
A.J. Wells & Sons LTD

Project # 22-751

Model: Charnwood Skye E700

Type: Residential Non-catalytic Wood
Fired Heater

March 14, 2022

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

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Affidavit

PFS-TECO was contracted by A.J. Wells & Sons Ltd (A.J. Wells) to provide testing services for the Charnwood Skye E700 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-TECO's Portland Laboratory beginning on 1/18/2022 and ending on 1/19/2022. PFS-TECO's Portland Laboratory is located at 11785 SE Highway 212 – Suite 305, Clackamas, Oregon 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

A.J. Wells of Newport, Isle of Wight, UK, contracted with PFS-TECO to perform EPA certification testing on Charnwood Skye E700 Wood-Fired Room Heater. All testing was performed at PFS-TECO's Portland Laboratory. All testing was performed by Aaron Kravitz.

Notes

- Prior to start of testing, 50 hours of conditioning was performed 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. No anomalies occurred. See the Run Narrative section for further detail on each run.

Wood Heater Identification and Testing

- Appliance Tested: **Charnwood Skye E700**
- Serial Number: **PFS Tracking Number 0097**
- Manufacturer: **A.J. Wells & Sons Ltd**
- Catalyst: **No**
- Heat exchange blower: **Optional**
- Type: **Wood Stove**
- Style: **Free-Standing**
- Date Received: **Monday, January 06, 2020**
- Testing Period – Start: **Tuesday, January 18, 2022**
Finish: **Wednesday, January 19, 2022**
- Test Location: **PFS-TECO Portland Laboratory**
11785 SE HWY 212 - Suite 305, Clackamas, OR 97015
- Elevation: **~131 Feet above sea level**
- Test Technician(s): **Aaron Kravitz**
- Observers: **N/A**

Test Procedures and Equipment

All Sampling and analytical procedures were performed by Sebastian Button. 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
051	10 lb audit weight
53	APEX XC-60 Digital Emissions Sampling Box A
54	APEX XC-60 Digital Emissions Sampling Box B
55	Ambient Sample Box
057	California Analytical ZRE CO2/CO/O2 IR ANALYZER
064	Digital Barometer
095	Anemometer
101	Tape Measure
107	Sartorius Analytical Balance
109A/B	Troemner 100mg/200mg Audit Weights
111	Microtector
115	Delmhorst Wood Moisture Meter
189	1000x0.02lb Platform Scale
CC106574	Gas Analyzer Calibration Span Gas
91005049	Gas Analyzer Calibration Mid Gas

Results

The weighted average emissions rate for the 3 run test series was measured to be **1.7 g/hr** with a Higher Heating Value efficiency of **77%**. The average CO emission rate for the 3 tests was **0.8 g/min.** The A.J. Wells Charnwood Skye E700 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	1/18/2022	1/18/2022	1/19/2022
Run Number	1	2	3
PM Emission Rate (g/hr)	3.84	0.99	1.24
Burn Rate (kg/hr)	2.06	0.72	0.81
Heat Output (BTU/hr)	29,850	10,520	11,327
HHV Efficiency (%)	77.1%	78.0%	74.7%
LHV Efficiency (%)	82.5%	83.4%	79.9%
CO Emissions (g/MJ output)	1.86	3.00	4.80
CO Emissions (g/kg dry fuel)	28.58	46.68	71.58
CO Emissions (g/min)	0.97	0.55	0.96
1 st Hour Emission Rate (g/hr)	4.57	3.03	2.79
Weighting Factor (%)	20%	40%	40%
Weighted particulate emission average of 3 test runs: 1.7 grams per hour.			
Weighted average HHV efficiency of 3 test runs: 77%.			
Average CO emission rate for 3 test runs: 0.8 grams per minute			

Test Run Narrative

Run 1

Run 1 was performed on 1/18/2022 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 22 minutes into the test. Testing was completed when 90% of the test fuel load was consumed. Total test time was 78 minutes, main test fuel load burn time was 56 min. The particulate emissions rate from kindling ignition to test completion was 3.84 g/hr. The burn rate of the test fuel load was 2.06 kg/hr. The main test load portion of the run had an overall HHV efficiency of 77.1%. Filter train A 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 1/18/2022 as a low fire test run per ASTM E3053. The overall test duration was 211 minutes. The burn rate for the test run was 0.72 kg/hr. The particulate emissions rate for the test run was 0.99 g/hr. The run had an overall HHV efficiency of 78.0%. Filter train A 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 1/19/2022 as a medium fire test run per ASTM E3053. The overall test duration was 196 minutes. The burn rate for the test run was 0.81 kg/hr, therefore the medium fire category requirements were met, less than the mid-point of the high and low burn rates (1.39 kg/hr). The particulate emissions rate for the test run was 1.24 g/hr. The run had an overall HHV efficiency of 74.7%. Filter train A was changed at 1 hr. At 172 min, no measurable weight loss had been observed for 10 minutes, so the fuel load was adjusted. This adjustment took less than 30 seconds. All test results were appropriate and valid. 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	63	67.1	43	61	30.15	2.69 ¹	5.75	20.4%	78 ²
2	66	65.9	61	63	30.19	5.75	6.77	21.5%	211
3	67	68.6	35	49	30.31	5.91	7.14	22.6%	196

¹This is the weight of the kindling and startup fuel

²Total test time was 78 min, high fire test load burn duration was 56 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 (Heat Setting #5)
Run 2	Air control set to High Fire Setting (Heat Setting #5) in accordance with ASTM E3053	Air control set to low fire test setting (Heat Setting #1)
Run 3	Air control set to High Fire Setting (Heat Setting #5) in accordance with ASTM E3053	Air control set to medium fire test setting (Heat Setting #2)

Appliance Description

Model(s): Charnwood Skye E700

Appliance Type: Electronically controlled automated wood stove

Firebox Volume: 0.58 ft³

Automatic Control: The appliance can be operated at one of five different heat settings via user control. The stove will then automatically regulate the burn rate of the appliance based on the selected heat setting, relying on a number of on-board sensors to adjust the various air inlets, described below.

Air Introduction System: Combustion air enters the appliance through the air control assembly located on the bottom of the stove. Three separate air pathways are individually regulated based on the setting of automatic control. Air Wash Air is routed to the back of the firebox, through two channels on either side of the top of the firebox, then down into the combustion chamber in front of the door glass. Under Grate Air, is routed up through the grate at the bottom of the fire chamber to maintain an active coal bed. “Over the Top” secondary air is routed to the back of the firebox and through hollow cavities at the top of the rear firebricks. Dimensions on all these features can be found in Appendix D.

Baffles: Combustion air is routed to the front of the stove the lower Micalite baffle, then back to the rear of the appliance via a mild steel upper baffle plate.

Refractory Insulation: The firebox is lined with 1” thick Micalite firebrick.

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

Fan: None

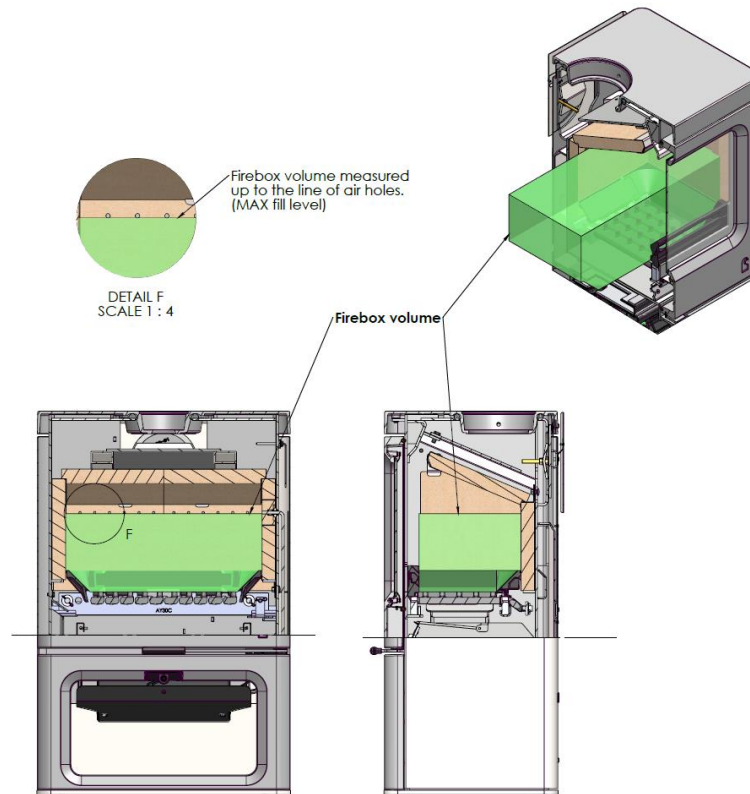
Appliance Dimensions

Skye E700 Unit Dimensions

Height	Width	Depth	Firebox Volume
33.75”	22.25”	15.25”	0.58 ft ³

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

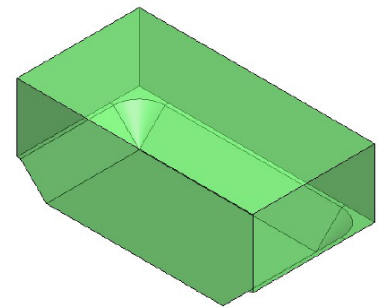
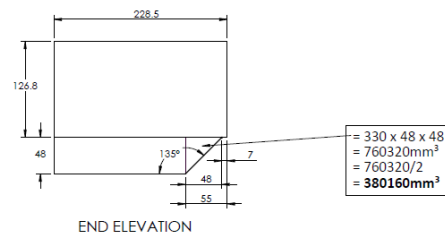
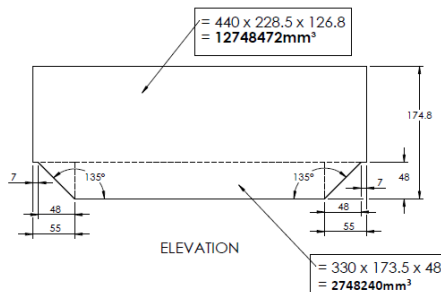
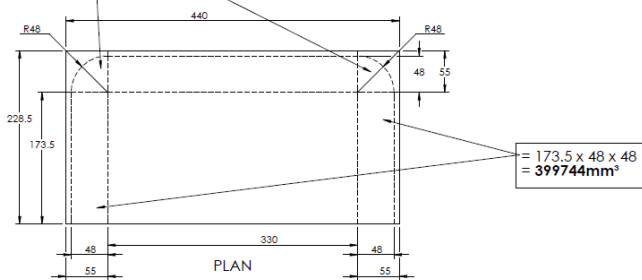
Firebox Volume Calculation



$$\begin{aligned}
 &= \pi^2 h/3 \\
 &= \pi 48^2 48/3 \\
 &= \pi 2304 \times 16 \\
 &= 7238.23 \times 16 \\
 &= 115811.68 \text{mm}^3 \\
 &115811.68/2 = 57905.84 \text{mm}^3
 \end{aligned}$$

$$\begin{aligned}
 &399744 + 12748472 + 2748240 + 57905.84 + 380160 \\
 &= 16334521.84 \text{mm}^3 \\
 &= 16334521.84 \text{mm}^3 / 1000000 \\
 &= 16.33 \text{liters}
 \end{aligned}$$

Total volume = 16.33 litres
= 0.58 ft³



ISOMETRIC VIEW

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



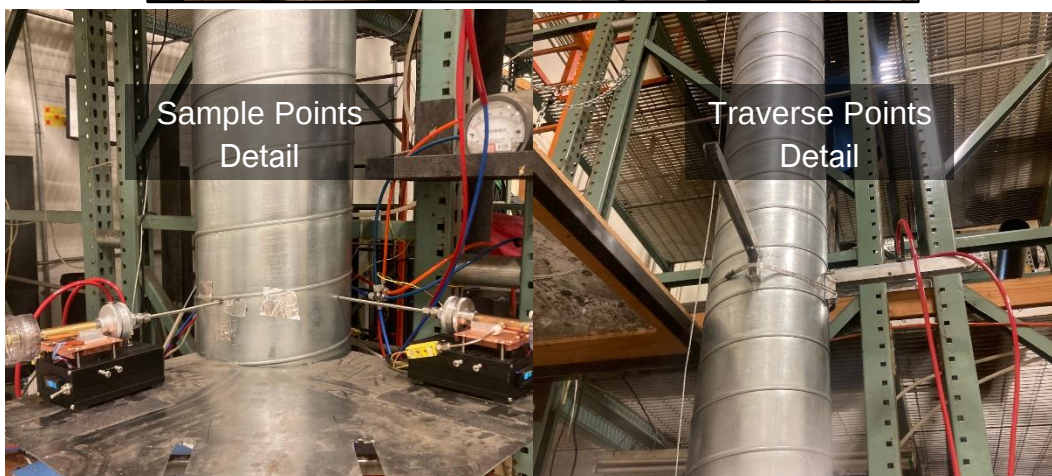
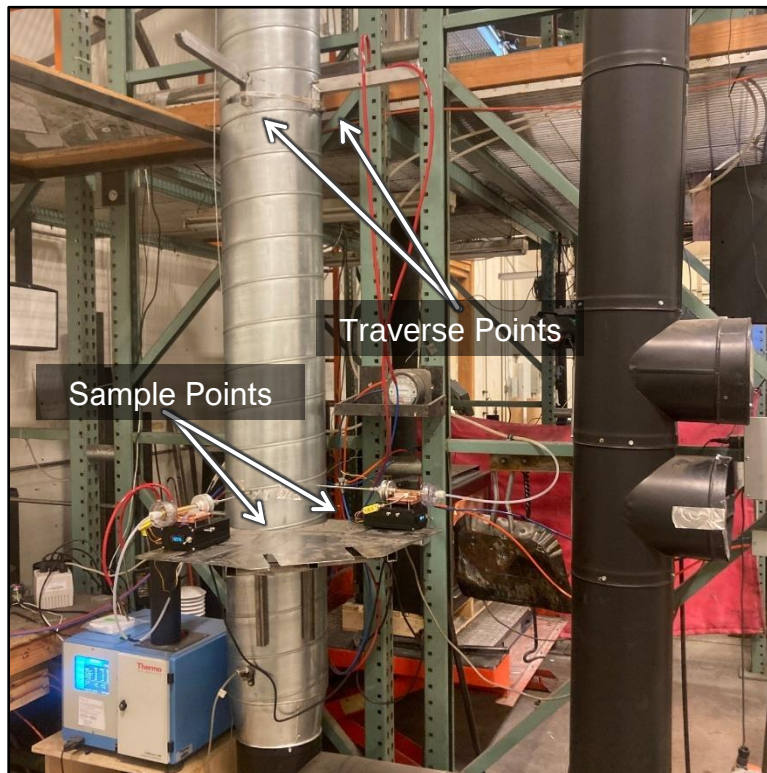
Typical Low Fire Load



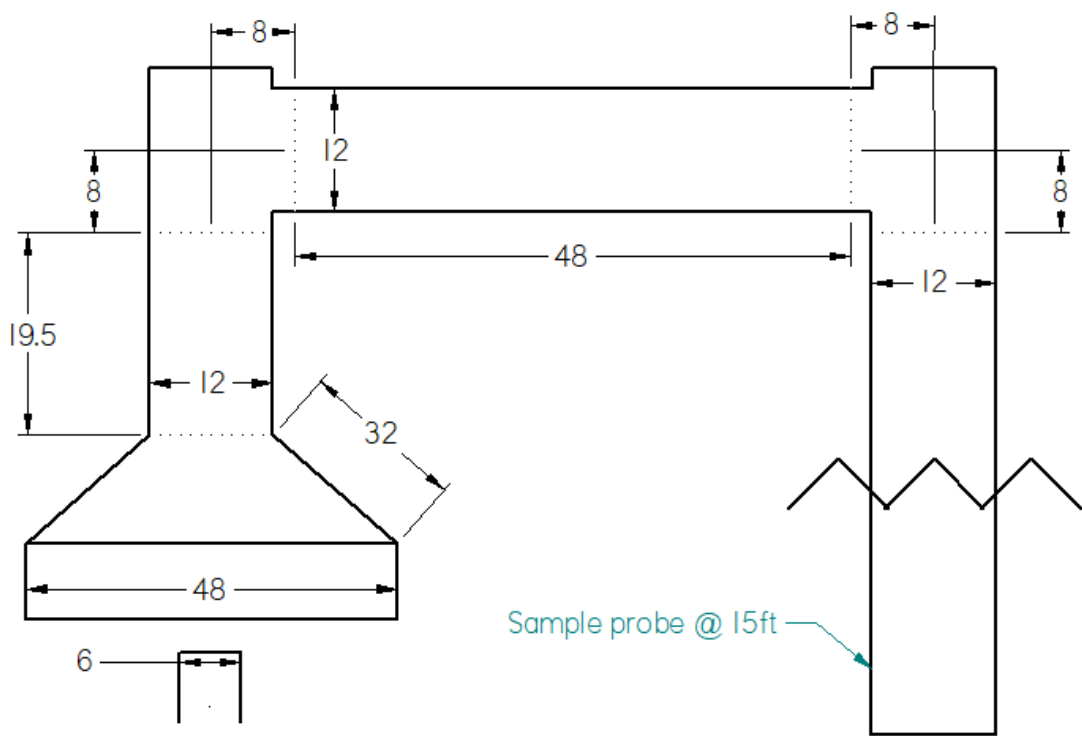
Sampling Locations and Descriptions

Sample ports are located 16.5 feet downstream from any disturbances and 2 feet upstream from any disturbances. Flow rate traverse data was collected 8 feet downstream from any disturbances and 4 feet upstream from any disturbances. (See below).

Photos



Tunnel Schematic



Sample probe @ 15ft

Dimensions in inches

Sampling Methods

ASTM E2515 was used in collecting particulate samples. The dilution tunnel is 12 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: Bishops Way, Newport, Isle of Wight PO30 5WS, United Kingdom, 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)	Charnwood Skye E700
Manufacturer	AJ WELLS & SONS LTD
Address 1	Bishops Way, Newport
Address 2	Isle of Wight PO30 5WS, England
Appliance Category(s) (Free-standing, Insert, etc.)	Free-standing
Usable Firebox Volume - ft ³	0.58
Catalytic/Non-Cat	Non-Cat
Convection Air Fan (No, Standard, Optional)	None

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	
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 #
 Date Tested
 Test Run Category (L, M, H)
 Average Barometric Pressure - in Hg
 Max. Observed Ambient Temp - °F
 Min. Observed Ambient Temp - °F
 Max. Observed Filter Temp - °F
 Test Fuel Load
 Cordwood Fuel Species
 Specific Gravity (from Table 1)
 Higher Heating Value - Btu/lb (from Annex A1)
 Nom. Test Fuel Load Piece Length - in.
 Number of Test Fuel Pieces
 Test Fuel Weight
 Kindling - As Fired lb
 Kindling Wt. - As % of Test Fuel Load
 Kindling Moisture - % DB
 Kindling - kg DB
 SU Fuel - As Fired lb
 SU Fuel Wt. - As % of Test Fuel Load
 SU Fuel Moisture - % DB
 SU Fuel - kg DB
 Test Fuel Load - As Fired lb
 Ave. Test Fuel Load MC % DB
 Test Fuel Load - kg DB
 Test Fuel Loading Density - lb/ft³
 Residual SU Fuel Wt. - As Fired lb
 Residual SU Fuel Wt. - As % of Test Fuel Load

1	2	3	
1/18/2022	1/18/2022	1/19/2022	
High Fire	Low Fire	Medium Fire	
30.15	30.19	30.31	
68	66	71	
63	61	67	
89	85	84	
Maple, Hard	Maple, Hard	Maple, Hard	
0.53	0.53	0.53	
8587	8587	8587	
12	12	12	
5	6	6	
1.00	N/A	N/A	
17%	N/A	N/A	
10%	N/A	N/A	
0.41	N/A	N/A	
1.69	N/A	N/A	
29%	N/A	N/A	
21%		N/A	
0.63	N/A	N/A	
5.75	N/A	7.14	
20.4%	677.0%	22.6%	
2.17	0.21	2.64	
9.97	2.53	12.38	
0.58	1174%	N/A	
10%	N/A	N/A	

N/A

Test Run Duration - minutes
 Test Run Duration - h
 Run Duration of High Fire Load Only - minutes
 Run Duration of High Fire Load Only - h
 Test Fuel Load Wt. at End of Test - As Fired lb
 Total Fuel Burned - kg DB

78	211	196	
1.30	3.52	3.27	
56	N/A	N/A	
0.93	N/A	N/A	
0.5	0	0	
2.71	2.53	2.64	

% Test Fuel Load Wt. at End of Test

9.2%	0.0%	0.0%	
------	------	------	--

SECTION 3 – Test Run Results Summary

Test Run #
Date Tested
Test Run Category
Burn Rate - kg/h DB
Heat Output - Btu/h
Average Dilution Tunnel Flow Rate - dscfm
Average Sample Flow Rates - dscfm
Train 1
Train 2
Total PM Emissions - g
Train 1
Train 2
Average
PM Emission Train Precision - %
PM Emission Train Precision - g/kg
PM Emission Rate - g/h
Total CO Emissions - g
CO Emissions Rate - g/h
Overall Efficiency - CSA B415.1-10
% HHV Basis
% LHV Basis

1	2	3	
1/18/22	1/18/22	1/19/22	
High Fire	Low Fire	Medium Fire	
2.06	0.72	0.81	
29,850	10,520	11,327	
439.95	439.87	450.24	
0.141	0.148	0.147	
0.142	0.149	0.147	
5.12	3.63	3.71	
4.85	3.34	4.38	
4.986	3.487	4.047	
2.8%	4.2%	8.3%	
0.05	0.06	0.13	
3.84	0.99	1.24	
55	117	187	
58	33	57	
77.1%	78.0%	74.7%	
82.5%	83.4%	79.9%	

SECTION 4 - Weighted Average Summary

Test Run Category
Burn Rate - kg/h DB
PM Emission Rate - g/h
CO Emissions Rate - g/h
Overall Efficiency - CSA B415.1-10
% HHV Basis
% LHV Basis
Heat Output - Btu/h
Category Weighting

High Fire	Low Fire	Medium Fire
2.06	0.72	0.81
3.84	0.99	1.24
58.4	33.3	57.3
77.1%	78.0%	74.7%
82.5%	83.4%	79.9%
29900	10500	11300
20%	40%	40%

ASTM E 3053 Weighted Averages

PM Emission Rate - g/h
CO Emissions Rate - g/h (Arithmetic Average)
CO Emissions Rate - g/min (Arithmetic Average)
Overall Efficiency - CSA B415.1-10
% HHV Basis
% LHV Basis
Heat Output Range - Btu/h

1.66
49.7
0.83
76.5%
81.8%
10500 to 29900

Fuel – Useable Firebox Volume 0.01633 cub m based

- Kindling:
 - 25mm cross section with 12-inch and 6-inch lengths in a lattice structure to assist ignition
 - High Burn Rate:
 - 5 pieces of 12-inch length
 - Low/Medium Burn Rate:
 - 6 pieces of 12-inch length
-

Combustion Procedure

1. Check that glass sensor on RHS of firebox is flush with bricks and not misty (clean **very gently** with damp tissue – ensure it is flush with the surrounding brick before proceeding).
2. Please clean the inner surface of the door glass before test to allow easy visual monitoring of the test.
3. Kindling and startup fuel in one load stacked as seen in figure 1. ***The aim is to keep the top surface well below the level of the air holes in the rear bricks***
4. Up to 1 min of blowtorch in centre top level of kindling – once an area of approximately 1” x 1” of the kindling is on fire with a single flame of at least 3” high, the door can gently be shut.
5. Door closed thereafter – A flashing red light indicates that the door has not been fully closed.
6. High fuel load added consisting of the following:
 - a. Layer 1 – 2 large section logs at the rear plus small at the front (figure 3 & 4)
 - b. Layer 2 – Remaining 2 logs stacked on top to allow gaps for flames to ensure effective ignition (figure 3 & 4)

When adding logs, keep the top surface of the logs below the level of the air holes in the rear bricks and central (left to right) in the firebox. It is beneficial to maximize the gaps in between the logs and the firebox boundaries, to encourage good ignition.

7. Door closed immediately.
 8. When the high burn rate test has ended the door, handle is opened and closed momentarily and the fire bed is burnt down by 100g. NB the next log load should be ready as the firebed burns down quickly.
 9. Change burn rate by short pressing the button 1-5 times which is indicated by an increasing brightness Blue light is the automatic mode. Long presses cycle through the modes (Blue - automatic, Green – room temp control, Red – Demo. Automatic, blue is the correct mode to test in: Level 5 = High Burn, Level 2 = Medium Burn, Level 1 = Low Burn.
-

Appendix



Figure 1: Kindling and start up fuel positioned



Figure 2: Lighting kindling



Figure 3: High Burn Fuel load stacking configuration



Figure 4: High burn wood stacking - end view



Figure 5: High burn fuel loaded



Figure 6: Low/Med burn wood stacking configuration



Figure 7: Lower level of Med/Low burn wood stacking configuration



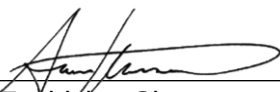
Figure 8: Med/Low fuel load loaded

WOOD STOVE TEST DATA PACKET
ASTM E3053/E2515



Run 1 Data Summary

Client: AJ Wells
Model: Skye E700
Job #: 22-751
Tracking #: 97
Test Date: 1/18/2022



Technician Signature

3/14/2022

Date

TEST RESULTS - ASTM E3053 / ASTM E2515

Client: AJ WellsModel: Skye E700Run #: 1Job #: 22-751Tracking #: 97Technician: AKDate: 1/18/2022

Burn Rate (kg/hr):	2.06
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	Ambient Sample	Sample Train A	Sample Train B	1st Hour Filter
Total Sample Volume (ft ³)	18.654	10.985	11.059	8.371
Average Gas Velocity in Dilution Tunnel (ft/sec)	9.68			
Average Gas Flow Rate in Dilution Tunnel (dscf/hr)	26396.8			
Average Gas Meter Temperature (°F)	65.3	79.9	78.8	78.0
Total Sample Volume (dscf)	18.830	10.994	10.916	8.408
Average Tunnel Temperature (°F)	80.5			
Total Time of Test (min)	78			
Total Particulate Catch (mg)	0.1	1.7	1.6	1.5
Particulate Concentration, dry-standard (g/dscf)	0.0000053	0.0001546	0.0001466	0.0001784
Total PM Emissions (g)	0.18	5.12	4.85	4.57
Particulate Emission Rate (g/hr)	0.14	3.94	3.73	4.57
Emissions Factor (g/kg)	-	1.89	1.79	-
Difference from Average Total Particulate Emissions (g)	-	0.14	0.14	-
Difference from Average Total Particulate Emissions (%)	-	2.8%	2.8%	-
Difference from Average Emissions Factor (g/kg)	-	0.05	0.05	-

Final Average Results	
Total Particulate Emissions (g)	4.99
Particulate Emission Rate (g/hr)	3.84
Emissions Factor (g/kg)	1.84
HHV Efficiency (%)	77.1%
LHV Efficiency (%)	82.5%
CO Emissions (g/min)	0.97

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: 80.3 / Max: 89.2	OK
Face Velocity	< 30 ft/min	9.4	OK
Leakage Rate	Less than 4% of average sample rate	0.001 cfm	OK
Ambient Temp	55-90 °F	Min: 63.4 / Max: 67.5	OK
Negative Probe Weight Evaluation	<5% of Total Catch	Probe Catch Not Negative	OK
Pro-Rate Variation	90% of readings between 90-110%; none greater than 120% or less than 80%	See Data Tabs	CHECK 10 MIN. INTERVAL PRO-RATES

B415.1 Efficiency Results

Manufacturer: AJ Wells
Model: Skye E700
Date: 01/18/22
Run: 1
Control #: 22-751
Test Duration: 56
Output Category: High

Test Results in Accordance with CSA B415.1-09

	HHV Basis	LHV Basis
Overall Efficiency	77.1%	82.5%
Combustion Efficiency	98.4%	98.4%
Heat Transfer Efficiency	78.4%	83.8%

Output Rate (kJ/h)	31,467	29,850	(Btu/h)
Burn Rate (kg/h)	2.04	4.50	(lb/h)
Input (kJ/h)	40,788	38,692	(Btu/h)

Test Load Weight (dry kg)	1.91	4.20	dry lb
MC wet (%)	16.93		
MC dry (%)	20.37		
Particulate (g)	4.99		
CO (g)	55		
Test Duration (h)	0.93		

Emissions	Particulate	CO
g/MJ Output	0.17	1.86
g/kg Dry Fuel	2.61	28.58
g/h	5.34	58.41
g/min	0.09	0.97
lb/MM Btu Output	0.39	4.31

Air/Fuel Ratio (A/F)	17.13
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VERSION:

2.2

12/14/2009

HIGH FIRE FUEL LOAD DATA - ASTM E3053

Client: AJ WellsJob #: 22-751Model: Skye E700Tracking # 97Run #: 1Technician: AKDate: 1/18/2022

Nominal Loading Density (lbs/ft³, wet basis): 10
 Usable Firebox Volume (ft³): 0.58
 Target Load Weight (lbs): 5.77
 Total Load Weight Range (lbs): 5.50 to 6.10
 Core Load Weight Range (lbs): 2.60 to 3.70
 Remainder Load Weight Range (lbs): 2.00 to 3.20
 Core Load Piece Range (lbs): 0.90 to 1.40
 Remainder Load Piece Range (lbs): 0.60 to 3.20
 Max Allowable Kindling Weight (lbs): 1.15
 Max Allowable Start-up Fuel Weight (lbs): 1.73

CORE LOAD DATA

Piece #	Length (in)	Weight (lbs)	Within Spec?	Fuel Piece Moisture Readings (%DB)				Within Spec?	Dry Weight	
				1	2	3	Ave.		lbs	kg
1	12.00	1.10	In Range	19.6	20.6	18.3	19.5	In Range	0.92	0.42
2	12.00	0.93	In Range	19.5	18.5	19.8	19.3	In Range	0.78	0.35
3	12.00	1.28	In Range	19.5	20.4	25.3	21.7	In Range	1.05	0.48
Core Load Wt. (lbs)		3.31	In Range							

REMAINDER LOAD DATA (1 to 3 Pieces)

Piece #	Length (in)	Weight (lbs)	Within Spec?	Fuel Piece Moisture Readings (%DB)				Within Spec?	Dry Weight	
				1	2	3	Ave.		lbs	kg
1	12.00	1.13	In Range	18.8	22.7	20.3	20.6	In Range	0.94	0.43
2	12.00	1.31	In Range	23.2	18.3	19.7	20.4	In Range	1.09	0.49
3			NA				NA	NA	NA	NA
Remainder Load (lbs)		2.44	In Range							

Total Load Weight (lbs): 5.75 In Range
 Core Load % of Total Weight: 58% In Range 45-65%
 Remainder % of Total Weight: 42% In Range 35-55%
 Total Load % of Target Weight: 100% In Range 95-105%
 Actual Fuel Loading Density (lb/ft³): 10.0
 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): 4.78 lbs 2.17 kg

KINDLING AND START-UP FUEL

Kindling Weight (lbs)	Within Spec?	Kindling Moisture Readings (%DB)				Within Spec?	Dry Weight	
		1	2	3	Avg.		lbs	kg
1.00	In Range	10	10	10	10.0	In Range	0.91	0.41

Start-up Fuel Wt. (lb)	Within Spec?	Start-up Moisture Readings (%DB)				Within Spec?	Dry Weight	
		1	2	3	Avg.		lbs	kg
1.69	In Range	23.5	21.7	19	21.4	In Range	1.39	0.63

TEST FUEL LOADING RANGE

Allowable Residual Start-up Fuel Range (lb): 0.58 to 1.15
 Actual Residual Start-up Fuel Weight (lb): 0.58 In Range

TEST END POINT

High Fire Test Run End Point Range: 0.52 to 0.63 tared lb
 1.10 to 1.21 untared lb
 Actual Fuel Load Ending Weight (lb): 0.53 In Range

Total Weight All Fuel Added: 8.44 lbs, wet basis Total Weight All Fuel Burned (dry basis): 5.97 lbs
 7.08 lbs, dry basis 2.71 kg

HIGH FIRE FUEL LOAD DATA - ASTM E3053

Client: AJ Wells
Model: Skye E700
Run #: 1

Job #: 22-751
Tracking #: 97
Technician: AK
Date: 1/18/2022

3.21 kg, dry basis

LOW & MEDIUM FIRE FUEL LOAD DATA - ASTM E3053

Client: AJ Wells
 Model: Skye E700
 Run #: 1

Job #: 22-751
 Tracking # 97
 Technician: AK
 Date: 1/18/2022

Nominal Loading Density (lbs/ft³, wet basis): 12
 Usable Firebox Volume (ft³): 0.58
 Target Load Weight (lbs): 6.92
 Total Load Weight Range (lbs): 6.57 to 7.27
 Core Load Weight Range (lbs): 3.11 to 4.50
 Remainder Load Weight Range (lbs): 2.42 to 3.81
 Core Load Piece Range (lbs): 1.04 to 1.73
 Remainder Load Piece Range (lbs): 0.69 to 2.08

CORE LOAD DATA

Piece #	Length (in)	Weight (lbs)	Within Spec?	Fuel Piece Moisture Readings (%DB)				Within Spec?	Dry Weight	
				1	2	3	Ave.		lbs	kg
1	12.00	1.27	In Range	19.4	19.5	20.6	19.8	In Range	1.06	0.48
2	12.00	1.12	In Range	24.9	23.4	20.2	22.8	In Range	0.91	0.41
3	12.00	1.05	In Range	18.9	20.5	20.2	19.9	In Range	0.88	0.40
Core Load Wt. (lbs)		3.44	In Range							

REMAINDER LOAD DATA (2 to 3 Pieces)

Piece #	Length (in)	Weight (lbs)	Within Spec?	Fuel Piece Moisture Readings (%DB)				Within Spec?	Dry Weight	
				1	2	3	Ave.		lbs	kg
1	12.00	0.90	In Range	22.8	18.3	18.7	19.9	In Range	0.75	0.34
2	12.00	1.00	In Range	26.7	24.3	18.9	23.3	In Range	0.81	0.37
3	12.00	1.43	In Range	25.3	23.2	19.7	22.7	In Range	1.17	0.53
Remainder Load (lbs)		3.33	In Range							

Remainder Load Small/Large Piece Weight Ratio: 63% In Range ≤ 67%
 Total Load Weight (lbs): 6.77 In Range
 Core Load % of Total Weight: 51% In Range 45-65%
 Remainder % of Total Weight: 49% In Range 35-55%
 Total Load % of Target Weight: 98% In Range 95-105%
 Actual Fuel Loading Density (lb/ft³): 11.7
 Total Load Average Moisture Content (%DB): 21.5 In Range 19-25%
 Total Load Average Moisture Content (%WB): 17.7
 Total Test Load Weight (dry basis): 5.57 lbs 2.53 kg

TEST FUEL LOADING RANGE

Allowable Charcoal Bed Weight Range (lb): 0.73 to 1.30
 Actual Charcoal Bed Wt. (lb): 0.94 In Range

TEST END POINT

Actual Fuel Load Ending Weight (lb): 0.00 Valid Test (≥90%)

Total Fuel Burned During Test Run:
 6.8 lbs, wet basis
 5.6 lbs, dry basis
 2.53 kg, dry basis

DILUTION TUNNEL & MISC. DATA - ASTM E3053 / E2515

Client: AJ Wells
 Model: Skye E700
 Run #: 1
 Test Start Time: 11:44
 Test End Time: 13:02
 Test Type: High Fire

Job #: 22-751
 Tracking #: 97
 Technician: AK
 Date: 1/18/2022

Recording Interval (min): 1
 Total Sampling Time (min): 78
 High Fire Test Load Time (min): 22

Meter Box γ Factor: 1.011 (A)
 Meter Box γ Factor: 0.995 (B)
 Meter Box γ Factor: 0.997 (Ambient)

Induced Draft Check (in. H₂O): 0
 Smoke Capture Check (%): 100
 Date Flue Pipe Last Cleaned: 1/17/2022

	Pre-Test	Post Test	Avg.
Barometric Pressure (in. Hg)	30.15	30.15	30.15
Relative Humidity (%)	43.0	61.0	
Room Air Velocity (ft/min)	<50	<50	
Scale Audit (lbs)	10.0	10.0	
Ambient Sample Volume:		18.654	ft ³

	Sample Train	Post-Test	Leak Checks
(A)	0.001	cfm @	-5 in. Hg
(B)	0.000	cfm @	-5 in. Hg
(C)	0.000	cfm @	-4 in. Hg
(Ambient)	0.002	cfm @	-10

DILUTION TUNNEL FLOW

Traverse Data		
Point	dP (in H ₂ O)	Temp (°F)
1	0.018	65
2	0.024	65
3	0.026	65
4	0.026	65
5	0.022	65
6	0.016	65
7	0.018	65
8	0.022	65
9	0.026	65
10	0.028	65
11	0.026	65
12	0.014	65
Center	0.033	65

Dilution Tunnel H₂O: 2.00 percent
 Tunnel Diameter: 12 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: 0.7854 ft²

V_{strav} : 9.75 ft/sec
 V_{scent} : 11.96 ft/sec
 F_p : 0.815 [ratio]
 Initial Tunnel Flow: 456.2 scf/min

Static Pressure: -0.080 in. H₂O

GAS ANALYZER CALIBRATION

Boottle Concentrations

	Span	Mid
CO ₂	17.08	10.09
CO	4.310	2.530

Pre Test

Post Test - 1/19/22

	Zero	Span	Mid	Zero	Span	Mid
Time	10:10	10:20	10:15	8:35	8:40	8:42
CO ₂	0.00	17.09	10.10	0.02	17.11	10.25
CO	0.000	4.310	2.550	0.005	4.326	2.544

TEST NOTES

Air setting	5/5 (max)						
Torch	Used for 45 seconds						
Door	Closed at 1 minute						
Test Load	Loaded at 22 min						
1 Hour Sample	Changed train A at 60 minutes						

DILUTION TUNNEL & MISC. DATA - ASTM E3053 / E2515

Client: AJ Wells
 Model: Skye E700
 Run #: 1
 Test Start Time: 11:44
 Test End Time: 13:02
 Test Type: High Fire

Job #: 22-751
 Tracking #: 97
 Technician: AK
 Date: 1/18/2022

Recording Interval (min): 1
 Total Sampling Time (min): 78
 High Fire Test Load Time (min): 22

Meter Box γ Factor: 1.011 (A)
 Meter Box γ Factor: 0.995 (B)
 Meter Box γ Factor: 0.997 (Ambient)

Induced Draft Check (in. H₂O): 0
 Smoke Capture Check (%): 100
 Date Flue Pipe Last Cleaned: 1/17/2022

	Pre-Test	Post Test	Avg.
Barometric Pressure (in. Hg)	30.15	30.15	30.15
Relative Humidity (%)	43.0	61.0	
Room Air Velocity (ft/min)	<50	<50	
Scale Audit (lbs)	10.0	10.0	
Ambient Sample Volume:		18.654	ft ³

Sample Train	Post-Test	Leak Checks
(A)	0.001	cfm @ -5 in. Hg
(B)	0.000	cfm @ -5 in. Hg
(C)	0.000	cfm @ -4 in. Hg

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, Yellow	49.80	6.50	43.40	0.30	20.12	8656
	Doug Fir (Coast, Int. West)	48.73	6.87	43.90	0.50	19.81	8522
	Doug Fir (Int. 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
	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 Long Leaf	52.60	7.02	40.10	1.30	22.30	9594

WOODSTOVE PREBURN DATA

Client: AJ Wells
Model: Skye E700
Run #: 1

Job #: 22-751
Tracking #: 97
Technician: AK
Date: 1/18/2022

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

WOODSTOVE PREBURN DATA

Client: AJ Wells
Model: Skye E700
Run #: 1

Job #: 22-751
Tracking #: 97
Technician: AK
Date: 1/18/2022

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

WOODSTOVE PREBURN DATA

Client: AJ Wells
Model: Skye E700
Run #: 1

Job #: 22-751
Tracking #: 97
Technician: AK
Date: 1/18/2022

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

WOODSTOVE PREBURN DATA

Client: AJ Wells
Model: Skye E700
Run #: 1

Job #: 22-751
Tracking #: 97
Technician: AK
Date: 1/18/2022

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

WOODSTOVE PREBURN DATA

Client: AJ Wells
Model: Skye E700
Run #: 1

Job #: 22-751
Tracking #: 97
Technician: AK
Date: 1/18/2022

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

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: AJ WellsJob #: 22-751Model: Skye E700Tracking #: 97Run #: 1Technician: AKDate: 1/18/2022

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
0	0.000		1.68	69.6	1.48		87	0.000	0.09	0.02
1	0.160	0.160	2.08	69.8	1.47	113	84	-0.020	0.19	0.02
2	0.302	0.142	2.08	70	1.3	98	83	-0.020	1.95	0.09
3	0.443	0.141	2.07	70.3	1.72	99	82	-0.030	5.71	0.24
4	0.584	0.141	2.07	70.5	1.37	99	81	-0.030	5.68	0.24
5	0.727	0.143	2.06	70.8	1.33	101	82	-0.030	6.07	0.22
6	0.867	0.140	2.07	71	1.56	98	82	-0.040	3.62	0.30
7	1.010	0.143	2.07	71.2	1.36	101	83	-0.040	5.40	0.22
8	1.150	0.140	2.07	71.4	1.74	99	83	-0.040	5.91	0.26
9	1.290	0.140	2.06	71.7	1.65	98	83	-0.040	5.96	0.28
10	1.435	0.145	2.06	72	1.39	104	84	-0.050	5.51	0.35
11	1.573	0.138	2.07	72.3	1.47	97	84	-0.050	7.39	0.22
12	1.717	0.144	2.06	72.7	1.64	103	84	-0.060	7.27	0.15
13	1.858	0.141	2.06	72.8	1.72	101	84	-0.060	7.95	0.13
14	1.998	0.140	2.06	73	1.38	98	84	-0.060	8.18	0.11
15	2.141	0.143	2.05	73	1.4	101	84	-0.060	9.10	0.16
16	2.281	0.140	2.05	73.3	1.39	99	84	-0.070	8.99	0.19
17	2.424	0.143	2.04	73.6	1.46	102	84	-0.070	10.68	0.55
18	2.564	0.140	2.05	73.9	1.67	100	84	-0.070	10.54	0.55
19	2.706	0.142	2.04	74.2	1.39	100	84	-0.070	9.50	0.25
20	2.847	0.141	2.04	74.6	1.53	99	84	-0.070	8.97	0.17
21	2.987	0.140	2.04	75.1	1.55	100	84	-0.070	8.82	0.13
22	3.130	0.143	2.04	75.5	1.75	103	85	-0.070	8.53	0.13
23	3.269	0.139	2.05	75.7	1.38	100	85	-0.060	4.75	0.18
24	3.414	0.145	2.06	76	1.74	104	84	-0.070	4.17	0.30
25	3.555	0.141	2.06	76.3	1.63	101	84	-0.080	7.19	0.34
26	3.696	0.141	2.06	76.5	1.37	102	85	-0.080	7.85	0.54
27	3.840	0.144	2.06	76.8	1.63	104	85	-0.080	8.54	0.49
28	3.980	0.140	2.06	77.2	1.37	101	85	-0.070	9.31	0.27
29	4.124	0.144	2.06	77.4	1.58	103	84	-0.070	8.58	0.16
30	4.265	0.141	2.06	77.7	1.74	101	84	-0.070	6.55	0.27
31	4.409	0.144	2.06	78	1.52	103	84	-0.070	5.41	0.36
32	4.550	0.141	2.05	78.2	1.67	101	85	-0.070	4.55	0.46

