCORD DE CHEMINÉE À PAROI DOUBLE HOMOLOGUÉ.
- CONSULTEZ LES CODES LOCAUX ET LES INSTRUCTIONS DU FABRICANT DE LA CHEMINÉE POUR CONNAÎTRE LES PRÉCAUTIONS NÉCESSAIRES SI VOUS FAITES PASSER UNE CHEMINÉE À TRAVERS UN MUR OU UN PLAFOND COMBUSTIBLE.
- POUR LES ÉTATS-UNIS : PLACEZ L'APPAREIL SUR UN PROTECTEUR DE PLANCHER AVEC UN FACTEUR R NON INFÉRIEUR À 1 INCOMBUSTIBLE CONFORME À LA NORME UL, QUI DÉPASSE DE ____ CM À L'AVANT ET DE ____ CM DE CHAQUE CÔTÉ DE L'OUVERTURE POUR L'ALIMENTATION EN COMBUSTIBLE.
- POUR LE CANADA : PLACEZ L'APPAREIL SUR UN PROTECTEUR DE PLANCHER AVEC UN FACTEUR R NON INFÉRIEUR À 1 INCOMBUSTIBLE CONFORME À LA NORME ULC , QUI DÉPASSE DE ___ MM À L'AVANT ET DE ___ MM DE CHAQUE CÔTÉ DE L'OUVERTURE POUR L'ALIMENTATION EN COMBUSTIBLE.
- RESPECTEZ LES DISTANCES MINIMALES INDIQUÉES DES COMBUSTIBLES LORSQUE VOUS UTILISEZ UN RACCORD DE CHEMINÉE À PAROI SIMPLE. CONSULTEZ LE MANUEL D'UTILISATION POUR EN SAVOIR PLUS SUR LES DISTANCES MINIMALES.
- UTILISEZ CET APPAREIL SEULEMENT LORSQUE LA PORTE EST FERMÉE ET BIEN VERROUILLÉE.
- LA PORTE DE CHARGEMENT PRINCIPALE EST MUNIE D'UNE FENÊTRE EN CÉRAMIQUE. NE CLAQUEZ JAMAIS LA PORTE ET NE FRAPPEZ JAMAIS CETTE FENÊTRE.
- TAUX D'ÉMISSION : 2.0 G/H
- SI LE VERRE EST FISSURÉ OU BRISÉ, REMPLACEZ-LE AVEC UN VERRE EN VITROCÉRAMIQUE SEULEMENT.
- CERTIFIÉ CONFORME AUX NORMES DE 2020 SUR L'ÉMISSION DE PARTICULES LORS DE L'UTILISATION DE CORD WOOD PAR L'ENVIRONMENTAL PROTECTION AGENCY DES ÉTATS-UNIS.
- PIÈCES EN OPTION – ÉCRANS THERMIQUES LATÉRAUX, NUMÉRO DE PIÈCE AC-30SHSB (ESW INC.).
- REPORTEZ-VOUS AU RÉPERTOIRE DES PRODUITS DE CONSTRUCTION D'PFS TECO POUR DES INFORMATIONS DÉTAILLÉES (HTTP://PFSTECO.COM/BUILDING-PRODUCTS).

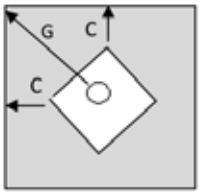
EXIGENCES RELATIVES À L'UTILISATION : UTILISEZ SEULEMENT AVEC DES COMBUSTIBLES SOLIDES (BOIS). ÉVITEZ L'EMBALLEMENT DE CET APPAREIL. SI LE RACCORD DE L'APPAREIL DE CHAUFFAGE OU DE LA CHEMINÉE COMMENCE À ROUGEOYER, IL Y A EMBALLEMENT. INSPECTEZ ET NETTOYEZ FRÉQUEMMENT LA CHEMINÉE. DANS CERTAINES CONDITIONS D'UTILISATION, UNE ACCUMULATION DE CRÉOSOTE PEUT SE PRODUIRE RAPIDEMENT. VOUS NE DEVEZ PAS UTILISER DE GRILLE NI SURÉLEVER LE FEU. INSTALLEZ LE BOIS DIRECTEMENT SUR L'ÂTRE. RISQUE D'ÉCHAPPEMENT DE FUMÉE OU DE FLAMMES – UTILISEZ L'APPAREIL SEULEMENT LORSQUE LA PORTE EST COMPLÈTEMENT FERMÉE.

Paroi arrière et paroi latérale



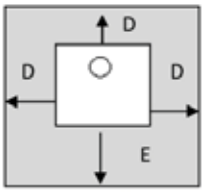
A = ____ mm (___ po)
D = ___ mm (_ po)
G = ____ mm (__ po)

Coin



B = ____ mm (___ po)
E = ___ mm (___po)
H = ____ mm (__ po)

Protection de plancher



C = ____ mm (___ po)
F = ____ mm (__ po)

ATTENTION – CET APPAREIL DEVIENT CHAUD LORSQU'IL EST EN MARCHE. N'Y TOUCHEZ PAS. MAINTENEZ-LE À BONNE DISTANCE DES MEUBLES ET DES VÊTEMENTS ET HORS DE PORTÉE DES ENFANTS. LE CONTACT AVEC L'APPAREIL PEUT BRÛLER LA PEAU. CONSULTEZ LA PLAQUE SIGNALÉTIQUE ET LES INSTRUCTIONS.

Vous pouvez inscrire la date de fabrication et le numéro de série de votre appareil dans les espaces prévus à cet effet sur cette étiquette, pour référence ultérieure. Cette étiquette comprend également des renseignements de sécurité, comme la norme d'essai UL (ULC au Canada), à l'intention de vos représentants locaux ou de toute autre personne qui peut en avoir besoin.

GARANTIE LIMITÉE DE CINQ (5) ANS

À partir de la date d'achat par le propriétaire d'origine

La garantie limitée du fabricant couvre les éléments ci-dessous :

Cinq ans :

1. Les joints d'acier au carbone et les joints soudés du foyer sont garantis pendant cinq (5) ans contre la fissuration.
2. La porte et les charnières en fonte sont garanties pendant cinq (5) ans contre le fendillement.

Un an :

1. Les composants électriques, les accessoires, le verre et la surface peinte du poêle sont garantis pendant un (1) an à partir de la date d'achat.

Conditions et exclusions

1. Les dommages causés par un emballement annulent votre garantie.
2. Cette garantie ne s'applique pas si les dommages sont causés par un accident, une manipulation inappropriée, une installation inadéquate, une utilisation incorrecte, un usage abusif, une réparation non autorisée ou une tentative de réparation non autorisée.
3. Le fabricant n'est pas responsable des dommages indirects, accessoires ou consécutifs découlant du produit, y compris les coûts ou dépenses, la fourniture de matériel de rechange ou la réparation pendant les périodes de mauvais fonctionnement ou de non-utilisation du produit.*
4. Le fabricant déclinera toute responsabilité pour les dommages consécutifs en cas de violation de toute garantie écrite ou implicite.
5. Cette garantie ne couvre pas l'usure des pièces internes du système de combustion, y compris le revêtement en vermiculite de la chambre à combustion et les joints d'étanchéité.

****Certains États ou certaines provinces ne permettent pas l'exclusion ou la limitation des dommages accessoires ou consécutifs, de sorte que les exclusions mentionnées ci-dessus peuvent ne pas s'appliquer à vous.****

Procédure

L'acheteur doit soumettre une réclamation pour défaut pendant la période de garantie et payer le transport vers le centre de service et à partir du centre de service désigné par le fabricant. Le revendeur qui a vendu l'appareil ou le fabricant, à notre gré, effectuera la réparation sous garantie.

Autres droits

Cette garantie vous confère des droits précis. Il est possible que vous disposiez également d'autres droits, qui varient d'un État ou d'une province à l'autre.

Veuillez noter : Cette garantie est nulle et non avenue si l'acheteur n'envoie pas la carte d'enregistrement de la garantie ci-jointe ET une copie du reçu de vente dans les trente (30) jours, à compter de la date d'achat.

Cette garantie est non transférable.

Avis important

Pour que la présente garantie soit valide, nous **DEVONS** recevoir et conserver dans nos dossiers cette information relative à l'enregistrement. Veuillez nous envoyer cette information dans les trente (30) jours suivant la date d'achat originale.

Il y a trois moyens faciles de nous faire parvenir cette information.

Adresse postale

England's Stove Works, Inc.
Technical Support Department
P.O. Box 206
Monroe, Virginia 24574,
États-Unis

Télécopieur

1 434 929-4810 – 24 heures par jour.

Enregistrement en ligne

Consultez notre page d'enregistrement de
la garantie sur notre site Web à :

http://www.heatredefined.com

(LA CARTE DE GARANTIE SE TROUVE À LA PAGE SUIVANTE.)

ENREGISTREMENT DE LA GARANTIE sur les produits England's Stove Works®

Renseignements sur l'acheteur

I. Nom de l'acheteur_____

II. Adresse_____

III. Ville_____État ou province_____Code postal _____

IV. Numéro de téléphone_____

V. Courriel _____

Renseignements sur le détaillant

VI. Nom du détaillant _____

VII. Adresse_____

VIII. Ville_____État ou province_____Code postal _____

Renseignements sur l'appareil
* Veuillez consulter l'étiquette à l'arrière du guide ou de la boîte pour remplir cette section. IX. Numéro de modèle_____Date d'achat_____

X. Prix d'achat_____

XI. Numéro de série_____Date de fabrication_____

Questions relatives à l'achat

Comment avez-vous entendu parler de notre produit? (Veuillez cocher l'une des réponses suivantes.)

De bouche à oreille____ Démonstration_____ Sur Internet____

Autre : _____

À quel endroit vous a-t-on donné des renseignements sur notre produit?

Au téléphone_____ Chez un détaillant (nom du détaillant) _____ Sur Internet_____

Autre : _____

Certifié conforme aux normes de 2020 sur l'émission de particules lors de l'utilisation de cord wood par l'ENVIRONMENTAL PROTECTION AGENCY des États-Unis.

RENSEIGNEMENTS SUR L'EPA

Les ajouts suivants à votre guide d'utilisation vous permettront de réduire au minimum les émissions produites par votre poêle à bois. Des conseils de sécurité importants vous sont également présentés.

- *Installation adéquate* – Veuillez consulter la section sur l'installation de votre guide d'utilisation et suivre les directives énoncées afin d'assurer la sécurité et de réduire au minimum les émissions.

Renseignements supplémentaires :

Généralités sur la ventilation :

Tirage : Le tirage désigne la force qui déplace l'air de l'appareil jusque dans la cheminée. La puissance du tirage dans votre cheminée dépend de la longueur de la cheminée, de la géographie locale, des obstructions à proximité et d'autres facteurs. Un tirage trop élevé peut entraîner des températures trop élevées dans l'appareil et endommager la chambre de combustion catalytique. Un tirage inadéquat peut entraîner un refoulement de fumée dans la pièce et obstruer la cheminée ou le catalyseur.
Un tirage inadéquat entraînera des fuites de fumée dans la pièce par les joints de raccord de l'appareil et de la cheminée.
Un taux de combustion incontrôlable ou une température trop élevée indique un tirage excessif.
Soyez conscient de l'emplacement de l'installation : un refoulement et d'autres problèmes de qualité de l'air peuvent survenir dans les vallées ou si l'appareil est installé à proximité d'habitations voisines.

Ce poêle à bois utilise un système de tirage naturel dans lequel le système de cheminée tire l'air dans le poêle. Cet appareil doit être installé conformément aux techniques de ventilation décrites en détail ci-après. Le non-respect des détails mentionnés pourrait réduire son rendement et causer des dommages matériels, des blessures ou la mort. Évitez d'avoir recours à des expédients lors de l'installation du système de ventilation. England's Stove Works n'est pas responsable des dommages causés par une installation incorrecte ou non sécuritaire.

Assurez-vous de bien suivre toutes les instructions du fabricant relatives au système de ventilation, surtout par rapport aux distances minimales nécessaires avec les matières combustibles. Assurez-vous également d'utiliser un écran antirayonnement de grenier afin d'éviter que l'isolant entre en contact avec une cheminée qui traverse un grenier.

Le système de cheminée est le « moteur » du poêle à bois. Il est donc essentiel que le système de ventilation soit installé exactement selon la description indiquée dans la section suivante afin d'assurer un fonctionnement adéquat de l'appareil.

Pour toute question relative à l'installation sécuritaire du poêle, appelez notre service de soutien technique au 1 800 245-6489. Communiquez avec un agent responsable local afin de

vous assurer que l'installation est conforme aux exigences municipales et nationales en matière de prévention des incendies. Si vous n'êtes pas certain de pouvoir installer le poêle de sécuritaire, nous vous suggérons fortement de faire appel à un installateur local certifié par le NFI (National Fireplace Institute des États-Unis).

Consignes pour la ventilation :

- Installez **TOUJOURS** le tuyau de ventilation en respectant rigoureusement les instructions et les indications sur les dégagements qui accompagnent le système de ventilation.
- Ne raccordez **PAS** le poêle à bois à un conduit de fumée déjà utilisé pour un autre appareil.
- N'INSTALLEZ **PAS** un régulateur de tirage ni aucun autre dispositif de réglage dans le système d'évacuation par ventilation de cet appareil.
- **UTILISEZ** un manchon d'emboîtement mural homologué pour traverser un mur et un support de plafond ou un coupe-feu pour traverser un plafond.
- **INSTALLEZ** trois vis à tôle sur chaque joint de raccord de cheminée.
- **ÉVITEZ** de trop nombreux coudes et parcours horizontaux, car ils réduiront le tirage du système de ventilation, ce qui nuira au rendement du poêle.
- **INSPECTEZ** souvent le système de ventilation afin de vous assurer qu'il ne contient pas de créosote, de cendres volantes ou d'autres obstructions.
- **NETTOYEZ** le système de ventilation comme il est décrit dans la section sur l'entretien du présent guide.
- **RESPECTEZ** la règle 10-3-2 concernant les raccordements de la cheminée.
- **INSTALLEZ** le raccord de cheminée à paroi simple avec l'extrémité mâle **vers le bas** pour éviter les fuites de créosote. Suivez les instructions du fabricant de raccords de cheminée à paroi double concernant l'installation adéquate des tuyaux.

AVERTISSEMENT : Les surfaces du système de ventilation deviennent CHAUDES et peuvent causer des brûlures si vous les touchez. Il peut être nécessaire d'utiliser un revêtement ou des grilles de protection incombustibles.

Règle 10-3-2 : Le système de cheminée doit se terminer à 0,91 m (3 pi) au-dessus du point où son axe central traverse le toit ET la cheminée doit se terminer à 0,61 m (2 pi) au-dessus de toute partie du logement dans un rayon de 3,05 m (10 pi) de la cheminée.

- *Fonctionnement et entretien* – Consultez les sections sur le fonctionnement (mode d'emploi) et l'entretien (y compris le retrait et l'élimination des cendres) de votre guide d'utilisation et suivez les directives énoncées pour assurer la sécurité *et* réduire au minimum les émissions.

Renseignements supplémentaires :
Respectez les instructions de votre guide d'utilisation concernant l'allumage d'un feu afin de produire un feu approprié et de réduire les émissions visibles.

Plus :

- *Alimentation en combustible et réalimentation :* Conseils pratiques pour faire un feu – Consultez votre guide d'utilisation pour obtenir des renseignements sur l'alimentation en combustible (et la réalimentation) ainsi que sur les procédures d'allumage de feu (c.-à-d., faire un feu).
- *Allumage du haut vers le bas :* L'EPA reconnaît l'efficacité de la méthode d'allumage du haut vers le bas. Vous trouverez un bon tutoriel sur cette méthode au http://woodheat.org/top-down-steps.html. Pour allumer un feu du haut vers le bas,

assurez-vous de suivre les instructions de votre guide d'utilisation et communiquez avec le service de soutien technique si vous avez des questions.

- *Sélection du combustible :* Lorsque votre appareil de chauffage au bois est correctement installé, vous devrez utiliser un bon bois de chauffage pour allumer un feu efficace (le bon bois en quantité suffisante) ainsi que connaître de bonnes méthodes d'allumage de feu. Les étapes pratiques suivantes vous aideront à tirer le meilleur rendement de votre poêle à bois ou foyer.

- Laissez votre bois sécher à l'extérieur tout l'été pendant au moins six mois avant de le brûler. Un bois correctement séché est plus foncé, présente des fissures sur le fil d'extrémité et sonne creux lorsque vous le cognez contre un autre morceau de bois.
- Conservez votre bois à l'extérieur, bien empilé sur le sol avec une protection au-dessus.
- Ne brûlez que du bois bien sec qui a été correctement fendu.
- Pour allumer un feu, utilisez uniquement du papier journal et du bois d'allumage, comme il est mentionné précédemment dans le guide.
- Faites des feux chauds.
- Pour maintenir une ventilation adéquate, retirez régulièrement les cendres de votre appareil de chauffage au bois dans un récipient en métal doté d'un couvercle que vous conserverez à l'extérieur.