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: AJ WellsJob #: 22-751Model: Skye E700Tracking #: 97Run #: 1Technician: AKDate: 1/18/2022

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
33	4.692	0.142	2.06	78.5	1.54	101	85	-0.070	7.32	0.31
34	4.837	0.145	2.06	78.8	1.79	104	84	-0.080	8.17	0.09
35	4.977	0.140	2.06	79	1.64	100	84	-0.070	7.65	0.09
36	5.122	0.145	2.06	79.2	1.41	103	85	-0.070	7.75	0.09
37	5.264	0.142	2.07	79.4	1.41	101	85	-0.070	8.33	0.09
38	5.407	0.143	2.06	79.4	1.74	100	84	-0.070	8.49	0.05
39	5.550	0.143	2.06	79.5	1.5	102	84	-0.080	8.50	0.05
40	5.691	0.141	2.06	79.7	1.57	99	84	-0.080	8.67	0.05
41	5.836	0.145	2.05	79.9	1.51	103	84	-0.080	8.93	0.10
42	5.976	0.140	2.05	80.1	1.58	98	84	-0.070	8.72	0.11
43	6.120	0.144	2.04	80.4	1.7	101	84	-0.080	8.58	0.10
44	6.262	0.142	2.02	80.8	1.44	101	84	-0.070	8.69	0.10
45	6.403	0.141	2.01	80.8	1.59	101	84	-0.080	8.81	0.10
46	6.545	0.142	1.98	81	1.56	100	84	-0.070	8.73	0.09
47	6.684	0.139	1.96	81.2	1.52	99	85	-0.070	8.70	0.10
48	6.825	0.141	1.95	81.4	1.81	99	85	-0.070	8.55	0.10
49	6.963	0.138	1.94	81.6	1.63	97	85	-0.070	8.52	0.12
50	7.100	0.137	1.93	81.9	1.7	96	85	-0.070	8.48	0.13
51	7.242	0.142	1.93	82	1.54	99	84	-0.070	8.36	0.13
52	7.377	0.135	1.92	82.2	1.84	94	84	-0.070	8.35	0.09
53	7.518	0.141	1.92	82.4	1.64	99	85	-0.070	8.48	0.15
54	7.655	0.137	1.92	82.5	1.63	96	84	-0.070	8.52	0.15
55	7.792	0.137	1.92	82.6	1.8	96	84	-0.070	8.43	0.14
56	7.933	0.141	1.91	82.8	1.6	98	85	-0.070	8.35	0.15
57	8.069	0.136	1.91	83	1.86	96	85	-0.070	8.27	0.14
58	8.208	0.139	1.91	83.2	1.92	97	85	-0.070	8.08	0.13
59	8.346	0.138	1.91	83.3	1.8	96	85	-0.070	7.88	0.12
60	8.486	0.140	2.05	83.4	1.79	99	85	-0.070	7.72	0.08
61	8.630	0.144	2.05	83.2	1.65	102	84	-0.070	7.44	0.05
62	8.771	0.141	2.04	83.3	1.95	100	84	-0.070	6.86	0.03
63	8.917	0.146	2.04	83.3	1.93	102	84	-0.070	6.27	0.03
64	9.058	0.141	2.04	83.5	1.94	98	84	-0.070	5.87	0.03
65	9.199	0.141	2.04	83.7	1.94	98	84	-0.070	5.83	0.03

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: AJ Wells
 Model: Skye E700
 Run #: 1

Job #: 22-751
 Tracking #: 97
 Technician: AK
 Date: 1/18/2022

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
66	9.345	0.146	2.04	84	1.66	102	84	-0.070	6.02	0.03
67	9.485	0.140	2.04	84.2	1.62	97	84	-0.070	5.98	0.03
68	9.630	0.145	2.03	84.3	1.69	101	84	-0.070	5.60	0.04
69	9.770	0.140	2.04	84.5	1.95	97	84	-0.070	5.17	0.05
70	9.916	0.146	2.04	84.8	1.76	103	85	-0.070	4.74	0.06
71	10.058	0.142	2.03	84.9	1.93	99	85	-0.070	4.55	0.07
72	10.199	0.141	2.04	85.1	1.87	98	85	-0.060	4.34	0.09
73	10.345	0.146	2.04	85.2	1.63	100	85	-0.060	3.87	0.15
74	10.485	0.140	2.04	85.3	1.62	97	85	-0.060	3.34	0.21
75	10.630	0.145	2.04	85.5	1.62	102	85	-0.050	3.14	0.25
76	10.771	0.141	2.05	85.6	1.68	99	85	-0.050	2.92	0.28
77	10.917	0.146	2.05	85.6	1.91	101	85	-0.050	3.55	0.37
78	11.059	0.142	2.05	85.8	1.68	98	85	-0.040	3.55	0.43
Avg/Tot	11.059	0.142	2.03	79	1.63	100	84	-0.063	6.86	0.17

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: AJ Wells
 Model: Skye E700
 Run #: 1

Job #: 22-751
 Tracking #: 97
 Technician: AK
 Date: 1/18/2022

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft ³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
0	0.000		0.032	1.62	69.7	0.63		2.65		66	65	84	63
1	0.176	0.176	0.032	1.99	69.9	0.65	125	2.59	-0.06	70	103	84	64
2	0.315	0.139	0.033	1.99	70.2	0.68	97	2.54	-0.05	68	105	84	64
3	0.451	0.136	0.032	1.99	70.5	0.65	96	2.50	-0.04	68	113	84	64
4	0.587	0.136	0.032	1.99	70.8	0.67	96	2.44	-0.06	68	127	84	64
5	0.726	0.139	0.032	1.98	71	0.7	99	2.41	-0.03	68	130	84	64
6	0.861	0.135	0.032	2.00	71.3	0.68	96	2.33	-0.08	69	134	84	64
7	1.001	0.140	0.032	2.01	71.5	0.71	99	2.26	-0.07	70	145	84	64
8	1.137	0.136	0.032	2.01	71.8	0.66	97	2.17	-0.09	71	154	84	64
9	1.274	0.137	0.032	2.02	72.1	0.66	97	2.08	-0.09	70	158	84	64
10	1.414	0.140	0.031	2.02	72.4	0.67	101	1.97	-0.11	71	176	84	64
11	1.549	0.135	0.032	2.01	72.7	0.68	96	1.86	-0.11	72	186	84	64
12	1.691	0.142	0.031	2.02	73.1	0.71	102	1.73	-0.13	72	200	84	64
13	1.827	0.136	0.031	2.02	73.3	0.72	98	1.60	-0.13	73	216	84	64
14	1.965	0.138	0.032	2.01	73.4	0.7	98	1.46	-0.14	73	231	84	64
15	2.106	0.141	0.032	2.02	73.4	0.72	100	1.33	-0.13	73	241	83	64
16	2.241	0.135	0.032	2.02	73.6	0.69	96	1.17	-0.16	74	264	83	64
17	2.382	0.141	0.031	2.02	73.9	0.74	102	1.01	-0.16	75	280	83	64
18	2.519	0.137	0.031	2.02	74.1	0.77	99	0.89	-0.12	75	280	83	64
19	2.658	0.139	0.032	2.02	74.6	0.72	99	0.79	-0.1	76	279	83	64
20	2.796	0.138	0.032	2.02	75	0.76	98	0.68	-0.11	77	278	83	64
21	2.934	0.138	0.031	2.03	75.5	0.78	99	0.58	-0.1	77	278	84	65
22	3.075	0.141	0.031	2.02	76	0.77	102	6.17	5.59	87	296	84	65
23	3.211	0.136	0.031	2.03	76.4	0.77	98	6.12	-0.05	81	271	84	65
24	3.354	0.143	0.031	2.05	76.7	0.76	103	5.99	-0.13	82	284	84	65
25	3.492	0.138	0.031	2.05	77	0.78	100	5.81	-0.18	85	321	84	65
26	3.631	0.139	0.031	2.05	77.3	0.76	101	5.61	-0.2	88	355	84	65
27	3.772	0.141	0.031	2.05	77.6	0.73	102	5.41	-0.2	90	383	84	65
28	3.911	0.139	0.031	2.05	78	0.77	101	5.26	-0.15	87	350	84	65
29	4.054	0.143	0.031	2.07	78.2	0.72	103	5.16	-0.1	85	321	84	65
30	4.190	0.136	0.031	2.06	78.6	0.77	98	5.07	-0.09	84	303	84	65
31	4.334	0.144	0.031	2.07	78.9	0.78	104	4.99	-0.08	84	295	84	65
32	4.473	0.139	0.031	2.06	79.1	0.8	100	4.85	-0.14	85	306	84	65

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: AJ Wells
 Model: Skye E700
 Run #: 1

Job #: 22-751
 Tracking #: 97
 Technician: AK
 Date: 1/18/2022

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft ³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
33	4.615	0.142	0.031	2.07	79.5	0.79	102	4.73	-0.12	84	300	84	65
34	4.754	0.139	0.031	2.07	79.8	0.75	100	4.61	-0.12	84	301	84	65
35	4.895	0.141	0.031	2.08	80	0.76	101	4.49	-0.12	84	303	84	65
36	5.039	0.144	0.031	2.09	80.3	0.74	103	4.36	-0.13	84	305	84	66
37	5.177	0.138	0.031	2.07	80.5	0.73	99	4.23	-0.13	84	304	84	65
38	5.320	0.143	0.032	2.07	80.5	0.8	101	4.11	-0.12	83	303	84	65
39	5.459	0.139	0.031	2.08	80.6	0.74	100	3.97	-0.14	83	304	84	65
40	5.604	0.145	0.032	2.08	80.7	0.76	102	3.83	-0.14	82	309	83	64
41	5.743	0.139	0.031	2.07	80.8	0.8	100	3.70	-0.13	83	313	83	63
42	5.885	0.142	0.032	2.07	81.1	0.77	100	3.56	-0.14	83	316	83	64
43	6.025	0.140	0.032	2.07	81.4	0.8	99	3.44	-0.12	85	317	83	64
44	6.165	0.140	0.031	2.06	81.9	0.78	100	3.31	-0.13	85	320	84	64
45	6.309	0.144	0.031	2.04	82.1	0.84	103	3.18	-0.13	86	321	84	65
46	6.446	0.137	0.032	2.02	82.4	0.88	97	3.06	-0.12	87	319	84	65
47	6.587	0.141	0.031	1.99	82.6	0.86	101	2.94	-0.12	87	319	84	65
48	6.724	0.137	0.032	1.97	82.9	0.91	97	2.83	-0.11	87	317	84	66
49	6.863	0.139	0.032	1.96	83.1	0.88	98	2.72	-0.11	86	308	84	66
50	7.000	0.137	0.032	1.95	83.3	0.96	96	2.62	-0.1	86	300	84	66
51	7.137	0.137	0.032	1.95	83.5	0.9	96	2.52	-0.1	85	293	84	66
52	7.276	0.139	0.032	1.95	83.8	0.95	98	2.42	-0.1	85	283	84	66
53	7.410	0.134	0.032	1.94	84	0.95	94	2.33	-0.09	85	274	84	66
54	7.550	0.140	0.032	1.95	84.2	0.93	98	2.24	-0.09	84	269	84	67
55	7.686	0.136	0.032	1.94	84.4	0.94	95	2.14	-0.1	84	265	84	67
56	7.823	0.137	0.032	1.94	84.6	0.94	96	2.06	-0.08	83	262	84	67
57	7.962	0.139	0.031	1.94	84.7	0.96	99	1.98	-0.08	83	261	84	67
58	8.096	0.134	0.032	1.94	85	0.98	94	1.89	-0.09	84	260	84	67
59	8.236	0.140	0.032	1.93	85.2	0.98	98	1.82	-0.07	84	260	84	67
60	8.371	0.135	0.031	1.92	85.2	1	96	1.75	-0.07	83	260	84	67
61	8.515	0.144	0.031	2.21	85.1	0.7	102	1.68	-0.07	82	263	82	67
62	8.662	0.147	0.031	2.20	85.1	0.74	105	1.62	-0.06	83	268	84	66
63	8.807	0.145	0.032	2.21	85.1	0.73	102	1.56	-0.06	83	276	84	67
64	8.953	0.146	0.032	2.20	85.2	0.74	102	1.49	-0.07	83	280	85	67
65	9.098	0.145	0.032	2.19	85.4	0.75	102	1.43	-0.06	83	282	86	67

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: AJ Wells
 Model: Skye E700
 Run #: 1

Job #: 22-751
 Tracking #: 97
 Technician: AK
 Date: 1/18/2022

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft ³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
66	9.245	0.147	0.032	2.18	85.7	0.7	103	1.37	-0.06	83	278	87	67
67	9.388	0.143	0.032	2.18	86	0.75	100	1.33	-0.04	84	270	88	67
68	9.536	0.148	0.032	2.17	86.2	0.74	103	1.29	-0.04	83	266	89	67
69	9.678	0.142	0.032	2.17	86.5	0.76	99	1.25	-0.04	84	268	80	67
70	9.825	0.147	0.031	2.17	86.8	0.71	104	1.22	-0.03	84	269	81	67
71	9.968	0.143	0.032	2.17	86.9	0.73	100	1.19	-0.03	84	267	82	67
72	10.115	0.147	0.032	2.17	87.2	0.72	103	1.17	-0.02	84	263	82	67
73	10.257	0.142	0.033	2.16	87.3	0.72	98	1.15	-0.02	84	256	83	67
74	10.404	0.147	0.032	2.16	87.5	0.79	103	1.13	-0.02	83	250	83	67
75	10.546	0.142	0.031	2.16	87.7	0.73	101	1.13	0	83	236	83	67
76	10.694	0.148	0.031	2.17	87.9	0.77	105	1.12	-0.01	81	211	84	67
77	10.836	0.142	0.032	2.16	87.9	0.78	99	1.11	-0.01	80	192	84	68
78	10.985	0.149	0.032	2.16	88.1	0.74	103	1.11	0	80	179	84	67
Avg/Tot	10.985	0.141	0.032	2.05	80	0.77	100			80	259	84	65.3

WOODSTOVE SURFACE TEMPERATURE DATA

Client: AJ WellsModel: Skye E700Run #: 1Job #: 22-751Tracking #: 97Technician: AKDate: 1/18/2022

Elapsed Time (min)	Temperature Data (°F)						
	FB Top	FB Bottom	FB Back	FB Left	FB Right	Stove Surface Average	Catalyst Exit
0	64	65	65	65	64	64.5	N/A
1	70	65	65	65	65	65.7	N/A
2	83	65	65	65	65	68.7	N/A
3	98	65	65	66	66	72.0	N/A
4	113	65	65	67	68	75.6	N/A
5	121	65	65	69	71	78.2	N/A
6	131	65	65	72	75	81.5	N/A
7	140	65	65	76	78	84.8	N/A
8	148	65	65	79	83	87.9	N/A
9	160	65	65	84	88	92.3	N/A
10	179	65	66	88	92	98.0	N/A
11	197	65	66	94	98	103.9	N/A
12	217	65	66	100	104	110.4	N/A
13	237	65	67	106	111	117.1	N/A
14	260	65	67	113	118	124.5	N/A
15	283	65	67	121	126	132.2	N/A
16	309	65	67	129	134	141.0	N/A
17	338	65	68	138	144	150.6	N/A
18	367	65	68	147	155	160.5	N/A
19	394	66	69	157	166	170.4	N/A
20	420	66	71	167	177	180.0	N/A
21	442	67	72	177	187	188.9	N/A
22	457	67	74	185	198	196.1	N/A
23	470	68	75	197	209	203.5	N/A
24	481	68	76	207	218	210.1	N/A
25	491	69	78	215	227	215.8	N/A
26	505	70	80	222	234	221.9	N/A
27	522	70	81	227	241	228.3	N/A
28	539	71	83	232	248	234.7	N/A
29	552	73	85	237	256	240.4	N/A
30	561	74	86	241	263	245.1	N/A
31	564	76	88	246	270	248.7	N/A
32	566	77	90	250	276	251.8	N/A
33	569	79	92	254	282	255.0	N/A
34	572	80	94	257	287	258.1	N/A
35	576	82	96	261	292	261.3	N/A
36	581	84	98	265	297	264.8	N/A
37	588	86	100	269	301	268.6	N/A
38	595	88	101	273	306	272.4	N/A
39	602	90	103	278	310	276.5	N/A
40	610	92	104	283	315	280.8	N/A
41	619	94	106	289	319	285.3	N/A
42	628	96	108	295	324	290.2	N/A
43	637	98	110	302	329	295.2	N/A
44	647	100	112	309	334	300.3	N/A
45	656	102	114	316	339	305.3	N/A
46	665	104	116	323	344	310.2	N/A
47	673	106	118	330	349	315.1	N/A
48	680	108	121	337	354	319.8	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: AJ WellsModel: Skye E700Run #: 1Job #: 22-751Tracking #: 97Technician: AKDate: 1/18/2022

Elapsed Time (min)	Temperature Data (°F)						
	FB Top	FB Bottom	FB Back	FB Left	FB Right	Stove Surface Average	Catalyst Exit
49	687	110	123	344	358	324.4	N/A
50	693	111	126	351	363	328.7	N/A
51	698	113	128	358	368	332.9	N/A
52	702	115	131	364	372	336.8	N/A
53	705	117	134	371	377	340.8	N/A
54	708	119	137	377	381	344.4	N/A
55	710	122	140	382	386	347.9	N/A
56	713	124	143	388	389	351.3	N/A
57	715	126	146	393	393	354.5	N/A
58	717	128	148	398	397	357.4	N/A
59	718	130	150	402	400	360.1	N/A
60	719	132	152	406	403	362.4	N/A
61	719	134	154	409	406	364.1	N/A
62	717	136	155	412	408	365.6	N/A
63	714	138	156	416	410	366.7	N/A
64	711	141	156	418	412	367.6	N/A
65	707	143	157	421	413	368.0	N/A
66	703	144	159	423	414	368.6	N/A
67	699	146	160	425	415	369.1	N/A
68	694	148	162	427	416	369.3	N/A
69	688	150	163	429	417	369.3	N/A
70	682	153	164	431	417	369.2	N/A
71	675	155	165	432	417	368.7	N/A
72	668	157	166	433	416	368.0	N/A
73	660	159	167	434	415	367.1	N/A
74	651	161	168	434	414	365.8	N/A
75	642	164	171	434	413	364.6	N/A
76	633	168	176	434	411	364.2	N/A
77	623	172	180	433	409	363.4	N/A
78	614	175	185	431	407	362.4	N/A
Average	520	100	110	273	279	256	N/A

LAB SAMPLE DATA - ASTM E2515

Client: AJ WellsJob #: 22-751Model: Skye E700Tracking #: 97Run #: 1Technician: AKDate: 1/18/2022

		Sample ID	Tare, mg	Final, mg	Catch, mg
Filters	A - 1st Hour	H0088	187.4	188.8	1.4
	B	H0089	184.8	186.3	1.5
	C - Post 1st Hour	H0090	186.2	186.3	0.1
	Amb	H0091	186.8	186.9	0.1
Probes	A - 1st Hour	1A	115624.9	115624.9	0.0
	B	1B	115900.1	115900.1	0.0
	C - Post 1st Hour	1C	116431.8	116431.8	0.0
O-rings	A - 1st Hour	1A	3567.9	3568.0	0.1
	B	1B	3556.1	3556.2	0.1
	C - Post 1st Hour	1C	4168.2	4168.3	0.1

Placed in Dessicator on: 1/18/2022

Filters	A - 1st Hour	188.9	1/20 15:57	188.8	1/21 15:57				
	B	186.4	1/20 15:57	186.3	1/21 15:57				
	C - Post 1st Hour	186.5	1/20 15:55	186.2	1/21 15:57	186.3	1/24 11:31		
	Amb	187.0	1/20 15:55	186.9	1/21 15:57				
Probes	A - 1st Hour	115624.9	1/20 15:57	115624.9	1/21 15:58				
	B	115900.1	1/20 15:55	115900.1	1/21 15:58				
	C - Post 1st Hour	116431.8	1/20 15:56	116431.8	1/21 15:58				
O-Rings	A - 1st Hour	3568.0	1/20 15:56	3568.0	1/21 15:58				
	B	3556.3	1/20 15:57	3556.2	1/21 15:58				
	C - Post 1st Hour	4168.4	1/20 15:56	4168.3	1/21 15:58				

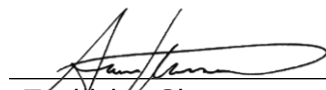
Train A Sub-total, mg	1.5
Train C Sub-Total, mg:	0.2
Train 1 Aggregate, mg:	1.7
Train 2 Aggregate, mg:	1.6
Ambient Aggregate, mg:	0.1

WOOD STOVE TEST DATA PACKET
ASTM E3053/E2515



Run 2 Data Summary

Client: AJ Wells
Model: Skye E700
Job #: 22-751
Tracking #: 97
Test Date: 1/18/2022



Technician Signature

3/14/2022

Date

TEST RESULTS - ASTM E3053 / ASTM E2515

Client: AJ WellsModel: Skye E700Run #: 2Job #: 22-751Tracking #: 97Technician: AKDate: 1/18/2022

Burn Rate (kg/hr):	0.72
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	Ambient Sample	Sample Train A	Sample Train B	1st Hour Filter
Total Sample Volume (ft ³)	45.715	31.163	31.408	8.779
Average Gas Velocity in Dilution Tunnel (ft/sec)	9.60			
Average Gas Flow Rate in Dilution Tunnel (dscf/hr)	26392.4			
Average Gas Meter Temperature (°F)	63.6	90.1	87.6	86.2
Total Sample Volume (dscf)	46.350	30.661	30.553	8.699
Average Tunnel Temperature (°F)	76.9			
Total Time of Test (min)	211			
Total Particulate Catch (mg)	0.0	1.2	1.1	1.0
Particulate Concentration, dry-standard (g/dscf)	0.0000000	0.0000391	0.0000360	0.0001150
Total PM Emissions (g)	0.00	3.63	3.34	3.03
Particulate Emission Rate (g/hr)	0.00	1.03	0.95	3.03
Emissions Factor (g/kg)	-	1.43	1.32	-
Difference from Average Total Particulate Emissions (g)	-	0.15	0.15	-
Difference from Average Total Particulate Emissions (%)	-	4.2%	4.2%	-
Difference from Average Emissions Factor (g/kg)	-	0.06	0.06	-

Final Average Results	
Total Particulate Emissions (g)	3.49
Particulate Emission Rate (g/hr)	0.99
Emissions Factor (g/kg)	1.38
HHV Efficiency (%)	78.0%
LHV Efficiency (%)	83.4%
CO Emissions (g/min)	0.55

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: 80.6 / Max: 85.1	OK
Face Velocity	< 30 ft/min	8.2	OK
Leakage Rate	Less than 4% of average sample rate	0 cfm	OK
Ambient Temp	55-90 °F	Min: 60.7 / Max: 66.1	OK
Negative Probe Weight Evaluation	<5% of Total Catch	Probe Catch Not Negative	OK
Pro-Rate Variation	90% of readings between 90-110%; none greater than 120% or less than 80%	See Data Tabs	OK

B415.1 Efficiency Results

Manufacturer: AJ Wells
Model: Skye E700
Date: 01/18/22
Run: 2
Control #: 22-751
Test Duration: 211
Output Category: Low

Test Results in Accordance with CSA B415.1-09

	HHV Basis	LHV Basis
Overall Efficiency	78.0%	83.4%
Combustion Efficiency	97.2%	97.2%
Heat Transfer Efficiency	80.2%	85.8%

Output Rate (kJ/h)	11,090	10,520	(Btu/h)
Burn Rate (kg/h)	0.71	1.57	(lb/h)
Input (kJ/h)	14,228	13,496	(Btu/h)

Test Load Weight (dry kg)	2.51	5.52	dry lb
MC wet (%)	17.66		
MC dry (%)	21.45		
Particulate (g)	3.49		
CO (g)	117		
Test Duration (h)	3.52		

Emissions	Particulate	CO
g/MJ Output	0.09	3.00
g/kg Dry Fuel	1.39	46.68
g/h	0.99	33.27
g/min	0.02	0.55
lb/MM Btu Output	0.21	6.97

Air/Fuel Ratio (A/F)	21.86
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VERSION:

2.2

12/14/2009

HIGH FIRE FUEL LOAD DATA - ASTM E3053

Client: AJ WellsJob #: 22-751Model: Skye E700Tracking # 97Run #: 2Technician: AKDate: 1/18/2022

Nominal Loading Density (lbs/ft³, wet basis): 10
 Usable Firebox Volume (ft³): 0.58
 Target Load Weight (lbs): 5.77
 Total Load Weight Range (lbs): 5.50 to 6.10
 Core Load Weight Range (lbs): 2.60 to 3.70
 Remainder Load Weight Range (lbs): 2.00 to 3.20
 Core Load Piece Range (lbs): 0.90 to 1.40
 Remainder Load Piece Range (lbs): 0.60 to 3.20
 Max Allowable Kindling Weight (lbs): 1.15
 Max Allowable Start-up Fuel Weight (lbs): 1.73

CORE LOAD DATA

Piece #	Length (in)	Weight (lbs)	Within Spec?	Fuel Piece Moisture Readings (%DB)				Within Spec?	Dry Weight	
				1	2	3	Ave.		lbs	kg
1	12.00	1.10	In Range	19.6	20.6	18.3	19.5	In Range	0.92	0.42
2	12.00	0.93	In Range	19.5	18.5	19.8	19.3	In Range	0.78	0.35
3	12.00	1.28	In Range	19.5	20.4	25.3	21.7	In Range	1.05	0.48
Core Load Wt. (lbs)		3.31	In Range							

REMAINDER LOAD DATA (1 to 3 Pieces)

Piece #	Length (in)	Weight (lbs)	Within Spec?	Fuel Piece Moisture Readings (%DB)				Within Spec?	Dry Weight	
				1	2	3	Ave.		lbs	kg
1	12.00	1.13	In Range	18.8	22.7	20.3	20.6	In Range	0.94	0.43
2	12.00	1.31	In Range	23.2	18.3	19.7	20.4	In Range	1.09	0.49
3			NA				NA	NA	NA	NA
Remainder Load (lbs)		2.44	In Range							

Total Load Weight (lbs): 5.75 In Range
 Core Load % of Total Weight: 58% In Range 45-65%
 Remainder % of Total Weight: 42% In Range 35-55%
 Total Load % of Target Weight: 100% In Range 95-105%
 Actual Fuel Loading Density (lb/ft³): 10.0
 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): 4.78 lbs 2.17 kg

KINDLING AND START-UP FUEL

Kindling Weight (lbs)	Within Spec?	Kindling Moisture Readings (%DB)				Within Spec?	Dry Weight	
		1	2	3	Avg.		lbs	kg
1.00	In Range	10	10	10	10.0	In Range	0.91	0.41

Start-up Fuel Wt. (lb)	Within Spec?	Start-up Moisture Readings (%DB)				Within Spec?	Dry Weight	
		1	2	3	Avg.		lbs	kg
1.69	In Range	23.5	21.7	19	21.4	In Range	1.39	0.63

TEST FUEL LOADING RANGE

Allowable Residual Start-up Fuel Range (lb): 0.58 to 1.15
 Actual Residual Start-up Fuel Weight (lb): 0.58 In Range

HIGH FIRE FUEL LOAD DATA - ASTM E3053

Client: AJ Wells
Model: Skye E700
Run #: 2

Job #: 22-751
Tracking #: 97
Technician: AK
Date: 1/18/2022

LOW & MEDIUM FIRE FUEL LOAD DATA - ASTM E3053

Client: AJ Wells
 Model: Skye E700
 Run #: 2

Job #: 22-751
 Tracking # 97
 Technician: AK
 Date: 1/18/2022

Nominal Loading Density (lbs/ft³, wet basis): 12
 Usable Firebox Volume (ft³): 0.58
 Target Load Weight (lbs): 6.92
 Total Load Weight Range (lbs): 6.57 to 7.27
 Core Load Weight Range (lbs): 3.11 to 4.50
 Remainder Load Weight Range (lbs): 2.42 to 3.81
 Core Load Piece Range (lbs): 1.04 to 1.73
 Remainder Load Piece Range (lbs): 0.69 to 2.08

CORE LOAD DATA

Piece #	Length (in)	Weight (lbs)	Within Spec?	Fuel Piece Moisture Readings (%DB)				Within Spec?	Dry Weight	
				1	2	3	Ave.		lbs	kg
1	12.00	1.27	In Range	19.4	19.5	20.6	19.8	In Range	1.06	0.48
2	12.00	1.12	In Range	24.9	23.4	20.2	22.8	In Range	0.91	0.41
3	12.00	1.05	In Range	18.9	20.5	20.2	19.9	In Range	0.88	0.40
Core Load Wt. (lbs)		3.44	In Range							

REMAINDER LOAD DATA (2 to 3 Pieces)

Piece #	Length (in)	Weight (lbs)	Within Spec?	Fuel Piece Moisture Readings (%DB)				Within Spec?	Dry Weight	
				1	2	3	Ave.		lbs	kg
1	12.00	0.90	In Range	22.8	18.3	18.7	19.9	In Range	0.75	0.34
2	12.00	1.00	In Range	26.7	24.3	18.9	23.3	In Range	0.81	0.37
3	12.00	1.43	In Range	25.3	23.2	19.7	22.7	In Range	1.17	0.53
Remainder Load (lbs)		3.33	In Range							

Remainder Load Small/Large Piece Weight Ratio: 63% In Range ≤ 67%
 Total Load Weight (lbs): 6.77 In Range
 Core Load % of Total Weight: 51% In Range 45-65%
 Remainder % of Total Weight: 49% In Range 35-55%
 Total Load % of Target Weight: 98% In Range 95-105%
 Actual Fuel Loading Density (lb/ft³): 11.7
 Total Load Average Moisture Content (%DB): 21.5 In Range 19-25%
 Total Load Average Moisture Content (%WB): 17.7
 Total Test Load Weight (dry basis): 5.57 lbs 2.53 kg

TEST FUEL LOADING RANGE

Allowable Charcoal Bed Weight Range (lb): 0.73 to 1.30
 Actual Charcoal Bed Wt. (lb): 0.94 In Range

TEST END POINT

Actual Fuel Load Ending Weight (lb): 0.00 Valid Test (≥90%)

Total Fuel Burned During Test Run:
 6.8 lbs, wet basis
 5.6 lbs, dry basis
 2.53 kg, dry basis

DILUTION TUNNEL & MISC. DATA - ASTM E3053 / E2515

Client: AJ Wells
 Model: Skye E700
 Run #: 2
 Test Start Time: 13:27
 Test End Time: 16:58
 Test Type: Low Fire

Job #: 22-751
 Tracking #: 97
 Technician: AK
 Date: 1/18/2022

Recording Interval (min): 1
 Total Sampling Time (min): 211

Meter Box γ Factor: 1.011 (A)
 Meter Box γ Factor: 0.995 (B)
 Meter Box γ Factor: 0.997 (Ambient)

Induced Draft Check (in. H₂O): 0
 Smoke Capture Check (%): 100
 Date Flue Pipe Last Cleaned: 1/17/2022

	Pre-Test	Post Test	Avg.
Barometric Pressure (in. Hg)	30.15	30.22	30.19
Relative Humidity (%)	61.0	63.0	
Room Air Velocity (ft/min)	<50	<50	
Scale Audit (lbs)	10.0	10.0	
Ambient Sample Volume:		45.715	ft ³

Sample Train Post-Test Leak Checks			
(A)	0.000	cfm @	-7 in. Hg
(B)	0.000	cfm @	-6 in. Hg
(C)	0.000	cfm @	-7 in. Hg
(Ambient)	0.001	cfm @	-10

DILUTION TUNNEL FLOW

Traverse Data		
Point	dP (in H ₂ O)	Temp (°F)
1	0.018	65
2	0.024	65
3	0.026	65
4	0.026	65
5	0.022	65
6	0.016	65
7	0.018	65
8	0.022	65
9	0.026	65
10	0.028	65
11	0.026	65
12	0.014	65
Center	0.033	65

Dilution Tunnel H₂O: 2.00 percent
 Tunnel Diameter: 12 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: 0.7854 ft²

V_{strav} : 9.75 ft/sec
 V_{scent} : 11.96 ft/sec
 F_p : 0.815 [ratio]
 Initial Tunnel Flow: 456.5 scf/min

Static Pressure: -0.080 in. H₂O

GAS ANALYZER CALIBRATION

Boottle Concentrations

	Span	Mid
CO ₂	17.08	10.09
CO	4.310	2.530

Pre Test

Post Test -- 1/19/22

	Zero	Span	Mid	Zero	Span	Mid
Time	10:10	10:20	10:15	8:35	8:40	8:42
CO ₂	0.00	17.09	10.10	0.02	17.11	10.25
CO	0.000	4.310	2.550	0.005	4.326	2.544

TEST NOTES

Air setting	1/5 (min)
Door	Closed at 1 minute
1 Hour Sample	Changed train A at 60 minutes

DILUTION TUNNEL & MISC. DATA - ASTM E3053 / E2515

Client: AJ Wells
 Model: Skye E700
 Run #: 2
 Test Start Time: 13:27
 Test End Time: 16:58
 Test Type: Low Fire

Job #: 22-751
 Tracking #: 97
 Technician: AK
 Date: 1/18/2022

Recording Interval (min): 1
 Total Sampling Time (min): 211

Meter Box γ Factor: 1.011 (A)
 Meter Box γ Factor: 0.995 (B)
 Meter Box γ Factor: 0.997 (Ambient)

Induced Draft Check (in. H₂O): 0
 Smoke Capture Check (%): 100
 Date Flue Pipe Last Cleaned: 1/17/2022

	Pre-Test	Post Test	Avg.
Barometric Pressure (in. Hg)	30.15	30.22	30.19
Relative Humidity (%)	61.0	63.0	
Room Air Velocity (ft/min)	<50	<50	
Scale Audit (lbs)	10.0	10.0	
Ambient Sample Volume:		45.715	ft ³

Sample Train Post-Test Leak Checks

(A)	0.000	cfm @	-7	in. Hg
(B)	0.000	cfm @	-6	in. Hg
(C)	0.000	cfm @	-7	in. Hg

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, Yellow	49.80	6.50	43.40	0.30	20.12	8656
	Doug Fir (Coast, Int. West)	48.73	6.87	43.90	0.50	19.81	8522
	Doug Fir (Int. 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
	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 Long Leaf	52.60	7.02	40.10	1.30	22.30	9594

WOODSTOVE PREBURN DATA

Client: AJ Wells
Model: Skye E700
Run #: 2

Job #: 22-751
Tracking #: 97
Technician: AK
Date: 1/18/2022

Low Fire performed as a continuation of High Fire Test, see Run 1 test data for details

WOODSTOVE PREBURN DATA

Client: AJ Wells
Model: Skye E700
Run #: 2

Job #: 22-751
Tracking #: 97
Technician: AK
Date: 1/18/2022

Low Fire performed as a continuation of High Fire Test, see Run 1 test data for details

WOODSTOVE PREBURN DATA

Client: AJ Wells
Model: Skye E700
Run #: 2

Job #: 22-751
Tracking #: 97
Technician: AK
Date: 1/18/2022

Low Fire performed as a continuation of High Fire Test, see Run 1 test data for details

WOODSTOVE PREBURN DATA

Client: AJ Wells
Model: Skye E700
Run #: 2

Job #: 22-751
Tracking #: 97
Technician: AK
Date: 1/18/2022

Low Fire performed as a continuation of High Fire Test, see Run 1 test data for details

WOODSTOVE PREBURN DATA

Client: AJ Wells
Model: Skye E700
Run #: 2

Job #: 22-751
Tracking #: 97
Technician: AK
Date: 1/18/2022

Low Fire performed as a continuation of High Fire Test, see Run 1 test data for details

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: AJ WellsJob #: 22-751Model: Skye E700Tracking #: 97Run #: 2Technician: AKDate: 1/18/2022

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
0	0.000		1.82	83.8	1.52		85	-0.040	3.63	0.36
1	0.137	0.137	2.24	83.3	1.45	92	82	-0.050	2.93	0.35
2	0.287	0.150	2.22	82.9	1.58	103	82	-0.070	1.91	0.27
3	0.434	0.147	2.22	82.6	1.64	99	81	-0.070	4.78	0.65
4	0.583	0.149	2.21	82.4	1.73	102	81	-0.070	7.03	0.61
5	0.730	0.147	2.21	82.3	1.41	101	81	-0.070	6.70	0.31
6	0.880	0.150	2.21	82.4	1.47	101	82	-0.070	7.62	0.32
7	1.026	0.146	2.21	82.3	1.37	100	83	-0.070	7.84	0.24
8	1.176	0.150	2.21	82.2	1.29	101	83	-0.070	7.47	0.16
9	1.322	0.146	2.21	82.4	1.32	99	84	-0.070	7.03	0.13
10	1.473	0.151	2.21	82.4	1.3	102	84	-0.070	6.92	0.13
11	1.618	0.145	2.21	82.4	1.7	98	84	-0.070	6.99	0.13
12	1.768	0.150	2.22	82.5	1.3	101	84	-0.070	7.48	0.12
13	1.914	0.146	2.21	82.5	1.37	100	84	-0.070	7.96	0.13
14	2.064	0.150	2.21	82.5	1.5	103	85	-0.080	7.75	0.13
15	2.210	0.146	2.21	82.6	1.33	102	85	-0.070	7.76	0.13
16	2.361	0.151	2.22	82.7	1.35	104	85	-0.080	7.77	0.13
17	2.507	0.146	2.21	82.8	1.35	100	85	-0.080	7.86	0.14
18	2.657	0.150	2.22	82.8	1.49	103	85	-0.080	7.85	0.12
19	2.804	0.147	2.22	83	1.73	101	84	-0.070	7.88	0.10
20	2.954	0.150	2.22	83	1.44	103	85	-0.080	7.88	0.10
21	3.101	0.147	2.22	83.6	1.53	101	85	-0.070	7.95	0.10
22	3.250	0.149	2.22	84	1.35	102	85	-0.080	8.05	0.11
23	3.398	0.148	2.22	83.9	1.58	105	85	-0.080	8.13	0.13
24	3.547	0.149	2.22	84.4	1.72	104	85	-0.080	8.12	0.11
25	3.695	0.148	2.21	84.4	1.72	103	85	-0.080	7.91	0.10
26	3.842	0.147	2.22	84.5	1.35	102	85	-0.080	7.76	0.07
27	3.991	0.149	2.22	84.8	1.59	103	85	-0.070	7.73	0.07
28	4.138	0.147	2.21	85.1	1.73	100	85	-0.080	7.77	0.07
29	4.288	0.150	2.21	85.2	1.35	104	85	-0.070	7.87	0.08
30	4.436	0.148	2.22	84.9	1.74	101	84	-0.070	8.08	0.13
31	4.586	0.150	2.22	84.7	1.61	102	84	-0.060	8.18	0.20
32	4.732	0.146	2.21	84.4	1.74	98	84	-0.060	8.16	0.36

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: AJ WellsJob #: 22-751Model: Skye E700Tracking #: 97Run #: 2Technician: AKDate: 1/18/2022

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
33	4.883	0.151	2.21	84.5	1.38	103	84	-0.060	7.88	0.55
34	5.029	0.146	2.22	84.4	1.47	101	84	-0.060	7.76	0.55
35	5.181	0.152	2.21	84.3	1.75	104	84	-0.060	7.95	0.32
36	5.326	0.145	2.21	84.4	1.35	99	84	-0.060	8.12	0.39
37	5.477	0.151	2.21	84.3	1.68	103	84	-0.060	8.16	0.61
38	5.623	0.146	2.21	84.4	1.76	100	84	-0.060	7.91	0.83
39	5.774	0.151	2.21	84.4	1.58	103	84	-0.060	8.26	0.47
40	5.920	0.146	2.21	84.4	1.76	101	85	-0.060	8.10	0.45
41	6.071	0.151	2.21	84.5	1.76	105	84	-0.060	7.90	0.47
42	6.216	0.145	2.21	84.6	1.4	97	84	-0.060	7.81	0.41
43	6.366	0.150	2.20	84.7	1.45	102	84	-0.060	7.83	0.33
44	6.513	0.147	2.20	84.8	1.32	99	84	-0.060	7.86	0.29
45	6.664	0.151	2.21	84.7	1.49	101	84	-0.060	7.68	0.22
46	6.811	0.147	2.21	84.6	1.75	100	84	-0.070	7.58	0.16
47	6.961	0.150	2.21	84.8	1.33	102	84	-0.060	7.54	0.19
48	7.107	0.146	2.20	84.9	1.71	98	84	-0.070	7.51	0.24
49	7.258	0.151	2.21	84.9	1.72	103	84	-0.070	7.46	0.26
50	7.405	0.147	2.21	85.1	1.36	100	84	-0.070	7.36	0.29
51	7.555	0.150	2.21	85.2	1.7	102	84	-0.060	7.33	0.28
52	7.702	0.147	2.21	85.4	1.67	99	84	-0.060	7.22	0.26
53	7.851	0.149	2.20	85.5	1.58	102	84	-0.060	7.09	0.20
54	7.999	0.148	2.20	85.6	1.54	99	84	-0.060	6.97	0.16
55	8.148	0.149	2.21	85.8	1.62	102	84	-0.060	7.06	0.21
56	8.296	0.148	2.20	85.8	1.5	101	84	-0.060	7.07	0.30
57	8.444	0.148	2.20	85.9	1.35	101	84	-0.060	6.91	0.22
58	8.592	0.148	2.20	85.9	1.47	101	84	-0.060	6.85	0.18
59	8.740	0.148	2.19	86	1.53	101	84	-0.060	6.73	0.16
60	8.889	0.149	2.20	86.1	1.75	100	84	-0.060	6.68	0.12
61	9.037	0.148	2.20	86.3	1.77	101	84	-0.060	6.35	0.10
62	9.187	0.150	2.20	86.4	1.38	102	84	-0.060	5.76	0.07
63	9.333	0.146	2.19	86.4	1.77	98	84	-0.060	5.44	0.06
64	9.484	0.151	2.20	86.5	1.64	103	84	-0.060	5.37	0.05
65	9.630	0.146	2.20	86.5	1.68	99	84	-0.060	5.23	0.06

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: AJ WellsJob #: 22-751Model: Skye E700Tracking #: 97Run #: 2Technician: AKDate: 1/18/2022