Renseignements sur l'humidimètre

- Le bois de chauffage peut être brûlé lorsqu'il a une teneur en humidité de 10 à 25 %.
- Les bûches fraîchement coupées peuvent avoir une teneur en humidité de 80 % ou plus, selon l'essence du bois. Puisque le bois rétrécit, et peut également se fendre, se tordre ou autrement changer de forme en séchant, la plupart des bois doivent être séchés avant d'être utilisés. Le séchage à l'air est la méthode la plus fréquemment utilisée pour le bois enstéré. Dans la plupart des régions des États-Unis, la teneur en humidité minimale qu'il est possible d'obtenir par un séchage à l'air est d'environ 12 à 15 %. La plupart des matériaux séchés à l'air ont une teneur en humidité avoisinant 20 % lorsqu'ils sont utilisés.
- Pour vérifier la teneur en humidité de votre bois de chauffage, enfoncez simplement les tiges dans le bois et attendez la lecture de l'humidimètre. Souvenez-vous **de ne pas enfoncer les tiges de l'humidimètre uniquement dans les extrémités du bois de chauffage**. Pour obtenir une lecture précise, fendez la bûche et faites le test au centre. Le centre de la bûche contiendra la plus forte teneur en humidité.

À quelle distance dois-je enfoncer les tiges non isolées dans le bois?

- Jusqu'à une profondeur maximale, si c'est possible. Toutefois, à des taux d'humidité inférieurs à 10 %, il est généralement suffisant de créer un contact franc avec le bois. À des taux d'humidité supérieurs, et particulièrement si l'inclinaison est grande, une pénétration complète est essentielle.

- *COMBUSTIBLES À ÉVITER :*

MISE EN GARDE

- **N'UTILISEZ JAMAIS D'ESSENCE, DE COMBUSTIBLE POUR LAMPE APPARENTÉ À L'ESSENCE, DE KÉROSÈNE, DE LIQUIDE D'ALLUMAGE POUR CHARBON, NI AUCUN LIQUIDE SIMILAIRE POUR ALLUMER OU RAVIVER UN FEU DANS CET APPAREIL DE CHAUFFAGE. CONSERVEZ DE TELS LIQUIDES ÉLOIGNÉS DE L'APPAREIL DE CHAUFFAGE LORSQUE CELUI-CI FONCTIONNE. DE PLUS, NE DISPOSEZ JAMAIS D'ALLUME-FEUX SUR UNE SURFACE CHAUDE NI SUR DES TISONS DANS LE POÊLE. N'UTILISEZ PAS DE PRODUITS CHIMIQUES NI DE FLUIDES**
- **POUR ALLUMER LE FEU.**
- **NE FAITES PAS BRÛLER DE LIQUIDES INFLAMMABLES COMME DE L'ESSENCE, DU NAPHTA OU DE L'HUILE POUR MOTEUR.**
- **NE FAITES PAS BRÛLER DES DÉCHETS, DU GAZON COUPÉ OU DES RÉSIDUS DE JARDINAGE, DES MATÉRIAUX CONTENANT DU CAOUTCHOUC, Y COMPRIS DES PNEUS, DES MATÉRIAUX CONTENANT DU PLASTIQUE, DES DÉCHETS DE PRODUITS PÉTROLIERS, DE LA PEINTURE OU DU DILUANT À PEINTURE, DES PRODUITS BITUMINEUX, DES MATÉRIAUX CONTENANT DE L'AMIANTE, DES DÉBLAIS OU DES DÉBRIS DE CONSTRUCTION, DES TRAVERSES DE CHEMIN DE FER OU DU BOIS TRAITÉ SOUS PRESSION, DU FUMIER OU DES RESTES D'ANIMAUX, DU BOIS DE GRÈVE IMPRÉGNÉ D'EAU SALÉE OU DES MATÉRIAUX PRÉALABLEMENT SATURÉS EN EAU SALÉE, DES PRODUITS DE PAPIER, DU CARTON, DU CONTREPLAQUÉ OU DES PANNEAUX DE PARTICULES. L'INTERDICTION DE BRÛLER CES MATÉRIAUX NE VOUS EMPÊCHE PAS D'UTILISER DES ALLUME-FEU À BASE DE PAPIER, DE CARTON, DE SCIURE, DE CIRE OU D'AUTRES SUBSTANCES SEMBLABLES POUR ALLUMER UN FEU DANS LE POÊLE À BOIS. LA COMBUSTION DE CES MATÉRIAUX PEUT COMPROMETTRE L'EFFICACITÉ DU POÊLE ET PRODUIRE DE LA FUMÉE ET DES VAPEURS TOXIQUES.**

- **Pratiques de chauffage au bois sécuritaires**

Une fois que votre appareil de chauffage au bois est correctement installé, suivez ces directives pour assurer un fonctionnement sécuritaire :

- Conservez tous les articles de maison inflammables (draps, meubles, journaux et livres) loin de l'appareil.
- Pour allumer un feu, utilisez uniquement du papier journal, du bois d'allumage et un allume-feu entièrement naturel ou biologique. N'utilisez jamais d'essence, de kérosène ou d'allumoir à charbon pour allumer un feu.
- Ne brûlez pas de bûches humides ou vertes (non séchées).
- N'utilisez pas de bûches faites de cire ou de sciure de bois dans votre poêle à bois, car elles sont conçues pour des foyers ouverts. Si vous utilisez des bûches fabriquées, prenez celles qui sont faites de sciure de bois compressée à 100 %.
- Faites des feux chauds. Pour la plupart des appareils de chauffage au bois, un feu qui couve n'est ni sécuritaire ni efficace.
- Gardez fermées les portes de votre appareil de chauffage au bois sauf pour ajouter des bûches ou alimenter le feu. Des produits chimiques nocifs, comme le monoxyde de carbone, peuvent être libérés dans votre domicile.
- Retirez régulièrement les cendres de votre appareil de chauffage au bois dans un récipient en métal doté d'un couvercle. Rangez le récipient contenant les cendres à l'extérieur, sur une dalle de ciment ou de brique (et non pas sur une terrasse en bois ni à proximité de bois). Consultez les instructions sur le retrait des cendres dans le guide d'utilisation.
- Gardez un extincteur d'incendie à portée de la main.
- N'oubliez pas de consulter les prévisions locales sur la qualité de l'air avant d'utiliser votre poêle à bois.

- *Commande d'air :* CONSULTEZ VOTRE GUIDE D'UTILISATION pour obtenir plus de renseignements sur l'utilisation appropriée de la commande d'air (dans la section Fonctionnement).
- *RETRAIT DES CENDRES* – Suivez les instructions du guide d'utilisation concernant le retrait et l'élimination des cendres.
- *REMPLACEMENT des pièces essentielles à un taux d'émission faible* – Suivez les instructions du guide d'utilisation concernant le remplacement des joints et des autres pièces essentielles à un taux d'émission faible.

Rappel : « Afin d'assurer le bon fonctionnement du poêle à bois, vous devez l'inspecter et le réparer périodiquement. En vertu des règlements fédéraux, il est interdit d'utiliser ce poêle à bois d'une manière non conforme au mode d'emploi indiqué dans le présent guide. »

Plus : Tubes de brûleur – Pour remplacer un tube, assurez-vous de commander le tube qui correspond à celui que vous devez remplacer. Retirez ensuite la vis située du côté gauche du tube à l'aide d'une douille ou d'une clé à fourches de 5/16 po. Assurez-vous de conserver la vis. Poussez le tube vers la droite, puis retirez-le (en ramenant le tube vers la gauche après avoir retiré ce côté de l'orifice). Pour remplacer le tube, inversez la procédure indiquée ci-dessus. Assurez-vous d'installer les tubes dans l'ordre adéquat. (Avant vers l'arrière)

- **Détecteurs de fumée**

England's Stove Works, Inc. recommande fortement l'utilisation de détecteurs de fumée dans chaque pièce de la maison. Cependant, le fait de poser un détecteur de fumée directement au-dessus de l'appareil pourrait causer des alarmes intempestives.

MISE EN GARDE

Cet appareil est conçu pour fonctionner uniquement lorsque la porte est fermée. L'utilisation du poêle avec la porte ouverte provoquerait un refoulement de fumée et une combustion lente et inefficace.

De plus, l'utilisation de combustibles interdits peut être dangereuse et produire un excès de monoxyde de carbone. Le monoxyde de carbone est un gaz mortel qui est inodore et incolore.

Il est fortement recommandé d'utiliser un détecteur de monoxyde de carbone.