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
66	9.782	0.152	2.20	86.5	1.37	103	84	-0.060	4.95	0.07
67	9.927	0.145	2.20	86.5	1.38	99	84	-0.060	4.76	0.07
68	10.078	0.151	2.19	86.6	1.77	101	84	-0.060	4.67	0.09
69	10.224	0.146	2.20	86.5	1.38	99	84	-0.060	4.57	0.10
70	10.375	0.151	2.20	86.6	1.74	103	84	-0.050	4.55	0.10
71	10.521	0.146	2.20	86.8	1.45	98	84	-0.050	4.37	0.10
72	10.672	0.151	2.20	87	1.7	102	84	-0.050	4.71	0.18
73	10.818	0.146	2.20	87.1	1.41	99	84	-0.040	4.79	0.23
74	10.969	0.151	2.20	87.1	1.41	101	84	-0.040	4.75	0.36
75	11.115	0.146	2.19	87.3	1.39	99	84	-0.040	4.49	0.46
76	11.266	0.151	2.20	87.3	1.37	102	84	-0.040	4.50	0.47
77	11.413	0.147	2.20	87.5	1.72	98	84	-0.040	4.56	0.44
78	11.564	0.151	2.21	87.6	1.42	102	84	-0.040	4.68	0.44
79	11.710	0.146	2.20	87.6	1.39	97	84	-0.040	4.73	0.44
80	11.861	0.151	2.20	87.7	1.46	102	84	-0.040	4.65	0.41
81	12.008	0.147	2.21	87.7	1.5	98	84	-0.040	4.84	0.43
82	12.159	0.151	2.21	87.7	1.75	102	84	-0.030	4.74	0.42
83	12.306	0.147	2.20	87.8	1.73	98	84	-0.030	4.69	0.41
84	12.457	0.151	2.20	87.9	1.73	102	84	-0.030	4.68	0.41
85	12.604	0.147	2.21	88	1.73	98	84	-0.030	4.84	0.42
86	12.754	0.150	2.20	88	1.41	101	84	-0.030	4.79	0.42
87	12.902	0.148	2.20	87.9	1.53	100	84	-0.030	4.61	0.40
88	13.052	0.150	2.20	87.8	1.6	101	84	-0.030	4.72	0.41
89	13.200	0.148	2.20	87.9	1.69	100	84	-0.030	4.72	0.41
90	13.349	0.149	2.20	87.9	1.75	100	84	-0.030	4.79	0.42
91	13.498	0.149	2.20	87.9	1.7	99	84	-0.030	4.61	0.41
92	13.647	0.149	2.21	88.1	1.66	100	84	-0.030	4.80	0.42
93	13.795	0.148	2.20	88.2	1.62	98	84	-0.030	4.79	0.42
94	13.943	0.148	2.21	88.3	1.63	100	84	-0.030	4.62	0.41
95	14.093	0.150	2.20	88.3	1.51	101	84	-0.030	4.82	0.41
96	14.241	0.148	2.20	88.4	1.61	100	84	-0.030	4.88	0.42
97	14.391	0.150	2.20	88.5	1.39	99	84	-0.030	4.74	0.42
98	14.539	0.148	2.21	88.6	1.74	100	84	-0.030	4.66	0.41

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: AJ WellsJob #: 22-751Model: Skye E700Tracking #: 97Run #: 2Technician: AKDate: 1/18/2022

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
99	14.690	0.151	2.21	88.6	1.58	102	84	-0.030	4.71	0.42
100	14.837	0.147	2.21	88.6	1.36	99	84	-0.030	4.85	0.43
101	14.988	0.151	2.21	88.5	1.38	102	84	-0.030	4.69	0.41
102	15.135	0.147	2.21	88.7	1.39	97	84	-0.030	4.62	0.41
103	15.286	0.151	2.21	88.8	1.45	100	84	-0.030	4.74	0.41
104	15.434	0.148	2.22	88.8	1.39	100	84	-0.030	4.60	0.40
105	15.585	0.151	2.21	88.7	1.38	102	84	-0.030	4.70	0.41
106	15.732	0.147	2.21	88.8	1.57	99	84	-0.030	4.69	0.41
107	15.884	0.152	2.21	88.8	1.38	102	84	-0.030	4.90	0.42
108	16.031	0.147	2.21	88.7	1.6	101	84	-0.030	4.79	0.42
109	16.182	0.151	2.21	88.6	1.39	100	84	-0.030	4.79	0.42
110	16.328	0.146	2.21	88.5	1.49	98	84	-0.030	4.92	0.42
111	16.480	0.152	2.21	88.6	1.71	102	84	-0.030	4.80	0.41
112	16.627	0.147	2.21	88.5	1.37	97	84	-0.030	4.72	0.39
113	16.779	0.152	2.21	88.7	1.71	102	84	-0.020	4.74	0.38
114	16.925	0.146	2.21	88.6	1.42	97	84	-0.020	4.77	0.39
115	17.077	0.152	2.20	88.7	1.4	102	84	-0.030	4.77	0.38
116	17.223	0.146	2.21	88.7	1.57	97	84	-0.030	4.72	0.38
117	17.375	0.152	2.21	88.8	1.54	102	84	-0.020	4.84	0.39
118	17.522	0.147	2.21	88.7	1.38	99	84	-0.030	4.86	0.38
119	17.673	0.151	2.21	88.7	1.46	102	84	-0.020	4.77	0.38
120	17.819	0.146	2.20	88.8	1.66	98	84	-0.020	4.83	0.39
121	17.971	0.152	2.21	88.8	1.38	102	84	-0.030	4.81	0.39
122	18.118	0.147	2.20	88.8	1.5	97	84	-0.020	4.80	0.40
123	18.269	0.151	2.20	88.9	1.5	102	84	-0.020	4.77	0.40
124	18.416	0.147	2.21	89	1.66	99	84	-0.020	4.88	0.41
125	18.568	0.152	2.21	89	1.54	102	84	-0.020	4.80	0.40
126	18.715	0.147	2.21	89.1	1.64	97	84	-0.020	4.65	0.39
127	18.866	0.151	2.21	89.2	1.39	101	84	-0.020	4.52	0.38
128	19.013	0.147	2.21	89.1	1.54	97	84	-0.020	4.34	0.38
129	19.164	0.151	2.21	89.2	1.38	101	84	-0.020	4.33	0.37
130	19.312	0.148	2.21	89.2	1.72	99	84	-0.020	4.36	0.37
131	19.463	0.151	2.21	89.1	1.53	101	84	-0.020	4.38	0.38

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: AJ WellsJob #: 22-751Model: Skye E700Tracking #: 97Run #: 2Technician: AKDate: 1/18/2022

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
132	19.610	0.147	2.21	89	1.72	99	84	-0.020	4.48	0.38
133	19.761	0.151	2.22	88.9	1.61	101	84	-0.020	4.42	0.37
134	19.909	0.148	2.21	89.1	1.41	99	84	-0.020	4.47	0.38
135	20.060	0.151	2.21	89.4	1.42	100	84	-0.020	4.46	0.37
136	20.208	0.148	2.21	89.8	1.4	99	84	-0.020	4.44	0.38
137	20.359	0.151	2.21	90	1.43	101	84	-0.020	4.42	0.39
138	20.507	0.148	2.21	90.3	1.42	101	84	-0.020	4.44	0.39
139	20.657	0.150	2.21	90.5	1.38	102	84	-0.020	4.43	0.38
140	20.806	0.149	2.21	90.5	1.64	100	84	-0.020	4.40	0.37
141	20.956	0.150	2.21	90.1	1.56	100	84	-0.020	4.32	0.37
142	21.104	0.148	2.21	89.8	1.74	98	84	-0.020	4.49	0.38
143	21.254	0.150	2.21	89.6	1.48	99	84	-0.020	4.44	0.37
144	21.403	0.149	2.21	89.4	1.4	100	84	-0.020	4.59	0.38
145	21.553	0.150	2.21	89.2	1.59	101	84	-0.020	4.47	0.38
146	21.702	0.149	2.21	89.2	1.76	100	84	-0.020	4.51	0.39
147	21.851	0.149	2.21	89.1	1.44	100	84	-0.020	4.45	0.38
148	22.000	0.149	2.21	89.1	1.71	100	84	-0.020	4.50	0.38
149	22.149	0.149	2.21	89.1	1.75	98	84	-0.020	4.40	0.38
150	22.298	0.149	2.21	89.2	1.45	100	84	-0.020	4.45	0.39
151	22.446	0.148	2.21	89	1.76	99	84	-0.020	4.36	0.37
152	22.596	0.150	2.20	89.2	1.73	101	84	-0.020	4.34	0.36
153	22.744	0.148	2.20	89.1	1.39	99	84	-0.020	4.45	0.37
154	22.895	0.151	2.21	89	1.69	101	84	-0.020	4.50	0.38
155	23.043	0.148	2.20	88.9	1.68	99	84	-0.020	4.46	0.38
156	23.193	0.150	2.21	88.9	1.67	101	84	-0.020	4.38	0.38
157	23.341	0.148	2.21	88.9	1.38	98	84	-0.020	4.33	0.38
158	23.492	0.151	2.21	88.8	1.45	101	84	-0.020	4.38	0.39
159	23.640	0.148	2.21	89	1.58	99	84	-0.020	4.36	0.39
160	23.790	0.150	2.21	89.1	1.74	99	84	-0.020	4.39	0.39
161	23.938	0.148	2.21	89.2	1.41	98	84	-0.020	4.35	0.39
162	24.089	0.151	2.21	89.2	1.38	100	84	-0.020	4.29	0.37
163	24.237	0.148	2.21	89.2	1.75	99	84	-0.020	4.34	0.38
164	24.388	0.151	2.21	89.2	1.73	101	84	-0.020	4.38	0.38

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: AJ WellsJob #: 22-751Model: Skye E700Tracking #: 97Run #: 2Technician: AKDate: 1/18/2022

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
165	24.535	0.147	2.21	89.2	1.66	97	84	-0.020	4.40	0.39
166	24.687	0.152	2.21	89.2	1.65	100	84	-0.020	4.49	0.39
167	24.834	0.147	2.21	89.3	1.41	97	84	-0.020	4.30	0.39
168	24.986	0.152	2.21	89.4	1.41	100	84	-0.020	4.42	0.39
169	25.132	0.146	2.21	89.4	1.38	96	84	-0.020	4.38	0.39
170	25.284	0.152	2.20	89.5	1.76	100	84	-0.020	4.34	0.38
171	25.431	0.147	2.21	89.5	1.76	99	84	-0.020	4.27	0.38
172	25.582	0.151	2.21	89.6	1.65	100	84	-0.010	4.26	0.38
173	25.729	0.147	2.21	89.7	1.75	97	84	-0.020	4.29	0.37
174	25.881	0.152	2.21	89.8	1.4	100	85	-0.020	4.22	0.36
175	26.028	0.147	2.21	89.8	1.38	97	85	-0.020	4.21	0.36
176	26.179	0.151	2.21	89.8	1.71	100	84	-0.020	4.15	0.35
177	26.326	0.147	2.21	89.7	1.74	97	84	-0.020	4.14	0.37
178	26.478	0.152	2.21	89.7	1.42	100	84	-0.020	4.09	0.36
179	26.625	0.147	2.21	89.7	1.47	97	84	-0.020	4.04	0.36
180	26.777	0.152	2.21	89.7	1.58	102	84	-0.020	4.16	0.38
181	26.923	0.146	2.21	89.8	1.4	96	84	-0.020	4.06	0.37
182	27.075	0.152	2.21	89.8	1.62	100	84	-0.020	4.13	0.37
183	27.222	0.147	2.21	89.9	1.52	97	84	-0.020	4.02	0.37
184	27.373	0.151	2.20	90.1	1.6	101	84	-0.020	4.01	0.36
185	27.520	0.147	2.21	90.2	1.39	97	84	-0.020	3.95	0.36
186	27.672	0.152	2.21	90.2	1.74	102	84	-0.020	3.96	0.36
187	27.819	0.147	2.21	90.2	1.63	97	84	-0.020	3.93	0.35
188	27.971	0.152	2.21	90.2	1.39	100	84	-0.020	3.93	0.35
189	28.119	0.148	2.21	90.4	1.57	97	85	-0.020	4.02	0.35
190	28.270	0.151	2.22	90.4	1.37	99	85	-0.020	3.91	0.35
191	28.418	0.148	2.22	90.4	1.48	97	85	-0.020	3.92	0.35
192	28.569	0.151	2.22	90.5	1.38	99	85	-0.020	3.94	0.35
193	28.716	0.147	2.21	90.4	1.64	97	85	-0.020	4.02	0.36
194	28.867	0.151	2.21	90.5	1.37	99	85	-0.020	3.91	0.36
195	29.015	0.148	2.21	90.4	1.41	97	85	-0.020	3.98	0.36
196	29.166	0.151	2.21	90.6	1.44	99	84	-0.020	3.86	0.35
197	29.315	0.149	2.21	90.5	1.56	98	84	-0.020	3.75	0.35

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: AJ Wells
 Model: Skye E700
 Run #: 2

Job #: 22-751
 Tracking #: 97
 Technician: AK
 Date: 1/18/2022

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
198	29.466	0.151	2.22	90.5	1.44	101	84	-0.020	3.78	0.34
199	29.614	0.148	2.22	90.4	1.65	97	84	-0.020	3.67	0.34
200	29.765	0.151	2.22	90.3	1.39	99	84	-0.020	3.62	0.33
201	29.913	0.148	2.21	90.1	1.48	97	84	-0.020	3.65	0.33
202	30.064	0.151	2.21	90.2	1.68	99	84	-0.020	3.58	0.33
203	30.212	0.148	2.21	90.2	1.37	97	84	-0.020	3.65	0.33
204	30.363	0.151	2.21	90.1	1.61	99	84	-0.020	3.53	0.33
205	30.511	0.148	2.21	90.3	1.41	99	84	-0.020	3.52	0.33
206	30.662	0.151	2.21	90.4	1.43	99	84	-0.020	3.47	0.32
207	30.810	0.148	2.21	90.5	1.47	99	84	-0.020	3.49	0.32
208	30.960	0.150	2.21	90.6	1.58	99	84	-0.020	3.39	0.32
209	31.109	0.149	2.21	90.6	1.55	98	84	-0.020	3.40	0.31
210	31.259	0.150	2.21	90.6	1.5	99	85	-0.020	3.48	0.32
211	31.408	0.149	2.21	90.6	1.44	98	85	-0.020	3.39	0.31
Avg/Tot	31.408	0.149	2.21	88	1.54	100	84	-0.038	5.27	0.33

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: AJ Wells
 Model: Skye E700
 Run #: 2

Job #: 22-751
 Tracking #: 97
 Technician: AK
 Date: 1/18/2022

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft ³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
0	0.000		0.032	1.76	86.2	0.6		6.71		78	156	84	66
1	0.139	0.139	0.032	2.22	85.5	0.63	94	6.70	-0.01	80	178	84	65
2	0.288	0.149	0.031	2.20	85	0.62	103	6.57	-0.13	81	223	84	65
3	0.429	0.141	0.032	2.19	84.7	0.63	96	6.43	-0.14	82	268	83	65
4	0.578	0.149	0.031	2.19	84.5	0.62	103	6.33	-0.1	81	268	83	65
5	0.720	0.142	0.031	2.19	84.3	0.63	98	6.19	-0.14	82	286	83	65
6	0.868	0.148	0.032	2.18	84.2	0.63	101	6.06	-0.13	83	291	83	65
7	1.011	0.143	0.031	2.19	84.2	0.64	99	5.94	-0.12	83	288	84	65
8	1.158	0.147	0.032	2.19	84.3	0.67	100	5.83	-0.11	83	282	84	65
9	1.301	0.143	0.032	2.19	84.4	0.66	97	5.72	-0.11	83	282	84	65
10	1.448	0.147	0.032	2.19	84.4	0.63	100	5.61	-0.11	84	283	84	64
11	1.592	0.144	0.032	2.20	84.5	0.67	98	5.49	-0.12	84	287	84	65
12	1.738	0.146	0.032	2.20	84.5	0.64	100	5.35	-0.14	85	292	84	64
13	1.883	0.145	0.031	2.20	84.6	0.63	100	5.22	-0.13	85	295	84	64
14	2.030	0.147	0.031	2.21	84.6	0.64	102	5.09	-0.13	85	299	84	65
15	2.175	0.145	0.030	2.20	84.7	0.65	102	4.97	-0.12	86	302	84	64
16	2.321	0.146	0.031	2.21	84.8	0.63	101	4.84	-0.13	86	305	84	65
17	2.466	0.145	0.031	2.21	84.9	0.66	101	4.71	-0.13	86	308	84	64
18	2.612	0.146	0.031	2.21	84.9	0.67	101	4.59	-0.12	87	308	84	64
19	2.759	0.147	0.031	2.21	85	0.68	102	4.46	-0.13	87	312	84	64
20	2.905	0.146	0.031	2.22	85.1	0.65	101	4.33	-0.13	87	313	84	64
21	3.051	0.146	0.031	2.22	85.4	0.63	101	4.20	-0.13	87	316	84	64
22	3.197	0.146	0.031	2.23	85.8	0.67	101	4.07	-0.13	86	316	84	64
23	3.344	0.147	0.029	2.23	85.7	0.65	105	3.95	-0.12	86	314	84	63
24	3.490	0.146	0.030	2.22	86	0.66	103	3.83	-0.12	85	312	84	63
25	3.637	0.147	0.030	2.23	86.1	0.62	103	3.72	-0.11	85	309	84	62
26	3.783	0.146	0.030	2.23	86.2	0.63	102	3.61	-0.11	84	303	84	63
27	3.930	0.147	0.030	2.23	86.4	0.65	103	3.51	-0.1	84	297	84	62
28	4.077	0.147	0.031	2.23	86.6	0.68	101	3.40	-0.11	83	286	84	62
29	4.224	0.147	0.030	2.23	86.8	0.66	103	3.30	-0.1	82	274	84	62
30	4.370	0.146	0.031	2.23	86.7	0.67	100	3.21	-0.09	81	263	84	62
31	4.517	0.147	0.031	2.22	86.6	0.69	101	3.13	-0.08	82	251	84	62
32	4.663	0.146	0.032	2.22	86.5	0.64	99	3.04	-0.09	83	242	84	62

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: AJ Wells
 Model: Skye E700
 Run #: 2

Job #: 22-751
 Tracking #: 97
 Technician: AK
 Date: 1/18/2022

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft ³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
33	4.810	0.147	0.031	2.23	86.5	0.68	101	2.94	-0.1	83	235	84	62
34	4.957	0.147	0.030	2.22	86.5	0.65	103	2.87	-0.07	83	235	84	63
35	5.104	0.147	0.031	2.23	86.5	0.65	101	2.78	-0.09	83	233	84	62
36	5.250	0.146	0.031	2.22	86.5	0.67	101	2.69	-0.09	83	231	84	63
37	5.397	0.147	0.031	2.22	86.6	0.67	101	2.61	-0.08	83	230	84	63
38	5.544	0.147	0.031	2.23	86.7	0.69	101	2.52	-0.09	83	230	84	63
39	5.691	0.147	0.031	2.22	86.7	0.69	101	2.44	-0.08	82	227	84	63
40	5.837	0.146	0.030	2.22	86.8	0.68	102	2.35	-0.09	83	227	84	63
41	5.984	0.147	0.030	2.23	86.8	0.69	103	2.28	-0.07	83	226	84	63
42	6.131	0.147	0.032	2.23	86.9	0.64	100	2.20	-0.08	83	227	84	63
43	6.278	0.147	0.031	2.22	87	0.69	101	2.13	-0.07	83	229	84	63
44	6.425	0.147	0.032	2.24	87.1	0.66	100	2.05	-0.08	83	233	84	63
45	6.572	0.147	0.032	2.23	86.9	0.69	100	1.97	-0.08	83	237	84	63
46	6.720	0.148	0.031	2.24	86.8	0.65	102	1.90	-0.07	83	240	83	63
47	6.866	0.146	0.031	2.24	86.8	0.71	100	1.82	-0.08	82	241	83	63
48	7.014	0.148	0.032	2.24	86.9	0.65	100	1.74	-0.08	82	243	83	63
49	7.160	0.146	0.031	2.23	86.9	0.7	100	1.68	-0.06	82	240	83	63
50	7.308	0.148	0.031	2.23	87.1	0.65	102	1.60	-0.08	83	240	83	63
51	7.454	0.146	0.031	2.23	87.3	0.69	100	1.54	-0.06	83	239	83	63
52	7.602	0.148	0.032	2.22	87.6	0.67	100	1.47	-0.07	83	239	84	63
53	7.748	0.146	0.031	2.23	87.7	0.68	100	1.42	-0.05	83	238	84	63
54	7.896	0.148	0.032	2.23	87.9	0.68	100	1.35	-0.07	83	239	84	63
55	8.042	0.146	0.031	2.23	88.1	0.67	100	1.29	-0.06	84	242	84	63
56	8.190	0.148	0.031	2.23	88.2	0.68	102	1.23	-0.06	83	240	84	63
57	8.336	0.146	0.031	2.24	88.3	0.67	100	1.18	-0.05	83	238	84	63
58	8.484	0.148	0.031	2.22	88.4	0.7	102	1.14	-0.04	83	236	84	63
59	8.630	0.146	0.031	2.24	88.5	0.72	100	1.09	-0.05	83	235	84	63
60	8.779	0.149	0.032	2.25	88.6	0.71	101	1.06	-0.03	83	229	85	63
61	8.925	0.146	0.031	2.25	88.7	0.7	100	1.02	-0.04	83	226	82	63
62	9.073	0.148	0.031	2.24	88.8	0.68	102	0.99	-0.03	83	227	83	63
63	9.219	0.146	0.032	2.23	88.9	0.66	99	0.96	-0.03	83	228	81	63
64	9.368	0.149	0.031	2.23	89	0.68	102	0.94	-0.02	83	233	81	63
65	9.513	0.145	0.031	2.24	89	0.7	99	0.91	-0.03	83	236	81	63

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: AJ Wells
 Model: Skye E700
 Run #: 2

Job #: 22-751
 Tracking #: 97
 Technician: AK
 Date: 1/18/2022

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft ³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
66	9.663	0.150	0.031	2.23	88.9	0.67	103	0.88	-0.03	83	239	81	63
67	9.808	0.145	0.031	2.24	88.8	0.67	99	0.86	-0.02	83	243	81	63
68	9.957	0.149	0.032	2.24	88.8	0.7	101	0.83	-0.03	83	248	82	63
69	10.102	0.145	0.031	2.25	88.7	0.72	99	0.81	-0.02	83	251	82	62
70	10.252	0.150	0.031	2.24	88.8	0.67	103	0.80	-0.01	82	239	83	62
71	10.396	0.144	0.032	2.25	89	0.71	97	0.80	0	81	211	81	63
72	10.546	0.150	0.031	2.25	89.2	0.67	103	0.79	-0.01	80	191	81	63
73	10.691	0.145	0.031	2.25	89.4	0.7	99	0.78	-0.01	80	179	82	63
74	10.840	0.149	0.032	2.24	89.5	0.68	100	0.78	0	79	169	82	63
75	10.985	0.145	0.031	2.25	89.7	0.68	99	0.76	-0.02	79	161	83	62
76	11.136	0.151	0.031	2.25	89.8	0.67	103	0.76	0	78	155	83	62
77	11.280	0.144	0.032	2.24	89.8	0.7	97	0.75	-0.01	78	152	83	62
78	11.431	0.151	0.031	2.25	90	0.71	103	0.74	-0.01	78	149	83	62
79	11.575	0.144	0.032	2.26	90.1	0.69	97	0.73	-0.01	78	146	84	62
80	11.726	0.151	0.031	2.23	90.2	0.66	103	0.72	-0.01	78	145	84	63
81	11.870	0.144	0.032	2.24	90.3	0.71	97	0.71	-0.01	78	141	84	62
82	12.021	0.151	0.031	2.24	90.3	0.7	103	0.71	0	78	139	84	62
83	12.166	0.145	0.032	2.25	90.4	0.72	97	0.70	-0.01	77	138	84	62
84	12.318	0.152	0.031	2.25	90.5	0.71	103	0.68	-0.02	77	137	84	62
85	12.462	0.144	0.032	2.24	90.5	0.72	96	0.68	0	77	136	84	62
86	12.613	0.151	0.031	2.25	90.5	0.67	103	0.67	-0.01	76	134	84	62
87	12.758	0.145	0.031	2.25	90.5	0.67	99	0.66	-0.01	76	133	84	62
88	12.909	0.151	0.031	2.25	90.3	0.67	103	0.65	-0.01	77	131	83	62
89	13.054	0.145	0.031	2.24	90.3	0.68	99	0.64	-0.01	76	129	83	62
90	13.204	0.150	0.031	2.26	90.3	0.66	102	0.64	0	75	128	83	62
91	13.350	0.146	0.032	2.25	90.3	0.68	98	0.63	-0.01	75	128	83	61
92	13.500	0.150	0.031	2.26	90.2	0.69	102	0.62	-0.01	75	127	83	61
93	13.645	0.145	0.032	2.26	90.4	0.68	97	0.61	-0.01	75	125	83	61
94	13.795	0.150	0.031	2.26	90.6	0.68	102	0.60	-0.01	75	126	84	62
95	13.941	0.146	0.031	2.25	90.8	0.68	99	0.59	-0.01	75	125	84	62
96	14.090	0.149	0.031	2.26	90.9	0.73	101	0.59	0	75	124	84	62
97	14.237	0.147	0.032	2.26	91	0.68	98	0.57	-0.02	76	122	84	62
98	14.385	0.148	0.031	2.26	91.1	0.67	100	0.56	-0.01	76	122	84	62

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: AJ Wells
 Model: Skye E700
 Run #: 2

Job #: 22-751
 Tracking #: 97
 Technician: AK
 Date: 1/18/2022

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft ³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
99	14.533	0.148	0.031	2.25	91.1	0.66	100	0.56	0	75	122	84	61
100	14.681	0.148	0.031	2.25	91.2	0.68	100	0.55	-0.01	75	121	84	61
101	14.829	0.148	0.031	2.25	91.2	0.72	100	0.54	-0.01	75	120	84	61
102	14.977	0.148	0.032	2.26	91.3	0.69	99	0.54	0	74	119	84	61
103	15.126	0.149	0.032	2.25	91.4	0.73	99	0.53	-0.01	74	118	84	62
104	15.274	0.148	0.031	2.26	91.3	0.7	100	0.52	-0.01	75	117	84	62
105	15.423	0.149	0.031	2.26	91.3	0.67	101	0.52	0	75	116	84	62
106	15.570	0.147	0.031	2.25	91.4	0.67	100	0.51	-0.01	76	117	84	62
107	15.720	0.150	0.031	2.26	91.4	0.73	102	0.51	0	76	116	84	63
108	15.866	0.146	0.030	2.26	91.4	0.66	101	0.51	0	76	116	84	63
109	16.017	0.151	0.032	2.25	91.2	0.68	101	0.50	-0.01	75	117	84	63
110	16.162	0.145	0.031	2.26	91.1	0.68	98	0.50	0	74	116	84	63
111	16.312	0.150	0.031	2.26	91.1	0.69	102	0.49	-0.01	74	115	83	63
112	16.457	0.145	0.032	2.25	91.1	0.71	97	0.48	-0.01	74	114	83	62
113	16.608	0.151	0.031	2.26	91.1	0.74	102	0.48	0	73	114	83	62
114	16.753	0.145	0.032	2.26	91	0.73	97	0.47	-0.01	74	114	83	63
115	16.904	0.151	0.031	2.25	91.2	0.71	102	0.47	0	75	113	83	63
116	17.049	0.145	0.032	2.25	91.3	0.72	97	0.46	-0.01	75	113	84	63
117	17.200	0.151	0.031	2.26	91.4	0.69	102	0.46	0	75	113	84	63
118	17.345	0.145	0.031	2.26	91.4	0.67	98	0.45	-0.01	75	112	84	64
119	17.497	0.152	0.031	2.25	91.5	0.69	103	0.46	0.01	75	112	84	64
120	17.643	0.146	0.031	2.25	91.5	0.71	99	0.44	-0.02	75	112	84	64
121	17.794	0.151	0.031	2.25	91.6	0.68	102	0.43	-0.01	75	112	84	64
122	17.939	0.145	0.032	2.25	91.6	0.7	97	0.43	0	75	112	84	64
123	18.090	0.151	0.031	2.25	91.7	0.69	102	0.43	0	75	113	84	64
124	18.236	0.146	0.031	2.26	91.7	0.73	99	0.42	-0.01	74	113	84	65
125	18.386	0.150	0.031	2.26	91.7	0.73	102	0.42	0	74	112	84	65
126	18.532	0.146	0.032	2.26	91.7	0.73	97	0.41	-0.01	74	111	84	65
127	18.682	0.150	0.031	2.25	91.8	0.72	102	0.41	0	74	110	84	65
128	18.828	0.146	0.032	2.26	91.9	0.72	97	0.40	-0.01	74	110	84	65
129	18.978	0.150	0.031	2.26	91.9	0.7	101	0.40	0	74	109	84	65
130	19.125	0.147	0.031	2.26	91.9	0.7	99	0.39	-0.01	74	108	84	65
131	19.274	0.149	0.031	2.25	91.8	0.67	101	0.39	0	74	108	84	65

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: AJ Wells
 Model: Skye E700
 Run #: 2

Job #: 22-751
 Tracking #: 97
 Technician: AK
 Date: 1/18/2022

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft ³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
132	19.422	0.148	0.031	2.25	91.6	0.69	100	0.38	-0.01	74	108	83	65
133	19.571	0.149	0.031	2.26	91.6	0.66	101	0.37	-0.01	74	107	83	65
134	19.720	0.149	0.031	2.25	91.6	0.73	101	0.37	0	73	107	83	64
135	19.868	0.148	0.032	2.25	91.8	0.75	98	0.35	-0.02	72	107	83	63
136	20.018	0.150	0.031	2.26	92.1	0.68	101	0.34	-0.01	72	107	83	62
137	20.165	0.147	0.031	2.26	92.4	0.69	99	0.34	0	72	107	84	62
138	20.316	0.151	0.030	2.27	92.8	0.7	103	0.32	-0.02	72	107	84	61
139	20.462	0.146	0.030	2.28	93	0.7	100	0.32	0	72	106	84	61
140	20.612	0.150	0.031	2.27	93	0.68	101	0.31	-0.01	72	105	84	61
141	20.758	0.146	0.031	2.27	92.8	0.65	98	0.30	-0.01	72	105	84	62
142	20.909	0.151	0.032	2.27	92.6	0.72	100	0.30	0	73	105	84	62
143	21.055	0.146	0.032	2.26	92.5	0.66	97	0.30	0	74	106	84	63
144	21.206	0.151	0.031	2.25	92.4	0.73	102	0.30	0	74	106	84	63
145	21.351	0.145	0.031	2.25	92.3	0.69	98	0.29	-0.01	74	106	84	63
146	21.504	0.153	0.031	2.26	92.3	0.67	103	0.28	-0.01	74	105	84	63
147	21.649	0.145	0.031	2.26	92.2	0.71	98	0.28	0	74	105	84	63
148	21.800	0.151	0.031	2.26	92.2	0.68	102	0.28	0	73	105	84	64
149	21.946	0.146	0.032	2.25	92.3	0.68	97	0.27	-0.01	73	105	84	64
150	22.097	0.151	0.031	2.26	92.2	0.72	102	0.27	0	73	104	84	64
151	22.243	0.146	0.031	2.26	92.2	0.71	99	0.27	0	73	103	84	64
152	22.393	0.150	0.031	2.25	92.2	0.67	101	0.26	-0.01	73	103	84	64
153	22.539	0.146	0.031	2.27	92.2	0.74	99	0.26	0	73	103	84	64
154	22.689	0.150	0.031	2.26	92.1	0.69	101	0.25	-0.01	73	103	84	64
155	22.836	0.147	0.031	2.26	91.9	0.72	99	0.25	0	72	102	83	63
156	22.985	0.149	0.031	2.25	91.7	0.75	101	0.24	-0.01	72	102	83	64
157	23.133	0.148	0.032	2.26	91.8	0.72	98	0.23	-0.01	72	102	83	64
158	23.281	0.148	0.031	2.25	91.7	0.74	100	0.23	0	72	101	83	64
159	23.430	0.149	0.031	2.25	91.8	0.74	101	0.22	-0.01	72	102	83	64
160	23.579	0.149	0.032	2.25	91.9	0.75	99	0.22	0	72	101	83	64
161	23.728	0.149	0.032	2.25	92.1	0.69	99	0.21	-0.01	72	101	84	65
162	23.876	0.148	0.032	2.26	92.2	0.71	98	0.21	0	72	101	84	65
163	24.026	0.150	0.031	2.25	92.2	0.66	101	0.21	0	73	101	84	65
164	24.172	0.146	0.031	2.26	92.2	0.7	99	0.20	-0.01	73	101	84	65

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: AJ Wells
 Model: Skye E700
 Run #: 2

Job #: 22-751
 Tracking #: 97
 Technician: AK
 Date: 1/18/2022

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft ³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
165	24.323	0.151	0.032	2.27	92.3	0.75	100	0.19	-0.01	73	102	84	65
166	24.469	0.146	0.032	2.27	92.4	0.67	97	0.18	-0.01	73	101	84	65
167	24.619	0.150	0.032	2.26	92.4	0.74	100	0.18	0	73	102	84	65
168	24.764	0.145	0.032	2.26	92.6	0.7	96	0.17	-0.01	73	102	84	65
169	24.916	0.152	0.032	2.26	92.6	0.72	101	0.17	0	73	102	84	65
170	25.061	0.145	0.032	2.25	92.7	0.71	96	0.17	0	73	101	84	65
171	25.213	0.152	0.031	2.25	92.7	0.72	103	0.17	0	73	101	84	65
172	25.358	0.145	0.032	2.26	92.8	0.69	96	0.15	-0.02	73	101	84	65
173	25.511	0.153	0.032	2.25	92.8	0.68	102	0.15	0	73	100	84	65
174	25.657	0.146	0.032	2.26	92.9	0.72	97	0.15	0	73	100	84	65
175	25.808	0.151	0.032	2.26	92.9	0.67	100	0.14	-0.01	73	99	84	65
176	25.954	0.146	0.032	2.25	92.9	0.69	97	0.14	0	73	99	84	66
177	26.105	0.151	0.032	2.27	92.7	0.68	100	0.14	0	72	99	84	65
178	26.251	0.146	0.032	2.26	92.7	0.68	97	0.13	-0.01	72	98	84	65
179	26.401	0.150	0.032	2.27	92.6	0.72	100	0.12	-0.01	72	98	83	65
180	26.548	0.147	0.031	2.26	92.5	0.69	99	0.12	0	72	98	83	65
181	26.698	0.150	0.032	2.27	92.6	0.75	100	0.11	-0.01	72	97	83	65
182	26.845	0.147	0.032	2.26	92.7	0.7	98	0.11	0	72	98	83	66
183	26.994	0.149	0.032	2.26	92.8	0.71	99	0.11	0	72	98	84	66
184	27.144	0.150	0.031	2.26	93	0.72	101	0.10	-0.01	72	98	84	66
185	27.292	0.148	0.032	2.26	93.1	0.72	98	0.10	0	72	98	84	66
186	27.442	0.150	0.031	2.27	93.1	0.7	101	0.09	-0.01	72	97	84	66
187	27.590	0.148	0.032	2.26	93.2	0.69	98	0.09	0	72	97	84	66
188	27.740	0.150	0.032	2.27	93.3	0.71	99	0.08	-0.01	72	97	84	66
189	27.887	0.147	0.032	2.27	93.4	0.69	97	0.08	0	72	97	84	66
190	28.038	0.151	0.032	2.27	93.5	0.66	100	0.08	0	72	96	84	66
191	28.183	0.145	0.032	2.27	93.5	0.74	96	0.07	-0.01	72	96	84	66
192	28.335	0.152	0.032	2.27	93.6	0.75	101	0.07	0	72	97	84	66
193	28.481	0.146	0.032	2.28	93.5	0.68	97	0.06	-0.01	72	96	84	66
194	28.632	0.151	0.032	2.26	93.6	0.7	100	0.05	-0.01	72	97	84	66
195	28.778	0.146	0.032	2.25	93.6	0.69	97	0.05	0	72	97	84	66
196	28.931	0.153	0.032	2.26	93.7	0.74	101	0.05	0	72	97	84	66
197	29.077	0.146	0.032	2.26	93.6	0.68	97	0.05	0	72	97	84	66

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: AJ Wells
 Model: Skye E700
 Run #: 2

Job #: 22-751
 Tracking #: 97
 Technician: AK
 Date: 1/18/2022

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft ³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
198	29.228	0.151	0.031	2.27	93.7	0.71	102	0.04	-0.01	72	96	84	66
199	29.375	0.147	0.032	2.27	93.5	0.67	97	0.04	0	72	96	84	66
200	29.526	0.151	0.032	2.27	93.3	0.69	100	0.04	0	71	95	84	66
201	29.672	0.146	0.032	2.27	93.2	0.67	97	0.03	-0.01	71	95	83	66
202	29.822	0.150	0.032	2.26	93.1	0.69	99	0.02	-0.01	71	95	83	66
203	29.970	0.148	0.032	2.27	93.1	0.71	98	0.02	0	71	94	83	66
204	30.119	0.149	0.032	2.26	93.2	0.73	99	0.02	0	71	94	83	66
205	30.267	0.148	0.031	2.26	93.3	0.68	100	0.02	0	71	94	84	66
206	30.417	0.150	0.032	2.27	93.4	0.7	99	0.01	-0.01	71	94	84	66
207	30.567	0.150	0.031	2.26	93.5	0.71	101	0.01	0	71	94	84	66
208	30.715	0.148	0.032	2.26	93.7	0.72	98	0.00	-0.01	71	93	84	66
209	30.865	0.150	0.032	2.26	93.7	0.72	99	0.00	0	71	94	84	66
210	31.012	0.147	0.032	2.27	93.8	0.73	97	0.00	0	71	94	84	66
211	31.163	0.151	0.032	2.27	93.8	0.74	100	0.00	0	71	94	84	66
Avg/Tot	31.163	0.148	0.031	2.24	90	0.69	100			77	161	84	63.6

WOODSTOVE SURFACE TEMPERATURE DATA

Client: AJ WellsModel: Skye E700Run #: 2Job #: 22-751Tracking #: 97Technician: AKDate: 1/18/2022

Elapsed Time (min)	Temperature Data (°F)						
	FB Top	FB Bottom	FB Back	FB Left	FB Right	Stove Surface Average	Catalyst Exit
0	463	230	235	368	344	328.0	N/A
1	456	231	232	366	342	325.4	N/A
2	452	229	227	364	340	322.5	N/A
3	455	224	223	362	338	320.3	N/A
4	460	221	220	360	337	319.5	N/A
5	470	218	216	358	337	319.6	N/A
6	484	217	213	356	337	321.3	N/A
7	499	216	210	354	339	323.5	N/A
8	513	216	207	353	341	326.1	N/A
9	528	217	205	352	344	329.1	N/A
10	541	217	203	352	348	332.1	N/A
11	554	218	202	352	351	335.3	N/A
12	567	219	200	352	355	338.5	N/A
13	580	219	199	353	358	341.9	N/A
14	592	219	198	354	362	345.2	N/A
15	605	220	198	356	366	348.8	N/A
16	617	220	197	358	370	352.3	N/A
17	629	221	197	360	374	355.9	N/A
18	639	221	196	362	378	359.3	N/A
19	650	221	196	365	382	362.7	N/A
20	659	221	196	368	387	366.1	N/A
21	669	221	196	371	391	369.8	N/A
22	678	221	197	374	396	373.2	N/A
23	686	221	197	377	400	376.3	N/A
24	694	221	198	381	405	379.6	N/A
25	701	221	199	384	409	382.6	N/A
26	706	220	200	388	413	385.3	N/A
27	710	220	201	391	417	387.9	N/A
28	714	220	203	395	421	390.4	N/A
29	717	220	206	399	425	393.0	N/A
30	718	221	208	402	428	395.4	N/A
31	720	222	211	405	431	397.9	N/A
32	722	224	214	408	434	400.3	N/A
33	723	225	217	411	437	402.6	N/A
34	724	225	219	414	440	404.4	N/A
35	725	226	221	416	443	406.1	N/A
36	726	227	223	418	445	407.8	N/A
37	727	228	224	420	448	409.3	N/A
38	728	228	226	422	450	410.8	N/A
39	730	229	228	423	452	412.3	N/A
40	731	230	229	425	454	413.8	N/A
41	732	230	230	426	456	414.9	N/A
42	733	231	231	428	457	416.0	N/A
43	734	230	232	429	458	416.7	N/A
44	735	230	232	430	460	417.3	N/A
45	736	229	232	431	460	417.5	N/A
46	736	228	231	433	460	417.8	N/A
47	737	228	231	434	460	418.1	N/A
48	738	228	231	435	460	418.5	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: AJ WellsModel: Skye E700Run #: 2Job #: 22-751Tracking #: 97Technician: AKDate: 1/18/2022

Elapsed Time (min)	Temperature Data (°F)						
	FB Top	FB Bottom	FB Back	FB Left	FB Right	Stove Surface Average	Catalyst Exit
49	738	228	231	437	460	418.9	N/A
50	739	228	232	439	460	419.4	N/A
51	738	228	232	441	460	419.8	N/A
52	738	228	233	443	459	420.2	N/A
53	737	228	233	444	459	420.2	N/A
54	737	228	233	446	458	420.2	N/A
55	737	228	233	448	458	420.3	N/A
56	736	228	233	449	457	420.4	N/A
57	735	228	233	451	456	420.2	N/A
58	733	228	233	452	455	420.2	N/A
59	731	228	234	453	454	420.0	N/A
60	729	228	234	455	454	419.9	N/A
61	725	229	235	456	453	419.4	N/A
62	721	229	235	457	452	418.5	N/A
63	716	229	234	458	451	417.4	N/A
64	711	229	234	458	450	416.2	N/A
65	705	229	232	459	449	414.7	N/A
66	698	229	231	459	448	413.0	N/A
67	692	228	229	459	447	411.0	N/A
68	686	227	227	459	446	409.0	N/A
69	679	227	226	459	445	407.2	N/A
70	672	230	227	459	444	406.2	N/A
71	666	234	230	459	443	406.3	N/A
72	659	238	234	458	442	406.0	N/A
73	651	241	238	457	441	405.6	N/A
74	644	244	242	456	439	405.0	N/A
75	637	247	245	455	438	404.3	N/A
76	630	249	248	454	436	403.3	N/A
77	622	251	251	452	434	402.2	N/A
78	615	254	254	450	432	400.9	N/A
79	608	256	257	448	430	399.7	N/A
80	601	258	259	445	428	398.1	N/A
81	594	260	262	443	426	396.7	N/A
82	587	262	264	440	423	395.2	N/A
83	581	264	266	437	421	393.8	N/A
84	574	266	267	435	419	392.2	N/A
85	568	267	269	432	416	390.5	N/A
86	562	269	270	429	414	388.9	N/A
87	557	270	271	426	412	387.1	N/A
88	551	271	272	424	409	385.4	N/A
89	546	272	273	421	407	383.7	N/A
90	540	273	274	418	405	381.9	N/A
91	535	274	275	416	402	380.4	N/A
92	531	275	275	413	400	378.8	N/A
93	526	276	276	411	398	377.3	N/A
94	521	277	277	408	396	375.9	N/A
95	517	278	278	406	394	374.4	N/A
96	513	278	278	404	392	373.0	N/A
97	509	279	278	402	390	371.6	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: AJ WellsModel: Skye E700Run #: 2Job #: 22-751Tracking #: 97Technician: AKDate: 1/18/2022