- *Conformité :* « Certifié conforme aux normes de 2020 sur l'émission de particules lors de l'utilisation de cord wood par l'ENVIRONMENTAL PROTECTION AGENCY des États-Unis.»
- *Avertissement relatif aux modifications :* « Ce poêle à bois est doté d'un taux de combustion bas minimum réglé en usine qui ne doit pas être modifié. En vertu des règlements fédéraux, il est interdit de modifier ce réglage et d'utiliser ce poêle à bois d'une manière non conforme au mode d'emploi indiqué dans le présent guide. »
- *Garantie :* Consultez votre guide d'utilisation pour obtenir le formulaire d'enregistrement de la garantie et connaître les instructions relatives aux procédures de la garantie. Dans le cas des pièces, les procédures de remplacement au titre de la garantie se trouvent sur le site de notre magasin de pièces : www.heatredefined.com

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11785 SE Hwy 212 STE#305
Clackamas, OR 97015

Report Number: DIRI01A05026191031

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INSTRUMENT INFORMATION

Item	Make	Model	Serial Number	Customer ID	Location
Scale	Rice Lake	IQ+355E-2A x 100(	A05026	#041	Lab
Units	**Readability**	**SOP**	**Cal Date**	**Last Cal Date**	**Cal Due Date**
lbs	0.1	QC033	10/31/19	6/10/19	6/2020

FUNCTIONAL CHECKS

SHIFT TEST	LINEARITY	REPEATABILITY	ENVIRONMENTAL CONDITIONS
Test Wt: 250 Tol: 0.3	Test Wt: HB44 Tol: HB44	Test Wt: 100 Tol: 0.1	☐ Good ☑ Fair ☐ Poor
As-Found: Pass:☑ Fail:☐	As-Found: Pass:☑ Fail:☐	As-Found: Pass:☑ Fail:☐	Temperature: 10°C
As-Left: Pass:☑ Fail:☐	As-Left: Pass:☑ Fail:☐	As-Left: Pass:☑ Fail:☐	

CALIBRATION DATA

Standard	As-Found	As-Left	Expanded Uncertainty
1000	1001.2	1000.4	0.12
700	700.4	700.1	0.12
500	500.2	499.9	0.08
300	300.0	299.9	0.08
100	100.0	99.9	0.05
50	50.0	50.0	0.05

CALIBRATION STANDARDS

Item	Make	Model	Serial Number	Cal Date	Cal Due Date	NIST ID
Weight Set	Rice Lake	.001 to 10lb	PW0990	10/4/18	10/2020	20181977

Permanent Information Concerning this Equipment:
10/19 New platform. Rice Lake sn# 128929

Comments/Information Concerning this Calibration
10/19 RH = 40%.

Report prepared/reviewed by: R. B. **Date:** 10-31-19 **Technician:** R. Butcher
Signature: R Butcher

The uncertainty is calculated according to the ISO Guide to the Expression of Uncertainty in Measurement and includes the uncertainty of standards used combined with the observed standard deviation of the unit under test. The uncertainty is expanded with a k factor of 2 for an approximate 95% level of confidence. Instruments listed above were calibrated using standards traceable to the National Institute of Standards and Technology (NIST). Calibration data reflect results at the time and location of calibration. Calibration data should be reviewed to insure that the instrument is performing to its required accuracy.

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Report Number: DIRI01D01487W16P190610

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INSTRUMENT INFORMATION

Item	Make	Model	Serial Number	Customer ID	Location
Scale	Digi-Weigh	DWP-440 400 x 0.1	D01487W16P	N/A	Lab

Units	Readability	SOP	Cal Date	Last Cal Date	Cal Due Date
lbs	0.1	QC033	6/10/19	N/A	6/2020

FUNCTIONAL CHECKS

SHIFT TEST	LINEARITY	REPEATABILITY	ENVIRONMENTAL CONDITIONS
Test Wt: 100 Tol: 0.5	Test Wt: HB44 Tol: HB44	Test Wt: 50 Tol: 0.1	☐ Good ☑ Fair ☐ Poor
As-Found: Pass:☑ Fail:☐	As-Found: Pass:☑ Fail:☐	As-Found: Pass:☑ Fail:☐	Temperature: 20.6°C
As-Left: Pass:☑ Fail:☐	As-Left: Pass:☑ Fail:☐	As-Left: Pass:☑ Fail:☐	

CALIBRATION DATA

Standard	As-Found	As-Left	Expanded Uncertainty
400	400.22	400.00	0.08
300	300.19	300.00	0.08
200	200.15	200.00	0.08
100	100.09	100.00	0.05
50	50.04	50.00	0.05
25	25.02	25.00	0.05

CALIBRATION STANDARDS

Item	Make	Model	Serial Number	Cal Date	Cal Due Date	NIST ID
Avoirdupois Cast W	Rice Lake	25 and 50lb	PWO990-CA	11/24/17	11/2019	20172265

Permanent Information Concerning this Equipment:
12 month calibration cycle

Comments/Information Concerning this Calibration
6/19 RH= 47%. Adjusted span.

Report prepared/reviewed by: ServiceTechX **Date:** 6/11/19

Technician: J. Colacchio
Signature:

The uncertainty is calculated according to the ISO Guide to the Expression of Uncertainty in Measurement and includes the uncertainty of standards used combined with the observed standard deviation of the unit under test. The uncertainty is expanded with a k factor of 2 for an approximate 95% level of confidence. Instruments listed above were calibrated using standards traceable to the National Institute of Standards and Technology (NIST). Calibration data reflect results at the time and location of calibration. Calibration data should be reviewed to insure that the instrument is performing to its required accuracy.

Dry Gas Meter Calibration

Meter Manufacturer:	Apex
Model:	XC-60-ED
Lab ID #:	53
Serial #:	1902130
Calibration Date:	1/23/2020
Calibration Expiration:	7/23/2020
Barometric Pressure:	29.93 in. Hg

Reference Standard DGM	
Manufacturer:	Apex
Model:	SK25DA
Lab ID#:	47
Serial #:	1101001
Calibration Expiration Date:	3/13/2020
Calibration γ Factor:	0.998

Unit Under Test Previous Calibration	
Date	6/14/2019
γ Factor:	0.999
Allowable Deviation (±5%):	0.04995
Actual Deviation:	0.01
Result:	PASS

Calibration Data	Run 1	Run 2	Run 3
Standard DGM Initial Volume (L)	0.000	0.000	0.000
Standard DGM Final Volume (L)	162.364	142.013	148.622
Standard DGM Temperature (°F)	69.0	70.0	70.0
Standard DGM Pressure (in H_2O)	0.00	0.00	0.0
DGM Initial Volume (ft^3)	0.000	0.000	0.000
DGM Final Volume (ft^3)	5.814	5.147	5.409
DGM Temperature (°F)	88.0	94.0	96.0
DGM Pressure (in H_2O)	3.42	2.04	1.0
Time (min)	32.0	36.0	52.0
Net Volume for Standard DGM (ft^3)	5.734	5.015	5.249
Net Volume for DGM (ft^3)	5.814	5.147	5.409

Dry Gas Meter γ Factor	1.011	1.011	1.013
γ Factor Deviation From Average	1.011	1.011	1.013

Average Gas Meter γ Factor: 1.012

Calculations:

1. Deviation = |Average value for all runs - current run value|
2. $\gamma = [V_{std} \times (\gamma_{Std}) \times (P_{bar}+P_{std}/13.6) \times (T_{DGM} + 460)] / [V_{DGM} \times (T_{std} + 460) \times (P_{bar} + P_{DGM}/ 13.6)]$

Standard Reference Meter is calibrated to NIST traceable standards. Uncertainty of measurement is ±0.5%.

Dry Gas Meter Calibration

Meter Manufacturer:	Apex
Model:	XC-60-ED
Lab ID #:	54
Serial #:	1902133
Calibration Date:	1/23/2020
Calibration Expiration:	7/23/2020
Barometric Pressure:	23.93 in. Hg

Reference Standard DGM	
Manufacturer:	Apex
Model:	SK25DA
Lab ID#:	47
Serial #:	1101001
Calibration Expiration Date:	3/13/2020
Calibration γ Factor:	0.998

Unit Under Test Previous Calibration	
Date	6/14/2019
γ Factor:	0.996
Allowable Deviation (±5%):	0.0498
Actual Deviation:	0.01
Result:	PASS

Calibration Data	Run 1	Run 2	Run 3
Standard DGM Initial Volume (L)	0.000	0.000	0.000
Standard DGM Final Volume (L)	153.663	172.691	287.542
Standard DGM Temperature (°F)	69.0	69.0	69.0
Standard DGM Pressure (in H_2O)	0.00	0.00	0.0
DGM Initial Volume (ft^3)	0.000	0.000	0.000
DGM Final Volume (ft^3)	5.576	6.296	10.530
DGM Temperature (°F)	95.0	95.0	96.0
DGM Pressure (in H_2O)	3.60	2.00	1.0
Time (min)	30.0	45.0	99.0
Net Volume for Standard DGM (ft^3)	5.427	6.099	10.154
Net Volume for DGM (ft^3)	5.576	6.296	10.530

Dry Gas Meter γ Factor	1.008	1.008	1.008
γ Factor Deviation From Average	1.008	1.008	1.008

Average Gas Meter γ Factor: 1.008

Calculations:

1. Deviation = |Average value for all runs - current run value|
2. $\gamma = [V_{std} \times (\gamma_{Std}) \times (P_{bar}+P_{std}/13.6) \times (T_{DGM} + 460)] / [V_{DGM} \times (T_{std} + 460) \times (P_{bar} + P_{DGM}/ 13.6)]$

Standard Reference Meter is calibrated to NIST traceable standards. Uncertainty of measurement is ±0.5%.