Elapsed Time (min)	Temperature Data (°F)						
	FB Top	FB Bottom	FB Back	FB Left	FB Right	Stove Surface Average	Catalyst Exit
98	505	280	279	399	388	370.1	N/A
99	501	280	279	397	386	368.6	N/A
100	497	281	279	395	384	367.1	N/A
101	493	281	279	393	382	365.7	N/A
102	489	282	279	391	381	364.3	N/A
103	486	282	279	389	379	362.9	N/A
104	482	283	279	387	377	361.6	N/A
105	479	283	279	385	375	360.1	N/A
106	476	283	279	383	374	358.9	N/A
107	473	283	278	382	372	357.5	N/A
108	469	283	278	380	370	356.2	N/A
109	466	283	278	378	369	354.7	N/A
110	463	283	277	376	367	353.3	N/A
111	461	283	277	375	365	352.0	N/A
112	458	283	276	373	364	350.8	N/A
113	455	283	276	371	362	349.6	N/A
114	453	283	276	370	361	348.3	N/A
115	450	283	275	368	359	347.1	N/A
116	448	283	275	367	358	346.0	N/A
117	445	283	275	365	357	344.8	N/A
118	443	282	274	364	355	343.6	N/A
119	440	282	274	362	354	342.4	N/A
120	438	282	274	361	353	341.3	N/A
121	435	282	273	360	351	340.2	N/A
122	433	282	273	358	350	339.1	N/A
123	431	281	272	357	348	338.0	N/A
124	429	281	272	356	347	337.0	N/A
125	427	281	271	355	346	335.8	N/A
126	425	280	270	353	345	334.7	N/A
127	423	280	270	352	343	333.7	N/A
128	421	280	269	351	342	332.6	N/A
129	419	280	269	350	341	331.5	N/A
130	416	280	268	349	339	330.5	N/A
131	414	279	268	347	338	329.2	N/A
132	412	279	267	346	337	328.0	N/A
133	410	278	266	345	335	326.8	N/A
134	408	278	265	343	334	325.7	N/A
135	406	278	265	342	333	324.8	N/A
136	404	278	265	341	332	323.9	N/A
137	402	278	264	340	331	323.0	N/A
138	401	278	264	339	330	322.1	N/A
139	399	277	263	338	329	321.2	N/A
140	397	277	263	337	327	320.1	N/A
141	395	276	262	335	326	318.7	N/A
142	393	275	261	334	325	317.4	N/A
143	391	274	260	333	323	316.1	N/A
144	389	273	260	331	322	315.0	N/A
145	387	273	259	330	321	313.9	N/A
146	385	272	258	329	320	312.9	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: AJ WellsModel: Skye E700Run #: 2Job #: 22-751Tracking #: 97Technician: AKDate: 1/18/2022

Elapsed Time (min)	Temperature Data (°F)						
	FB Top	FB Bottom	FB Back	FB Left	FB Right	Stove Surface Average	Catalyst Exit
147	384	271	258	328	319	311.9	N/A
148	382	271	257	327	318	310.9	N/A
149	380	270	256	326	317	309.9	N/A
150	379	270	256	325	316	308.9	N/A
151	377	269	255	324	315	308.0	N/A
152	376	269	255	323	314	307.1	N/A
153	374	269	254	322	313	306.2	N/A
154	373	268	253	321	311	305.1	N/A
155	371	268	252	320	310	304.1	N/A
156	370	267	252	319	309	303.2	N/A
157	369	266	251	318	308	302.3	N/A
158	367	266	250	317	307	301.3	N/A
159	366	265	250	316	306	300.6	N/A
160	365	265	249	316	305	299.8	N/A
161	364	264	249	315	304	299.1	N/A
162	363	264	248	314	304	298.3	N/A
163	361	263	248	313	303	297.5	N/A
164	360	262	247	312	302	296.7	N/A
165	359	262	246	312	301	295.9	N/A
166	358	261	246	311	300	295.2	N/A
167	357	260	245	310	299	294.5	N/A
168	356	260	245	310	299	293.7	N/A
169	355	259	244	309	298	293.0	N/A
170	355	258	243	308	297	292.3	N/A
171	354	258	243	308	296	291.7	N/A
172	353	257	242	307	295	291.0	N/A
173	352	257	242	307	295	290.4	N/A
174	351	256	241	306	294	289.7	N/A
175	350	256	241	305	293	289.0	N/A
176	350	255	240	305	292	288.3	N/A
177	349	255	239	304	291	287.5	N/A
178	348	254	238	303	290	286.6	N/A
179	347	253	237	303	289	285.8	N/A
180	346	253	237	302	288	285.1	N/A
181	345	252	236	302	287	284.4	N/A
182	344	252	236	301	286	283.7	N/A
183	344	251	235	300	286	283.1	N/A
184	343	250	235	300	285	282.5	N/A
185	342	250	234	299	284	281.9	N/A
186	341	249	234	299	283	281.2	N/A
187	341	249	233	298	282	280.6	N/A
188	340	248	233	298	281	279.9	N/A
189	339	248	232	297	280	279.2	N/A
190	338	247	232	296	280	278.6	N/A
191	338	247	231	296	279	277.9	N/A
192	337	246	231	295	278	277.3	N/A
193	336	245	230	295	277	276.5	N/A
194	335	245	229	294	276	275.8	N/A
195	334	244	229	293	275	275.1	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: AJ WellsJob #: 22-751Model: Skye E700Tracking #: 97Run #: 2Technician: AKDate: 1/18/2022

Elapsed Time (min)	Temperature Data (°F)						
	FB Top	FB Bottom	FB Back	FB Left	FB Right	Stove Surface Average	Catalyst Exit
196	334	243	228	293	274	274.4	N/A
197	333	243	227	292	274	273.7	N/A
198	332	242	227	292	273	273.0	N/A
199	331	241	226	291	272	272.2	N/A
200	330	240	225	290	271	271.3	N/A
201	329	240	224	290	270	270.5	N/A
202	329	239	224	289	269	269.7	N/A
203	328	238	223	288	268	269.0	N/A
204	327	238	222	288	267	268.3	N/A
205	326	237	222	287	266	267.7	N/A
206	325	237	222	287	266	267.2	N/A
207	324	236	221	286	265	266.5	N/A
208	324	236	221	285	264	265.8	N/A
209	323	235	220	285	263	265.1	N/A
210	322	235	219	284	262	264.4	N/A
211	321	234	219	284	261	263.7	N/A
Average	505	251	242	368	363	346	N/A

LAB SAMPLE DATA - ASTM E2515

Client: AJ WellsJob #: 22-751Model: Skye E700Tracking #: 97Run #: 2Technician: AKDate: 1/18/2022

		Sample ID	Tare, mg	Final, mg	Catch, mg
Filters	A - 1st Hour	H0092	187.8	188.5	0.7
	B	H0093	187.4	188.1	0.7
	C - Post 1st Hour	H0094	187.5	187.5	0.0
	Amb	H0095	187.7	187.7	0.0
Probes	A - 1st Hour	2A	116055.5	116055.6	0.1
	B	2B	116172.2	116172.6	0.4
	C - Post 1st Hour	2C	116428.5	116428.5	0.0
O-rings	A - 1st Hour	2A	3553.5	3553.7	0.2
	B	2B	3572.4	3572.4	0.0
	C - Post 1st Hour	2C	3392.4	3392.6	0.2

Placed in Dessicator on:1/18/2022

Filters	A - 1st Hour	188.4	1/20 15:58	188.5	1/21 15:59				
	B	188.0	1/20 15:58	188.1	1/21 16:00				
	C - Post 1st Hour	187.5	1/20 15:58	187.5	1/21 15:59				
	Amb	187.6	1/20 15:58	187.7	1/21 15:59				
Probes	A - 1st Hour	116055.7	1/20 15:59	116055.6	1/21 15:59				
	B	116172.6	1/20 15:59	116172.6	1/21 15:59				
	C - Post 1st Hour	116428.5	1/20 15:59	116428.5	1/21 16:00				
O-Rings	A - 1st Hour	3553.7	1/20 16:18	3553.7	1/21 16:00				
	B	3572.3	1/20 15:59	3572.4	1/21 16:00				
	C - Post 1st Hour	3392.5	1/20 15:59	3392.6	1/21 16:00				

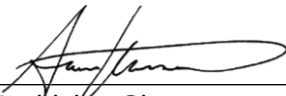
Train A Sub-total, mg	1.0
Train C Sub-Total, mg:	0.2
Train 1 Aggregate, mg:	1.2
Train 2 Aggregate, mg:	1.1
Ambient Aggregate, mg:	0.0

WOOD STOVE TEST DATA PACKET
ASTM E3053/E2515



Run 3 Data Summary

Client: AJ Wells
Model: Skye E700
Job #: 22-751
Tracking #: 97
Test Date: 1/19/2022



Technician Signature

3/14/2022

Date

TEST RESULTS - ASTM E3053 / ASTM E2515

Client: AJ WellsModel: Skye E700Run #: 3Job #: 22-751Tracking #: 97Technician: AKDate: 1/19/2022

Burn Rate (kg/hr):	0.81
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	Ambient Sample	Sample Train A	Sample Train B	1st Hour Filter
Total Sample Volume (ft ³)	40.275	28.814	28.810	8.596
Average Gas Velocity in Dilution Tunnel (ft/sec)	9.89			
Average Gas Flow Rate in Dilution Tunnel (dscf/hr)	27014.1			
Average Gas Meter Temperature (°F)	68.8	88.5	86.7	76.5
Total Sample Volume (dscf)	40.590	28.545	28.176	8.702
Average Tunnel Temperature (°F)	82.3			
Total Time of Test (min)	196			
Total Particulate Catch (mg)	0.0	1.2	1.4	0.9
Particulate Concentration, dry-standard (g/dscf)	0.0000000	0.0000420	0.0000497	0.0001034
Total PM Emissions (g)	0.00	3.71	4.38	2.79
Particulate Emission Rate (g/hr)	0.00	1.14	1.34	2.79
Emissions Factor (g/kg)	-	1.40	1.66	-
Difference from Average Total Particulate Emissions (g)	-	0.34	0.34	-
Difference from Average Total Particulate Emissions (%)	-	8.3%	8.3%	-
Difference from Average Emissions Factor (g/kg)	-	0.13	0.13	-

Final Average Results	
Total Particulate Emissions (g)	4.05
Particulate Emission Rate (g/hr)	1.24
Emissions Factor (g/kg)	1.53
HHV Efficiency (%)	74.7%
LHV Efficiency (%)	79.9%
CO Emissions (g/min)	0.96

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: 80.2 / Max: 84.4	OK
Face Velocity	< 30 ft/min	18.9	OK
Leakage Rate	Less than 4% of average sample rate	0 cfm	OK
Ambient Temp	55-90 °F	Min: 66.8 / Max: 70.5	OK
Negative Probe Weight Evaluation	<5% of Total Catch	Probe Catch Not Negative	OK
Pro-Rate Variation	90% of readings between 90-110%; none greater than 120% or less than 80%	See Data Tabs	CHECK 10 MIN. INTERVAL PRO-RATES



B415.1 Efficiency Results

Manufacturer: AJ Wells
Model: Skye E700
Date: 01/19/22
Run: 3
Control #: 22-751
Test Duration: 196
Output Category: Medium

Test Results in Accordance with CSA B415.1-09

	HHV Basis	LHV Basis
Overall Efficiency	74.7%	79.9%
Combustion Efficiency	95.5%	95.5%
Heat Transfer Efficiency	78.2%	83.6%

Output Rate (kJ/h)	11,941	11,327	(Btu/h)
Burn Rate (kg/h)	0.80	1.77	(lb/h)
Input (kJ/h)	15,990	15,169	(Btu/h)

Test Load Weight (dry kg)	2.62	5.77	dry lb
MC wet (%)	18.42		
MC dry (%)	22.58		
Particulate (g)	4.05		
CO (g)	187		
Test Duration (h)	3.27		

Emissions	Particulate	CO
g/MJ Output	0.10	4.80
g/kg Dry Fuel	1.55	71.58
g/h	1.24	57.34
g/min	0.02	0.96
lb/MM Btu Output	0.24	11.16

Air/Fuel Ratio (A/F)	23.86
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VERSION:

2.2

12/14/2009

HIGH FIRE FUEL LOAD DATA - ASTM E3053

Client: AJ WellsJob #: 22-751Model: Skye E700Tracking # 97Run #: 3Technician: AKDate: 1/19/2022

Nominal Loading Density (lbs/ft³, wet basis): 10
 Usable Firebox Volume (ft³): 0.58
 Target Load Weight (lbs): 5.77
 Total Load Weight Range (lbs): 5.50 to 6.10
 Core Load Weight Range (lbs): 2.60 to 3.70
 Remainder Load Weight Range (lbs): 2.00 to 3.20
 Core Load Piece Range (lbs): 0.90 to 1.40
 Remainder Load Piece Range (lbs): 0.60 to 3.20
 Max Allowable Kindling Weight (lbs): 1.18
 Max Allowable Start-up Fuel Weight (lbs): 1.77

CORE LOAD DATA

Piece #	Length (in)	Weight (lbs)	Within Spec?	Fuel Piece Moisture Readings (%DB)				Within Spec?	Dry Weight	
				1	2	3	Ave.		lbs	kg
1	12.00	1.03	In Range	19.6	20.6	18.3	19.5	In Range	0.86	0.39
2	12.00	1.10	In Range	19.5	18.5	19.8	19.3	In Range	0.92	0.42
3	12.00	1.34	In Range	19.5	20.4	25.3	21.7	In Range	1.10	0.50
Core Load Wt. (lbs)		3.47	In Range							

REMAINDER LOAD DATA (1 to 3 Pieces)

Piece #	Length (in)	Weight (lbs)	Within Spec?	Fuel Piece Moisture Readings (%DB)				Within Spec?	Dry Weight	
				1	2	3	Ave.		lbs	kg
1	12.00	1.13	In Range	19.8	21.4	18.2	19.8	In Range	0.94	0.43
2	12.00	1.31	In Range	21.2	25.8	24.5	23.8	In Range	1.06	0.48
3			NA				NA	NA	NA	NA
Remainder Load (lbs)		2.44	In Range							

Total Load Weight (lbs): 5.91 In Range
 Core Load % of Total Weight: 59% In Range 45-65%
 Remainder % of Total Weight: 41% In Range 35-55%
 Total Load % of Target Weight: 102% In Range 95-105%
 Actual Fuel Loading Density (lb/ft³): 10.2
 Total Load Average Moisture Content (%DB): 21.0 In Range 19-25%
 Total Load Average Moisture Content (%WB): 17.3
 Total Test Load Weight (dry basis): 4.89 lbs 2.22 kg

KINDLING AND START-UP FUEL

Kindling Weight (lbs)	Within Spec?	Kindling Moisture Readings (%DB)				Within Spec?	Dry Weight	
		1	2	3	Avg.		lbs	kg
0.90	In Range	10	10	10	10.0	In Range	0.82	0.37

Start-up Fuel Wt. (lb)	Within Spec?	Start-up Moisture Readings (%DB)				Within Spec?	Dry Weight	
		1	2	3	Avg.		lbs	kg
1.56	In Range	22.4	19.5	21	21.0	In Range	1.29	0.58

TEST FUEL LOADING RANGE

Allowable Residual Start-up Fuel Range (lb): 0.59 to 1.18
 Actual Residual Start-up Fuel Weight (lb): 0.59 In Range

LOW & MEDIUM FIRE FUEL LOAD DATA - ASTM E3053

Client: AJ WellsJob #: 22-751Model: Skye E700Tracking # 97Run #: 3Technician: AKDate: 1/19/2022

Nominal Loading Density (lbs/ft³, wet basis): 12
 Usable Firebox Volume (ft³): 0.58
 Target Load Weight (lbs): 6.92
 Total Load Weight Range (lbs): 6.57 to 7.27
 Core Load Weight Range (lbs): 3.11 to 4.50
 Remainder Load Weight Range (lbs): 2.42 to 3.81
 Core Load Piece Range (lbs): 1.04 to 1.73
 Remainder Load Piece Range (lbs): 0.69 to 2.08

CORE LOAD DATA

Piece #	Length (in)	Weight (lbs)	Within Spec?	Fuel Piece Moisture Readings (%DB)				Within Spec?	Dry Weight	
				1	2	3	Ave.		lbs	kg
1	12.00	1.16	In Range	19.9	21.7	19.1	20.2	In Range	0.96	0.44
2	12.00	1.23	In Range	24.2	23.0	23.0	23.4	In Range	1.00	0.45
3	12.00	1.16	In Range	24.4	24.9	18.8	22.7	In Range	0.95	0.43
Core Load Wt. (lbs)		3.55	In Range							

REMAINDER LOAD DATA (2 to 3 Pieces)

Piece #	Length (in)	Weight (lbs)	Within Spec?	Fuel Piece Moisture Readings (%DB)				Within Spec?	Dry Weight	
				1	2	3	Ave.		lbs	kg
1	12.00	0.94	In Range	23.0	24.0	19.7	22.2	In Range	0.77	0.35
2	12.00	0.94	In Range	21.0	18.4	23.7	21.0	In Range	0.78	0.35
3	12.00	1.71	In Range	26.5	23.2	24.1	24.6	In Range	1.37	0.62
Remainder Load (lbs)		3.59	In Range							

Remainder Load Small/Large Piece Weight Ratio: 55% In Range ≤ 67%
 Total Load Weight (lbs): 7.14 In Range
 Core Load % of Total Weight: 50% In Range 45-65%
 Remainder % of Total Weight: 50% In Range 35-55%
 Total Load % of Target Weight: 103% In Range 95-105%
 Actual Fuel Loading Density (lb/ft³): 12.4
 Total Load Average Moisture Content (%DB): 22.6 In Range 19-25%
 Total Load Average Moisture Content (%WB): 18.4
 Total Test Load Weight (dry basis): 5.83 lbs 2.64 kg

TEST FUEL LOADING RANGE

Allowable Charcoal Bed Weight Range (lb): 0.76 to 1.38
 Actual Charcoal Bed Wt. (lb): 0.94 In Range

TEST END POINT

Actual Fuel Load Ending Weight (lb): 0.00 Valid Test (≥90%)

Total Fuel Burned During Test Run:
 7.1 lbs, wet basis
 5.8 lbs, dry basis
 2.64 kg, dry basis

DILUTION TUNNEL & MISC. DATA - ASTM E3053 / E2515

Client: AJ Wells
 Model: Skye E700
 Run #: 3
 Test Start Time: 12:27
 Test End Time: 15:43
 Test Type: Medium Fire

Job #: 22-751
 Tracking #: 97
 Technician: AK
 Date: 1/19/2022

Recording Interval (min): 1
 Total Sampling Time (min): 196

Meter Box γ Factor: 1.011 (A)
 Meter Box γ Factor: 0.995 (B)
 Meter Box γ Factor: 0.997 (Ambient)

Induced Draft Check (in. H₂O): 0
 Smoke Capture Check (%): 100
 Date Flue Pipe Last Cleaned: 1/17/2022

	Pre-Test	Post Test	Avg.
Barometric Pressure (in. Hg)	30.28	30.33	30.31
Relative Humidity (%)	35.0	49.0	
Room Air Velocity (ft/min)	<50	<50	
Scale Audit (lbs)	10.0	10.0	
Ambient Sample Volume:	40.275 ft ³		

Sample Train Post-Test Leak Checks

(A)	0.000	cfm @	-6 in. Hg
(B)	0.000	cfm @	-5 in. Hg
(C)	0.000	cfm @	-6 in. Hg
(Ambient)	0.020	cfm @	-10

DILUTION TUNNEL FLOW

Traverse Data		
Point	dP (in H ₂ O)	Temp (°F)
1	0.018	68
2	0.024	68
3	0.026	68
4	0.028	68
5	0.024	68
6	0.016	68
7	0.018	68
8	0.024	68
9	0.028	68
10	0.028	68
11	0.026	68
12	0.018	68
Center	0.033	68

Dilution Tunnel H₂O: 2.00 percent
 Tunnel Diameter: 12 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: 0.7854 ft²

V_{strav} : 9.98 ft/sec
 V_{scnt} : 11.97 ft/sec
 F_p : 0.834 [ratio]
 Initial Tunnel Flow: 466.7 scf/min

Static Pressure: -0.080 in. H₂O

GAS ANALYZER CALIBRATION

Boottle Concentrations

	Span	Mid
CO ₂	17.08	10.09
CO	4.310	2.530

Pre Test -1/18/22

	Zero	Span	Mid
Time	10:10	10:20	10:15
CO ₂	0.00	17.09	10.10
CO	0.000	4.310	2.550

Post Test

	Zero	Span	Mid
Time	8:35	8:40	8:42
CO ₂	0.02	17.11	10.25
CO	0.005	4.326	2.544

TEST NOTES

High Burn	
Air setting	5/5 (max)
Torch	Used for 50 seconds
Test load	Loaded at 15 min
Medium Burn	
Air setting	2/5
1 Hour Sample	Changed train A at 60 minutes
172 min	No weight change for 10 min, fuel adjusted <30 sec

DILUTION TUNNEL & MISC. DATA - ASTM E3053 / E2515

Client: AJ Wells	Job #: 22-751
Model: Skye E700	Tracking #: 97
Run #: 3	Technician: AK
Test Start Time: 12:27	Date: 1/19/2022
Test End Time: 15:43	
Test Type: Medium Fire	

Recording Interval (min):	1				
Total Sampling Time (min):	196	Barometric Pressure (in. Hg)	Pre-Test 30.28	Post Test 30.33	Avg. 30.31
		Relative Humidity (%)	35.0	49.0	
		Room Air Velocity (ft/min)	<50	<50	
		Scale Audit (lbs)	10.0	10.0	
Meter Box γ Factor:	1.011 (A)	Ambient Sample Volume:	40.275	ft ³	
Meter Box γ Factor:	0.995 (B)				
Meter Box γ Factor:	0.997 (Ambient)				
Induced Draft Check (in. H ₂ O):	0	Sample Train Post-Test Leak Checks			
Smoke Capture Check (%):	100	(A) 0.000 cfm @	-6	in. Hg	
Date Flue Pipe Last Cleaned:	1/17/2022	(B) 0.000 cfm @	-5	in. Hg	
		(C) 0.000 cfm @	-6	in. Hg	

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, Yellow	49.80	6.50	43.40	0.30	20.12	8656
	Doug Fir (Coast, Int. West)	48.73	6.87	43.90	0.50	19.81	8522
	Doug Fir (Int. 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
	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 Long Leaf	52.60	7.02	40.10	1.30	22.30	9594

WOODSTOVE PREBURN DATA

Client: AJ Wells
 Model: Skye E700
 Run #: 3

Job #: 22-751
 Tracking #: 97
 Technician: AK
 Date: 1/19/2022

Recording Interval (min): 1
 Run Time (min): 70

Elapsed Time (min)	Scale Reading (lbs)	Flue Draft (in H ₂ O)	Temperatures (°F)							
			FB Top	FB Bottom	FB Back	FB Left	FB Right	Stove Surface Average	Flue	Ambient
0	2.46	0.000	65	66	66	66	66	65.6	65	64
1	2.41	-0.020	68	66	66	66	66	66.2	98	64
2	2.40	-0.020	71	66	66	66	66	67.0	94	64
3	2.38	-0.020	75	66	66	66	67	67.9	96	64
4	2.34	-0.030	81	66	66	67	67	69.2	103	64
5	2.27	-0.030	89	66	65	67	68	71.1	123	64
6	2.19	-0.040	102	65	65	68	70	73.9	145	64
7	2.10	-0.040	115	65	65	69	72	77.2	164	63
8	1.97	-0.060	129	65	65	71	76	81.0	191	63
9	1.75	-0.070	144	65	65	74	80	85.6	248	64
10	1.54	-0.070	168	65	65	78	86	92.5	269	64
11	1.31	-0.080	202	65	65	84	94	101.9	313	64
12	0.99	-0.080	244	65	66	91	101	113.4	369	65
13	0.81	-0.080	283	65	66	100	110	124.9	349	65
14	0.64	-0.070	322	66	67	110	121	137.2	337	65
15	7.98	-0.090	362	66	68	121	133	150.0	339	65
16	6.27	-0.070	393	66	69	133	145	161.3	315	65
17	6.18	-0.070	419	67	70	146	158	171.9	289	66
18	6.01	-0.080	441	67	72	157	169	181.1	319	66
19	5.83	-0.080	460	67	73	168	180	189.5	356	66
20	5.66	-0.080	480	68	75	176	190	197.7	371	65
21	5.50	-0.080	497	69	76	185	199	205.2	373	66
22	5.31	-0.080	517	70	78	192	208	212.8	387	66
23	5.12	-0.090	536	71	80	199	215	220.0	405	66
24	4.92	-0.090	555	72	82	206	222	227.4	418	66
25	4.73	-0.090	575	73	84	214	229	235.0	423	66
26	4.56	-0.080	592	75	86	222	236	242.1	406	66
27	4.42	-0.080	606	76	88	231	243	248.8	389	66
28	4.29	-0.080	617	78	90	239	251	254.9	375	66
29	4.16	-0.080	624	79	93	247	258	260.2	360	66
30	4.04	-0.080	629	81	95	255	265	265.1	349	66
31	3.91	-0.080	633	83	97	263	271	269.6	337	66
32	3.79	-0.070	636	85	99	271	278	273.8	328	66
33	3.67	-0.080	638	88	102	278	284	277.9	321	66
34	3.55	-0.080	639	90	104	285	291	281.8	318	67
35	3.43	-0.080	641	92	107	292	297	285.7	319	67
36	3.31	-0.080	644	95	109	299	303	289.8	319	67
37	3.18	-0.080	648	97	111	305	309	294.0	321	67
38	3.06	-0.080	652	99	114	312	315	298.2	322	67
39	2.94	-0.080	656	101	116	318	321	302.5	321	67
40	2.81	-0.070	661	104	119	325	327	306.9	323	67
41	2.70	-0.070	666	106	121	331	333	311.2	321	68
42	2.60	-0.070	669	108	124	338	339	315.4	307	67
43	2.49	-0.070	673	110	126	344	345	319.4	304	68
44	2.40	-0.070	676	112	129	350	350	323.4	304	67

Job #: 22-751

Tracking #: 97

Technician: AK

Date: 1/19/2022

1

70

Temperatures (°F)

WOODSTOVE PREBURN DATA

Client: AJ Wells
Model: Skye E700
Run #: 3

Job #: 22-751
Tracking #: 97
Technician: AK
Date: 1/19/2022

Recording Interval (min):	1
Run Time (min):	70

[illegible]

WOODSTOVE PREBURN DATA

Client: AJ Wells
Model: Skye E700
Run #: 3

Job #: 22-751
Tracking #: 97
Technician: AK
Date: 1/19/2022

Recording Interval (min):	1
Run Time (min):	70

[illegible]

WOODSTOVE PREBURN DATA

Client: AJ Wells
 Model: Skye E700
 Run #: 3

Job #: 22-751
 Tracking #: 97
 Technician: AK
 Date: 1/19/2022

Recording Interval (min): 1
 Run Time (min): 70

			Temperatures (°F)							
Elapsed Time (min)	Scale Reading (lbs)	Flue Draft (in H ₂ O)	FB Top	FB Bottom	FB Back	FB Left	FB Right	Stove Surface Average	Flue	Ambient

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: AJ WellsJob #: 22-751Model: Skye E700Tracking #: 97Run #: 3Technician: AKDate: 1/19/2022

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
0	0.000		1.68	68.8	1.48		84	-0.050	2.75	0.25
1	0.147	0.147	2.14	68.6	1.67	103	84	-0.060	2.69	0.26
2	0.286	0.139	2.13	68.5	1.5	98	84	-0.070	1.92	0.22
3	0.432	0.146	2.12	68.4	1.64	103	84	-0.080	2.78	0.36
4	0.574	0.142	2.12	68.4	1.56	102	84	-0.080	4.87	0.38
5	0.716	0.142	2.13	68.4	1.68	102	84	-0.080	6.73	0.43
6	0.860	0.144	2.12	68.7	1.77	103	84	-0.070	7.69	0.61
7	1.002	0.142	2.12	68.7	1.36	100	84	-0.070	7.75	0.43
8	1.146	0.144	2.12	69.1	1.37	103	84	-0.070	7.80	0.27
9	1.286	0.140	2.12	69.4	1.77	100	84	-0.080	7.68	0.21
10	1.432	0.146	2.12	69.6	1.76	104	84	-0.070	7.47	0.19
11	1.573	0.141	2.12	70	1.45	101	84	-0.080	7.36	0.19
12	1.715	0.142	2.12	70.2	1.47	101	84	-0.080	7.46	0.19
13	1.859	0.144	2.11	70.5	1.77	103	84	-0.080	7.59	0.21
14	2.001	0.142	2.12	70.7	1.72	100	84	-0.080	7.78	0.28
15	2.147	0.146	2.12	71	1.76	103	84	-0.080	7.92	0.34
16	2.287	0.140	2.11	71.3	1.37	100	84	-0.070	7.94	0.34
17	2.433	0.146	2.12	71.7	1.79	104	84	-0.070	8.08	0.37
18	2.574	0.141	2.12	71.9	1.65	99	84	-0.070	8.18	0.46
19	2.716	0.142	2.11	72.2	1.41	101	84	-0.070	8.07	0.55
20	2.861	0.145	2.12	72.6	1.77	103	84	-0.070	7.91	0.49
21	3.004	0.143	2.12	72.9	1.72	101	84	-0.070	7.60	0.29
22	3.149	0.145	2.12	73.1	1.62	104	84	-0.070	7.39	0.19
23	3.290	0.141	2.12	73.4	1.41	100	84	-0.070	7.19	0.28
24	3.436	0.146	2.12	73.6	1.73	102	84	-0.070	7.13	0.41
25	3.579	0.143	2.12	73.9	1.63	101	84	-0.070	7.31	0.46
26	3.722	0.143	2.12	74.3	1.6	101	84	-0.070	7.82	0.53
27	3.866	0.144	2.12	74.5	1.57	100	84	-0.070	8.09	0.79
28	4.009	0.143	2.12	74.9	1.77	101	84	-0.070	8.14	0.94
29	4.155	0.146	2.12	75.5	1.48	103	84	-0.070	8.20	0.92
30	4.296	0.141	2.12	75.9	1.67	98	84	-0.070	8.17	0.87
31	4.442	0.146	2.12	76.2	1.58	101	84	-0.070	8.18	0.82
32	4.585	0.143	2.12	76.6	1.63	99	84	-0.070	8.10	0.70

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: AJ Wells
 Model: Skye E700
 Run #: 3

Job #: 22-751
 Tracking #: 97
 Technician: AK
 Date: 1/19/2022

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
33	4.730	0.145	2.12	77	1.81	101	84	-0.070	7.91	0.52
34	4.874	0.144	2.12	77.3	1.44	100	84	-0.070	7.86	0.50
35	5.016	0.142	2.12	77.6	1.52	98	84	-0.070	7.81	0.51
36	5.163	0.147	2.13	78	1.61	102	84	-0.070	7.80	0.48
37	5.306	0.143	2.13	78.3	1.4	99	84	-0.070	7.87	0.47
38	5.453	0.147	2.13	78.6	1.62	103	84	-0.060	7.96	0.64
39	5.594	0.141	2.13	78.9	1.76	97	84	-0.060	7.88	0.94
40	5.742	0.148	2.13	79.2	1.42	102	84	-0.060	7.75	0.72
41	5.885	0.143	2.13	79.5	1.59	100	84	-0.070	7.54	0.49
42	6.031	0.146	2.13	79.7	1.42	102	84	-0.060	7.35	0.31
43	6.175	0.144	2.14	80	1.43	101	84	-0.070	7.20	0.23
44	6.319	0.144	2.13	80.1	1.76	99	84	-0.070	7.13	0.25
45	6.466	0.147	2.14	80.5	1.77	101	84	-0.070	7.26	0.24
46	6.610	0.144	2.14	80.7	1.74	99	84	-0.060	7.03	0.16
47	6.758	0.148	2.14	80.9	1.61	102	84	-0.060	6.79	0.14
48	6.901	0.143	2.14	81.3	1.46	98	84	-0.070	6.32	0.10
49	7.048	0.147	2.14	81.6	1.63	103	84	-0.070	6.07	0.09
50	7.192	0.144	2.14	82.1	1.6	100	84	-0.070	6.05	0.08
51	7.339	0.147	2.13	82.3	1.49	101	84	-0.060	5.96	0.07
52	7.485	0.146	2.14	82.6	1.45	102	84	-0.060	5.80	0.06
53	7.630	0.145	2.14	82.9	1.48	101	84	-0.060	5.72	0.06
54	7.776	0.146	2.14	83.2	1.58	100	84	-0.060	5.62	0.06
55	7.920	0.144	2.13	83.3	1.72	99	84	-0.060	5.26	0.04
56	8.068	0.148	2.14	83.5	1.67	101	84	-0.060	4.83	0.04
57	8.212	0.144	2.14	83.9	1.53	100	84	-0.070	4.59	0.06
58	8.361	0.149	2.15	84.1	1.51	103	84	-0.070	4.57	0.05
59	8.504	0.143	2.14	84.1	1.71	99	84	-0.070	4.50	0.07
60	8.652	0.148	2.13	84.4	1.65	103	84	-0.070	4.47	0.07
61	8.794	0.142	2.14	84.7	1.65	99	84	-0.060	4.39	0.06
62	8.944	0.150	2.15	84.9	1.58	104	84	-0.050	4.25	0.06
63	9.088	0.144	2.14	84.9	1.64	100	84	-0.050	3.96	0.07
64	9.237	0.149	2.15	85	1.49	103	84	-0.040	4.16	0.12
65	9.381	0.144	2.15	85.2	1.74	98	84	-0.040	4.20	0.21

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: AJ Wells
 Model: Skye E700
 Run #: 3

Job #: 22-751
 Tracking #: 97
 Technician: AK
 Date: 1/19/2022

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
66	9.528	0.147	2.15	85.4	1.55	101	84	-0.040	4.04	0.32
67	9.675	0.147	2.15	85.6	1.65	100	84	-0.040	3.91	0.38
68	9.820	0.145	2.15	85.7	1.54	100	84	-0.040	3.88	0.38
69	9.968	0.148	2.15	86.2	1.77	102	84	-0.040	3.85	0.36
70	10.113	0.145	2.15	86.4	1.45	100	84	-0.040	3.83	0.35
71	10.263	0.150	2.16	86.6	1.48	103	84	-0.040	3.87	0.36
72	10.408	0.145	2.15	86.8	1.74	100	84	-0.040	3.85	0.36
73	10.557	0.149	2.15	87.1	1.76	101	84	-0.040	3.87	0.36
74	10.701	0.144	2.15	87.2	1.56	97	84	-0.040	3.89	0.37
75	10.850	0.149	2.16	87.3	1.76	101	84	-0.030	3.88	0.38
76	10.995	0.145	2.15	87.5	1.74	99	84	-0.030	3.87	0.37
77	11.144	0.149	2.16	87.7	1.67	101	84	-0.030	3.91	0.37
78	11.290	0.146	2.16	87.9	1.73	98	84	-0.030	3.76	0.37
79	11.439	0.149	2.16	88	1.46	100	84	-0.030	3.89	0.38
80	11.585	0.146	2.17	88.1	1.56	98	84	-0.030	3.88	0.36
81	11.740	0.155	2.16	88.4	1.47	104	84	-0.030	3.89	0.36
82	11.887	0.147	2.16	88.3	1.77	99	84	-0.030	3.85	0.35
83	12.034	0.147	2.16	88.4	1.47	99	84	-0.030	3.85	0.35
84	12.181	0.147	2.16	88.4	1.78	100	84	-0.030	3.78	0.34
85	12.328	0.147	2.16	88.5	1.54	99	84	-0.030	3.76	0.34
86	12.477	0.149	2.16	88.7	1.66	100	84	-0.030	3.78	0.33
87	12.622	0.145	2.16	88.8	1.54	97	84	-0.030	3.75	0.32
88	12.772	0.150	2.16	89	1.54	101	84	-0.030	3.79	0.33
89	12.918	0.146	2.16	89.2	1.54	98	84	-0.030	3.81	0.33
90	13.068	0.150	2.16	89.5	1.7	101	84	-0.030	3.83	0.34
91	13.213	0.145	2.17	89.6	1.55	97	84	-0.030	3.82	0.34
92	13.363	0.150	2.16	89.7	1.72	101	84	-0.030	3.88	0.35
93	13.508	0.145	2.17	89.9	1.59	97	84	-0.030	3.84	0.34
94	13.657	0.149	2.16	90.1	1.69	100	84	-0.030	3.97	0.35
95	13.803	0.146	2.16	90.1	1.71	98	84	-0.030	3.93	0.36
96	13.953	0.150	2.17	90.2	1.53	102	84	-0.030	3.98	0.37
97	14.099	0.146	2.17	90.3	1.57	98	84	-0.030	3.90	0.35
98	14.248	0.149	2.17	90.4	1.63	100	84	-0.030	4.00	0.36

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: AJ Wells
 Model: Skye E700
 Run #: 3

Job #: 22-751
 Tracking #: 97
 Technician: AK
 Date: 1/19/2022

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
99	14.395	0.147	2.17	90.4	1.54	100	84	-0.030	4.10	0.38
100	14.545	0.150	2.17	90.6	1.53	100	84	-0.030	3.93	0.36
101	14.691	0.146	2.16	90.7	1.5	99	84	-0.030	4.05	0.37
102	14.840	0.149	2.17	90.7	1.49	101	84	-0.020	4.04	0.38
103	14.987	0.147	2.17	90.6	1.73	98	84	-0.020	4.03	0.38
104	15.135	0.148	2.17	90.7	1.69	100	84	-0.030	4.05	0.36
105	15.283	0.148	2.17	90.8	1.51	99	84	-0.030	4.13	0.38
106	15.430	0.147	2.16	90.8	1.62	98	84	-0.030	4.10	0.37
107	15.579	0.149	2.17	91	1.66	99	84	-0.030	4.16	0.37
108	15.726	0.147	2.17	91.1	1.54	100	84	-0.030	4.23	0.38
109	15.875	0.149	2.17	91.3	1.74	101	84	-0.020	4.10	0.37
110	16.022	0.147	2.17	91.4	1.53	100	84	-0.030	4.20	0.37
111	16.173	0.151	2.17	91.6	1.54	101	84	-0.030	4.14	0.38
112	16.319	0.146	2.17	91.6	1.52	97	84	-0.020	4.17	0.37
113	16.469	0.150	2.17	91.7	1.67	100	84	-0.020	4.20	0.37
114	16.615	0.146	2.17	91.9	1.51	97	84	-0.020	4.17	0.37
115	16.766	0.151	2.17	91.8	1.73	101	84	-0.020	4.23	0.38
116	16.911	0.145	2.17	92	1.61	97	84	-0.020	4.08	0.36
117	17.062	0.151	2.17	92	1.73	102	84	-0.020	4.12	0.36
118	17.207	0.145	2.17	92.2	1.58	97	84	-0.020	4.25	0.37
119	17.358	0.151	2.17	92.1	1.62	102	84	-0.020	4.15	0.38
120	17.504	0.146	2.17	92.1	1.52	97	84	-0.020	4.16	0.37
121	17.655	0.151	2.17	92.2	1.65	102	84	-0.020	4.25	0.38
122	17.801	0.146	2.18	92.3	1.7	97	84	-0.020	4.27	0.39
123	17.951	0.150	2.17	92.1	1.7	100	84	-0.020	4.17	0.38
124	18.098	0.147	2.18	92.2	1.57	98	84	-0.020	4.26	0.39
125	18.248	0.150	2.18	92.3	1.54	100	84	-0.020	4.16	0.38
126	18.396	0.148	2.17	92.2	1.6	98	84	-0.020	4.06	0.37
127	18.545	0.149	2.17	92.3	1.73	101	84	-0.020	4.13	0.36
128	18.692	0.147	2.17	92.4	1.63	99	84	-0.020	4.19	0.38
129	18.841	0.149	2.18	92.5	1.65	99	84	-0.020	4.12	0.38
130	18.990	0.149	2.18	92.7	1.54	99	84	-0.020	4.18	0.38
131	19.138	0.148	2.17	92.8	1.74	98	84	-0.020	4.23	0.38

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: AJ Wells
 Model: Skye E700
 Run #: 3

Job #: 22-751
 Tracking #: 97
 Technician: AK
 Date: 1/19/2022

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
132	19.286	0.148	2.17	92.8	1.68	98	84	-0.020	4.14	0.38
133	19.433	0.147	2.18	92.9	1.51	98	84	-0.020	4.12	0.37
134	19.583	0.150	2.17	93	1.66	100	84	-0.020	4.13	0.36
135	19.730	0.147	2.17	93	1.51	99	84	-0.020	4.21	0.37
136	19.881	0.151	2.18	93	1.52	100	84	-0.020	4.25	0.38
137	20.028	0.147	2.18	93.1	1.54	98	84	-0.020	4.18	0.38
138	20.178	0.150	2.18	93.1	1.73	100	84	-0.020	4.05	0.37
139	20.324	0.146	2.18	93.1	1.52	97	84	-0.020	4.05	0.37
140	20.475	0.151	2.18	93.2	1.62	102	84	-0.020	4.09	0.37
141	20.622	0.147	2.18	93.2	1.6	99	84	-0.020	4.04	0.36
142	20.774	0.152	2.18	93.4	1.68	103	84	-0.020	3.92	0.35
143	20.920	0.146	2.18	93.2	1.66	99	84	-0.020	3.94	0.35
144	21.070	0.150	2.18	93.2	1.65	101	84	-0.020	3.97	0.34
145	21.216	0.146	2.17	93	1.75	99	84	-0.020	4.02	0.35
146	21.368	0.152	2.18	93.2	1.75	103	84	-0.020	3.97	0.35
147	21.514	0.146	2.18	93.1	1.49	97	84	-0.020	3.92	0.35
148	21.665	0.151	2.18	93.1	1.49	100	84	-0.020	3.99	0.35
149	21.811	0.146	2.18	93.3	1.56	97	84	-0.020	4.04	0.37
150	21.962	0.151	2.18	93.3	1.5	102	84	-0.020	4.00	0.37
151	22.108	0.146	2.18	93.4	1.56	98	84	-0.020	3.89	0.36
152	22.259	0.151	2.17	93.5	1.54	102	84	-0.020	3.92	0.36
153	22.406	0.147	2.18	93.6	1.5	97	84	-0.020	4.02	0.37
154	22.557	0.151	2.18	93.7	1.61	100	84	-0.020	3.94	0.36
155	22.704	0.147	2.18	93.7	1.51	97	84	-0.020	3.92	0.36
156	22.854	0.150	2.18	93.8	1.74	99	84	-0.020	3.96	0.36
157	23.001	0.147	2.18	93.8	1.74	97	84	-0.020	4.09	0.38
158	23.152	0.151	2.18	93.8	1.51	100	84	-0.020	4.00	0.38
159	23.299	0.147	2.19	93.8	1.48	99	84	-0.020	3.99	0.37
160	23.450	0.151	2.18	93.8	1.5	100	84	-0.020	4.07	0.38
161	23.598	0.148	2.18	93.9	1.75	98	84	-0.020	3.98	0.38
162	23.748	0.150	2.19	93.9	1.51	101	84	-0.020	3.97	0.37
163	23.895	0.147	2.18	94	1.67	99	84	-0.020	4.05	0.37
164	24.045	0.150	2.18	93.9	1.57	99	84	-0.020	4.13	0.38

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: AJ WellsJob #: 22-751Model: Skye E700Tracking #: 97Run #: 3Technician: AKDate: 1/19/2022

Elapsed Time (min)	Particulate Sampling Data							Flue Gas Data		
	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
165	24.193	0.148	2.18	93.8	1.77	98	84	-0.020	3.98	0.37
166	24.342	0.149	2.18	93.7	1.5	99	84	-0.020	3.92	0.37
167	24.491	0.149	2.18	93.8	1.68	99	84	-0.020	3.91	0.36
168	24.639	0.148	2.18	93.8	1.69	100	84	-0.020	4.00	0.37
169	24.789	0.150	2.18	93.8	1.61	101	84	-0.020	3.87	0.37
170	24.937	0.148	2.18	93.9	1.5	100	84	-0.020	3.84	0.37
171	25.086	0.149	2.18	94	1.68	100	84	-0.020	3.91	0.37
172	25.234	0.148	2.17	94	1.69	100	84	-0.020	3.95	0.38
173	25.383	0.149	2.18	94.1	1.72	99	84	-0.020	3.86	0.38
174	25.531	0.148	2.18	94.1	1.7	98	84	-0.020	3.94	0.38
175	25.682	0.151	2.18	94.3	1.64	100	84	-0.020	3.95	0.38
176	25.829	0.147	2.18	94.3	1.54	97	84	-0.020	3.98	0.39
177	25.980	0.151	2.18	94.3	1.55	100	84	-0.020	3.84	0.37
178	26.127	0.147	2.18	94.2	1.54	99	84	-0.040	3.91	0.37
179	26.278	0.151	2.18	94.2	1.54	102	84	-0.030	3.94	0.37
180	26.425	0.147	2.19	94.4	1.58	97	84	-0.040	2.75	0.29
181	26.576	0.151	2.18	94.3	1.51	102	84	-0.040	2.94	0.40
182	26.723	0.147	2.18	94.3	1.55	98	84	-0.040	3.13	0.41
183	26.874	0.151	2.18	94.3	1.58	100	84	-0.040	3.14	0.39
184	27.023	0.149	2.18	94.4	1.51	99	84	-0.040	3.07	0.37
185	27.174	0.151	2.18	94.3	1.65	102	84	-0.040	3.02	0.35
186	27.321	0.147	2.18	94.2	1.69	98	84	-0.040	3.00	0.35
187	27.472	0.151	2.18	94.1	1.51	102	84	-0.040	2.97	0.34
188	27.619	0.147	2.18	94.2	1.71	99	84	-0.040	2.91	0.34
189	27.770	0.151	2.18	94.1	1.57	102	84	-0.040	2.91	0.33
190	27.916	0.146	2.18	94.3	1.68	98	84	-0.040	2.86	0.32
191	28.068	0.152	2.18	94.4	1.56	101	84	-0.040	2.85	0.31
192	28.214	0.146	2.18	94.4	1.6	98	84	-0.040	2.77	0.31
193	28.365	0.151	2.18	94.5	1.53	102	84	-0.040	2.72	0.30
194	28.512	0.147	2.18	94.5	1.65	98	84	-0.040	2.69	0.29
195	28.662	0.150	2.17	94.5	1.5	101	84	-0.040	2.65	0.28
196	28.810	0.148	2.18	94.5	1.55	98	84	-0.040	2.58	0.29
Avg/Tot	28.810	0.147	2.16	87	1.60	100	84	-0.040	4.77	0.35

BOX B TEST DATA - ASTM E3053 / ASTM E2515

Client: AJ WellsJob #: 22-751Model: Skye E700Tracking #: 97Run #: 3Technician: AKDate: 1/19/2022

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: AJ Wells
 Model: Skye E700
 Run #: 3

Job #: 22-751
 Tracking #: 97
 Technician: AK
 Date: 1/19/2022

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft ³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
0	0.001		0.032	1.48	69.1	0.53		7.07		86	240	84	67
1	0.354	0.353	0.032	1.95	68.9	0.59	249	7.07	0	91	243	84	67
2	0.489	0.135	0.032	1.95	68.8	0.59	95	6.96	-0.11	91	277	84	67
3	0.627	0.138	0.032	1.96	68.6	0.61	98	6.82	-0.14	93	323	83	67
4	0.758	0.131	0.031	1.95	68.5	0.6	94	6.62	-0.2	95	363	83	68
5	0.899	0.141	0.031	1.96	68.6	0.64	101	6.47	-0.15	92	339	83	68
6	1.032	0.133	0.031	1.97	68.6	0.63	95	6.32	-0.15	91	328	83	68
7	1.167	0.135	0.032	1.96	68.8	0.66	95	6.17	-0.15	91	323	83	68
8	1.306	0.139	0.031	1.97	69.2	0.63	100	6.03	-0.14	92	322	83	68
9	1.439	0.133	0.031	1.97	69.5	0.64	95	5.89	-0.14	92	321	84	68
10	1.579	0.140	0.031	1.98	69.8	0.66	100	5.75	-0.14	93	321	84	68
11	1.713	0.134	0.031	1.99	70.2	0.66	96	5.61	-0.14	93	321	84	68
12	1.850	0.137	0.031	2.00	70.5	0.66	98	5.47	-0.14	93	326	84	68
13	1.990	0.140	0.031	2.00	70.8	0.65	100	5.31	-0.16	93	327	84	69
14	2.124	0.134	0.032	2.00	71.1	0.67	94	5.16	-0.15	93	328	84	69
15	2.265	0.141	0.032	2.01	71.4	0.67	99	5.02	-0.14	94	331	84	69
16	2.400	0.135	0.031	2.01	71.8	0.71	97	4.88	-0.14	95	329	84	69
17	2.537	0.137	0.031	2.01	72.1	0.67	98	4.73	-0.15	94	323	84	69
18	2.678	0.141	0.032	2.02	72.4	0.73	99	4.60	-0.13	93	307	84	69
19	2.812	0.134	0.031	2.01	72.8	0.69	95	4.48	-0.12	92	290	84	69
20	2.955	0.143	0.031	2.04	73.1	0.73	102	4.39	-0.09	90	274	84	69
21	3.091	0.136	0.031	2.04	73.4	0.73	97	4.29	-0.1	90	266	84	69
22	3.229	0.138	0.030	2.03	73.7	0.75	100	4.19	-0.1	90	266	84	69
23	3.370	0.141	0.031	2.04	73.9	0.75	100	4.08	-0.11	90	272	84	69
24	3.507	0.137	0.032	2.05	74	0.74	96	3.96	-0.12	90	279	83	69
25	3.649	0.142	0.031	2.04	74.3	0.77	101	3.83	-0.13	91	293	83	69
26	3.785	0.136	0.031	2.04	74.6	0.76	97	3.69	-0.14	91	299	83	69
27	3.928	0.143	0.032	2.05	74.8	0.76	100	3.55	-0.14	91	300	83	69
28	4.066	0.138	0.031	2.05	75.3	0.73	98	3.42	-0.13	91	300	83	69
29	4.205	0.139	0.031	2.05	75.8	0.8	98	3.30	-0.12	91	295	83	69
30	4.347	0.142	0.032	2.07	76.3	0.78	99	3.17	-0.13	91	293	83	69
31	4.485	0.138	0.032	2.07	76.8	0.76	96	3.07	-0.1	91	290	84	69
32	4.626	0.141	0.032	2.06	77.2	0.72	98	2.96	-0.11	91	289	84	70

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: AJ Wells
 Model: Skye E700
 Run #: 3

Job #: 22-751
 Tracking #: 97
 Technician: AK
 Date: 1/19/2022

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft ³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
33	4.764	0.138	0.032	2.07	77.6	0.72	96	2.85	-0.11	91	287	84	70
34	4.908	0.144	0.032	2.08	78	0.74	100	2.76	-0.09	91	283	84	70
35	5.046	0.138	0.032	2.08	78.4	0.77	96	2.65	-0.11	92	278	84	70
36	5.187	0.141	0.032	2.08	78.7	0.76	98	2.55	-0.1	92	277	84	70
37	5.328	0.141	0.032	2.08	79.1	0.79	98	2.46	-0.09	91	271	84	70
38	5.469	0.141	0.031	2.09	79.5	0.74	99	2.37	-0.09	91	265	84	70
39	5.612	0.143	0.032	2.10	79.8	0.79	99	2.28	-0.09	91	260	84	70
40	5.750	0.138	0.032	2.09	80.2	0.75	95	2.20	-0.08	90	254	84	69
41	5.894	0.144	0.031	2.10	80.5	0.79	101	2.13	-0.07	90	257	84	70
42	6.033	0.139	0.031	2.09	80.8	0.76	97	2.04	-0.09	90	263	84	70
43	6.178	0.145	0.031	2.11	80.9	0.75	102	1.96	-0.08	90	263	84	69
44	6.318	0.140	0.032	2.10	81	0.8	97	1.88	-0.08	90	267	83	69
45	6.460	0.142	0.032	2.10	81.2	0.8	98	1.81	-0.07	90	267	83	69
46	6.601	0.141	0.032	2.11	81.5	0.79	97	1.75	-0.06	90	264	83	70
47	6.742	0.141	0.032	2.10	81.7	0.76	97	1.69	-0.06	90	263	83	70
48	6.887	0.145	0.032	2.11	82.1	0.74	100	1.63	-0.06	90	267	83	70
49	7.027	0.140	0.031	2.10	82.5	0.81	98	1.56	-0.07	90	270	83	70
50	7.172	0.145	0.031	2.11	83	0.81	101	1.51	-0.05	90	268	84	70
51	7.310	0.138	0.032	2.10	83.3	0.83	95	1.46	-0.05	90	262	84	70
52	7.456	0.146	0.031	2.12	83.7	0.77	102	1.42	-0.04	90	254	84	70
53	7.596	0.140	0.031	2.11	84.1	0.75	97	1.38	-0.04	89	248	84	70
54	7.742	0.146	0.032	2.12	84.4	0.79	100	1.34	-0.04	89	244	84	70
55	7.883	0.141	0.032	2.12	84.6	0.83	97	1.31	-0.03	89	247	84	70
56	8.027	0.144	0.032	2.12	84.9	0.84	99	1.27	-0.04	90	251	84	70
57	8.168	0.141	0.031	2.12	85.2	0.78	98	1.24	-0.03	90	256	84	70
58	8.311	0.143	0.031	2.12	85.5	0.77	99	1.20	-0.04	90	261	84	70
59	8.455	0.144	0.031	2.13	85.6	0.75	100	1.17	-0.03	90	266	84	71
60	8.597	0.142	0.031	2.12	85.9	0.79	99	1.14	-0.03	91	269	84	70
61	8.744	0.147	0.031	2.22	86.2	0.75	102	1.12	-0.02	91	269	82	70
62	8.888	0.144	0.031	2.23	86.3	0.72	100	1.11	-0.01	89	248	82	70
63	9.037	0.149	0.031	2.22	86.4	0.69	103	1.10	-0.01	87	220	81	70
64	9.181	0.144	0.031	2.23	86.4	0.75	99	1.10	0	86	201	80	70
65	9.330	0.149	0.032	2.23	86.5	0.69	101	1.09	-0.01	85	186	80	69

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: AJ Wells
 Model: Skye E700
 Run #: 3

Job #: 22-751
 Tracking #: 97
 Technician: AK
 Date: 1/19/2022

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft ³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
66	9.474	0.144	0.031	2.23	86.7	0.69	99	1.08	-0.01	84	177	81	70
67	9.623	0.149	0.032	2.24	86.8	0.75	101	1.07	-0.01	83	170	80	69
68	9.767	0.144	0.031	2.23	87	0.7	99	1.07	0	83	164	80	69
69	9.916	0.149	0.031	2.24	87.4	0.73	103	1.05	-0.02	83	159	81	70
70	10.061	0.145	0.031	2.24	87.8	0.7	100	1.05	0	83	156	80	69
71	10.210	0.149	0.031	2.23	88.1	0.67	102	1.04	-0.01	83	154	81	70
72	10.355	0.145	0.031	2.24	88.4	0.67	100	1.03	-0.01	83	152	81	70
73	10.504	0.149	0.032	2.24	88.6	0.69	101	1.02	-0.01	83	150	82	70
74	10.648	0.144	0.032	2.24	88.9	0.73	97	1.01	-0.01	82	148	82	70
75	10.797	0.149	0.032	2.24	89.1	0.71	101	1.01	0	83	147	82	70
76	10.942	0.145	0.031	2.24	89.3	0.69	99	1.00	-0.01	83	145	83	70
77	11.091	0.149	0.032	2.25	89.5	0.7	100	1.00	0	83	143	83	70
78	11.237	0.146	0.032	2.25	89.7	0.7	98	0.98	-0.02	82	141	83	70
79	11.386	0.149	0.032	2.25	89.9	0.73	100	0.98	0	82	140	83	70
80	11.532	0.146	0.032	2.25	90	0.74	98	0.97	-0.01	82	139	83	69
81	11.681	0.149	0.032	2.25	90.2	0.72	100	0.96	-0.01	82	138	83	70
82	11.827	0.146	0.032	2.25	90.2	0.74	98	0.96	0	81	138	83	69
83	11.975	0.148	0.032	2.25	90.2	0.7	100	0.95	-0.01	81	136	83	69
84	12.122	0.147	0.031	2.26	90.2	0.72	100	0.94	-0.01	80	134	83	69
85	12.270	0.148	0.032	2.24	90.2	0.73	99	0.94	0	80	132	82	69
86	12.418	0.148	0.032	2.24	90.3	0.67	99	0.93	-0.01	80	131	82	69
87	12.566	0.148	0.032	2.24	90.4	0.75	99	0.92	-0.01	79	130	82	69
88	12.714	0.148	0.032	2.25	90.6	0.77	99	0.92	0	79	129	83	69
89	12.861	0.147	0.032	2.25	91	0.74	99	0.91	-0.01	80	129	83	69
90	13.010	0.149	0.032	2.25	91.3	0.71	100	0.90	-0.01	80	128	83	69
91	13.157	0.147	0.032	2.25	91.5	0.7	99	0.89	-0.01	80	128	83	69
92	13.306	0.149	0.032	2.25	91.7	0.77	100	0.88	-0.01	80	127	83	69
93	13.452	0.146	0.032	2.26	91.8	0.72	98	0.89	0.01	80	127	83	69
94	13.602	0.150	0.032	2.25	92	0.72	100	0.87	-0.02	80	126	83	69
95	13.749	0.147	0.032	2.26	92.2	0.7	98	0.86	-0.01	80	126	84	69
96	13.899	0.150	0.031	2.26	92.3	0.72	102	0.86	0	80	125	84	69
97	14.044	0.145	0.032	2.26	92.4	0.7	97	0.85	-0.01	80	124	84	69
98	14.194	0.150	0.032	2.27	92.6	0.73	100	0.85	0	80	123	84	69

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: AJ Wells
 Model: Skye E700
 Run #: 3

Job #: 22-751
 Tracking #: 97
 Technician: AK
 Date: 1/19/2022

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft ³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
99	14.340	0.146	0.031	2.26	92.7	0.76	99	0.84	-0.01	79	122	84	69
100	14.491	0.151	0.032	2.26	92.9	0.68	101	0.83	-0.01	79	122	84	69
101	14.636	0.145	0.031	2.26	92.9	0.67	98	0.82	-0.01	79	121	84	69
102	14.787	0.151	0.031	2.26	92.9	0.69	103	0.81	-0.01	79	122	84	69
103	14.932	0.145	0.032	2.26	92.9	0.74	97	0.81	0	79	120	83	69
104	15.083	0.151	0.031	2.26	92.8	0.7	102	0.80	-0.01	78	119	83	69
105	15.229	0.146	0.032	2.27	92.7	0.75	97	0.79	-0.01	78	118	83	69
106	15.381	0.152	0.032	2.27	92.7	0.7	101	0.78	-0.01	78	118	83	69
107	15.527	0.146	0.032	2.27	92.9	0.73	97	0.78	0	78	117	83	69
108	15.678	0.151	0.031	2.25	93	0.72	102	0.77	-0.01	77	117	83	69
109	15.824	0.146	0.031	2.27	93.3	0.7	99	0.76	-0.01	78	118	83	69
110	15.975	0.151	0.031	2.27	93.5	0.75	102	0.75	-0.01	78	117	83	69
111	16.121	0.146	0.032	2.27	93.7	0.72	97	0.74	-0.01	78	117	84	69
112	16.271	0.150	0.032	2.27	93.8	0.7	100	0.74	0	78	117	84	69
113	16.419	0.148	0.032	2.27	94	0.69	99	0.73	-0.01	78	117	84	69
114	16.568	0.149	0.032	2.27	94.1	0.76	99	0.72	-0.01	78	116	84	69
115	16.716	0.148	0.032	2.26	94.2	0.77	99	0.72	0	78	115	84	69
116	16.865	0.149	0.032	2.26	94.3	0.7	99	0.71	-0.01	79	115	84	69
117	17.015	0.150	0.031	2.27	94.3	0.74	101	0.70	-0.01	79	115	84	69
118	17.163	0.148	0.032	2.28	94.5	0.72	99	0.70	0	78	114	84	69
119	17.313	0.150	0.031	2.27	94.5	0.68	101	0.69	-0.01	78	114	84	69
120	17.460	0.147	0.032	2.27	94.6	0.69	98	0.68	-0.01	78	114	83	69
121	17.612	0.152	0.031	2.28	94.6	0.74	103	0.67	-0.01	78	114	83	69
122	17.757	0.145	0.032	2.28	94.8	0.75	96	0.66	-0.01	78	114	83	69
123	17.908	0.151	0.032	2.27	94.6	0.75	100	0.65	-0.01	77	114	83	69
124	18.054	0.146	0.032	2.27	94.5	0.67	97	0.65	0	77	112	83	68
125	18.206	0.152	0.032	2.27	94.4	0.75	101	0.64	-0.01	76	111	83	68
126	18.352	0.146	0.032	2.26	94.3	0.76	97	0.63	-0.01	76	111	83	68
127	18.504	0.152	0.031	2.28	94.4	0.7	103	0.63	0	76	111	82	68
128	18.650	0.146	0.031	2.28	94.6	0.69	99	0.63	0	76	111	82	68
129	18.803	0.153	0.032	2.27	94.7	0.73	102	0.61	-0.02	77	111	83	69
130	18.949	0.146	0.032	2.27	94.9	0.72	97	0.61	0	77	111	83	69
131	19.101	0.152	0.032	2.27	95	0.7	101	0.60	-0.01	77	110	83	69

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: AJ Wells
 Model: Skye E700
 Run #: 3

Job #: 22-751
 Tracking #: 97
 Technician: AK
 Date: 1/19/2022

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft ³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
132	19.247	0.146	0.032	2.28	95.2	0.71	97	0.59	-0.01	77	110	83	69
133	19.397	0.150	0.032	2.27	95.3	0.7	100	0.59	0	77	110	83	69
134	19.545	0.148	0.032	2.29	95.4	0.71	98	0.58	-0.01	77	111	83	69
135	19.695	0.150	0.031	2.28	95.5	0.71	101	0.57	-0.01	77	111	83	69
136	19.843	0.148	0.032	2.28	95.5	0.69	98	0.57	0	77	111	83	69
137	19.994	0.151	0.032	2.28	95.6	0.71	100	0.56	-0.01	77	110	83	69
138	20.144	0.150	0.032	2.28	95.6	0.72	100	0.55	-0.01	77	110	83	69
139	20.292	0.148	0.032	2.28	95.6	0.69	98	0.54	-0.01	77	111	83	69
140	20.443	0.151	0.031	2.28	95.7	0.73	102	0.53	-0.01	77	110	83	69
141	20.590	0.147	0.031	2.28	95.7	0.72	99	0.53	0	77	109	83	69
142	20.741	0.151	0.031	2.28	95.8	0.76	102	0.52	-0.01	77	108	83	69
143	20.887	0.146	0.031	2.28	95.7	0.76	98	0.52	0	77	107	83	68
144	21.040	0.153	0.031	2.29	95.6	0.77	103	0.51	-0.01	77	108	83	68
145	21.185	0.145	0.031	2.28	95.5	0.77	98	0.50	-0.01	77	107	83	68
146	21.339	0.154	0.031	2.29	95.6	0.74	104	0.49	-0.01	76	106	83	68
147	21.485	0.146	0.032	2.28	95.5	0.75	97	0.49	0	76	106	83	68
148	21.638	0.153	0.032	2.29	95.5	0.73	101	0.48	-0.01	76	106	83	68
149	21.784	0.146	0.032	2.28	95.6	0.74	97	0.47	-0.01	76	106	83	68
150	21.936	0.152	0.031	2.29	95.7	0.69	102	0.47	0	76	107	83	68
151	22.083	0.147	0.031	2.28	95.8	0.71	99	0.46	-0.01	76	107	83	68
152	22.234	0.151	0.031	2.29	96	0.68	102	0.45	-0.01	76	107	83	68
153	22.382	0.148	0.032	2.29	96.1	0.71	98	0.45	0	76	106	83	68
154	22.532	0.150	0.032	2.29	96.2	0.7	99	0.44	-0.01	76	106	83	69
155	22.682	0.150	0.032	2.29	96.3	0.73	99	0.43	-0.01	76	106	83	68
156	22.832	0.150	0.032	2.28	96.4	0.75	99	0.42	-0.01	76	107	83	68
157	22.982	0.150	0.032	2.28	96.5	0.73	99	0.42	0	76	107	83	68
158	23.131	0.149	0.032	2.28	96.4	0.74	99	0.41	-0.01	76	107	84	68
159	23.282	0.151	0.031	2.29	96.5	0.7	102	0.40	-0.01	77	107	84	68
160	23.428	0.146	0.032	2.28	96.4	0.75	97	0.40	0	77	106	84	68
161	23.581	0.153	0.032	2.29	96.5	0.73	101	0.39	-0.01	77	106	84	68
162	23.727	0.146	0.031	2.28	96.5	0.71	98	0.39	0	77	106	84	69
163	23.880	0.153	0.031	2.28	96.6	0.74	103	0.38	-0.01	76	106	84	69
164	24.027	0.147	0.032	2.29	96.5	0.76	97	0.37	-0.01	76	105	83	68

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: AJ Wells
 Model: Skye E700
 Run #: 3

Job #: 22-751
 Tracking #: 97
 Technician: AK
 Date: 1/19/2022

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft ³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
165	24.179	0.152	0.032	2.28	96.4	0.77	101	0.37	0	76	104	83	68
166	24.327	0.148	0.032	2.29	96.2	0.75	98	0.36	-0.01	75	104	83	68
167	24.478	0.151	0.032	2.30	96.2	0.76	100	0.35	-0.01	75	105	83	68
168	24.625	0.147	0.031	2.28	96.2	0.75	99	0.34	-0.01	75	104	82	68
169	24.776	0.151	0.031	2.29	96.2	0.77	101	0.34	0	75	103	82	68
170	24.925	0.149	0.031	2.28	96.3	0.74	100	0.34	0	75	104	82	68
171	25.075	0.150	0.031	2.29	96.4	0.77	101	0.33	-0.01	75	104	83	68
172	25.226	0.151	0.031	2.29	96.5	0.71	102	0.33	0	76	104	83	68
173	25.375	0.149	0.032	2.28	96.7	0.77	99	0.32	-0.01	76	104	83	68
174	25.526	0.151	0.032	2.28	96.7	0.7	100	0.31	-0.01	76	104	83	68
175	25.673	0.147	0.032	2.29	96.8	0.77	97	0.31	0	76	104	83	68
176	25.824	0.151	0.032	2.28	96.9	0.69	100	0.30	-0.01	76	104	83	68
177	25.971	0.147	0.032	2.29	97	0.76	97	0.29	-0.01	76	104	83	68
178	26.123	0.152	0.031	2.29	97	0.72	102	0.27	-0.02	77	112	83	69
179	26.270	0.147	0.031	2.29	97	0.71	99	0.24	-0.03	78	129	83	68
180	26.423	0.153	0.032	2.29	97.1	0.72	101	0.23	-0.01	78	137	83	68
181	26.570	0.147	0.031	2.29	97	0.7	99	0.21	-0.02	77	143	83	68
182	26.723	0.153	0.032	2.29	97	0.74	101	0.19	-0.02	78	148	83	68
183	26.869	0.146	0.032	2.29	97.1	0.77	97	0.17	-0.02	78	151	83	68
184	27.020	0.151	0.032	2.29	97.1	0.72	100	0.17	0	78	155	83	68
185	27.169	0.149	0.031	2.28	96.9	0.77	100	0.15	-0.02	78	157	83	68
186	27.319	0.150	0.032	2.28	96.8	0.77	99	0.14	-0.01	78	158	83	68
187	27.469	0.150	0.031	2.29	96.6	0.7	101	0.12	-0.02	78	159	83	68
188	27.618	0.149	0.031	2.29	96.6	0.77	100	0.10	-0.02	78	161	83	68
189	27.770	0.152	0.031	2.28	96.6	0.71	102	0.09	-0.01	78	163	83	68
190	27.918	0.148	0.031	2.29	96.7	0.77	100	0.08	-0.01	78	163	83	68
191	28.069	0.151	0.032	2.29	96.7	0.71	100	0.06	-0.02	78	163	83	68
192	28.215	0.146	0.031	2.29	96.8	0.73	98	0.05	-0.01	78	165	83	69
193	28.368	0.153	0.031	2.29	97	0.77	103	0.04	-0.01	78	165	83	69
194	28.514	0.146	0.032	2.28	97	0.74	97	0.02	-0.02	78	165	83	69
195	28.667	0.153	0.031	2.29	97.1	0.77	103	0.02	0	79	165	83	69
196	28.815	0.148	0.032	2.28	97.2	0.69	98	0.00	-0.02	79	166	83	69
Avg/Tot	28.814	0.147	0.032	2.20	88	0.73	100			82	176	83	68.8

BOX A TEST DATA - ASTM E3053 / ASTM E2515

Client: AJ Wells
 Model: Skye E700
 Run #: 3

Job #: 22-751
 Tracking #: 97
 Technician: AK
 Date: 1/19/2022

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft ³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient

WOODSTOVE SURFACE TEMPERATURE DATA

Client: AJ WellsModel: Skye E700Run #: 3Job #: 22-751Tracking #: 97Technician: AKDate: 1/19/2022

Elapsed Time (min)	Temperature Data (°F)						
	FB Top	FB Bottom	FB Back	FB Left	FB Right	Stove Surface Average	Catalyst Exit
0	608	170	174	428	411	358.0	N/A
1	594	173	176	427	409	355.7	N/A
2	584	174	176	425	406	353.1	N/A
3	579	172	177	422	403	350.4	N/A
4	582	171	177	418	400	349.6	N/A
5	588	171	177	414	398	349.7	N/A
6	599	172	177	412	397	351.2	N/A
7	610	173	177	410	396	353.3	N/A
8	623	176	178	409	396	356.4	N/A
9	636	178	178	409	397	359.8	N/A
10	648	180	179	410	398	363.0	N/A
11	660	182	179	411	400	366.3	N/A
12	671	185	180	411	401	369.5	N/A
13	682	186	180	412	403	372.7	N/A
14	692	188	181	413	404	375.7	N/A
15	701	190	182	414	406	378.5	N/A
16	710	191	183	416	408	381.4	N/A
17	718	192	185	418	410	384.4	N/A
18	725	192	187	420	412	387.2	N/A
19	731	195	191	422	414	390.5	N/A
20	735	197	194	425	417	393.4	N/A
21	738	198	197	427	419	395.8	N/A
22	741	199	199	430	421	398.0	N/A
23	745	200	200	431	423	399.7	N/A
24	748	201	200	432	425	401.3	N/A
25	753	202	200	433	426	403.0	N/A
26	759	204	200	435	427	405.1	N/A
27	764	205	201	435	429	406.7	N/A
28	768	205	202	437	430	408.5	N/A
29	772	206	203	439	432	410.4	N/A
30	775	207	205	442	433	412.2	N/A
31	778	208	206	445	435	414.2	N/A
32	780	208	207	448	437	416.0	N/A
33	783	209	208	451	439	417.9	N/A
34	785	210	209	454	441	419.6	N/A
35	786	210	210	457	443	421.3	N/A
36	787	211	212	460	445	422.9	N/A
37	788	213	213	463	446	424.5	N/A
38	789	214	215	466	448	426.2	N/A
39	789	215	217	468	450	427.8	N/A
40	789	216	218	471	451	429.0	N/A
41	789	216	219	473	453	429.8	N/A
42	789	216	219	475	454	430.4	N/A
43	789	216	219	476	455	430.9	N/A
44	788	216	219	477	456	431.2	N/A
45	787	216	219	478	457	431.5	N/A
46	786	216	220	479	458	431.6	N/A
47	783	217	220	480	459	431.6	N/A
48	780	217	219	481	459	431.4	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: AJ WellsModel: Skye E700Run #: 3Job #: 22-751Tracking #: 97Technician: AKDate: 1/19/2022

Elapsed Time (min)	Temperature Data (°F)						
	FB Top	FB Bottom	FB Back	FB Left	FB Right	Stove Surface Average	Catalyst Exit
49	778	217	219	482	460	431.1	N/A
50	775	217	219	483	460	430.9	N/A
51	771	217	220	484	460	430.4	N/A
52	767	218	221	484	460	430.0	N/A
53	763	219	222	485	459	429.5	N/A
54	758	219	223	485	459	428.6	N/A
55	752	220	223	485	458	427.5	N/A
56	745	220	223	485	457	425.9	N/A
57	738	221	222	485	456	424.2	N/A
58	731	221	221	484	454	422.2	N/A
59	724	222	220	483	453	420.2	N/A
60	717	223	218	482	451	418.3	N/A
61	710	224	217	481	449	416.3	N/A
62	702	227	219	480	448	415.0	N/A
63	694	231	223	478	445	414.1	N/A
64	685	234	227	477	444	413.2	N/A
65	676	237	231	475	442	412.2	N/A
66	668	239	235	474	440	411.1	N/A
67	659	242	238	472	438	409.6	N/A
68	650	244	242	470	437	408.2	N/A
69	641	246	245	467	435	406.8	N/A
70	632	249	248	464	433	405.2	N/A
71	624	251	251	462	431	403.5	N/A
72	615	253	254	459	429	401.8	N/A
73	607	254	257	455	426	399.9	N/A
74	599	256	259	452	424	398.1	N/A
75	592	257	261	449	422	396.1	N/A
76	584	259	263	445	419	394.2	N/A
77	577	261	265	442	417	392.3	N/A
78	570	262	267	439	415	390.4	N/A
79	563	263	268	435	412	388.6	N/A
80	557	265	270	432	410	386.6	N/A
81	551	266	271	429	408	384.8	N/A
82	544	267	272	426	405	382.8	N/A
83	538	268	273	423	403	380.8	N/A
84	532	269	273	419	400	378.8	N/A
85	527	270	274	416	398	376.9	N/A
86	521	271	275	413	396	375.1	N/A
87	516	272	275	410	393	373.4	N/A
88	511	273	276	408	391	371.7	N/A
89	506	274	277	405	389	370.2	N/A
90	502	275	277	403	387	368.6	N/A
91	497	275	278	400	385	367.0	N/A
92	493	276	278	398	383	365.5	N/A
93	488	277	278	396	381	364.0	N/A
94	484	277	279	393	380	362.4	N/A
95	480	277	279	391	378	360.9	N/A
96	476	278	279	389	376	359.4	N/A
97	472	278	279	386	374	357.9	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: AJ WellsModel: Skye E700Run #: 3Job #: 22-751Tracking #: 97Technician: AKDate: 1/19/2022

Elapsed Time (min)	Temperature Data (°F)						
	FB Top	FB Bottom	FB Back	FB Left	FB Right	Stove Surface Average	Catalyst Exit
98	469	279	279	384	372	356.4	N/A
99	465	279	279	382	370	355.0	N/A
100	462	280	278	380	369	353.6	N/A
101	458	280	278	378	367	352.2	N/A
102	455	280	278	376	365	350.7	N/A
103	452	280	278	374	363	349.2	N/A
104	449	280	277	372	361	347.7	N/A
105	446	280	277	370	360	346.3	N/A
106	443	280	276	368	358	345.0	N/A
107	440	280	276	366	357	343.8	N/A
108	438	280	275	365	355	342.6	N/A
109	435	281	275	363	354	341.6	N/A
110	433	281	275	362	353	340.4	N/A
111	430	281	275	360	351	339.4	N/A
112	428	281	275	359	350	338.4	N/A
113	426	281	274	357	349	337.3	N/A
114	423	281	274	356	348	336.2	N/A
115	421	280	273	355	346	335.1	N/A
116	419	280	273	353	345	334.1	N/A
117	417	280	273	352	344	333.1	N/A
118	415	280	272	350	343	332.1	N/A
119	413	280	272	349	341	331.1	N/A
120	411	280	271	348	340	330.1	N/A
121	409	280	271	347	339	329.1	N/A
122	408	279	270	345	338	328.1	N/A
123	406	279	270	344	337	327.0	N/A
124	404	279	269	343	336	325.9	N/A
125	402	278	268	342	334	324.9	N/A
126	400	278	268	340	333	324.0	N/A
127	399	278	267	339	332	323.0	N/A
128	397	278	267	338	331	322.2	N/A
129	396	278	266	337	331	321.5	N/A
130	394	277	266	336	330	320.7	N/A
131	393	277	266	335	329	320.0	N/A
132	392	277	265	334	328	319.1	N/A
133	390	277	265	334	327	318.4	N/A
134	389	276	264	332	326	317.6	N/A
135	387	276	264	332	326	316.8	N/A
136	386	275	263	331	325	316.0	N/A
137	385	275	263	330	324	315.2	N/A
138	384	275	263	329	323	314.5	N/A
139	382	274	262	328	322	313.6	N/A
140	381	274	262	327	321	312.9	N/A
141	380	273	261	326	320	312.1	N/A
142	379	273	261	325	320	311.4	N/A
143	377	273	260	324	319	310.5	N/A
144	376	272	259	323	318	309.7	N/A
145	375	272	259	322	317	308.8	N/A
146	374	272	258	321	316	308.0	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: AJ WellsModel: Skye E700Run #: 3Job #: 22-751Tracking #: 97Technician: AKDate: 1/19/2022

Elapsed Time (min)	Temperature Data (°F)						
	FB Top	FB Bottom	FB Back	FB Left	FB Right	Stove Surface Average	Catalyst Exit
147	372	271	257	320	315	307.2	N/A
148	371	271	257	319	314	306.4	N/A
149	370	270	256	318	313	305.6	N/A
150	369	270	256	318	313	305.0	N/A
151	368	270	255	317	312	304.2	N/A
152	367	269	255	316	311	303.6	N/A
153	366	269	255	315	310	302.9	N/A
154	364	268	254	315	310	302.2	N/A
155	363	268	254	314	309	301.5	N/A
156	362	268	253	313	308	300.7	N/A
157	361	267	252	312	307	299.9	N/A
158	360	266	252	312	306	299.2	N/A
159	359	266	251	311	305	298.5	N/A
160	358	265	251	310	305	297.8	N/A
161	357	265	250	309	304	297.1	N/A
162	357	265	250	309	303	296.5	N/A
163	356	264	249	308	302	295.7	N/A
164	355	263	248	307	301	295.0	N/A
165	354	263	248	306	300	294.1	N/A
166	353	262	247	305	299	293.4	N/A
167	352	262	246	305	299	292.7	N/A
168	351	261	246	304	298	292.0	N/A
169	350	261	245	303	297	291.3	N/A
170	349	261	245	303	297	290.8	N/A
171	349	260	244	302	296	290.3	N/A
172	348	260	244	302	295	289.7	N/A
173	347	259	244	301	295	289.2	N/A
174	346	259	243	301	294	288.6	N/A
175	346	258	243	300	293	288.0	N/A
176	345	258	242	300	293	287.4	N/A
177	344	257	242	299	292	286.8	N/A
178	343	257	242	299	291	286.3	N/A
179	342	254	238	298	291	284.5	N/A
180	341	250	233	297	290	282.5	N/A
181	341	247	229	297	290	280.7	N/A
182	341	244	225	297	289	279.1	N/A
183	341	242	221	296	289	277.8	N/A
184	341	239	218	296	289	276.7	N/A
185	341	237	214	296	289	275.6	N/A
186	342	235	211	297	289	274.8	N/A
187	343	233	208	297	290	274.1	N/A
188	343	231	206	298	290	273.6	N/A
189	344	230	204	298	291	273.2	N/A
190	345	228	201	299	291	273.0	N/A
191	346	227	200	300	292	272.9	N/A
192	347	225	198	301	293	272.8	N/A
193	348	224	196	302	294	272.8	N/A
194	349	223	195	303	294	272.8	N/A
195	349	222	194	304	295	272.7	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: AJ Wells
 Model: Skye E700
 Run #: 3

Job #: 22-751
 Tracking #: 97
 Technician: AK
 Date: 1/19/2022

Elapsed Time (min)	Temperature Data (°F)						
	FB Top	FB Bottom	FB Back	FB Left	FB Right	Stove Surface Average	Catalyst Exit
196	350	221	192	304	296	272.7	N/A
Average	525	245	238	384	371	353	N/A

LAB SAMPLE DATA - ASTM E2515

Client: AJ WellsModel: Skye E700Run #: 3Job #: 22-751Tracking #: 97Technician: AKDate: 1/19/2022

		Sample ID	Tare, mg	Final, mg	Catch, mg
Filters	A - 1st Hour	H0096	187.2	187.8	0.6
	B	H0097	185.8	187.0	1.2
	C - Post 1st Hour	H0098	185.5	185.6	0.1
	Amb	H0099	185.6	185.6	0.0
Probes	A - 1st Hour	3A	115877.8	115877.9	0.1
	B	3B	116117.6	116117.6	0.0
	C - Post 1st Hour	3C	116615.3	116615.3	0.0
O-rings	A - 1st Hour	3A	3580.7	3580.9	0.2
	B	3B	3569.1	3569.3	0.2
	C - Post 1st Hour	3C	3377.1	3377.3	0.2

Placed in Dessicator on:

1/18/2022

Filters	A - 1st Hour	187.9	1/20 16:00	187.8	1/21 16:01				
	B	187.1	1/20 16:00	187.0	1/21 16:01				
	C - Post 1st Hour	185.6	1/20 16:01	185.6	1/21 16:02				
	Amb	185.6	1/20 16:01	185.6	1/21 16:01				
Probes	A - 1st Hour	115878.5	1/20 16:03	115878.0	1/21 16:03	115877.9	1/24 11:31		
	B	116118.1	1/20 16:02	116117.6	1/21 16:02	116117.6	1/24 11:32		
	C - Post 1st Hour	116615.7	1/20 16:02	116615.3	1/21 16:02	116615.3	1/24 11:32		
O-Rings	A - 1st Hour	3580.7	1/21 16:00	3580.9	1/21 16:02				
	B	3569.2	1/21 16:01	3569.5	1/21 16:02	3569.3	1/24 11:31		
	C - Post 1st Hour	3377.3	1/21 16:01	3377.3	1/21 16:02				

Train A Sub-total, mg	0.9
Train C Sub-Total, mg:	0.3
Train 1 Aggregate, mg:	1.2
Train 2 Aggregate, mg:	1.4
Ambient Aggregate, mg:	0.0

ASTM E2515 - TX Filters

Sample	Weight 1	Weight 2	Weight 3	Weight 4	Initial	Project	Run
H0074	193.9	193.9	-	-	SB	21-733	#5
H0075	189.7	189.9	-	-	SB	20-654	#1
H0076	190.0	190.2	-	-	SB	↓	↓
H0077	181.8	182.3	182.3	-	SB	↓	↓
H0078	191.3	191.4	-	-	SB	↓	↓
H0079	181.2	181.5	181.3	-	SB	20-654	#2
H0080	182.7	182.7	-	-	SB	↓	↓
H0081	193.0	193.1	-	-	SB	↓	↓
H0082	185.7	183.7	-	-	SB	↓	↓
H0083	185.5	185.7	-	-	SB	20-654	#3
H0084	183.5	183.6	-	-	SB	↓	↓
H0085	189.6	189.7	-	-	SB	↓	↓
H0086	187.1	187.3	-	-	SB	↓	↓
H0087	188.8	188.8	-	-	SB	↓	↓
H0088	187.4	187.4	-	-	SB	20-22-751	#1
H0089	184.6	184.8	-	-	SB	↓	↓
H0090	186.2	186.2	-	-	SB	↓	↓
H0091	186.8	186.8	-	-	SB	↓	↓

Weight 1 Date/Time:
11/17/21 - 1600
Weight 2 Date/Time:
11/19/21 - 7:30
Weight 3 Date/Time:
11/22/21 - 9:45
Weight 4 Date/Time:

Sample	Weight 1	Weight 2	Weight 3	Weight 4	Initial	Project	Run
H0092	187.7	187.8	-	-	A	22-751	#2
H0093	187.02	187.4	-	-	A	↓	↓
H0094	187.6	187.5	-	-	A	↓	↓
H0095	187.7	187.7	-	-	A	↓	↓
H0096	187.2	187.2	-	-	A	22-751	#3
H0097	185.9	185.8	-	-	A	↓	↓
H0098	185.4	185.5	-	-	A	↓	↓
H0099	185.4	185.6	-	-	A	↓	↓
H0100	185.3	185.2	-	-	A	X	
H0101	184.1	183.9	-	-	A		
H0102	184.8	185.0	-	-	A		
H0103	184.4	184.6	-	-	A		
H0104	184.8	184.7	-	-	A		
H0105	184.0	183.9	-	-	A		
H0106	186.1	186.0	-	-	A		
H0107	187.4	187.2	-	-	A		
H0108	189.4	189.3	-	-	N		
H0109	187.9	187.8	-	-	N		

Weight 1 Date/Time:
11/17/22 1000
Weight 2 Date/Time:
11/18/22 0900
Weight 3 Date/Time:
Weight 4 Date/Time:

ASTM E2515 - O-Ring Samples 1-10

Date:	11/7/22	11/18/22	-	-			
Time:	1600	0900	-	-			
	Weight 1	Weight 2	Weight 3	Weight 4	Initial	Project	Run
1A	3568.0	3567.9	-	-	A	22-751	1
1B	3556.2	3556.1	-	-	A		
1C	4168.4	4168.2	-	-	A		
2A	3553.4	3553.5	-	-	A	22-751	2
2B	3572.3	3572.4	-	-	A		
2C	3392.5	3392.4	-	-	A		
3A	3580.6	3580.7	-	-	A	22-751	3
3B	3569.1	3569.1	-	-	A		
3C	3377.2	3377.1	-	-	A		
4A	3627.1	3628.3.0	-	-	A		
4B	3580.3	3580.5	-	-	A		
4C	3373.7	3373.9	-	-	A		
5A	3526.0	3536.2	-	-	A		
5B	3531.9	3532.0	-	-	A		
5C	3378.1	3378.2	-	-	A		

Date:							
Time:							
	Weight 1	Weight 2	Weight 3	Weight 4	Initial	Project	Run
6A							
6B							
6C							
7A							
7B							
7C							
8A							
8B							
8C							
9A							
9B							
9C							
10A							
10B							
10C							

ASTM E2515 - Probe Samples 1-10

Date:	1/17/22	1/18/22	-	-			
Time:	16:00	0900	-	-			
	Weight 1	Weight 2	Weight 3	Weight 4	Initial	Project	Run
1A	115624.9	115624.9	-	-	A	22-751	#1
1B	115900.1	115900.1	-	-	A		
1C	116431.9	116431.8	-	-	A		
2A	116055.6	116055.5	-	-	A	22-751	#2
2B	116172.2	116172.1	-	-	A		
2C	116428.5	116428.5	-	-	A		
3A	115877.8	115877.8	-	-	A	22-751	#3
3B	116117.7	116117.6	-	-	A		
3C	116615.5	116615.3	-	-	A		
4A	116020.5	116020.4	-	-	A		
4B	116178.1	116178.0	-	-	A		
4C	116994.2	116994.3	-	-	A		
5A	116754.6	116754.5	-	-	A		
5B	116873.3	116873.1	-	-	A		
5C	115854.4	115854.4	-	-	A		

Date:							
Time:							
	Weight 1	Weight 2	Weight 3	Weight 4	Initial	Project	Run
6A							
6B							
6C							
7A							
7B							
7C							
8A							
8B							
8C							
9A							
9B							
9C							
10A							
10B							
10C							

Pre-Conditioning Data

Client: <u>AJ Wells</u>	Job #: <u>22-751</u>
Model: <u>Charnwood E700</u>	Tracking #: <u>97</u>
Date(s): <u>1/10/2022 - 1/17/2022</u>	Technician: <u>AK</u>

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	177	N/A	+12.73 lb, maple, 22.1% DB, air setting 2/5
1	178	N/A	
2	162	N/A	
3	119	N/A	
4	108	N/A	
5	99	N/A	
6	337	N/A	+10.48 lb, maple, 19.7% DB, air setting 2/5
7	246	N/A	
8	199	N/A	
9	326	N/A	
10	302	N/A	
11	170	N/A	
12	333	N/A	+7.32 lb, maple, 21.6% DB, air setting 2/5
13	212	N/A	
14	168	N/A	
15	144	N/A	
16	131	N/A	
17	259	N/A	
18	132	N/A	
19	101	N/A	
20	96	N/A	
21	225	N/A	+12.22 lb, maple, 21.3% DB, air setting 2/5
22	181	N/A	
23	118	N/A	
24	103	N/A	
25	94	N/A	
26	90	N/A	
27	302	N/A	+11.39 lb, maple, 24.7% DB, air setting 2/5
28	195	N/A	
29	332	N/A	
30	270	N/A	
31	284	N/A	
32	233	N/A	
33	177	N/A	
34	150	N/A	
35	133	N/A	
36	314	N/A	+14.31 lb, maple, 24.9% DB, air setting 2/5
37	257	N/A	
38	223	N/A	
39	265	N/A	
40	261	N/A	
41	120	N/A	
42	104	N/A	

Pre-Conditioning Data

Client: AJ Wells	Job #: 22-751
Model: Charnwood E700	Tracking #: 97
Date(s): 1/10/2022 - 1/17/2022	Technician: AK

43	99	N/A	
44	102	N/A	
45	111	N/A	+12.53 lb, maple, 22% DB, air setting 2/5
46	255	N/A	
47	120	N/A	
48	122	N/A	
49	182	N/A	
50	354	N/A	

Sample Calculations – ASTM E3053 & E2515

Client: AJ Wells
 Model: Skye E700
 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_{TFBdb} - 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)

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

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	1.10	19.5	1.1 (100) / (100+ 19.5)) =	0.92
2	0.93	19.3	0.93 (100) / (100+ 19.3)) =	0.78
3	1.28	21.7	1.28 (100) / (100+ 21.7)) =	1.05
4	1.13	20.6	1.13 (100) / (100+ 20.6)) =	0.94
5	1.31	20.4	1.31 (100) / (100+ 20.4)) =	1.09
6	0.00	NA	#VALUE!	#VALUE!
7	N/A	N/A	N/A	-
SUM				#VALUE! lbs

M_{Fldb} = #VALUE! lbsM_{Fldb} = #VALUE! kg

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

ASTM 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

Sample Calculation:

$$M_{SUwb} = 1.69$$

$$MC_{SU} = 21.4$$

$$M_{SUdb} = 1.7 (100/(100+ 21.4)$$

$$M_{SUdb} = \mathbf{1.39} \text{ lbs}$$

$$= \mathbf{0.63} \text{ kg}$$

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

ASTM E3053 equation (3)

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

Where,

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.