 Technician:

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INSTRUMENT INFORMATION

Item	Make	Model	Serial Number	Customer ID	Location
Balance	Sartorius	ENTRIS224-1S	34307497	#107	Lab
Units	**Readability**	**SOP**	**Cal Date**	**Last Cal Date**	**Cal Due Date**
g	0.0001	QC012	1/10/20	6/10/19	6/2020

FUNCTIONAL CHECKS

ECCENTRICITY
Test Wt: 100 Tol: 0.0003
As-Found: Pass: ☑ Fail: ☐
As-Left: Pass: ☑ Fail: ☐

LINEARITY
Test Wt: 50 x 4 Tol: 0.0002
As-Found: Pass: ☑ Fail: ☐
As-Left: Pass: ☑ Fail: ☐

STANDARD DEVIATION
Test Wt: 100 Tol: 0.0001

1. 100.0001	5. 99.9999	9. 100.0000
2. 100.0000	6. 100.0000	10. 99.9999
3. 100.0000	7. 100.0001	**Result**
4. 100.0000	8. 100.0000	0.00006

ENVIRONMENTAL CONDITIONS
☐ Good ☑ Fair ☐ Poor
Temperature: 19.3°C

A2LA ACCREDITED SECTION OF REPORT

Standard	As-Found	As-Left	Expanded Uncertainty
200	199.9997	200.0000	0.00019
100	100.0000	100.0001	0.00018
50	49.9999	50.0001	0.00018
20	20.0001	20.0000	0.00017
1	0.9998	0.9999	0.00017
0.1	0.0999	0.1000	0.00017

CALIBRATION STANDARDS

Item	Make	Model	Serial Number	Cal Date	Cal Due Date	NIST ID
Weight Set	Rice Lake	20kg to 1mg	7133	4/19/19	4/2020	20190811

Permanent Information Concerning this Equipment:

Comments/Info Concerning this Calibration:
01/20 RH= 49% Adjusted span.

Report prepared/reviewed by: R.B. **Date:** 1-10-20 **Technician:** R. Butcher
Signature: R. Butcher

The uncertainty is calculated according to the ISO Guide to the Expression of Uncertainty in Measurement and includes the uncertainty of standards used combined with the observed standard deviation and readability of the unit under test. The uncertainty is expanded with a k factor of 2 for an approximate 95% level of confidence. Instruments listed above were calibrated using standards traceable to the National Institute of Standards and Technology (NIST). Calibration data reflect results at the time and location of calibration. Calibration data should be reviewed to insure that the instrument is performing to its required accuracy. Calibrations comply with ISO/IEC 17025 and ANSI/Z540-1-1994 quality standards.

Certificate of Calibration

Certificate Number: **712600**

JJ Calibrations, Inc.
7724 SE Aspen Summit Drive
Portland, OR 97266-9217
Phone 503.786.3005
FAX 503.786.2994

PFS TECO
11785 SE Hwy 212
Suite 305
Clackamas, OR 97015

0723.01
Calibration

PO: **john.steinest.PFSTECO.co**
Order Date: 11/06/2019
Authorized By: **N/A**

Property #: **064**
User: **N/A**
Department: **N/A**
Make: **Control Company**
Model: **4198**
Serial #: **80531676**
Description: **Digital Temp. / Barometer**
Procedure: **404323**
Accuracy: **±1°C ±0.2362Hg(±8mb)**

Calibrated on: 11/15/2019
*Recommended Due: 11/15/2020
Environment: **21** °C **48** % RH
* As Received: **Within Tolerance**
* As Returned: **Within Tolerance**
Action Taken: **Calibrated**
Technician: **146**

Remarks: * Many factors may cause the unit to drift out of calibration before the recommended due date. Any reported error is the absolute value between the reference and the unit. Uncertainties include the effects of the unit.

Standards Used

Std ID	Manufacturer	Model	Nomenclature	Due Date	Trace ID
644A	Thunder Scientific	1200	Two Pressure Humidity Generator	10/14/2020	710583
847A	Fluke	RPM4	Reference Pressure Monitor	11/21/2019	688957

Measurement Data

Parameter / Measurement Description	Range Unit	Reference	Min	Max	ᵏError	UUT	Uncertainty
Before/After							Accredited = ✓
Temperature							
	°C	20.00	19.0	21.0	0.1	20.1 °C	8.1E-02 ✓
	°C	30.00	29.0	31.0	0.8	29.2 °C	8.1E-02 ✓
	°C	40.00	39.0	41.0	0.2	39.8 °C	8.1E-02 ✓
Barometer							
	mbar	1010.70	1002.7	1018.7	0.7	1010.0 mbar	

This instrument has been calibrated in accordance with the JJ Calibrations Quality Assurance Manual and is traceable to either the SI or to National Institute of Standards and Technology (NIST). The quality system and this certificate are in compliance with ANSI/NCSL Z540-1-1994, ISO/IEC 17025-2017, ISO 10012-1, the ISO 9000 family and QS 9000. The expanded uncertainties of measurements for this calibration are based upon 95% (2 sigma) confidence limits. Unless stated in the comments, certificates reflect the "Simple Acceptance Rule" as specified by JCGM 106:2012. Unless otherwise stated, a test accuracy ration (TAR) of 4:1, if achievable, is maintained. The results reported herein apply only to the calibration of the item described above. This report may not be reproduced, except in full, without written approval of JJ Calibrations.

Reviewer

3 Issued 11/16/2019 Rev # 15

Inspector

Established 1974

QUALITY CONTROL SERVICES

LABORATORY EQUIPMENT • SALES • SERVICE • CALIBRATION • REPAIRS

2340 SE 11TH Ave. Portland, Oregon 97214 • Box 14831 Portland, Oregon 97293

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ACCREDITED

Calibration Services

Certificate Number: 1550.01

Laboratory code: 115953

Report of Calibration

Firm: Dirigo Laboratories
Address: 11785 SE Hwy 212, Ste 305
City/State/Zip: Clackamas, OR 97015

Test Completed: 03/21/17
Submitted By: John Steiner
Traceable Number: 20170468

Test Item: 200mg and 100mg Individual Weights
Serial No.: Listed in Table

Manufacturer: Troemner

Material	Assumed Density	Range	Tolerance Class
Stainless Steel	7.95 g/cm^3	200mg & 100mg	ASTM Class 1

Method and Traceability
The procedure used for this calibration is NIST IR 6969 SOP 4 Double Substitution Weighing Design. Standards used for comparison are traceable to the National Institute of Standards and Technology (reports on file) and are part of a comprehensive measurement assurance program for ensuring continued accuracy and traceability within the level of uncertainty reported. The Traceable Number listed above is Traceable to National Standards through an unbroken chain of comparison each having stated uncertainties.

Standards Used:
100g to 1mg Working Standards Were Calibrated: 03/03/17 Due: 03/31/18 Standards ID: 723318
Mass Comparators Used: MET-05 **Tested by:** D. Thompson

Conventional Mass: "The conventional value of the result of weighing a body in air is equal to the mass of a standard, of conventionally chosen density, at a conventionally chosen temperature, which balances this body at this reference temperature in air of conventionally chosen density. International Recommendation 33 (OIML IR 33 1973, 1979). "Conventional Value of the Result of Weighing in Air" **(Previously known as "Apparent Mass vs. 8.0g/cm^3).**

Uncertainty Statement: The uncertainty conforms to the ISO Guide to the Expressions of Uncertainty in Measurement. Uncertainty as reported is based on a coverage factor k=2 for an approximate 95 percent level of uncertainty. Uncertainty components include the standard deviation of the process, the uncertainty of the standard used, an uncertainty component associated with the potential drift of the standard used, and the estimated uncertainty related to measuring and determining the air buoyancy effect.

Conventional Mass Values are listed on page 2 of this report.

Quality Control Services, Inc.
Metrology Laboratory Manager
E-mail dthompson@qc-services.com

Date: 03/21/17

Signature David S. Thompson

Established 1974

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ACCREDITED

Calibration Services

Certificate Number: 1550.01

Laboratory code: 115953

Report of Calibration

Firm: Dirigo Laboratories
Address: 11785 SE Hwy 212, Ste 305
City/State/Zip: Clackamas, OR 97015

Test Completed: 03/21/17
Submitted By: John Steiner
Traceable Number: 20170468

Test Item: 200mg and 100mg Individual Weights
Serial No.: Listed in Table

Manufacturer: Troemner

Laboratory Environment at time of test

Temperature °C	Pressure mmHg	Humidity %RH
21.967	753.44	49.44

Conventional Mass Value

Nominal Value	As Found grams	As Found Correction* (mg)	Uncertainty (mg)	Tolerance (mg)
200mg SN 1000101395	0.2000061	0.0061	0.0026	0.01
100mg SN 1000126267	0.1000046	0.0046	0.0028	0.01

*Correction is the difference between the conventional mass value of a weight and its nominal value.

Comments: These weights were new from the manufacturer and were within ASTM Class 1 tolerances As Found. No adjustments or changes were made so As Found values should be considered to be As Left values.

Accredited by the American Association for Laboratory Accreditation (A2LA) under Calibration Laboratory Code 115953 and Certificate Number 1550.01. This laboratory meets the requirements of ISO/IEC 17025:2005 *General Requirements for the Competence of Testing and Calibration Laboratories.* This laboratory also meets the requirements of ANSI/NCSL Z540-1-1994 and any additional program requirements in the field of calibration.

Quality Control Services, Inc.
Metrology Laboratory Manager
E-mail dthompson@qc-services.com

Date: 03/21/17

Signature David S. Thompson

Established 1974

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ACCREDITED
Calibration Services
Certificate Number: 1550.01
Laboratory code: 115953

Report of Calibration

Firm: Dirigo Laboratories
Address: 11785 SE Hwy 212, Ste 305
City/State/Zip: Clackamas, OR 97015

Test Completed: 01/15/16
Purchase Order: 1001
Traceable Number: 20152489

Test Item: 20lb and 10lb Individual Grip Handle Weights
Serial No.: Listed in Table

Manufacturer: Unknown

Material	Assumed Density	Range	Tolerance Class
Cast Iron	7.2 g/cm^3	20lb to 10lb	NIST HB 105-1 (F)

Method and Traceability
The procedure used for this calibration is NIST IR 6969 SOP 7 Single Substitution Weighing Design. Standards used for comparison are traceable to the National Institute of Standards and Technology (reports on file) and are part of a comprehensive measurement assurance program for ensuring continued accuracy and traceability within the level of uncertainty reported. The Traceable Number listed above is Traceable to National Standards through an unbroken chain of comparison each having stated uncertainties.

Standards Used:
Avoirdupois Working Standards were calibrated: 06/18/2014 Due: 06/18/2016 Standards ID: 34AA
Mass Comparators Used: MET-09, 20 **Tested by:** D. Thompson

Conventional Mass: "The conventional value of the result of weighing a body in air is equal to the mass of a standard, of conventionally chosen density, at a conventionally chosen temperature, which balances this body at this reference temperature in air of conventionally chosen density. International Recommendation 33 (OIML IR 33 1973, 1979). "Conventional Value of the Result of Weighing in Air" **(Previously known as "Apparent Mass vs. 8.0g/cm^3).**

Uncertainty Statement: The uncertainty conforms to the ISO Guide to the Expressions of Uncertainty in Measurement. Uncertainty as reported is based on a coverage factor K=2 for an approximate 95 percent level of uncertainty. Uncertainty components include the standard deviation of the process, the uncertainty of the standard used, an uncertainty component associated with the potential drift of the standard used, and the estimated uncertainty related to measuring and determining the air buoyancy effect.

Conventional Mass Values are listed on page 2 of this report.

Quality Control Services, Inc.
Metrology Laboratory Manager
E-mail dthompson@qc-services.com

Date: 01/15/16

Signature David S. Thompson

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ACCREDITED
Calibration Services
Certificate Number: 1550.01
Laboratory code: 115953

Report of Calibration

Firm: Dirigo Laboratories
Address: 11785 SE Hwy 212, Ste 305
City/State/Zip: Clackamas, OR 97015

Test Completed: 01/15/16
Purchase Order: 1001
Traceable Number: 20152489

Test Item: 20lb and 10lb Individual Grip Handle Weights
Serial No.: Listed in Table

Manufacturer: Unknown

Laboratory Environment at time of test

Temperature °C	Pressure mmHg	Humidity %RH
21.448	760.64	44.58

Conventional Mass Value

Nominal Value	As Found pounds	As Found Correction* (mg)	Uncertainty (mg)	Tolerance (mg)
20lb #098	19.9995450	-206.4	6.4	910
10lb #097	10.0006510	295.3	5.1	450
10lb #051	10.0003421	155.2	5.1	450

*Correction is the difference between the conventional mass value of a weight and its nominal value.

Comments: These weights were received in good condition and were within NIST Handbook 105-1 Class F tolerances As Found. No adjustments or changes were made so As Found values should be considered to be As Left values.

Accredited by the American Association for Laboratory Accreditation (A2LA) under Calibration Laboratory Code 115953 and Certificate Number 1550.01. This laboratory meets the requirements of ISO/IEC 17025:2005 *General Requirements for the Competence of Testing and Calibration Laboratories.* This laboratory also meets the requirements of ANSI/NCSL Z540-1-1994 and any additional program requirements in the field of calibration.

Quality Control Services, Inc.
Metrology Laboratory Manager
E-mail dthompson@qc-services.com

Date: 01/15/16

Signature David S. Thompson

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A2LA ACCREDITED
CERTIFICATE #1550.01

Report of Calibration

Firm: PFS Teco
Address: 11785 SE Hwy 212, Ste 305
City/State/Zip: Clackamas, OR 97015

Test Completed: 08/27/18
Submitted By: John Steinert
Traceable Number: 20181772

Test Item: 5 lb Individual Grip Handle Weight
Serial No.: 10744

Manufacturer: Rice Lake

Material	Assumed Density	Range	Tolerance Class
Cast Iron	7.2 g/cm^3	5 lb	ASTM Class 7

Method and Traceability
The procedure used for this calibration is NIST IR 6969 SOP 7 Single Substitution Weighing Design. Standards used for comparison are traceable to the National Institute of Standards and Technology (reports on file) and are part of a comprehensive measurement assurance program for ensuring continued accuracy and traceability within the level of uncertainty reported. The Traceable Number listed above is Traceable to National Standards through an unbroken chain of comparison each having stated uncertainties.

Standards Used:
20 kg to 200 g Working Standards Were Calibrated: 03/22/18 Due: 03/31/19 Standards ID: 75388
100 g to 1 mg Working Standards Were Calibrated: 04/04/18 Due: 04/30/19 Standards ID: 723318
Mass Comparators Used: MET-08 **Tested by:** D. Thompson

Conventional Mass: "The conventional value of the result of weighing a body in air is equal to the mass of a standard, of conventionally chosen density, at a conventionally chosen temperature, which balances this body at this reference temperature in air of conventionally chosen density. International Recommendation 33 (OIML IR 33 1973, 1979). "Conventional Value of the Result of Weighing in Air" **(Previously known as "Apparent Mass vs. 8.0 g/cm^3).**

Uncertainty Statement: The uncertainty conforms to the ISO Guide to the Expressions of Uncertainty in Measurement. Uncertainty as reported is based on a coverage factor k=2 for an approximate 95 percent level of uncertainty. Uncertainty components include the standard deviation of the process, the uncertainty of the standard used, an uncertainty component associated with the potential drift of the standard used, and the estimated uncertainty related to measuring and determining the air buoyancy effect.

Conventional Mass Values are listed on page 2 of this report.

Quality Control Services, Inc.
Metrology Laboratory Manager
E-mail dthompson@qc-services.com

Date: 08/28/18

Signature David S. Thompson

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ACCREDITED
CERTIFICATE #1550.01

Report of Calibration

Firm: PFS Teco
Address: 11785 SE Hwy 212, Ste 305
City/State/Zip: Clackamas, OR 97015

Test Completed: 08/27/18
Submitted By: John Steinert
Traceable Number: 20181772

Test Item: 5 lb Individual Grip Handle Weight
Serial No.: 10744

Manufacturer: Rice Lake

Laboratory Environment at time of test

Temperature °C	Pressure mmHg	Humidity %RH
21.838	762.06	52.23

Conventional Mass Value

Nominal Value	As Found pounds	As Found Correction* (mg)	Uncertainty (mg)	Tolerance (mg)
5 lb	5.0006085	276.0	2.0	760

*Correction is the difference between the conventional mass value of a weight and its nominal value.

Comments: This weight was new from the manufacturer and was within ASTM Class 7 tolerances As Found. No adjustments or changes were made so As Found values should be considered to be As Left values.

Accredited by the American Association for Laboratory Accreditation (A2LA) under Calibration Laboratory Code 115953 and Certificate Number 1550.01. This laboratory meets the requirements of ISO/IEC 17025:2005 *General Requirements for the Competence of Testing and Calibration Laboratories.* This laboratory also meets the requirements of ANSI/NCSL Z540-1-1994 and any additional program requirements in the field of calibration.