Sample calculation:

$$M_{Kwb} = 1$$

$$MC_K = 10.0$$

$$M_{Kdb} = 1.00 (100/(100 + 10.0))$$

$$M_{Kdb} = \mathbf{0.91 \text{ lbs}}$$

$$= \mathbf{0.41 \text{ kgs}}$$

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:

$$M_{RSUBdb} = 0.58$$

$$M_{FLEHdb} = 0.53$$

$$M_{FREHdb} = 0.58 + 0.53$$

$$\begin{aligned} M_{FREHdb} &= \mathbf{1.11} \text{ lbs} \\ &= \mathbf{0.50} \text{ kg} \end{aligned}$$

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:

$$M_{Kdb} = 0.91$$

$$M_{SUdb} = 1.39$$

$$M_{FLdb} = #####$$

$$M_{FREHdb} = 1.11$$

$$\begin{aligned} M_{TFBHdb} &= 0.91 + 1.39 + \text{\#VALUE!} - 1.11 \\ &= \text{\#VALUE! lbs} \\ &= \text{\#VALUE! kg} \end{aligned}$$

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:

$$\begin{aligned} M_{FLdb} &= ##### \\ M_{FLEHdb} &= 0.53 \\ \theta_{H1} &= 56 \end{aligned}$$

$$BR_H = \frac{60 (##### - 0.53)}{56}$$

$$\begin{aligned} BR_H &= \text{\#VALUE! lb/hr} \\ &= \text{\#VALUE! kg/hr} \end{aligned}$$

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

$$\begin{aligned} M_{TFBdb} &= \text{N/A} - \text{N/A} \\ &= \text{N/A} \quad \text{lbs} \\ &= \text{N/A} \quad \text{kg} \end{aligned}$$

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

$$BR = \frac{60 \times N/A}{N/A}$$

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 ₂ O
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 ₂ O; (in Hg = in H ₂ O/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:

$$F_p = \frac{9.75}{11.96} = 0.815$$

$$V_s = 0.815 \times 85.49 \times 0.99 \times 0.178 \times \left(\left(\frac{80.5}{30.15} + \frac{460}{-0.08} \right) \times \frac{28.78}{13.6} \right)^{1/2}$$

$$V_s = \mathbf{9.68} \text{ ft/s}$$

*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 M_s 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, ft²
- 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:

$$Q_{sd} = 3600 \times (1 - 0.02) \times 9.68 \times 0.7854 \times \frac{528}{80.5 + 460} \times \frac{30.15 + \frac{-0.08}{13.6}}{29.92}$$

$$Q_{sd} = \mathbf{26396.8} \quad \text{dscf/hr}$$

$V_{m(std)}$ – 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 ₂ O
T_m	=	Absolute average dry gas meter temperature, °R

Sample Calculation:

Using equation for Train 1:

$$V_{m(std)} = 17.64 \times 10.985 \times 1.011 \times \frac{(30.15 + \frac{2.05}{13.6})}{(79.9 + 460)}$$

$$V_{m(std)} = \mathbf{10.994} \text{ dscf}$$

Using equation for Train 2:

$$V_{m(std)} = 17.64 \times 11.059 \times 0.995 \times \frac{(30.15 + \frac{2.03}{13.6})}{(78.8 + 460)}$$

$$V_{m(std)} = \mathbf{10.916} \text{ dscf}$$

Using equation for ambient train:

$$V_{m(std)} = 17.64 \times 18.65 \times 0.997 \times \frac{(30.15 + \frac{0.00}{13.6})}{(65.3 + 460)}$$

$$V_{m(std)} = \mathbf{18.830} \text{ dscf}$$

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):

$$m_n = 0.0 + 1.4 + 0.1$$

$$m_n = 1.5 \text{ mg}$$

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

$$m_n = 0.0 + 0.1 + 0.1$$

$$m_n = 0.2 \text{ mg}$$

Train A aggregate:

$$m_n = 1.5 + 0.2$$

$$m_n = \mathbf{1.7} \text{ mg}$$

Using equation for Train B:

$$m_n = 0 + 1.5 + 0.1$$

$$m_n = \mathbf{1.6} \text{ mg}$$

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

ASTM E2515 equation (13)

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

Where:

K₂ = Constant, 0.001 g/mgm_n = Total mass of particulate matter collected in the sampling train, mgV_{m(std)} = Volume of gas sampled corrected to dry standard conditions, dscf

Sample calculation:

For Train 1:

$$C_s = 0.001 \times \frac{1.7}{10.99}$$

$$C_s = \mathbf{0.00015} \text{ g/dscf}$$

For Train 2

$$C_s = 0.001 \times \frac{1.6}{10.92}$$

$$C_s = \mathbf{0.00015} \text{ g/dscf}$$

For Ambient Train

$$C_r = 0.001 \times \frac{0.1}{18.83}$$

$$C_r = \mathbf{0.000005} \text{ g/dscf}$$

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

$$E_T = (0.000155 - 0.000005) \times 26396.8 \times 78 / 60$$

$$E_T = 5.12 \text{ g}$$

For Train 2

$$E_T = (0.000147 - 0.000005) \times 26396.8 \times 78 / 60$$

$$E_T = 4.85 \text{ g}$$

Average

$$E = 4.99 \text{ g}$$

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

$$7.5\% \text{ of the average} = 0.37$$

$$\text{Train 1 difference} = 0.14$$

$$\text{Train 2 difference} = 0.14$$

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, °R
- T_m = Absolute average dry gas meter temperature, °R
- T_{si} = Absolute average gas temperature in the dilution tunnel during the "ith" time interval, °R
- T_s = Absolute average gas temperature in the dilution tunnel, °R

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

$$PR = \left(\frac{78 \times 0.176 \times 9.68 \times (69.5 + 460) \times (79.9 + 460)}{1 \times 10.985 \times 9.64 \times (80.5 + 460) \times (69.7 + 460)} \right) \times 100$$

$$PR = 125 \%$$

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

Sample Calculation:

$$E_{TH} = 4.99$$

$$\theta_{H2} = 78$$

$$PM_{RH} = 60(4.99 / 78)$$

$$PM_{RH} = 3.84 \text{ g/hr}$$

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:

$$E_{TH} = 4.99$$

$$M_{TFBHdb} = \text{#####}$$

$$PM_{FH} = 4.99 / \text{#####}$$

$$= \text{##### g/kg}$$

PM_R - Particulate emission rate for low or medium fire test runs, g/hr

ASTM E3053 equation (12)

$$PM_R = 60(E_T/\theta)$$

Where,

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

Sample Calculation:

E_T = N/A - Applicable to Low/Medium Fire Tests Only

θ = N/A - Applicable to Low/Medium Fire Tests Only

$$PM_R = 60(\text{N/A} / \text{N/A})$$

$$PM_{RH} = \text{N/A g/hr}$$

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

ASTM E3053 equation (13)

$$PM_F = E_T/M_{TFBdb}$$

Sample Calculation:

E_T = N/A - Applicable to Low/Medium Fire Tests Only

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

$$PM_{FH} = \text{N/A} / \text{N/A}$$

$$= \text{N/A g/kg}$$



Front



Back



Left



Right



Run 1 Kindling



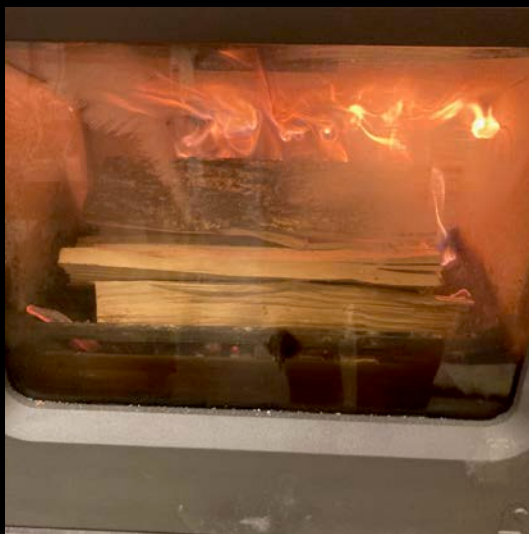
Run 1 Startup



Run 1 Fuel



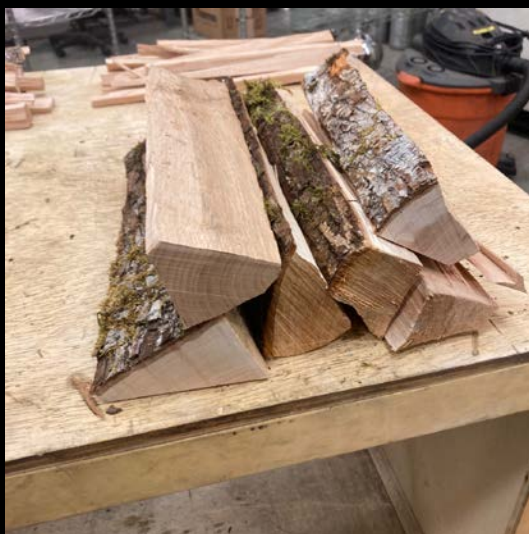
Run 1 Kindling Loaded



Run 1 Fuel Loaded



Run 1 End



Run 2 Fuel



Run 2 Fuel Loaded



Run 3 Pre Kindling



Run 3 Pre Startup



Run 3 Pre Fuel



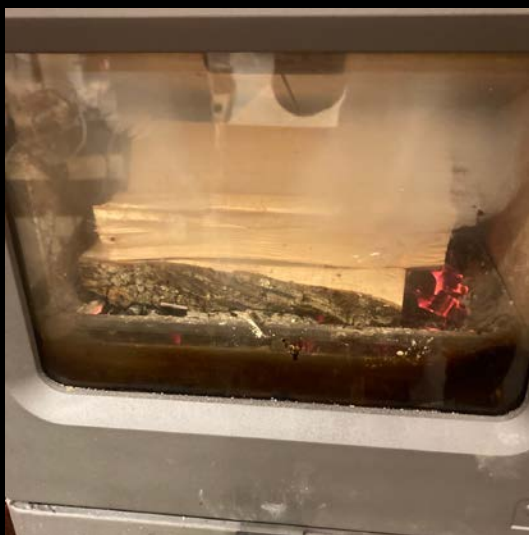
Run 3 Fuel



Run 3 Pre Kindling Loaded



Run 3 Pre Fuel Loaded



Run 3 Fuel Loaded



Sealed

QR code to contain the website link
and the serial number in the format:
[https://www.charnwood.com/
fms?a=CUL&b=0000](https://www.charnwood.com/fms?a=CUL&b=0000)

The QR Code here is shown at low with
100% fill of the blocks. 14 x 14 mm

All printing to be in black, items shown in
red are serial number specific.



CHARNWOOD

NEWPORT, IW

PO30 5WS, UK

CHARNWOOD.COM



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

Fuel	Wood	
Heat output range:	10,520 - 29,850 btu/h (3.1 - 8.7kW)	
Certified emissions:	1.7 g/hr	
Energy efficiency:	82% LHV / 77% HHV	
Distance to combustibles:	Side	Back
With single wall flue:	TBD	TBD
With ins. flue & heatshield:	TBD	TBD

Year of manufacture:

2022

2023

2024

2025

2026

2027

Month of manufacture:

JAN

FEB

MAR

APR

MAY

JUNE

JULY

AUG

SEPT

OCT

NOV

DEC

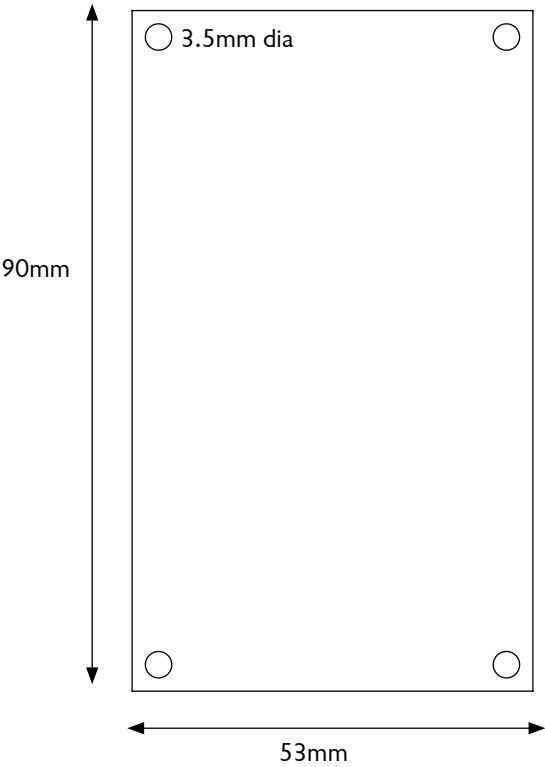
Model:

skye E700 LOW

Serial No:

CUL0000

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.



QR code to contain the website link
and the serial number in the format:
[https://www.charnwood.com/
fms?a=CU&b=0000](https://www.charnwood.com/fms?a=CU&b=0000)

The QR Code here is shown at low with
100% fill of the blocks. 14 x 14 mm

All printing to be in black, items shown in
red are serial number specific.



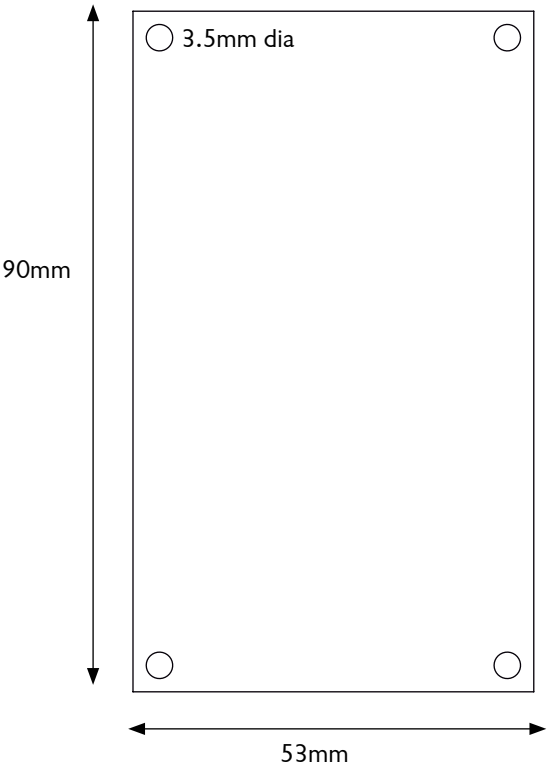
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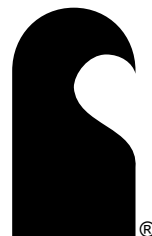


U.S. ENVIRONMENTAL PROTECTION AGENCY *Certified to
comply with 2020 particulate emission standards using cord wood*

Fuel	Wood	
Heat output range:	10,520 - 29,850 btu/h (3.1 - 8.7kW)	
Certified emissions:	1.7 g/hr	
Energy efficiency:	82% LHV / 77% HHV	
Distance to combustibles:	Side	Back
With single wall flue:	TBD	TBD
With ins. flue & heatshield:	TBD	TBD
Year of manufacture:	■ 2022 ■ 2023 ■ 2024 ■ 2025 ■ 2026 ■ 2027	
Month of manufacture:	■ JAN ■ FEB ■ MAR ■ APR ■ MAY ■ JUNE ■ JULY ■ AUG ■ SEPT ■ OCT ■ NOV ■ DEC	
Model:	skye E700 STORE STAND	
Serial No:	CU	0000

*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.*





skyeE700

charnwood

Operating & Installation Instructions

PLEASE SAVE THESE INSTRUCTIONS FOR FUTURE USE

SAFETY NOTICE

PLEASE READ THIS ENTIRE MANUAL BEFORE YOU INSTALL AND USE YOUR NEW ROOM HEATER. FAILURE TO FOLLOW INSTRUCTIONS MAY RESULT IN PROPERTY DAMAGE, BODILY INJURY OR EVEN DEATH.

IF THIS ROOM HEATER IS NOT PROPERLY INSTALLED, OPERATED AND MAINTAINED, A HOUSE FIRE MAY RESULT.

TO REDUCE THE RISK OF FIRE, FOLLOW THE INSTALLATION INSTRUCTIONS.

CONTACT LOCAL BUILDING OR FIRE OFFICIALS ABOUT RESTRICTIONS AND INSTALLATION INSPECTION REQUIREMENTS IN YOUR AREA AND THE NEED TO OBTAIN A PERMIT.

DO NOT INSTALL IN A MOBILE HOME.

DO NOT CONNECT THE UNIT TO A CHIMEY FLUE SERVING ANOTHER APPLIANCE.

ONLY BURN NATURAL, UNTREATED, DRY WOOD.

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

Tested to ASTM E3053. Model Skye E700 – 1.69g /hr.

This unit must be connected to either a listed factory built chimney suitable for use with solid fuels and conforming to, ULC629 in Canada or UL-103HT in the United States of America. or code approved masonry chimney with flue liner.

COPY OF SAFETY LABEL LOCATED ON THE BACK OF THE APPLIANCE

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skyeE700

charnwood

CAUTION

ATTENTION

HOT WHILE IN OPERATION DO NOT TOUCH, KEEP CHILDREN AND CLOTHING AWAY, CONTACT MAY CAUSE SKIN BURNS. KEEP FURNISHINGS AND OTHER COMBUSTIBLE MATERIAL FAR AWAY FROM THE APPLIANCE, SEE NAMEPLATE AND INSTRUCTIONS.

CHAUD LORS DU FONCTIONNEMENT. NE PAS TOUCHER. GARDEZ LES ENFANTS ET LES VÊTEMENTS HORS DE PORTÉE DE L'INSTALLATION. LE CONTACT PEUT CAUSER DES BRÛLURES DE PEAU. GARDEZ LES MEUBLES ET LES MATÉRIAUX COMBUSTIBLES ELOIGNÉS DE L'APPAREIL. VOIR L'ÉTIQUETTE ET LES INSTRUCTIONS.

PREVENT HOUSE FIRES

- Install and use only in accordance with manufacturer's installation and operating instructions.
- Contact local building or fire officials about restrictions and installation inspection in your area.
- For use with solid wood fuel only.
- Refer to manufacturer's installation instructions and local codes for precautions required for passing chimney through a combustible wall or ceiling.
- Do not over fire – if heater or chimney connector glows you are overfiring.
- Inspect and clean chimney frequently – under certain conditions of use, creosote buildup may occur rapidly
- Do not connect this unit to a chimney flue serving another appliance.
- This room heater should be operated with the door closed.
- Replace door glass only with ceramic glass part no D06/PY18 available from your dealer.
- This room heater must be installed with the stand provided, attached as shown in the installation instructions.

PRÉVENTION DES FEUX DE MAISON

- Installez et utilisez en accord avec les instructions d'installation et d'utilisation du fabricant.
- Contactez les autorités de construction ou les autorités incendie au sujet des restrictions et des inspections d'installation dans votre région.
- Pour usage avec du bois solide seulement.
- Référez vous aux instructions du fabricant et des codes locaux relatives aux précautions requises pour faire passer une cheminée à travers un mur ou un plafond combustibles.
- Ne surchauffez pas. Si l'appareil de chauffage ou le tuyau de cheminée rougissent, vous surchauffez.
- Inspectez et nettoyez la cheminée fréquemment. Sous certaines conditions, il se peut que la cressote s'accumule rapidement.
- Ne connectez pas cet appareil à une cheminée servant un autre appareil.
- Opérez l'appareil seulement lorsque la porte de chargement est fermée.
- Remplacez la vitre seulement avec la vitre céramique D06/PY18 disponible chez votre fournisseur.
- Cet appareil de chauffage doit être installé sur le support fourni et y être fixé comme décrit dans les instructions d'installation fournies.

MINIMUM CLEARANCES TO COMBUSTIBLE MATERIALS / ESPACES LIBRES MINIMUM DES MATÉRIAUX COMBUSTIBLES

Dimensions	A	B	C	D	E	F
Single Wall Pipe Conduit paroi simple	TBC** (TBCmm)	TBC** (TBCmm)	TBC** (TBCmm)	TBC** (TBCmm)	TBC** (TBCmm)	TBC** (TBCmm)
Double Wall Pipe** Conduit paroi double**	TBC** (TBCmm)	TBC** (TBCmm)	TBC** (TBCmm)	TBC** (TBCmm)	TBC** (TBCmm)	TBC** (TBCmm)

BACK WALL / SIDE WALL
MUR ARRIÈRE / MUR DE CÔTÉ

CORNER INSTALLATION
INSTALLATION DANS UN COIN

** With rear heat shield
** Avec écran thermique

FLOOR PROTECTION

Floor protector must be of non combustible material such as 24 AWG (0.5mm) sheet metal or equivalent extending beneath heater and to front/sides/rear as indicated on the diagram below. In addition: Non-combustible floor protections must extend beneath the chimney connector when installed horizontal from the rear flue exit and extend 2" (51mm) beyond each side.

PROTECTION DU PLANCHER

Le protecteur de plancher doit être en matériau incombustible comme une plaque de métal d'épaisseur 24 AWG (0.5mm) ou équivalent, s'étendant sous l'appareil de chauffage, sur les côtés, à l'avant et à l'arrière comme indiqué sur le diagramme suivant.

Cas particulier – Les protections incombustibles du plancher doivent s'étendre en dessous du raccord de cheminée lorsqu'il est installé horizontalement et s'étendre de 2" (51mm) au-delà de chaque côté du tuyau.

MANUFACTURED BY: / FABRIQUÉ PAR: Charnwood, Bishops Way, Newport PO30 5WS, United Kingdom / Royaume Uni

2022 2023 2024

JAN. JANV. FEB. FÉV. MAR. MARS APR. AVR. MAY MAI JUNE JUIN JULY JUILLET AUG. AOÛT. SEPT. SEPT. OCT. OCT. NOV. NOV. DEC. DEC.

DO NOT REMOVE THIS LABEL / NE PAS ENLEVER L'ÉTIQUETTE

Made in UK / Fait au Royaume Uni

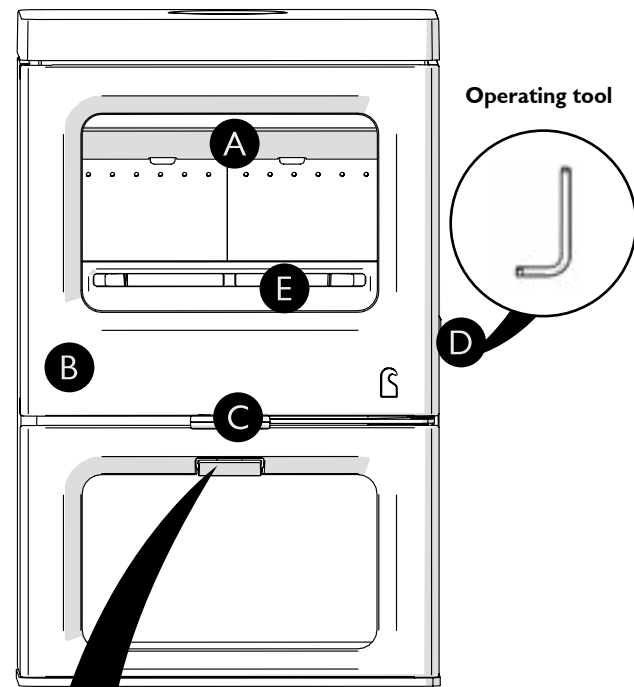
U.S. ENVIRONMENTAL PROTECTION AGENCY – Certified to comply with July 1990 particulate emission standards

AGENCE DE PROTECTION DE L'ENVIRONNEMENT US - Est conforme aux exigences sur les normes d'émissions de particules de juillet 1990

TESTED TO: / TESTÉ À: UL 1482, ULC –S627-00

Ref. skye E700 30.03.20 REV F

QUICK GUIDE

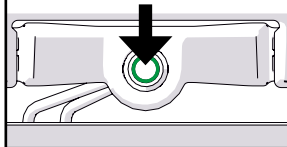


- A Throat plate**
Improves efficiency of stove by slowing down flue gases
- B Door**
Keep closed when stove is in use
- C Door handle**
Pull out to open
- D Riddler knob**
Use operating tool to riddle
- E Fuel retainer**
Ensure fuel does not protrude beyond retainer

AIR CONTROL

Blue light = Automatic mode
Green light = Room Temperature mode
Red light = Temporary Manual mode
The intensity of the light displayed indicates the burn level. There are 5 levels in each mode, indicated by increasing light intensity.

PRESS



MAINTENANCE AND CLEANING

GLASS

Wipe with damp, lint free cloth. Any stubborn deposits on the glass may be removed with a proprietary stove glass cleaner or ceramic hob cleaner.

THROAT PLATE & UPPER BAFFLE

Take down once a month and clean. Sweep sooty deposits into fire

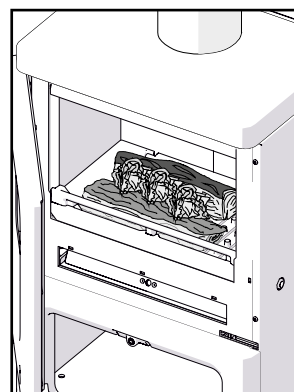
CHIMNEY

Have chimney swept twice a year. Chimney can be swept through stove.

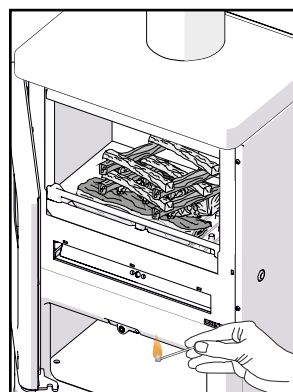
SERVICING

Stove should be serviced by a professional at least once a year.

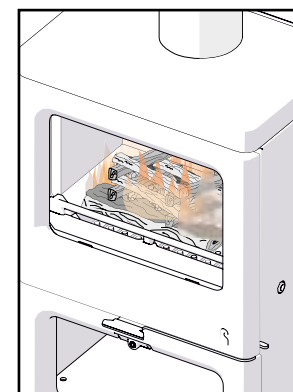
LIGHTING AND CONTROLLING THE FIRE



Place 2-3 dry well seasoned logs into the bottom of the firebox. In Room Temperature or Automatic modes, lighting is controlled by the stove regardless of the setting.



Build a stack of 6-8 softwood kindling sticks. This can be in grid shape or a pyramid, ensure to leave a space between the pieces to allow the air to circulate around and through them and light. If cracked open, the door can now be closed.



Add larger logs once the fire is established. Target Room Temperature, or burn level can be selected depending on the mode being used.

Suitable fuels for your Charnwood:

Wood logs

Unsuitable fuels:

Petroleum coke
Liquid fuel
Household waste
Coal singles
Small nuts or coal dust
Wet or unseasoned wood

OPERATING INSTRUCTIONS



Congratulations on becoming the owner of a Charnwood Skye Stove. It is very important that you read and understand these instructions before using the stove.

Before lighting the stove check with the installer that the work and checks described in the Installation Instructions have been carried out correctly and that the chimney has been swept, is sound and free from any obstructions. The stove is not suitable for use in a shared flue system.

Remember that the stove will be hot and that it is made from hard materials – ensure that you have good balance before operating the fire. Always use the provided operating tool and gloves.

Do not use an aerosol spray on or near the stove when it is alight. There is a risk of explosion or flash ignition of the spray.

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.

REMEMBER THE STOVE WILL BE HOT WHILE IN OPERATION. KEEP CHILDREN, CLOTHING AND FURNITURE AWAY. CONTACT MAY CAUSE SKIN BURNS.

The stove is suitable for intermittent operation.

FUEL

Only dry well seasoned wood should be burnt on this appliance as burning wet unseasoned wood will give rise to heavy tar deposits in the stove, on the glass and within the chimney. For the same reason hard woods (such as Ash, Beech and Oak) are better than soft woods (such as Pine and Spruce). Burning wet unseasoned wood will also result in considerably reduced outputs. The wood should be cut and split and then left to season in a well ventilated dry place for at least one year but preferably two years before use. Recommended log sizes are:

12" (300mm) long and 3" (75mm) diameter

The maximum log length is 17" (430mm)

Log moisture content of less than 20% is recommended.

PETROLEUM COKE IS NOT SUITABLE FOR USE ON THIS APPLIANCE. ITS USE WILL INVALIDATE THE GUARANTEE.

DO NOT USE CHEMICALS OR FLUIDS TO START THE FIRE.

DO NOT BURN GARBAGE OR FLAMMABLE LIQUIDS SUCH AS GASOLINE, NAPHTHA OR ENGINE OIL.

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 IT IS IN USE.

MULTI GRATE

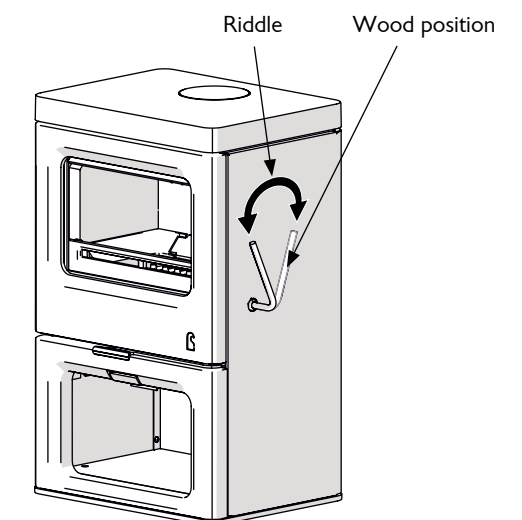
Your Charnwood Skye is fitted with a multi grate to enable wood to be burned and ash to be cleared. The grate has two positions:

1) In the wood position the grate bars are horizontal, allowing the combustion air to come round the sides of the grate and over the top of it. In this position ash is able to build up on the grate as is necessary for effective wood burning.

2) In the open position the grate bars are vertical with gaps in between allowing the ash to fall in the ashpan.

The grate is put into the open position by turning the operation tool anticlockwise. The grate is put into the wood position by turning the operation tool clockwise. To riddle the appliance the tool should be moved between the clockwise and anticlockwise positions several times. When burning wood the ash should be allowed to build up and riddling should only be carried out once or twice a week.

Fig. 1 Operating the grate



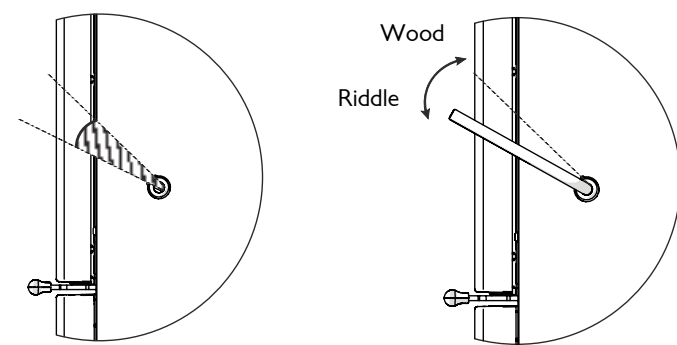
OPERATING INSTRUCTIONS



RIDDLING

When burning wood, ash should be allowed to build up and only riddled when the ash begins to cover the rear fireplate. The fire should be riddled with the door shut (see Fig.2). Place the operating tool onto the riddling lever and rotate between the open and closed positions several times. Too much riddling can result in emptying unburnt fuel into the ashpan and should therefore be avoided. After riddling, the grate should be put back into the closed position for burning wood.

Fig. 2 Riddling tool



LIGHTING

Before lighting, ensure the stove is in automatic mode. On initial lighting, the stove may smoke and give off an odour as the silicon paint with which the firebox is painted reacts to the heat. This is normal and will cease after a short time, but meanwhile the room should be kept well ventilated.

At first only light a small fire and burn it slowly for two hours to allow any residual moisture in the chimney to evaporate.

In Automatic or Room Temperature modes, the stove will ensure that the automatic maximum level 5 setting is selected for the lighting stage and the setting that is made on the app or on the air control at the stove itself, determines how the stove will burn once the fuel is thoroughly alight. First, start by placing 2-3 dry well seasoned logs into the bottom of the firebox. On top of this build a stack of 6-8 softwood kindling sticks. This can be in grid shape or a pyramid, ensure to leave a space between the pieces to allow the air to circulate around and through them. Ensure that the assembled wood is no higher than the holes on the back bricks of the firebox and that no logs protrude over the front fence. Place natural fire lighters or paper inside, light the fire and close the stove door. In Room Temperature or Automatic modes, the stove automatically

ensures thorough lighting and then transitions to the burn rate set by the user on the app or the air control on the stove itself. The user can leave the stove unattended during lighting if this method is used. Do not leave the door open except as directed above to avoid excessive smoke.

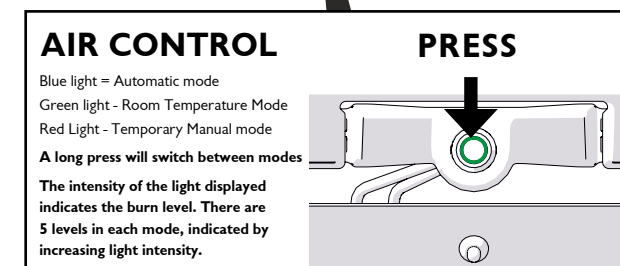
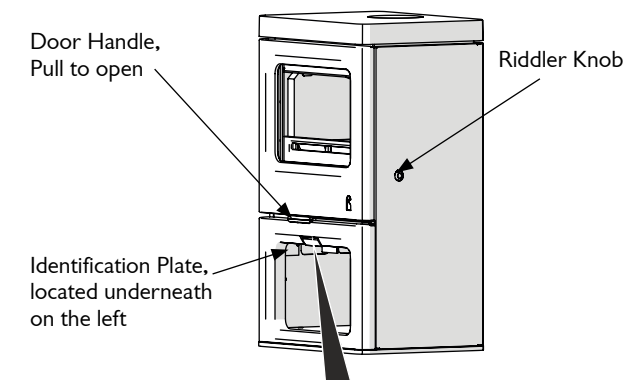
When relighting the stove, leave the ash on the base if burning wood, unless it is becoming too deep, in which case some of it may be removed.

CONTROLLING THE FIRE

The rate of burning and hence the output is controlled by the air control (see Fig.3) or the mobile phone app (see Fig.4)

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.

Fig. 3 Stove controls



	AUTOMATIC MODE Blue light
1st Press	Lowest burn rate 1
2nd Press	Burn rate 2
3rd Press	Burn rate 3
4th Press	Burn rate 4
5th Press	Highest burn rate 5

OPERATING INSTRUCTIONS



The stove has two main modes of control - Automatic and Room Temperature Mode. In Automatic Mode there are five levels and the stove will give the most efficient and clean burn at each level over the refuelling cycle. In Room Temperature mode, the stove will drop to a lower level once the set temperature has been reached.

The air control will endeavour to burn the fuel loaded in the best way possible and so the output will vary depending on how much fuel is loaded.

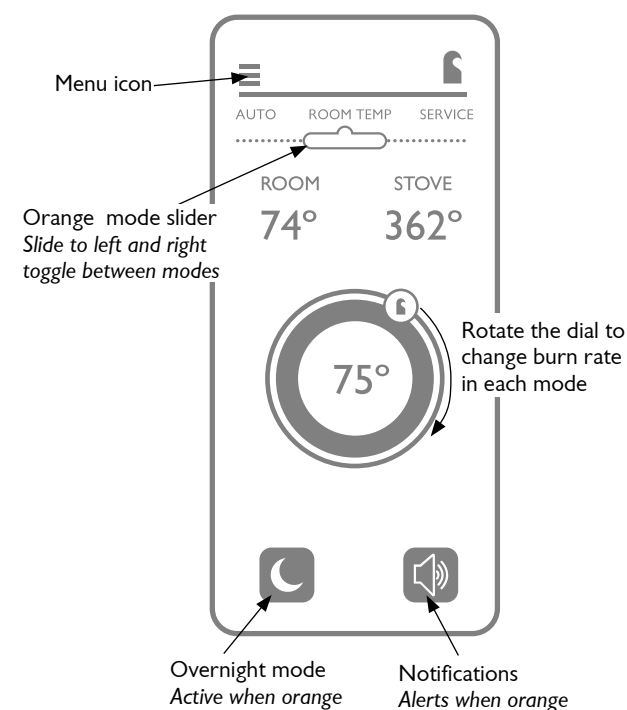
There are two ways to control the fire - using the air control on the stove (see Fig.3) or by using the app. The air control on the stove itself allows the user access to step through the levels of the Automatic mode, whereas the App also offers the Room Temperature mode.

The stove mounted air control is easily accessible a short push changes the burn. When gently pushed, the stove will enter Automatic mode on the lowest burn rate 1, denoted by a dim blue light. Subsequent pushes of the air control button will index up through the next four burn rates, accompanied by an increasingly intense blue light, until the highest burn rate 5 is reached, after which it reverts to the lowest burn rate.

CONTROLLING THE FIRE WITH THE APP

The stove can also be controlled by the Charnwood app, which gives more refined controls to the user. This can be downloaded from the Apple app or Google Play stores.

Fig.4 Charnwood App



The orange mode slider is used to change between the 3 Modes:

Auto Mode – The stove controls the air to maximise the efficiency and minimise the emissions and once it has ensured that the fuel is properly lit, it will burn at the rate defined by the user (1 – 5).

Room Temp Mode – As Auto mode, except that the user defines a set room temperature (61 – 90F/16 – 30C) that is compared to the room temperature measured by the stove and displayed on the App. The stove automatically adjusts the burn rate to suit the desired room temperature.

The central dial can be used to change the burn rate within each mode; in Auto mode, burn rates 1 – 5 can be selected, in Room Temp mode, set room temperatures of 61 – 90F (16 – 30C) can be selected.

The Overnight mode button is active when orange. In this mode, the stove will shut down to preserve char firebed for as long as possible, once the fire is no longer producing smoke. The stove returns to its original mode when fuel is reloaded.

The Notifications button is active when orange and allows the user to receive notifications that the stove requires fuel.

The stove title shows which stove the App is currently communicating with.

The room temperature displayed in the top left of the screen is actually measured at the stove, so may be slightly warmer than the room at a distance from the stove, however the set temperature is made in relation to this temperature, which allows the user to make an informed choice.

The stove temperature displayed in the top right of the screen is the firebox temperature in the stove and indicates how hot it is running.

When the door is open, an icon appears at the bottom of the screen indicating that the door is open. The button on the stove will also flash red.

When the fire needs refuelling, a log icon flashes in between the overnight and notification buttons and this disappears upon refuelling.

The menu icon in the top left of the screen can be pressed or alternatively dragged in from the left hand side of the screen, to reveal the Graphs, Settings and Charnwood.com options. Graphs displays the last readings obtained from the stove and a graph of the stove and room temperatures with the door opening events can be

OPERATING INSTRUCTIONS



obtained for a selected date. The settings page is where you select the stove you want to connect to, name it, define the temperature readings as Celsius or Fahrenheit and control the data saved for the Graphs.

REFUELLING

Logs should be evenly distributed and are best placed from side to side, but not touching either side of the firebox or the glass in the door. Logs must not be loaded above the row of holes in the back firebricks. When loading fuel, that there should be an established flame in the firebox before the door is closed. It is best to refuel onto a hot bed of embers and the App will notify you when this is required. Automatic and Room Temperature Modes will keep a char firebed active for as long as possible. It may be necessary to crack the door open to invigorate the firebed in order to adequately light the new fuel and if the firebed has died down too much then more kindling wood must also be added. Once flames are established on the fuel, larger logs can be added. This will avoid excessive smoke emission.

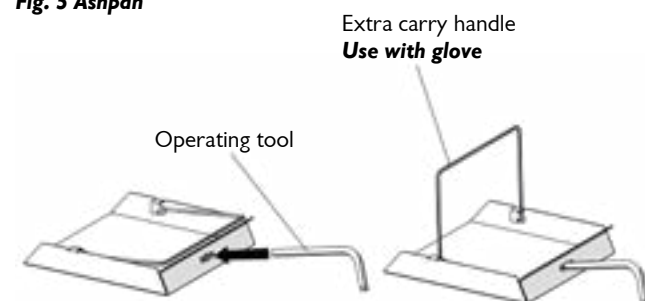
ASH CLEARANCE

For optimum wood burning, it is important to leave a layer of ash around 1cm thick on the base of the stove. Before removing ash ensure that it has cooled down,

The ashpan is handled using the operation tool and gloves provided. Ensure that the tool is fully engaged before lifting (See Fig.5). When carrying the ashpan, it should be kept horizontal and supported by the carrying handle to prevent it falling off the tool. Please avoid emptying hot ash into plastic liners or bins.

The Ashpan should be emptied regularly before it becomes too full. Never allow the ash to accumulate in the ashpan so that it comes in contact with the underside of the grate as this will seriously damage the grate bars.

Fig. 5 Ashpan

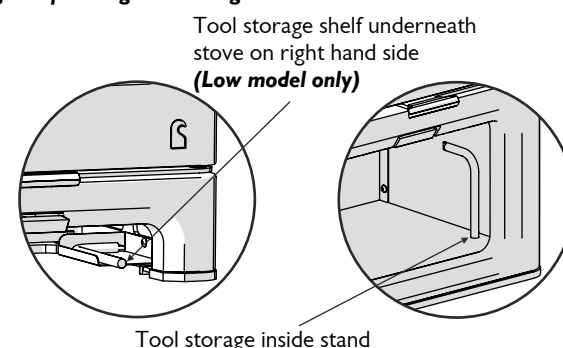


To make ash removal easier there are ash carriers available. These may be purchased from your supplier or, in case of difficulty, from Charnwood.

OPERATING TOOL HOLDER

When not in use the operating tool can be stored inside the store stand or on the shelf underneath the stove. (See fig. 6.)

Fig. 6 Operating tool storage



REDUCED BURNING

For reduced burning, the fire door must be closed. Automatic mode should be selected and the burn rate set at level 1. In addition, the overnight button on the App should be active. This will ensure that once the fuel has thoroughly lit, it will burn steadily and slowly to reduce smoke emissions and then maximise the time for which the char firebed is active, before shutting down further to maintain an active firebed for as long as possible.

MAINTENANCE

Cleaning

The stove is finished with a high temperature paint which will withstand the temperatures encountered in normal use. This may be cleaned with a damp lint-free cloth when the stove is cold. Should re-painting become necessary, high temperature paints are available from your supplier or from stove shops.

Cleaning the Glass

Most deposits on the glass may be burnt off simply by running the fire at a fast rate for a few minutes. If it becomes necessary to clean the glass then open the door and allow it to cool. Clean the glass using a damp cloth and then wiping over with a dry cloth. Any stubborn deposits on the glass may be removed with a proprietary stove glass cleaner or ceramic hob cleaner. Do not use abrasive cleaners or pads as these can scratch the surface which will weaken the glass and cause premature failure

OPERATING INSTRUCTIONS



When Not in Use

If the fire is going to be out of use for a long period (for instance in the summer) then to prevent condensation, and hence corrosion, the air control should be left fully open, select burn rate burn rate 5 on the stove or 99 on the app, turn off power after 30 seconds and the fire door should be left ajar. It is also advisable to sweep the chimney and clean out the fire. Spraying the inside of the door and metal parts of the firebox with a light oil, such as WD40, will also help to keep all internal parts working well. After long periods where the fire has been out of use, the chimney and appliance flueways should be cleaned before lighting.

Door Seals

For the fire to operate correctly it is important that the door seals are in good condition. Check that they do not become worn or frayed and replace them when necessary.

Servicing

It is recommended that the fire is serviced once a year to keep it in first class working order. After cleaning out the firebox thoroughly, check that all internal parts are in good working order, replacing any parts that are beginning to show signs of wear. Check that the door seals are in good condition and that the door seals correctly. A servicing guide is available on request. Repairs or modifications may only be carried out by the Manufacturer or their approved agents. Use only genuine Charnwood replacement parts.

THROAT PLATE AND FLUEWAY CLEANING

It is important that the throat plate and all the stove flueways are kept clean in order to prevent potentially dangerous fume emission. They should be cleaned at least monthly, and more frequently if necessary. It is necessary to let the fire out to carry out these operations.

The throat plate is made up of two bricks and a bracket that slides over the front that holds the two bricks together.

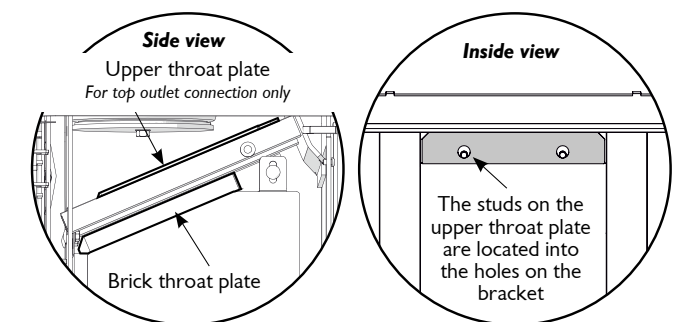
To remove the throat plate, first remove first carefully remove the joining bracket at the front of the throat plate and then lift the two pieces down from the top of the stove. Sweep any sooty deposits from the top of the throat plate into the fire.

Lift out the upper throat plate and clean any deposits, then re-fit it as shown in figure 7. If the rear flue connection is used then the upper throat plate is not required.

To re-fit the lower throat plate, fit each half so that it rests on the side

and back brick, then, making sure the two halves are fitted closely together, slide the joining clip back onto the front edge, making sure that it is central on the join. The upper throat plate is positioned on top of the air wash tubes and is located with studs into the two holes on the bracket attached to the air wash manifold. The upper throat plate will not be required if the rear flue connection is used.

Fig. 7. Throat Plate Location



CHIMNEY SWEEPING

Where the chimney previously served an open fire, it is possible that the higher flue gas temperature from a stove may loosen soot deposits with the consequent risk of flue blockage. It is therefore recommended that the chimney be swept a second time within a month of regular use after installation.

The chimney should be swept at least twice a year. Where the top outlet or vertical rear flue connector is used it will generally be possible to sweep the chimney through the appliance.

First remove the fuel retainer, throat plate and upper baffle (Skye E700 only). Then sweep the chimney ensuring that soot is removed from all horizontal surfaces after sweeping.

In situations where it is not possible to sweep through the appliance the installer will have provided alternative means, such as a soot door. After sweeping the chimney the appliance flue outlet and the flue pipe connecting the stove to the chimney must be cleaned with a flue brush.

After clearing any soot from within the stove, replace upper baffle (Skye E700), the throat plate (see Fig. 7) and the fuel retainer.

Different types of sweep's brushes are available to suit different flueways. For prefabricated insulated chimneys the manufacturers instructions with regard to sweeping should be consulted.



TROUBLE SHOOTING

Fire Will Not Burn

- Check that:
- a) the air inlet is not obstructed in any way,
 - b) chimneys and flueways are clear,
 - c) a suitable fuel is being used,
 - d) there is an adequate air supply into the room,
 - e) an extractor fan is not fitted in the same room as the stove.
 - f) there is sufficient draw in the chimney. Once the chimney is warm a draught reading of at least 1.25 mm (0.05 in.) water gauge (12Pa) should be obtained.
 - g) The power to the stove control unit is turned on and plugged in. Check that the App can connect and receive stove and room temperatures, indicating that the control unit has power.

Blackening of Door Glass

- Differences in chimney draughts mean that the best settings of the air controls will vary for different installations. A certain amount of experimentation may be required, however the following points should be noted and with a little care should enable the glass to be kept clean in most situations:
- a) Wet or unseasoned wood, or logs overhanging the front fence will cause the glass to blacken.
 - b) The airwash relies on a supply of heated air to keep the glass clean, therefore, when lighting the stove allow the firebed to become well established before closing the air control.
 - c) When re-fuelling keep the fuel as far back from the front fence as possible, do not try to fit too much fuel into the firebox. Do not stanck wood above the level of the tertiary air holes in the back firebox bricks.
 - d) Do not completely close the air control (dial at 0) when burning in Manual mode.

It is always more difficult to keep the glass clean when running the stove very slowly for long periods.

If blackening of the glass still occurs check that all flue connections and the blanking plate are well sealed. It is also important that the chimney draw is sufficient and that it is not affected by down-draught. When the chimney is warm a draught reading of at least 1.25 mm (0.05 in.) water gauge (12Pa) should be obtained. Some blackening of the glass may occur below the level of the fuel retainer. This will

- not obscure the view of the fire or affect its performance.
- Fume Emission**
- Warning Note:**
- Properly installed and operated this appliance will not emit fumes. Occasional fumes from de-ashing and re-fuelling may occur. Persistent fume emission is potentially dangerous and must not be tolerated. If fume emission does persist, then the following immediate actions should be taken:**
- a) **Open doors and windows to ventilate the room and then leave the premises.**
 - b) **Let the fire out and safely dispose of the fuel from the appliance.**
 - c) **Check for flue or chimney blockage, and clean if required.**
 - d) **Do not attempt to re-light the fire until cause of fuming has been identified, if necessary seek professional advice.**
- The most common cause of fume emission is flueway or chimney blockage. For your own safety these must be kept clean.**

- Fire blazing out of control**
- Check that:
- a) The door is tightly closed.
 - b) The control unit is working by putting it into Manual mode and adjusting the burn level to 0.
 - c) A suitable fuel is being used.
 - d) Door seals and airwash slide are intact.
 - e) The control unit is plugged in and that the power is on.

- Chimney Fires**
- If the chimney is thoroughly and regularly swept, chimney fires should not occur. However, if a chimney fire does occur tightly close the stove door, then press and hold the air control until a red light appears. Release the air control and disconnect the power supply to the stove. This will shut off the air supply to the fire which should cause the chimney fire to go out. Leave the stove until the fire has gone out. The chimney and flueways should then be cleaned. If the chimney fire does not go out when the above action is taken then the fire brigade should be called immediately. After a chimney fire the chimney should be carefully examined for any damage. Expert advice should be sought if necessary.

CO ALARM

Your installer should have fitted a CO alarm in the same room as the



appliance. If the alarm sounds unexpectedly, follow the instructions given under “Warning Note” above.

IF YOU NEED FURTHER HELP

If you need further help with your Charnwood then your Installer will be able to provide the answers to most questions. Your Local Charnwood Premier Dealer has a great deal of experience and will also be able to provide helpful advice. Further help is available from the Charnwood Customer Services department who will be pleased to give advice, if necessary.

INSTALLATION INSTRUCTIONS



UNPACKING THE STOVE

The stove arrives bolted and strapped to its pallet. There must be adequate facilities for unloading and manoeuvring into position. The wrapping is first removed, then the stove released from the pallet by removing 4 pallet bolts using a 10mm spanner. The pallet brackets can now be removed from the stove by tilting it and using a 13mm spanner to remove the bolts. The pallet is intended to be cut up and used for kindling fuel. Replace the bolts to be used for levelling the stove.

HEALTH AND SAFETY PRECAUTIONS

Please take care when installing the stove that the requirements of the health and safety at work are met.

All aspects of the installation must conform to NFPA 211

Some types of fire cement are caustic and should not be allowed to come into contact with the skin. In case of contact wash with plenty of water.

If there is a possibility of disturbing any asbestos in the course of installation then please use appropriate protective equipment.

If room air is used for combustion, then there should not be an extractor fan fitted in the same room as the stove as this can cause the appliance to emit fumes into the room.

There must be an adequate air supply into the room in which the appliance is installed to provide combustion air. The combustion air supply must be via a permanently open vent. The requirement for minimum free area is partly dependent on the design air permeability of the house. In older properties the air permeability will be above 5.0m³/(h.m²), but in some modern properties it may be less. The vent must be positioned such that it is not liable to blockage. Minimum areas are given in the following table:

AIR PERMEABILITY m ³ /(h.m ²)	MINIMUM VENT AREA cm ² (in ²)
	Skype E700
>5.0	11 (1.76)
<5.0	38.5 (6.0)

A fixed ducted air supply may be used as an alternative to the traditional method of using a permanent open vent into a room to supply air for combustion.

External air supply kits are available please contact Charnwood for more information.

This stove is capable of intermittent operation, and is not suitable for use in a shared flue system.

CO AND SMOKE ALARMS

Building regulations require that whenever a new or replacement fixed solid fuel or wood/biomass appliance is installed in a dwelling a carbon monoxide and smoke alarm must be fitted in the same room as the appliance. Provision of an alarm must not be considered a substitute for either installing the appliance correctly or ensuring regular servicing and maintenance of the appliance and chimney system.

SPECIFICATION

SPECIFICATION	SKYE E700	
Fuel	Wood logs	
Output	11,100 - 31,900 btu/h (3.3 - 9.3kW)	
Stove Weight kg (Packed)	346lb (157kg) - Store Stand 390lb (177kg) - Low	
Emissions Output	1.69 g/hr	
Average Flue Temperature	196F	
Max Hearth Temperature	TBD	
Minimum distance from combustibles mm	SIDE	REAR
With Uninsulated Flue	TBD	TBD
With Insulated Flue and rear Heat shield	TBD	TBD
These results were obtained during EPA testing Avoid the possibility of sucking fumes into the room.		

INSTALLATION INSTRUCTIONS



CHIMNEY

The stove must be connected to a code-approved masonry chimney with a flue liner, to a relined masonry chimney that meets local codes, or to a prefabricated metal chimney that complies with the requirements for Type HT chimneys in the Standard for Chimneys Factory-Built, Residential Type and Building Heating Appliance, UL 103, or High Temperature (650°C) Standard ULC S-629 for Canada. In order for the appliance to perform satisfactorily the chimney height must not be less than 13' (4 metres) measured vertically from the outlet of the stove to the top of the chimney. The minimum internal chimney size is 6 inches diameter(150mm) or 6"x6"(150mm x 150mm).

The chimney must extend at least 3' (914mm) above the highest point where it passes through a roof, and at least 2' (610mm) higher than any portion of a building within 10' (3m)

DO NOT CONNECT THE UNIT TO A CHIMNEY FLUE SERVING ANOTHER APPLIANCE.

If an existing chimney is to be used it must be swept and checked, it must be in good condition, free from cracks and blockages, and should not have an excessive cross sectional area. Your local building inspector, professional chimney sweep or fire department official will be able to inspect the chimney, or refer you to someone who can. If the chimney is in poor condition then advice should be sought regarding the necessity of having the chimney lined. If it is found necessary to line the chimney then a lining suitable for Solid Fuel must be used.

If there is no existing chimney then a prefabricated block chimney or a twin walled insulated stainless steel flue can be used either internally or externally. These chimneys must be fitted in accordance with the manufacturers instructions and Building Regulations.

Single wall flue pipe is suitable for connecting the stove to the chimney but is not suitable for using for the complete chimney.

If it is found that there is excessive draw in the chimney then a draft stabilizer should be fitted.

It is important that there is sufficient draw in the chimney and that the chimney does not suffer from down-draft. When the chimney is warm the draw should be not less than 1.25mm (0.05") water gauge (12 Pa). If in doubt about the chimney seek expert advice.

HEARTH AND FIRE SURROUND

Fig. 8. Floor Protector - USA

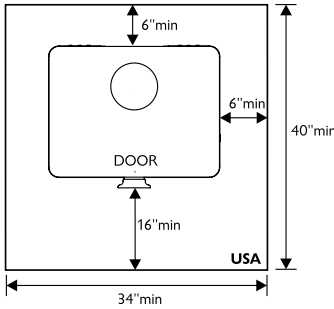
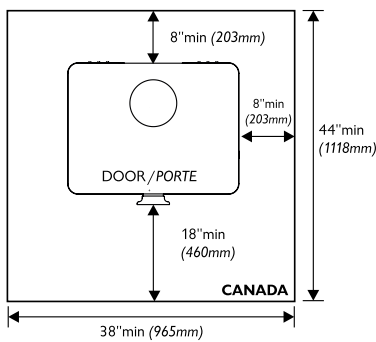


Fig. 9. Floor Protector - Canada



The stove must stand on a fireproof hearth or a non combustible floor protector must be used. The floor protector must be of non combustible material such as 24 gauge sheet metal or equivalent. If carpeting is present, it must be removed before installation of the floor protector. The floor protector may be covered with a noncombustible decorative material if desired. When using brick, tile or stone, individual pieces must be joined by mortar so sparks cannot fall through. When the fire door is open, it extends beyond the flat front of the stove by 19"

In the United States, the floor protector (see Fig. 8.) must extend at least 16" from of the stove front and at least 6" from sides and rear. To meet the requirement in the United States, a floor protector must be at least 34" wide and 40" deep.

In Canada, the floor protector (see Fig. 9) must extend 18"(460mm) to the front, and 8" (203 mm) from the sides and rear. To meet Canadian requirements, a floor protector must be at least 38" (965 mm) wide and 44" (1118 mm) deep.

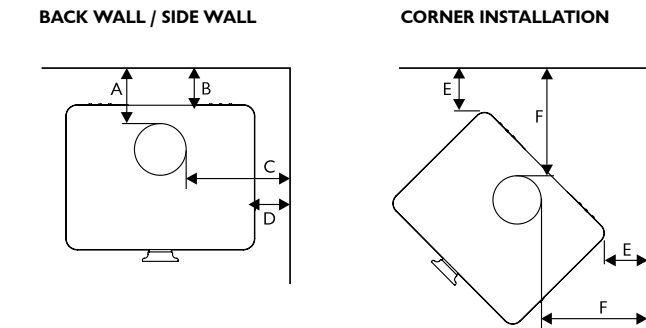
For Rear Flue Connection, floor protection also must extend under the chimney connector and 2" (51 mm) to either side. For the 6" (150 mm) connector used with the Skype E700, the protector must be a minimum of 10" (254 mm) wide, central under the connector.

INSTALLATION INSTRUCTIONS



The stove must be installed with minimum clearances from combustible materials shown in Fig 10.

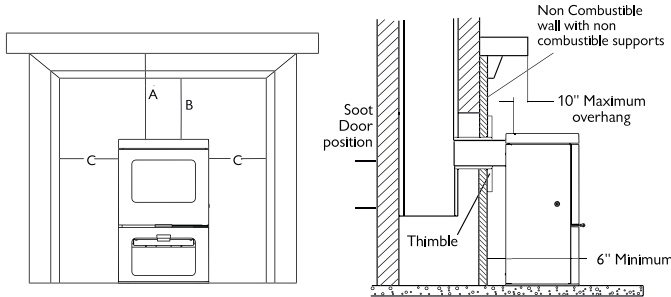
Fig. 10. Clearances from combustible materials



DIMS	AB		CD		EF	
Single Wall Pipe	TBD"	TBD"	TBD"	TBD"	TBD"	TBD"
Double Wall Pipe + Heat Shield	TBD"	TBD"	TBD"	TBD"	TBD"	TBD"

For the reduced clearances shown above, double wall flue pipe must be fitted directly to the top of the stove and a heat shield, Part No. 010/TW33 fitted to the rear of the stove. A spacer is also required to attach the optional vertical rear flue connector to the Skye E700 Part no. 010/AU021.

Fig. 11. Clearances from wooden fire surrounds



Minimum Distances from Wooden Fire Surrounds

.....Unshielded.....
A.....Mantelpiece.....25"(635mm).....
B.....Top Trim.....20"(508mm).....
C.....Side Trim.....15"(381mm).....

If a wooden mantelpiece or beam is used in the fireplace it should be a minimum of 18 inches (460mm) from the appliance. In some situations it may be necessary to shield the beam or mantelpiece to protect it. Shielding must be of non combustible material spaced off the beam by at least 1/2 in (12mm) on non combustible spacers.

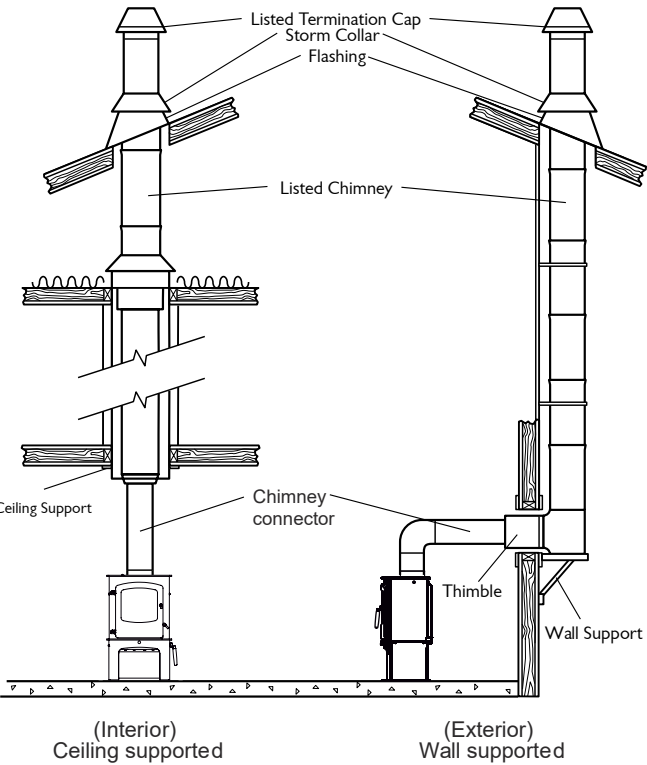
If in doubt as to the positioning of the stove expert advice should be sought either from the supplier or the local building inspector.

The fireplace must allow good circulation of air around the appliance to ensure that maximum heat is transferred to the room and also to prevent the fireplace from overheating. A gap of 6 inches (150mm) each side and 12 inches (300mm) above the appliance from non combustible materials should give sufficient air circulation.

When the fire door is open, it extends beyond the front of the stove by 19 inches.

In order for the fire to operate correctly there must be an air gap behind the appliance of at least 1.9"(50mm), but be aware that this distance will need to be greater in some cases to meet Building Regulation requirements.

Fig. 12. Connection to a factory-built chimney



Prefabricated Metal Chimney

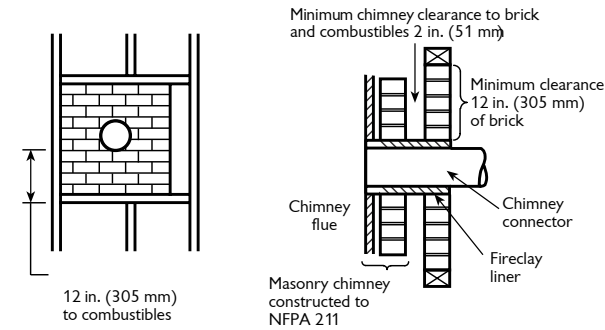
Chimney must be minimum 6 in.(152mm) diameter high temperature chimney listed to UL 103 HT or CAN/ULC-S629-M87.

It must use components required by the manufacturer for installation. All the installation clearances required by the manufacturer must be maintained. Refer to the manufacturer's instructions for installation.

INSTALLATION INSTRUCTIONS



Fig. 13. Connection through a combustible wall



Minimum 3.5 in. (90 mm) thick brick masonry wall framed into combustible wall with a minimum of 12 in. (305mm) brick separation from clay liner to combustibles. Fireclay liner (ASTM C 315, Standard Specification for Clay Fire Linings, or equivalent), minimum 5/8 in. (16-mm) wall thickness, 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.

CONNECTIONS TO FLUES

The stove must be connected to the flue using flue pipe of the following sizes:

150mm (6") diameter - Skye E700.

This may be stainless steel, cast iron, or thick wall steel pipe. Straight lengths of Charnwood Pipe to match the stove are available if required. If using twin wall flue, the flue spigot must be shielded to protect exposed combustible material. This can be done with a shielded starter length of flue.

There are several ways of connecting the stove to the flue. These are illustrated in Figs. 14 to 17.

If the top flue connection or optional vertical rear flue connector is used then the chimney may be swept through the appliance.

A spacer is required to attach the optional vertical rear flue connector to the Skye E700.

Horizontal lengths of flue must be kept to a minimum and should not be more in length than the flue diameter.

The stove comes with the blanking plate (fig. 18) fitted to the top flue outlet. The seal for the top outlet is a 155mm dia ring of rope seal. The seal for the rear outlet is a length of adhesive backed fibre webbing supplied with instructions ref: TIS093. This is applied to the flue collar or the Vertical Rear Flue adapter for rear outlet installations. For top outlet installations, the blanking plate must be removed, have the webbing fitted to its sealing face, and fitted to the rear flue outlet. Ensure that the fold on the clamping plate is

in line with the lugs on the firebox as shown in Fig 11. Ensure that the clamping plate does not prevent the throat plate from seating correctly. All flue connections must be well sealed. The top outlet connection is made directly to the cast top, the Skye is supplied with a flue collar for rear outlet installations.

Fig.14. Chimney Connection above the Fireplace

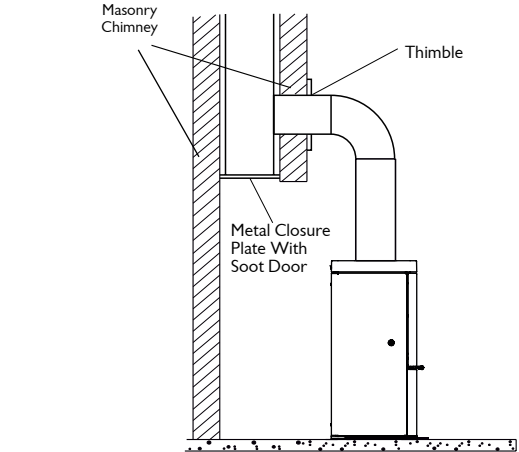


Fig.15. Horizontal Closure Plate with rear flue connection

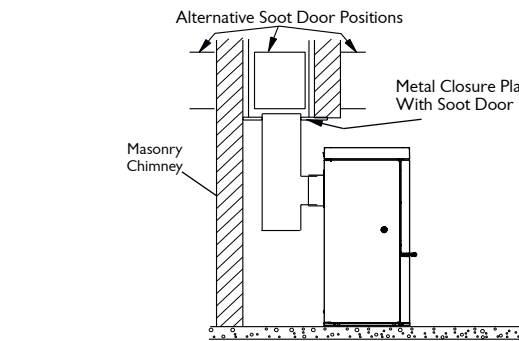
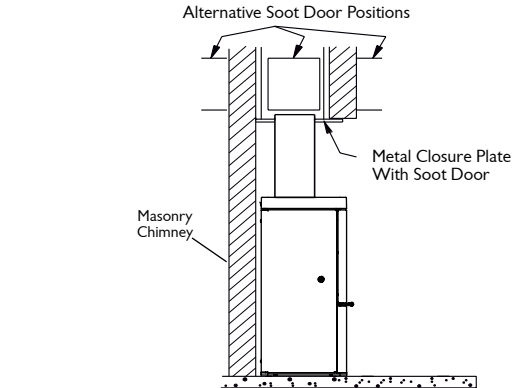


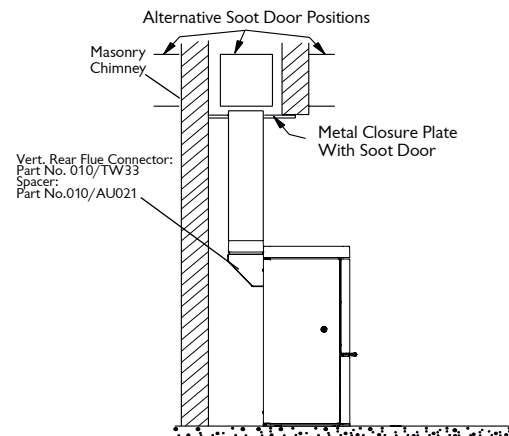
Fig. 16. Horizontal Closure Plate with top flue connection



INSTALLATION INSTRUCTIONS



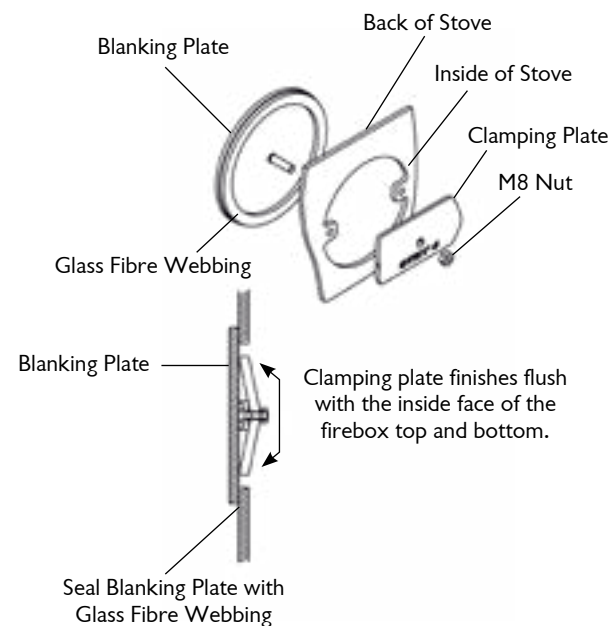
Fig. 17. Horizontal Closure Plate with optional vertical rear flue connector



SOOT DOORS

It is possible to pass a 16 inch diameter sweeps brush through the appliance but in most back outlet installations it will be necessary to have a soot door to enable the chimney to be swept. The optional vertical rear flue connector does allow the chimney to be swept through the stove. Soot doors may either be in the actual brickwork of the chimney or in the register plate. Various positions of soot doors are shown in Figs. 14 to 17.

Fig. 18. Flue Blanking Plate



PRE LIGHTING CHECK

Ensure that upper throat plate (Skye E700, top flue outlet connection only) and the throat plate is fitted in the roof of the appliance. The

location and positioning of the throat plate is shown in Fig. 6.

Check that the front fence is fitted correctly and that the door closes properly.

COMMISSIONING

On completion of the installation allow a suitable period of time for the fire cement and mortar to dry out before lighting the fire. Make a layer of ash or sand on the base of the stove before lighting. Check to ensure that smoke and fumes are taken from the appliance up the chimney and emitted safely. Also check all joints and seals. On completion of the installation and commissioning please leave the operating instructions with the customer and advise them on the use of the appliance.

Flue draught can be checked by removing the bolt underneath the front left hand side (Skye E700)

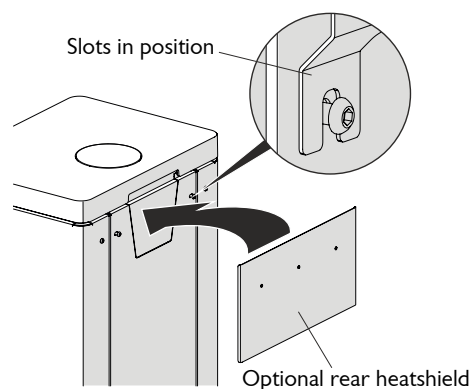
FITTING THE REAR HEAT SHIELD

The Skye is supplied with an optional rear heat shield. When fitted to the back of the stove it will reduce the rear distance to combustibles:

Skye E700: 100mm (TBC)

To fit the optional rear heat shield, loosen the button head allen screws and slide the heat shield on so that the slots on the back of the heat shield fit over the screws. (fig. 19)

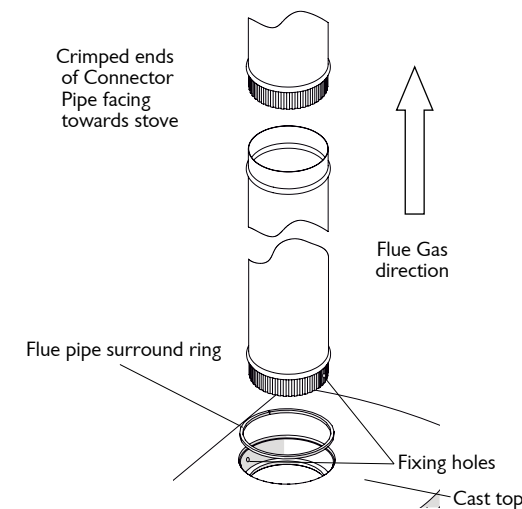
Fig. 19. Fitting the optional rear heat shield.



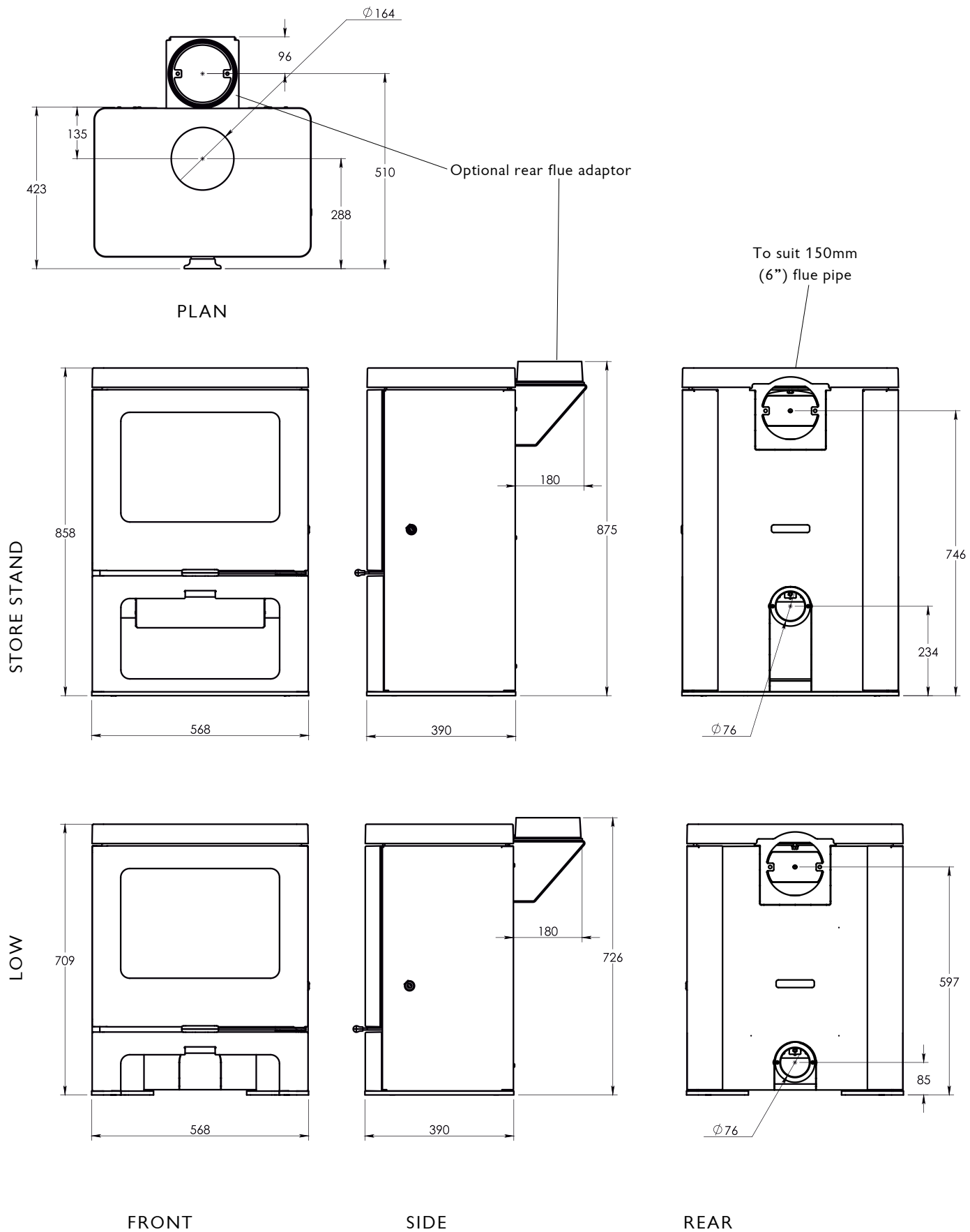
INSTALLATION INSTRUCTIONS



Fig. 20. Chimney Connector.



SKYE E700 DIMENSIONS



Charnwood Skye 7 E700 Store Stand Parts List

Issue A

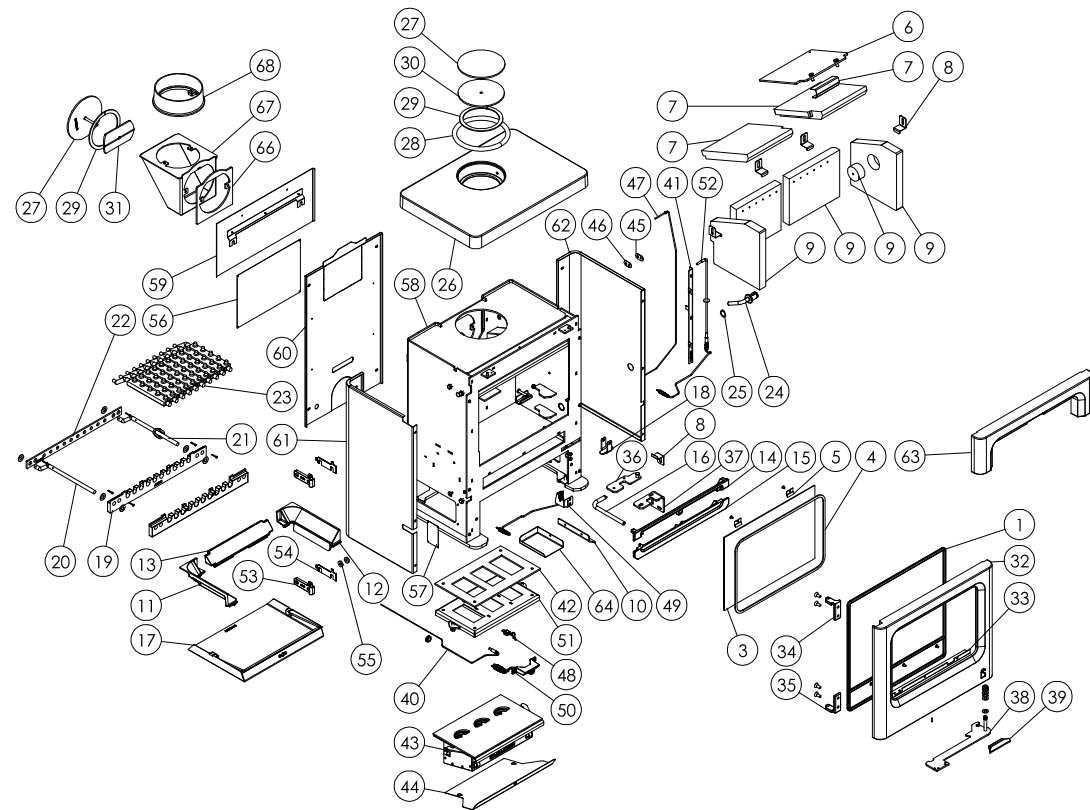
Item	Part No.	Description	Item	Part No.	Description
1	008/AU0355	Rope Door Seal Inc Adhesive	36	010/CU063	Door Latch
2*	008/FW29	Door Seal Adhesive	37	010/CU064	Door Latch Bracket
3	006/AU018	Glass	38#	010/CU060	Door Catch Arm
4	008/EW45	Glass Seal	39	008/BU049	Door Handle
5	004/KV23	Glass Retainer	40	008/EL307	6V Power Supply
6	010/AU032	Upper Throat Plate	41	008/CU161	Light Optic Guard
7	011/AU031S	Set of Throat Plate Bricks Inc. Bracket	42	008/CU109	Air Control Gasket
8	004/XV30	Brick Bracket	43	010/CU135	Air Control Assembly
9	011/CU029S	Set of Firebricks	44	008/CU043	Cable Tray With Grommet
10	010/AU019	Undergrate Deflector	45	008/NH700	Thermocouple Retainer
11	002/BU015L	LH Side Fire Plate	46	008/NH701	Thermocouple Retainer
12	002/BU015R	RH Side Fireplate	47	008/CU260	Firebox Thermocouple
13	002/AU016	Back Fireplate	48	008/CU261	Room Thermocouple
14	002/AU008	Deepening Bar	49	008/CU066	Switch and Bracket
15	002/AU007	Front Fence	50	008/CU250	Manual Control Button
16	004/EZ095	Ashpan/Riddling Tool	51	010/CU232	Airbox Upper With
17	004/AP017	Ashpan	52	008/CU160	Glass Rod Assembly
18	010/BU097	Carrier Bar Clamping Bracket	53	002/BU040	Door Hinge Bracket
19	002/AY30	Carrier Bar	54	004/BU039	Door Hinge Shim
20	012/AY13	Idler Rod	55	010/DY24	Spacer
21	010/BU077	Riddler Rod Assembly	56	012/CU012	Safety Label
22	010/AU033	Mover Bar	57	012/CU011	Serial No. Label
23	002/CG20S10	Set of Grate Bars (10)	58#	001/CU010	Firebox
24	002/BU098	Riddler Spigot	59#	005/AU081	Rear Heatshield
25	008/FFM081	Circlip	60#	005/CU080	Rear Panel
26#	003/CU006	Cast Top	61#	005/AU059	Rear Lower Panel
27	010/KZ132	Blanking Plate	62#	005/AU093L	Left Side Panel
28	008/KZ136	Flue Fixing Rope Seal	63#	005/AU093R	Right Side Panel
29	008/KS134	Blanking Plate Seal	64#	010/AU058	Base Plate
30	010/KZ133	Blanking Plate Retainer	65#	003/CU072	Front Casting
31	010/AY51	Clamping Plate	66	010/EW51	Ash Carrier (Optional Extra)
32#	003/CU001A	Door Casting	67	010/AU021	Vertical Rear Flue Adapter Spacer
33	004/AU050	Rope Seal Channel	68#	010/TW33	Vertical Rear Flue Adapter (Opt'l Extra)
34	002/BU041	Upper Hinge	69#	002/CH12B	Flue Collar
35	002/BU042	Lower Hinge			

*These items are not shown on the drawing.
Please specify colour when ordering.