Quality Control Services, Inc.
Metrology Laboratory Manager
E-mail dthompson@qc-services.com

Date: 08/28/18

Signature David S. Thompson

Tape Measure Calibration

Rule Equipment ID:	101	Date:	1/23/2020
		Ambient (F):	70
Std. Gage Block ID:	146	Technician:	AK
Cal. Expiration Date:	1/7/2023		
Std. Surface Plate ID:	147		
Cal. Expiration Date:	1/3/2023		

System: ☑ Imperial ☐ Metric

Visual Inspection

☑ Pass ☐ Fail

Full Length Operation Check

☑ Pass ☐ Fail

Tape in Tension

Tolerance: 0.1

Standard	Measured
1.0	1.0
6.0	6.0

Within Tolerance

Tape in Compression

Tolerance: 0.1

Standard	Measured
1.0	1.0
6.0	6.0

Within Tolerance

Body Length

Tolerance: 0.1

Standard	Measured
3.0	3.0

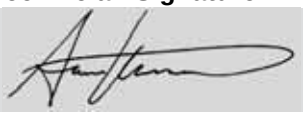
Within Tolerance

Calibration Due

1/23/2021

Notes

Technician Signature



Caliper Calibration

Caliper Equipment ID:	117	Date:	1/23/2020
		Ambient (F):	70
Std. Gage Block ID:	146	Technician:	AK
Cal. Expiration Date:	1/10/2023		
Std. Surface Plate ID:	147		
Cal. Expiration Date:	1/3/2023		

System: ☑ Imperial ☐ Metric

PFS·TECO

Visual Inspection

☑ Pass ☐ Fail

Outside Jaws

Tolerance: 0.002

Standard	Measured
0.050	0.050
0.250	0.250
1.000	1.000
2.000	2.001
6.000	5.999	

Within Tolerance

Inside Jaws

Tolerance: 0.005

Standard	Measured
0.050	0.050
0.250	0.248
1.000	0.999
2.000	1.999
6.000	6.001	

Within Tolerance

Depth

Tolerance: 0.005

Standard	Measured
0.050	0.056

Out of Tolerance

Calibration Due

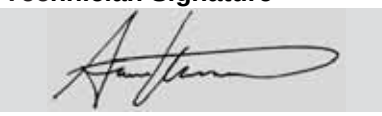
1/17/2021

Notes

Depth gauge found out of tolerance and therefore removed

Calibration covers only inside & outside jaws

Technician Signature



CERTIFICATE OF CALIBRATION

CUSTOMER:	**PFS-TECO :** CLACKAMAS, OR	**CALIBRATION DATE:**	03/14/2019
PO NUMBER:	N/A	**CALIBRATION DUE:**	03/14/2020
INST. MANUFACTURER:	DWYER	**PROCEDURE:**	T.O.33K6-4-1769-1
INST. DESCRIPTION:	VELOMETER	**CALIBRATION FLUID:**	AIR @ 14.7 PSIA 70°F
MODEL NUMBER:	471	**RECEIVED CONDITION:**	WITHIN MFG. SPECS.
SERIAL NUMBER:	CP288559 (ID# 095)	**LEFT CONDITION:**	WITHIN MFG. SPECS.
RATED UNCERTAINTY:	SEE NOTES BELOW.	**AMBIENT CONDITIONS:**	762 mm HGA 43% RH 69°F
UNCERTAINTY GIVEN:	± .20% RD ; k=2	**CERTIFICATE FILE #:**	490265.2019

NOTES: ± 3% FS (0-500 / 0-1500) *** ± 4% F.S. (0-5000) ***± 5% F.S. (0-15000) *** ± 2 °F

NOTES CONT. : Q.MANUAL IM 1.5 REV 2017.1 DATED 7-18-2017

UUT INDICATED FT/MIN	DM.STD. ACTUAL FT/MIN	UUT INDICATED DEG. F	DM STD. ACTUAL DEG. F
64	65	0 TO 200°F	0 TO 200°F
110	112	43.4	43.5
206	210	69.0	68.9
498	509	99.4	99.2
503	505		
1049	1058		
1497	1514		
509	513		
3419	3460		
4992	5068		
5136	5235		
13928	14232		

STANDARDS USED:		
A220: 12" WIND TUNNEL 0 - 8000 FPM | CMC ± .203% RD | TRACE# 1520423238	DUE	05/23/2019
A24: HART SCIENTIFIC TEMP. STANDARD | ± .024 F | TRACE# 1520423238	DUE	03/07/2020

All instruments used in the performance of the shown calibration have traceability to the National Institute of Standards and Technology (NIST). The uncertainty ratio between the calibration standards (DM.STD.) used and the unit under test (UUT) is a minimum of 4:1, unless otherwise noted. Calibration has been performed per the shown procedure number, in accordance with ISO 10012:2003, ISO 17025:2005, ANSI/NCSL-Z-540.3, and/or MIL-STD-45662A. Test methods: API2530-92 & ASME MFC-3M-1989.

Dick Munns Company • 11133 Winners Circle • Los Alamitos, CA 90720
Phone (714) 827-1215 • Fax (714) 827-0823

Date: 3/14/2019

Approved By:

Calibration Technician:

Model 1430 Microtector® Electronic Point Gage

Installation and Operating Instructions

Model 1430 Microtector® Portable Electronic Point Gage combines modern, solid-state integrated circuit electronics with a time-proven point gage manometer to provide fast, accurate pressure measurements.

SPECIFICATIONS AND FEATURES

- Accurate and repeatable to ± .00025 inches water column
- Pressure range: 0 - 2″ w.c., positive, negative, or differential pressures
- Non-toxic and inexpensive gage fluid consists of distilled water mixed with a small amount of fluorescein green color concentrate
- Convenient, portable, lightweight and self-contained, the unit requires no external power connections and is operated by a 1.5 volt penlight cell
- A.C. detector current eliminates point plating, fouling and erosion
- Micrometers are manufactured in accordance with ASME B89.1.13-2001, and are traceable to a standard at the National Institute of Standards and Technology
- Three-point mounting, dual leveling adjustment, and circular level vial assure rapid setup
- Durablock® precision-machined acrylic plastic gage body
- Sensitive 0 - 50 microamp D.C. meter acts as a detector and also indicates battery and probe condition
- Heavy 2″ thick steel base plate provides steady mounting
- Top-quality glass epoxy circuit board and solid-state, integrated circuit electronics
- Electronic enclosure of tough, molded styrene acrylonitrile provides maximum protection to components yet allows easy access to battery compartment
- Rugged sheet steel cover and carrying case protects the entire unit when not in use
- Accessories included are (2) 3-foot lengths Tygon® tubing, (2) 1/8″ pipe thread adapters and 3/4 oz. bottle of fluorescein green color concentrate with wetting agent

Maximum pressure: 100 psig with optional pipe thread connections.

Tygon® is a registered trademark of Saint-Gobain Corporation

DWYER INSTRUMENTS, INC.
P.O. BOX 373
MICHIGAN CITY, INDIANA 46361,U.S.A

Phone: 219/879-8000
Fax: 219/872-9057

www.dwyer-inst.com
e-mail: info@dwyer-inst.com

J-2000

owner's manual

DELMHORST®
INSTRUMENT CO.

WHEN ACCURACY IS THE POINT.™

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DocNumber: 225861

Praxair Distribution, Inc.
5700 S. Alameda Street
Los Angeles CA 90058
Tel: 323-585-2154
Fax: 714-542-6689
PGVP ID: F22018

CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

Customer & Order Information

PXPKG TUALATIN OR H
10450 SW TUALATIN SHERWOOD ROAD
TUALATIN OR 97062

Certificate Modification Date: 10/01/2018
Praxair Order Number: 70743165
Part Number: NI CD17CO8E-AS

Fill Date: 09/26/2018
Lot Number: 70086826911
Cylinder Style & Outlet: AS CGA 590
Cylinder Pressure and Volume: 1290 psig 140 ft3

Certified Concentration

ProSpec EZ Cert

Expiration Date:	10/01/2026	NIST Traceable
Cylinder Number:	SA17187	Expanded Uncertainty
17.00 %	Carbon dioxide	± 0.3 %
4.31 %	Carbon monoxide	± 0.6 %
16.99 %	Oxygen	± 0.2 %
Balance	Nitrogen	

Certification Information:

Certification Date: 10/01/2018 *Term:* 96 Months *Expiration Date:* 10/01/2026

This cylinder was certified according to the 2012 EPA Traceability Protocol, Document #EPA-600/R-12/531, using Procedure G1.
Do Not Use this Standard if Pressure is less than 100 PSIG.
CO2 responses have been corrected for Oxygen IR Broadening effect. O2 responses have been corrected for CO2 interference.

Analytical Data:

(R=Reference Standard, Z=Zero Gas, C=Gas Candidate)

1. ***Component:*** **Carbon dioxide**

Requested Concentration: 17 %
Certified Concentration: 17.00 %
Instrument Used: Horiba VIA-510 S/N 20C194WK
Analytical Method: NDIR
Last Multipoint Calibration: 09/21/2018

First Analysis Data:						Date	10/01/2018
Z:	0	R:	20.1	C:	17	Conc:	17
R:	20.1	Z:	0	C:	17	Conc:	17
Z:	0	C:	17.01	R:	20.11	Conc:	17.01
UOM:	%			Mean Test Assay:		17	%

Reference Standard: Type / Cylinder #: GMIS / CC187238
Concentration / Uncertainty: 20.10 % ±0.24%
Expiration Date: 06/07/2026
Traceable to: SRM # / Sample # / Cylinder #: RGM#CC193512 / N/A / RGM#CC193512
SRM Concentration / Uncertainty: 26.99% / ±0.05%
SRM Expiration Date: 05/15/2023

Second Analysis Data:						Date	
Z:	0	R:	0	C:	0	Conc:	0
R:	0	Z:	0	C:	0	Conc:	0
Z:	0	C:	0	R:	0	Conc:	0
UOM:	%			Mean Test Assay:			%

2. ***Component:*** **Carbon monoxide**

Requested Concentration: 4.25 %
Certified Concentration: 4.31 %
Instrument Used: Horiba VIA-510 S/N UB9UCSYX
Analytical Method: NDIR
Last Multipoint Calibration: 09/21/2018

First Analysis Data:						Date	10/01/2018
Z:	0	R:	5	C:	4.31	Conc:	4.31
R:	5	Z:	0	C:	4.3	Conc:	4.3
Z:	0	C:	4.32	R:	5.01	Conc:	4.32
UOM:	%			Mean Test Assay:		4.31	%

Reference Standard: Type / Cylinder #: GMIS / CC242633
Concentration / Uncertainty: 5.00 % ±0.543%
Expiration Date: 04/03/2025
Traceable to: SRM # / Sample # / Cylinder #: SRM 2642a / 51-D-23 / FF23106
SRM Concentration / Uncertainty: 7.859% / ±0.039%
SRM Expiration Date: 07/15/2019

Second Analysis Data:						Date	
Z:	0	R:	0	C:	0	Conc:	0
R:	0	Z:	0	C:	0	Conc:	0
Z:	0	C:	0	R:	0	Conc:	0
UOM:	%			Mean Test Assay:			%

3. ***Component:*** **Oxygen**

Requested Concentration: 17 %
Certified Concentration: 16.99 %
Instrument Used: OXYMAT 5E
Analytical Method: Paramagnetic
Last Multipoint Calibration: 09/04/2018

First Analysis Data:						Date	10/01/2018
Z:	0	R:	20.86	C:	16.99	Conc:	16.99
R:	20.86	Z:	0	C:	16.99	Conc:	16.99
Z:	0	C:	16.99	R:	20.86	Conc:	16.99
UOM:	%			Mean Test Assay:		16.99	%

Reference Standard: Type / Cylinder #: GMIS / CC75874
Concentration / Uncertainty: 20.86 % ±0.111%
Expiration Date: 11/07/2025
Traceable to: SRM # / Sample # / Cylinder #: SRM 2659a / 71-E-19 / FF22331
SRM Concentration / Uncertainty: 20.863% / ±0.021%
SRM Expiration Date: 08/23/2021

Second Analysis Data:						Date	
Z:	0	R:	0	C:	0	Conc:	0
R:	0	Z:	0	C:	0	Conc:	0
Z:	0	C:	0	R:	0	Conc:	0
UOM:	%			Mean Test Assay:			%

Analyzed By: Jose Vasquez

Certified By: Danielle Burns

PRAXAIR
Making our planet more productive

DocNumber: 223791

Praxair Distribution, Inc.
5700 S. Alameda Street
Los Angeles CA 90058
Tel: 323-585-2154
Fax: 714-542-6689
PGVP ID: F22018

CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

Customer & Order Information

PXPKG TUALATIN OR H
10450 SW TUALATIN SHERWOOD ROAD
TUALATIN OR 97062

Certificate Modification Date: 09/05/2018
Praxair Order Number: 70716136
Part Number: NI CD10CO33E-AS

Fill Date: 08/31/2018
Lot Number: 70086824308
Cylinder Style & Outlet: AS CGA 590
Cylinder Pressure and Volume: 2000 psig 140 ft3

Certified Concentration

ProSpec EZ Cert

Expiration Date:	09/05/2026	NIST Traceable
Cylinder Number:	CC170624	Expanded Uncertainty
10.00 %	Carbon dioxide	± 0.3 %
2.51 %	Carbon monoxide	± 0.7 %
10.50 %	Oxygen	± 0.6 %
Balance	Nitrogen	

Certification Information:

Certification Date: 09/05/2018 *Term:* 96 Months *Expiration Date:* 09/05/2026

This cylinder was certified according to the 2012 EPA Traceability Protocol, Document #EPA-600/R-12/531, using Procedure G1.

Do Not Use this Standard if Pressure is less than 100 PSIG.

CO responses have been corrected for CO2 interference. CO2 responses have been corrected for Oxygen IR Broadening effect. O2 responses have been corrected for CO2 interference

Analytical Data:

(R=Reference Standard, Z=Zero Gas, C=Gas Candidate)

1. *Component:* **Carbon dioxide**

Requested Concentration: 10 %
Certified Concentration: 10.00 %
Instrument Used: Horiba VIA-510 S/N 20C194WK
Analytical Method: NDIR
Last Multipoint Calibration: 08/20/2018

First Analysis Data:						Date	09/05/2018
Z:	0	R:	14.02	C:	10	Conc:	10
R:	14.02	Z:	0	C:	10	Conc:	10
Z:	0	C:	10	R:	14.02	Conc:	10
UOM:	%			Mean Test Assay:		10	%

Reference Standard: Type / Cylinder #: GMIS / CC141375
Concentration / Uncertainty: 14.02 % ±0.3%
Expiration Date: 06/11/2026
Traceable to: SRM # / Sample # / Cylinder #: SRM 1675b / 6-F-51 / CAL014538
SRM Concentration / Uncertainty: 13.963% / ±0.034%
SRM Expiration Date: 05/16/2022

Second Analysis Data:						Date	
Z:	0	R:	0	C:	0	Conc:	0
R:	0	Z:	0	C:	0	Conc:	0
Z:	0	C:	0	R:	0	Conc:	0
UOM:	%			Mean Test Assay:			%

2. *Component:* **Carbon monoxide**

Requested Concentration: 2.5 %
Certified Concentration: 2.51 %
Instrument Used: Horiba VIA-510 S/N UB9UCSYX
Analytical Method: NDIR
Last Multipoint Calibration: 08/20/2018

First Analysis Data:						Date	09/05/2018
Z:	0	R:	2.48	C:	2.51	Conc:	2.51
R:	2.48	Z:	0	C:	2.51	Conc:	2.51
Z:	0	C:	2.51	R:	2.48	Conc:	2.51
UOM:	%			Mean Test Assay:		2.51	%

Reference Standard: Type / Cylinder #: GMIS / CC102045
Concentration / Uncertainty: 2.48 % ±0.448%
Expiration Date: 04/03/2025
Traceable to: SRM # / Sample # / Cylinder #: SRM 2641a / 52-D-30 / CAL017193
SRM Concentration / Uncertainty: 4.008% / ±0.017%
SRM Expiration Date: 07/15/2019

Second Analysis Data:						Date	
Z:	0	R:	0	C:	0	Conc:	0
R:	0	Z:	0	C:	0	Conc:	0
Z:	0	C:	0	R:	0	Conc:	0
UOM:	%			Mean Test Assay:			%

3. *Component:* **Oxygen**

Requested Concentration: 10.5 %
Certified Concentration: 10.50 %
Instrument Used: OXYMAT 5E
Analytical Method: Paramagnetic
Last Multipoint Calibration: 09/04/2018

First Analysis Data:						Date	09/05/2018
Z:	0	R:	9.88	C:	10.49	Conc:	10.49
R:	9.88	Z:	0	C:	10.5	Conc:	10.5
Z:	0	C:	10.5	R:	9.88	Conc:	10.5
UOM:	%			Mean Test Assay:		10.5	%

Reference Standard: Type / Cylinder #: NTRM / DT0010402
Concentration / Uncertainty: 9.88 % ±0.4%
Expiration Date: 11/18/2022
Traceable to: SRM # / Sample # / Cylinder #: NTRM #170701 / N/A / NTRM #DT0010402
SRM Concentration / Uncertainty: 9.875% / ±0.04%
SRM Expiration Date: 11/18/2022

Second Analysis Data:						Date	
Z:	0	R:	0	C:	0	Conc:	0
R:	0	Z:	0	C:	0	Conc:	0
Z:	0	C:	0	R:	0	Conc:	0
UOM:	%			Mean Test Assay:			%

Analyzed By: Danielle Burns

Certified By: Jose Vasquez