To obtain spare parts please contact your local stockist giving Model, Part No. and Description. In case of difficulty contact the manufacturer at the address shown. This drawing is for identification purposes only.

Skye E700 Low Parts List

Issue A

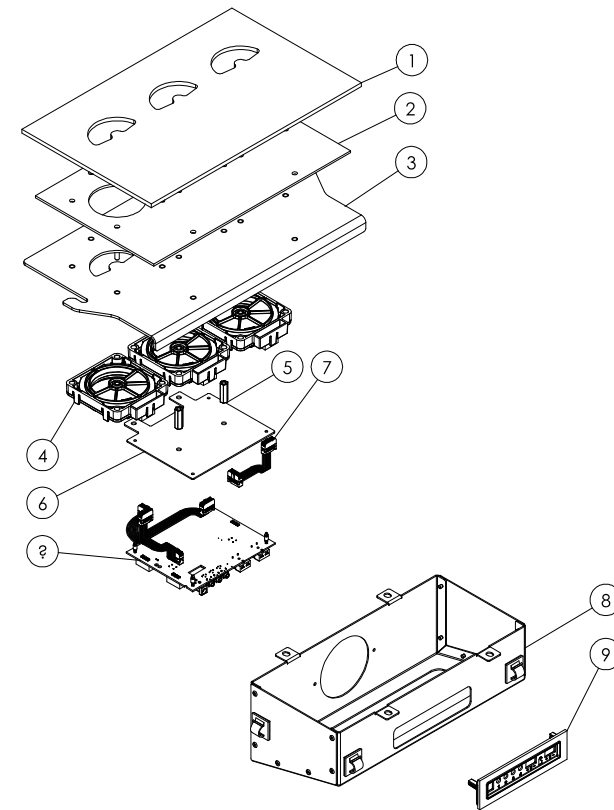


Item	Part No.	Description
1	008/AU0355	Rope Door Seal Inc Adhesive
2*	008/FW29	Door Seal Adhesive
3	006/AU018	Glass
4	008/EW45	Glass Seal
5	004/KV23	Glass Retainer
6	010/AU032	Upper Throat Plate
7	011/AU031S	Set of Throat Plate Bricks Inc. Bracket
8	004/XV30	Brick Bracket
9	011/CU029S	Set of Firebricks
10	010/AU019	Undergrate Deflector
11	002/BU015L	LH Side Fire Plate
12	002/BU015R	RH Side Fireplate
13	002/AU016	Back Fireplate
14	002/AU008	Deepening Bar
15	002/AU007	Front Fence
16	004/EZ095	Ashpan/Riddling Tool
17	004/AP017	Ashpan
18	010/BU097	Carrier Bar Clamping Bracket
19	002/AY30	Carrier Bar
20	012/AY13	Idler Rod
21	010/BU077	Riddler Rod Assembly
22	010/AU033	Mover Bar
23	002/CG20S10	Set of Grate Bars (10)
24	002/BU098	Riddler Spigot
25	008/FFM081	Circlip
26#	003/CU006	Cast Top
27	010/KZ132	Blanking Plate
28	008/KZ136	Flue Fixing Rope Seal
29	008/KS134	Blanking Plate Seal
30	010/KZ133	Blanking Plate Retainer
31	010/AY51	Clamping Plate
32#	003/CU001A	Door Casting
33	004/AU050	Rope Seal Channel
34	002/BU041	Upper Hinge

Item	Part No.	Description
35	002/BU042	Lower Hinge
36	010/CU063	Door Latch
37	010/CU064	Door Latch Bracket
38#	010/CU060	Door Catch Arm
39	008/BU049	Door Handle
40	008/EL307	6V Power Supply
41	008/CU161	Light Optic Guard
42	008/CU109	Air Control Gasket
43	010/CU135	Air Control Assembly
44	008/CU043	Cable Tray With Grommet
45	008/NH700	Thermocouple Retainer
46	008/NH701	Thermocouple Retainer
47	008/CU260	Firebox Thermocouple
48	008/CU261	Room Thermocouple
49	008/CU066	Switch and Bracket
50	008/CU250	Manual Control Button
51	010/CU232	Airbox Upper With
52	008/CU160	Glass Rod Assembly
53	002/BU040	Door Hinge Bracket
54	004/BU039	Door Hinge Shim
55	010/DY24	Spacer
56	012/CUL012	Safety Label
57	012/CUL011	Serial No. Label
58#	001/CUL010	Firebox
59#	005/AU081	Rear Heatshield
60#	005/CUL080	Rear Panel
61#	005/AUL093L	Left Side Panel
62#	005/AUL093R	Right Side Panel
63#	003/AUL071	Front Casting
64	BUL048	Tool Holder
65	010/EW51	Ash Carrier (Optional Extra)
66	010/AU021	Vertical Rear Flue Adapter Spacer
67#	010/TW33	Vertical Rear Flue Adapter (Opt'l Extra)
68#	002/CH12B	Flue Collar

Charnwood Skye 7 E700 Air Box Assembly Parts List

Issue A



Item	Part No.	Description	Item	Part No.	Description
1	008/CU110	Air Control Gasket	6	008/CU235	Circuit Board Mount
2	008/CU242	Airbox Cover Gasket	7	008/EL325	Ribbon Cable Connector
3	010/CU231	Lower Plate Assembly	8	010/CU040	Airbox Cover
4	008/NH570	75Mm Air Disk Lower Casing	9	008/CU239	Socket Surround With Gasket
5	008/FFM087	Hex Spacer M5x25			

*These items are not shown on the drawing.
Please specify colour when ordering.

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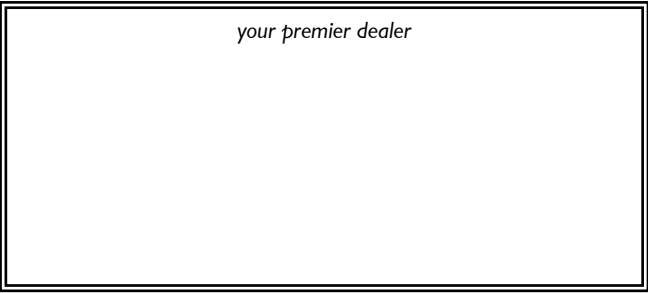
AJ WELLS & SONS LTD

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22

ROOMHEATERS FIRED BY SOLID FUEL

Model:	Skye E700
EC Certificate of conformity no:	CU44-CPD-2020 CUL44-CPD-2020
Fuel type:	WOOD LOGS
EPA HEAT OUTPUT RANGE	11,100 - 31,900 btu/h (3.3 - 9.3kW)
EPA CERTIFIED EMISSIONS	1.69 g/hr
EPA CERTIFIED ENERGY EFFICIENCY	84% LHV / 78% HHV
Minimum distance to combustible materials with uninsulated flue Side: Rear:	 TBA TBA
Minimum distance to combustible materials with insulated flue & rear heat shield Side: Rear:	 TBA TBA



Warranty - Skye E700

TERMS AND CONDITIONS

Fireboxes and internal fire-parts (excluding consumable items) of our stoves will be covered by a 12 month guarantee from date of purchase against material and manufacturing defect.

The following conditions apply:

- If any part fails due to manufacturing or material defect within the guarantee period Charnwood will, free of charge, either repair or replace the part at their discretion. The decision of Charnwood is final.
- This guarantee is for parts only.
- Consumable items such as bricks, glass, rope seal and associated parts are not included.
- Charnwood will not be liable for any consequential loss or incidental loss, damage or injury however caused.
- This guarantee will become void if the appliance: is not installed in accordance with the installation instructions; is not regularly serviced, in accordance with the installation instructions; is subject to misuse or neglect, including the use of non-recommended fuel; or if repairs or modifications have been carried out by anyone other than Charnwood or their official representatives.
- All claims on this guarantee must be made through the supplier of the appliance and must be accompanied by proof of purchase.
- Nothing in this guarantee shall affect your statutory rights.
- This guarantee is applicable in the UK, Ireland, France and the United States of America.

EXCLUSIONS AND LIMITATIONS

- Charnwood will not be liable for any consequential loss or incidental loss, damage or injury however caused.
- This guarantee will become void if the appliance is not installed by a suitably qualified person (e.g. Hetas or other competence scheme registered in the UK or United States of America) and is not installed in accordance with the current Building Regulations.
- This guarantee will become void if the appliance is not installed in accordance with the installation instructions and is not regularly serviced, in accordance with the installation instructions.
- If the product is subject to misuse or neglect, including the use of non-recommended fuels.
- If repairs or modifications have been carried out by anyone other than Charnwood or their authorised representatives.
- Consumable service items such as grate components, internal protection plates, throat plates, bricks, glass, rope seal and associated parts are not covered by this guarantee.
- Damage caused by over-firing of the stove. Please refer to our operating instructions for further details.
- Damage caused by storing or using the product in a damp environment. Corrosion caused by condensation, damp or water ingress into the flue, chimney or the surrounding of the stove.
- Defects or faults caused by local conditions such as draught problems and chimney defects.
- The paint finish will require touching up or repainting from time to time. Maintaining the finish is normal practice and is not covered by the guarantee.

Certificate of Calibration

Certificate Number: **743897**



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

PO: **1033**

Order Date: **03/08/2021**

Authorized By: **N/A**

Calibrated on: **03/18/2021**

*Recommended Due: **03/18/2022**

Environment: **22 °C 37 % RH**

* As Received: **Within Tolerance**

* As Returned: **Within Tolerance**

Action Taken: **Calibrated w/Parts**

Technician: **146**



0723.01

Calibration

Property #: **064**

User: **N/A**

Department: **N/A**

Make: **Control Company**

Model: **4198**

Serial #: **80531676**

Description: **Digital Temp. / Barometer**

Procedure: **404323**

Accuracy: **$\pm 1^{\circ}\text{C} \pm 0.2362\text{Hg}(\pm 8\text{mb})$**

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.

Replaced batteries.

Standards Used

Std ID	Manufacturer	Model	Nomenclature	Due Date	Trace ID
644A	Thunder Scientific	1200	Two Pressure Humidity Generator	11/17/2021	734190
847A	Fluke	RPM4	Reference Pressure Monitor	12/30/2021	738139

Parameter

Measurement Data

Measurement Description	Range Unit	Reference	Min	Max	*Error	UUT	Uncertainty
Before/After Temperature							Accredited = Ü
	°C	20.00	19.0	21.0	0.1	20.1 °C	8.1E-02 Ü
	°C	30.00	29.0	31.0	0.2	30.2 °C	8.1E-02 Ü
	°C	40.00	39.0	41.0	0.7	39.3 °C	8.1E-02 Ü
Barometer							
	mbar	1013.0	1005	1021	8	1005 mbar	6.2E-01 Ü

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/NCCL 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 ratio (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 03/25/2021

Rev # 15

Inspector

Certificate of Calibration

Certificate Number: 743892



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

PO: 1033

Order Date: 03/08/2021

Authorized By: N/A

Calibrated on: 03/18/2021

*Recommended Due: 03/18/2026

Environment: 19 °C 41 % RH

* As Received: Other - See Remarks

* As Returned: Other - See Remarks

Action Taken: Calibrated

Technician: 126



0723.01

Calibration

Property #: 097

User: N/A

Department: N/A

Make: Unknown

Model: 10 Lbs.

Serial #: 097

Description: Mass

Procedure: DCN 500901

Accuracy: Raw Data

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.

Data is provided for your determination of acceptability. Received/returned without accessories.

Standards Used

Std ID	Manufacturer	Model	Nomenclature	Due Date	Trace ID
484A	Rice Lake	1kg-10kg (Class ASTM 1)	Mass Set,	05/28/2021	699197
503A	Rice Lake	1mg-200g (Class 0)	Mass Set,	09/11/2021	729241
550A	And (A&D) Co.	HP-30K	Balance 30 Kg	12/31/2021	739307
723A	Rice Lake	1mg-200g (Class 0)	Mass Set,	06/09/2021	723431

Parameter

Measurement Data

Measurement Description	Range	Unit	Reference	Min	Max	*Error	UUT	Uncertainty
Before/After								Accredited = $\bar{u}$
Mass								
Raw Data		g	4535.92370000	0.0000000	0.0000000	0.1785299	4536.1022299 g	3.5E-01 $\bar{u}$

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/NCCL 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 ratio (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 03/25/2021

Rev # 15

Inspector



CERTIFICATE OF CALIBRATION

CUSTOMER:	PFS-TECO : CLACKAMAS, OR	CALIBRATION DATE:	05/25/2021
PO NUMBER:	1047	CALIBRATION DUE:	05/25/2022
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 ACCURACY:	SEE NOTES BELOW.	AMBIENT CONDITIONS:	763mm HGA 49% RH 72°F
UNCERTAINTY GIVEN:	± 0.43% RD ; k=2	CERTIFICATE FILE #:	490265.2021
NOTES:	± 3% FS (0-500 / 0-1500) *** ± 4% F.S. (0-5000) *** ± 5% F.S. (0-15000) *** ± 2 °F		

Q.MANUAL IM 1.5 REV 2017.1 DATED 7-18-2017 ** DECISION RULE : NO PFA%**

UUT INDICATED FT/MIN	DM.STD. ACTUAL FT/MIN	UUT INDICATED DEG. F	DM STD. ACTUAL DEG. F
53	55	0 TO 200°F	0 TO 200°F
118	120	45.1	44.3
244	249	70.6	69.9
493	503	100.3	99.8
517	522		
1062	1076		
1494	1517		
560	565		
3129	3164		
4996	5082		
6251	6374		
14829	15148		

STANDARDS USED:

A220: 12" WIND TUNNEL 0 - 8000 FPM CMC ± 0.203% RD TRACE# 1329407628	DUE	02/18/2022
A800: FLOW-DYNE SONIC NOZZLE SYSTEM 0 - 1086 CFM ± 0.46% RD. TRACE# 1329407628, 89576, 152043238	DUE	01/26/2022

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.) and the Unit Under Test (UUT) is a minimum of 4:1, unless otherwise noted. Calibration has been performed according to the shown procedure. The use of IAS/ILAC logo indicates calibrations are in accordance to ISO/IEC 17025:2017.

Dick Munns Company - 11133 Winners Circle, Los Alamitos, CA 90720
Phone: 714-827-1215 - www.dickmunns.com

This Calibration Certificate shall not be reproduced except, in full, without approval by Dick Munns Company. The data shown applies only to the instrument being calibrated and under the stated conditions of calibration.

Issuing Date: 05/25/2021 Approved By: *Charles Lane* Cal. Technician: *D.C.* Calibrated at: ☒ Lab ☐ On-Site (Customer's)

Page 1 of 1



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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

<u>Material</u>	<u>Assumed Density</u>	<u>Range</u>	<u>Tolerance Class</u>
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/cm³).

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.

page 1 of 2

Quality Control Services, Inc.
Metrology Laboratory Manager
E-mail dthompson@qc-services.com

Date: 03/21/17

Signature David S. Thompson

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Member: National Conference of Standards Laboratories and Weights & Measures



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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.

page 2 of 2

Quality Control Services, Inc.
Metrology Laboratory Manager
E-mail dthompson@qc-services.com

Date: 03/21/17

Signature David S. Thompson



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PFS Teco
11785 SE Hwy 212 STE#305
Clackamas, OR 97015

Report Number: DIRI0134307497210625

A2LA ACCREDITED **CERTIFICATE OF CALIBRATION WITH DATA**

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	6/25/21	12/8/20	6/2022

FUNCTIONAL CHECKS

ECCENTRICITY		LINEARITY		STANDARD DEVIATION			ENVIRONMENTAL CONDITIONS		
Test Wt:	Tol:	Test Wt:	Tol:	Test Wt:	Tol:		☒	☐	☐
100	0.0003	50 x 4	0.0002	100	0.0001		Good	Fair	Poor
As-Found:		As-Found:		1. 99.9999	5. 99.9999	9. 99.9999	Temperature: 22.1°C		
Pass: ☒	Fail: ☐	Pass: ☒	Fail: ☐	2. 99.9999	6. 99.9999	10. 100.0000			
As-Left:		As-Left:		3. 99.9999	7. 100.0000	<u>Result</u>			
Pass: ☒	Fail: ☐	Pass: ☒	Fail: ☐	4. 99.9999	8. 100.0000	0.00004			

A2LA ACCREDITED SECTION OF REPORT

Standard	As-Found	As-Left	Expanded Uncertainty
200	199.9995	200.0000	0.00016
100	99.9999	100.0000	0.00016
50	50.0002	50.0000	0.00015
20	20.0000	20.0000	0.00015
1	.9999	.9999	0.00015
0.1	.0999	.0999	0.00015

CALIBRATION STANDARDS

Item	Make	Model	Serial Number	Cal Date	Cal Due Date	NIST ID
Weight Set	R.L./Troemner	10kg to 1mg	G782	4/30/21	4/2022	20210012

Permanent Information Concerning this Equipment:

6 month calibration cycle
12/20 Extra checkpoint to encapsulate user range 0.05g.
AF= 0.0499g A/L= 0.0500

Comments/Info Concerning this Calibration:

6/21: RH 44.7%

Report prepared/reviewed by: R.B. Date: 6-25-21

Technician: K. Dexter

Signature: Kyle Dexter

THIS CERTIFICATE SHALL NOT BE REPRODUCED WITHOUT THE APPROVAL OF QUALITY CONTROL SERVICES, INC.

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.

Emissions Sampling System Thermocouple Calibration Check

Calibration based on NIST Monograph 175 per ASTM E2515-11

All thermocouples are type "K"

Date: 3/10/2021

Sampling System ID Numbers: 053/054

Performed By: A. Kravitz

Calibration Instrument ID Number: 165

Reference Temperature (F)	Acceptable Error (F)	Thermocouple Location						
		FB Left	FB Right	FB Back	FB Top	FB Bottom	Catalyst Exit	Flue
0	± 4.0	0	0	0	0	0	0	0
200	± 4.0	200	200	200	200	200	200	200
400	± 4.0	400	400	400	400	400	400	400
600	± 4.5	600	600	600	600	600	600	600
800	± 6.0	800	800	800	800	800	800	800

Reference Temperature (F)	Acceptable Error (F)	Thermocouple Location					
		Ambient	Filter A	Filter B	Meter A	Meter B	Dilution Tunnel
0	± 4.0	0	0	0	0	0	1
200	± 4.0	200	200	201	200	200	200
400	± 4.0	400	400	401	400	400	400
600	± 4.5	600	600	601	600	600	600
800	± 6.0	800	800	801	800	800	800

Technician Signature: 

Date: 3/10/2021

Pressure Gauge Calibration Work Sheet

Gauge Manufacturer: Apex
 Maximum Range (inH₂O): 1
 Instrument ID #: 053 (dP)
 Calibration Date: 9/13/2021
 Calibration Expiration: 9/13/2022
 Barometric Pressure: 30.08 in. Hg



Reference Standard Gauge	
Manufacturer:	Dwyer
Model:	475-000
Instrument ID#:	76
Calibration Expiration Date:	8/3/2022

Calibration Point (inH ₂ O)	Reference Gauge Reading (inH ₂ O)	Pressure Gauge Reading (inH ₂ O)	Difference (Reference - UUT)	% Error of Full Range
0.0 - 0.2	0.19	0.16	0.03	3.0%
0.2 - 0.4	0.39	0.35	0.04	4.0%
0.4 - 0.6	0.50	0.47	0.03	3.0%
0.6 - 0.8	0.74	0.73	0.01	1.0%
0.8 - 1.0	0.96	0.95	0.01	1.0%

Acceptable tolerance is 4%

Technican Signature: _____

Date: 9/13/2021

Uncertainty is 0.4 inH₂O, based on minumum uncertainty ration of 4:1 between standard reference meter and unit under test.
 PFS-TECO

Dry Gas Meter Calibration

Meter Manufacturer: Apex
 Model: XC-60
 Lab ID #: 53
 Serial #: 1902130
 Calibration Date: 9/10/2021
 Calibration Expiration: 3/10/2022
 Barometric Pressure: 29.97 in. Hg



Reference Standard DGM	
Manufacturer:	Apex
Model:	SK25DA
Lab ID#:	47
Serial #:	1101001
Calibration Expiration Date:	3/22/2022
Calibration γ Factor:	0.998

Unit Under Test Previous Calibration	
Date	3/10/2021
γ Factor:	0.996
Allowable Deviation ($\pm 5\%$):	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)	181.377	213.253	216.905
Standard DGM Temperature ($^{\circ}\text{F}$)	70.0	69.0	69.0
Standard DGM Pressure (in H_2O)	0.00	0.00	0.0
DGM Initial Volume (ft^3)	0.000	6.327	0.000
DGM Final Volume (ft^3)	6.327	13.957	7.869
DGM Temperature ($^{\circ}\text{F}$)	77.0	85.0	92.0
DGM Pressure (in H_2O)	2.95	3.79	1.4
Time (min)			
Net Volume for Standard DGM (ft^3)	6.405	7.531	7.660
Net Volume for DGM (ft^3)	6.327	7.630	7.869

Dry Gas Meter γ Factor	1.016	1.005	1.010
γ Factor Deviation From Average	1.016	1.005	1.010

Average Gas Meter γ Factor

1.011

Calculations:

- Deviation = |Average value for all runs - current run value|
- $\gamma = [V_{\text{std}} \times (\gamma_{\text{std}}) \times (P_{\text{bar}} + P_{\text{std}}/13.6) \times (T_{\text{DGM}} + 460)] / [V_{\text{DGM}} \times (T_{\text{std}} + 460) \times (P_{\text{bar}} + P_{\text{DGM}}/13.6)]$

Standard Reference Meter is calibrated to NIST traceable standards. Uncertainty of measurement is $\pm 0.5\%$.

Pressure Gauge Calibration Work Sheet

Gauge Manufacturer: Apex
 Maximum Range (inH₂O): 1
 Instrument ID #: 054 (dP)
 Calibration Date: 9/13/2021
 Calibration Expiration: 9/13/2022
 Barometric Pressure: 30.08 in. Hg



Reference Standard Gauge	
Manufacturer:	Dwyer
Model:	475-000
Instrument ID#:	76
Calibration Expiration Date:	8/3/2022

Calibration Point (inH ₂ O)	Reference Gauge Reading (inH ₂ O)	Pressure Gauge Reading (inH ₂ O)	Difference (Reference - UUT)	% Error of Full Range
0.0 - 0.2	0.07	0.07	0	0.0%
0.2 - 0.4	0.31	0.31	0	0.0%
0.4 - 0.6	0.44	0.43	0.01	1.0%
0.6 - 0.8	0.67	0.66	0.01	1.0%
0.8 - 1.0	0.99	0.98	0.01	1.0%

Acceptable tolerance is 4%

Technican Signature: _____

Date: 9/13/2021

Uncertainty is 0.4 inH₂O, based on mininum uncertainty ration of 4:1 between standard reference meter and unit under test.

Dry Gas Meter Calibration

Meter Manufacturer: Apex
 Model: XC-60
 Lab ID #: 54
 Serial #: 1902133
 Calibration Date: 9/9/2021
 Calibration Expiration: 3/9/2022
 Barometric Pressure: 30.06 in. Hg



Reference Standard DGM	
Manufacturer:	Apex
Model:	SK25DA
Lab ID#:	47
Serial #:	1101001
Calibration Expiration Date:	3/22/2022
Calibration γ Factor:	0.998

Unit Under Test Previous Calibration	
Date	3/10/2021
γ Factor:	1.017
Allowable Deviation ($\pm 5\%$):	0.05085
Actual Deviation:	0.02
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)	151.729	153.305	137.314
Standard DGM Temperature ($^{\circ}\text{F}$)	71.0	72.0	60.0
Standard DGM Pressure (in H_2O)	0.00	0.00	0.0
DGM Initial Volume (ft^3)	0.000	5.422	10.992
DGM Final Volume (ft^3)	5.422	10.992	16.089
DGM Temperature ($^{\circ}\text{F}$)	82.0	88.0	89.0
DGM Pressure (in H_2O)	2.80	5.65	1.1
Time (min)			
Net Volume for Standard DGM (ft^3)	5.358	5.414	4.849
Net Volume for DGM (ft^3)	5.422	5.570	5.097

Dry Gas Meter γ Factor	1.000	0.986	1.000
γ Factor Deviation From Average	1.000	0.986	1.000

Average Gas Meter γ Factor

0.995

Calculations:

- Deviation = |Average value for all runs - current run value|
- $\gamma = [V_{\text{std}} \times (\gamma_{\text{std}}) \times (P_{\text{bar}} + P_{\text{std}}/13.6) \times (T_{\text{DGM}} + 460)] / [V_{\text{DGM}} \times (T_{\text{std}} + 460) \times (P_{\text{bar}} + P_{\text{DGM}}/13.6)]$

Standard Reference Meter is calibrated to NIST traceable standards. Uncertainty of measurement is $\pm 0.5\%$.



Established 1974

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PFS Teco
11785 SE Hwy 212 STE#305
Clackamas, OR 97015

Report Number: DIRI01D01487W16P210625

A2LA ACCREDITED **CERTIFICATE OF CALIBRATION WITH DATA**

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	0.01	QC033	6/25/21	6/24/20	6/2022

FUNCTIONAL CHECKS

SHIFT TEST	LINEARITY	REPEATABILITY	ENVIRONMENTAL CONDITIONS
Test Wt: Tol: 100 0.5	Test Wt: Tol: HB44 HB44	Test Wt: Tol: 50 0.1	
As-Found:	As-Found:	As-Found:	☐ Good ☒ Fair ☐ Poor
Pass: ☒ Fail: ☐	Pass: ☒ Fail: ☐	Pass: ☒ Fail: ☐	Temperature: 21.3°C
As-Left:	As-Left:	As-Left:	
Pass: ☒ Fail: ☐	Pass: ☒ Fail: ☐	Pass: ☒ Fail: ☐	

CALIBRATION DATA

Standard	As-Found	As-Left	Expanded Uncertainty
400	399.81	399.93	0.058
300	299.88	299.92	0.058
200	199.95	200.01	0.058
100	99.98	100.00	0.012
50	49.99	100.00	0.012
25	25.00	25.00	0.012

CALIBRATION STANDARDS

Item	Make	Model	Serial Number	Cal Date	Cal Due Date	NIST ID
Avoirdupois Cast W	Rice Lake	25 and 50lb	PWO990-CA	12/14/19	12/2021	20172265

Permanent Information Concerning this Equipment:

12 month calibration cycle

Comments/Information Concerning this Calibration

6/21 Adjusted span. RH = 46%

Report prepared/reviewed by: R.B. Date: 6-25-21

Technician: R. Butcher

Signature: R. Butcher

THIS CERTIFICATE SHALL NOT BE REPRODUCED, EXCEPT IN FULL, WITHOUT THE APPROVAL OF QUALITY CONTROL SERVICES, INC.

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: Apex-AK-600
 Lab ID #: 55
 Serial #: 810016
 Calibration Date: 3/31/2021
 Calibration Expiration: 9/30/2021
 Barometric Pressure: 30.31 in. Hg



Reference Standard DGM	
Manufacturer:	apex
Model:	SK25DA
Lab ID#:	47
Serial #:	1101001
Calibration Expiration Date:	
Calibration γ Factor:	0.998

Unit Under Test Previous Calibration	
Date	6/14/2019
γ Factor:	0.992
Allowable Deviation ($\pm 5\%$):	0.0496
Actual Deviation:	0.02
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)	151.130	140.010	142.787
Standard DGM Temperature ($^{\circ}\text{F}$)	64.7	64.7	65.4
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)	5.162	4.905	5.019
DGM Temperature ($^{\circ}\text{F}$)	63.0	67.0	68.0
DGM Pressure (in H_2O)	2.20	2.20	2.2
Time (min)	27.0	25.0	25.0
Net Volume for Standard DGM (ft^3)	5.337	4.944	5.042
Net Volume for DGM (ft^3)	5.162	4.905	5.019
Dry Gas Meter γ Factor	1.023	1.005	1.002
γ Factor Deviation From Average	1.023	1.005	1.002

Average Gas Meter γ Factor

1.010

Calculations:

- Deviation = |Average value for all runs - current run value|
- $\gamma = [V_{\text{std}} \times (\gamma_{\text{std}}) \times (P_{\text{bar}} + P_{\text{std}}/13.6) \times (T_{\text{DGM}} + 460)] / [V_{\text{DGM}} \times (T_{\text{std}} + 460) \times (P_{\text{bar}} + P_{\text{DGM}}/13.6)]$

Standard Reference Meter is calibrated to NIST traceable standards. Uncertainty of measurement is $\pm 0.5\%$.



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 $\pm .00025$ 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

Tape Measure Calibration

Rule Equipment ID: 101

Date: 1/23/2020

Std. Gage Block ID: 146

Ambient (F): 70

Cal. Expiration Date: 1/7/2023

Technician: AK

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

A handwritten signature in black ink, appearing to read 'AK', written over a light gray background.



QUALITY CONTROL SERVICES

LABORATORY EQUIPMENT • SALES • SERVICE • CALIBRATION • REPAIRS
2340 SE 11TH Ave. Portland, Oregon 97214 • Box 14831 Portland, Oregon 97293
(503) 236-2712 • FAX (503) 235-2535 • www.qc-services.com



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.

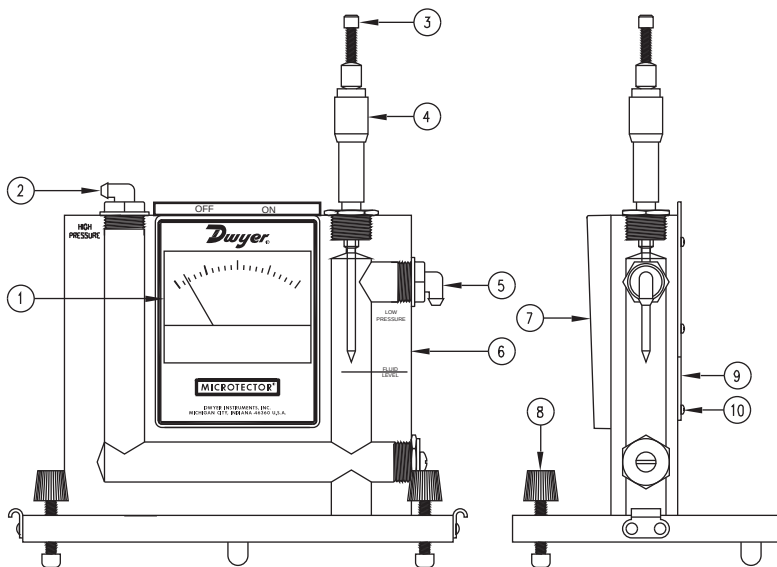
Accredited by the American Association for Laboratory Accreditation (A2LA) under Calibration Laboratory Code 115953 and Certificate Number 1550.01. This laboratory meets the requirements of ISO/IEC 17025:2005 *General Requirements for the Competence of Testing and Calibration Laboratories*. This laboratory also meets the requirements of ANSI/NCSL Z540-1-1994 and any additional program requirements in the field of calibration.

page 2 of 2

Quality Control Services, Inc.
Metrology Laboratory Manager
E-mail dthompson@qc-services.com

Date: 03/21/17

Signature David S. Thompson



Microtector® Gage

Precision Pressure Measurement

The Microtector® Gage combines the time-proven principles of the Hook Gage type manometer and modern solid-state integrated circuit electronics. It provides an inexpensive means of achieving accuracy and repeatability within $\pm .00025$ inches water column throughout its 0 to 2 inches w.c. range. It is truly a new standard in precision measuring devices.

Principles of Operation

A pressure to be measured is applied to the manometer fluid which is displaced in each leg of the manometer by an amount equal to $1/2$ the applied pressure. A micrometer mounted point is then lowered until it contacts the manometer gage fluid. The instant of contact is detected by completion of a low-power A.C. circuit. Current for this circuit is supplied by a 1.5 volt penlight cell feeding two semiconductor amplifiers which act as a free-running multivibrator operating at a frequency of approximately two kilohertz. Completion of the A.C. circuit activates a bridge rectifier which provides the signal for indication on a sensitive (0 to 50 microamps) D.C. microammeter.

On indication of contact, the operator stops lowering the point and reads the micrometer which indicates one half the applied pressure. By interpolating eight divisions (each being $.000125$ " w.c.) between $.001$ micrometer graduations, a total accuracy of $.00025$ can easily be achieved. The micrometer complies with Federal Specification GGG-C-105A and is traceable to a master at the NIST.

Locating and Opening

Stand the Microtector® Gage and case on a firm flat level surface. Remove cover by releasing the latches and lifting it straight up. If it is necessary to move the gage without case, handle only the base plate or clear acrylic block. **(CAUTION:** Do not handle gage by grasping meter-electronic package housing Item 7 on drawing.)

Fluid Level

Level the gage by adjusting the two front leveling screws (Item 8 on drawing) until the bubble in the spirit level is centered in the small circle. After leveling the gage, open both rapid shut-off valve tube connectors (Items 2 and 5). Back off the micrometer (Item 4), if necessary, to make sure that the point is not immersed in the gage fluid. The fluid level in the gage should now coincide with the mark on the right hand bore (Item 6) plus or minus approximately 1/32 inch. If the level of fluid is too high, fluid can be removed with an eye dropper pipette or carefully poured out of the right connection (Item 5).

If the level is too low, remove the top left rapid shut-off valve tube connector (Item 2) and add distilled water pre-mixed with the proper amount of green concentrate. (See maintenance instructions for proportions. After correcting the fluid level, re-install the rapid shut-off connectors and, with these in the open position, re-level the Microtector® Gage. The gage is now ready to be zeroed.

Zeroing

Turn the Micrometer barrel (Item 4) until its lower end just coincides with the zero mark on the scale and the zero on the barrel scale coincides with the vertical line on the internal scale. Note that the internal scale is graduated every .025" from 0 to 1.00 inch and the barrel scale is graduated in one thousandths from 0 to .025". Turn the meter circuit switch at the top of gage to the "on" position. While holding the barrel at the zero position (and with gage level), raise or lower the point by turning the knurled knob (Item 3) until the point is above, but near, the fluid.

Check to be sure that the meter registers zero. Watch the meter, hold the barrel, and lower the point slowly by turning the top knurled knob. As the knob is turned, the point will contact the fluid and the meter pointer will move from zero to some upscale position.

After making contact, turn the point out of the fluid by turning the micrometer barrel counter-clockwise to a reading of .010 or more. Again, watch the meter and, this time, lower the point by turning the micrometer barrel. The point position where the meter pointer begins to move up scale is the zero position. This position should correspond to the zero reading on the micrometer. Adjust the point in relation to the micrometer barrel by turning the top knob while holding the barrel steady. Repeat lowering the point, watching the meter for contact, and adjusting the point until the zero position and zero reading exactly coincide. The gage is now zeroed and should not be moved.

An alternative method of zeroing and reading can be used wherein, instead of zeroing the gage completely, a zero correction reading is taken and recorded, then subtracted from the final reading. Comparable results can be obtained with either method.

Positive Pressure Measurement

With the fluid at its proper level, a pressure of 2.0" water column maximum can be measured. Positive pressure should be applied to the top left connection (Item 2) with the micrometer zeroed as described above. This will permit a simple direct reading to be taken.

After an unknown pressure has been applied at the top left connection, the fluid level will drop in the left bore and rise over the point in the right bore. Note that the indicating meter point has moved upscale because the point is immersed in the fluid. Turn the micrometer counter-clockwise until the point leaves the fluid as indicated by the meter pointer dropping to zero on its scale. Then slowly turn the micrometer down until its point just touches the fluid surface, causing movement of the meter pointer. Withdraw the point and repeat several times, noting each time the micrometer reading where the meter pointer begins. The average of these readings multiplied by two is the pressure applied to the gage. (Avg. reading $\times 2$ = pressure applied in inches w.c. The degree of uncertainty for the operator is indicated by the difference in these readings.

When the readings are complete, the pressure should be removed and the zero setting of Microtector® Gage rechecked. Any change in the zero position will indicate inaccurate readings. Should this happen, the zero-set and pressure measurement procedure should be repeated.

Negative Pressure or Vacuum Measurement

Zero the gage. Connect the source of vacuum or negative pressure to the right-side gage connection (Item 5) and proceed as described under Positive Pressure Measurement section. Remember that the pressure measured in this way is negative.

Differential Pressure Measurement

Differential pressures may be measured by connecting the higher (more positive) pressure to the left connection (Item 2) and the lower pressure to the right connection (Item 5).

Storage

Turn meter circuit switch to "off" position and withdraw the point well clear of fluid (by turning micrometer clockwise) when gage is not in use. This will conserve the batteries and minimize build-up of oxides, etc., on the point. Keep the unit covered and in an area free of strong solvent fumes.

Maintenance

When the meter reading becomes reduced or the pointer movement gets sluggish (with the circuit on and the point in fluid), the following should be done:

(1) Remove the point (by unscrewing) and clean the tip lightly using fine crocus cloth. Wipe off all grit and dirt with a clean rag; reassemble and recheck meter operation.

(2) If the meter operation continues to be sluggish, replace the size AA, 1.5 volt battery. (Replace the battery at least once a year to avoid deterioration of battery and damage to gage. Leakproof alkaline battery is recommended.)

To replace the battery, remove center screw (Item 10) located in the back of the electronic enclosure. Cover (Item 9) will come off, exposing the battery. Pull the old battery out and push a new battery into the battery holder with the positive (center) terminal to the right (to the end marked with + on the holder).

If the fluid becomes contaminated and requires replacement: empty old fluid from gage; flush out with clear water and replace with distilled water and A-126 fluorescein green color concentrate mixed with 3/4 oz. concentrate to each quart of water.

CAUTION:

1. Do not substitute other gage fluids, as proper gage operation depends on use of the specified gage fluid to provide proper surface tension, wetting ability and electrolyte capability with unity specific gravity.

If the gage bore is very dirty, a mild soap solution may be used to aid in cleaning prior to flushing with clear water.

2. Do not clean with liquid soaps, special solvent, de-greasers, aromatic hydrocarbons, etc. Such cleaners and solvents may contain chlorine, fluorine, acetone and related compounds that will permanently damage the gage and prevent proper operation.

Mettler Toledo

Service Business Unit Industrial
1900 Polaris Parkway
Columbus, OH 43240
1-800-523-5123



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

ISO 17025 Registered
ANSI/NCSL Z540-1 Accredited

Accuracy Calibration Certificate

Customer

Company:	PFS-TECO		
Address:	11785 SE Hwy 212; Ste 305		
City:	Clackamas	Contact:	John Steinert
Zip / Postal:	97015-9050		
State / Province:	Oregon		

Weighing Device

Manufacturer:	Mettler Toledo	Instrument Type:	Weighing Instrument
Model:	PFD774-US11	Asset Number:	2
Serial No.:	C112381343	Terminal Model:	IND570
Building:	N/A	Terminal Serial No.:	C101887029
Floor:	N/A	Terminal Asset No.:	N/A
Room:	N/A		

Range	Max. Capacity	Readability (d)
1	1000 lb	0.02 lb

Procedure

Calibration Guideline:	ASTM E898 - 20
METTLER TOLEDO Work Instruction:	30260953

This calibration certificate including procedures and uncertainty estimation also complies with EURAMET cg-18 v 4.0.

This calibration certificate contains measurements for As Found and As Left calibrations.

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

	Temperature		Humidity	
As Found	Start: 20.0 °C	End: 20.0 °C	Start: 28.0 %	End: 28.0 %
As Left	Start: 20.0 °C	End: 20.0 °C	Start: 28.0 %	End: 28.0 %

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

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

As Found Calibration Date:	16-Apr-2021	Authorized A2LA Signatory:	
As Left Calibration Date:	16-Apr-2021		
Issue Date:	16-Apr-2021		
Requested Next Calibration Date:	30-Apr-2022		Gary Sargent

Measurement Results

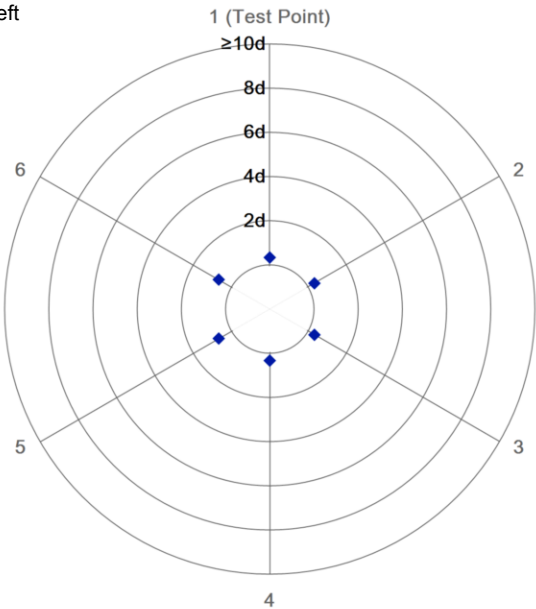
Repeatability

Test Load: 500 lb

	As Found	As Left
1	N/A	500.00 lb
2	N/A	500.00 lb
3	N/A	500.00 lb
4	N/A	500.00 lb
5	N/A	500.02 lb
6	N/A	500.02 lb

Standard Deviation	N/A	0.010 lb
--------------------	-----	----------

○ As Found
◆ As Left



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

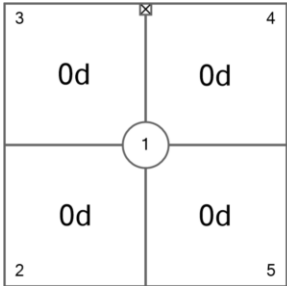
The results of this graph are based upon the absolute values of the differences from the mean value.

Eccentricity

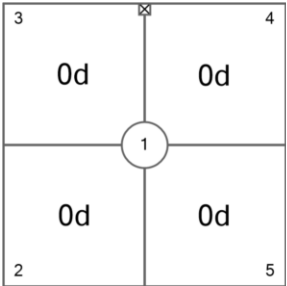
Test Load: 325 lb

Position	As Found	As Left
1	325.00 lb	325.00 lb
2	325.00 lb	325.00 lb
3	325.00 lb	325.00 lb
4	325.00 lb	325.00 lb
5	325.00 lb	325.00 lb

Maximum Deviation	0.00 lb	0.00 lb
-------------------	---------	---------



As Found



As Left

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

Error of Indication

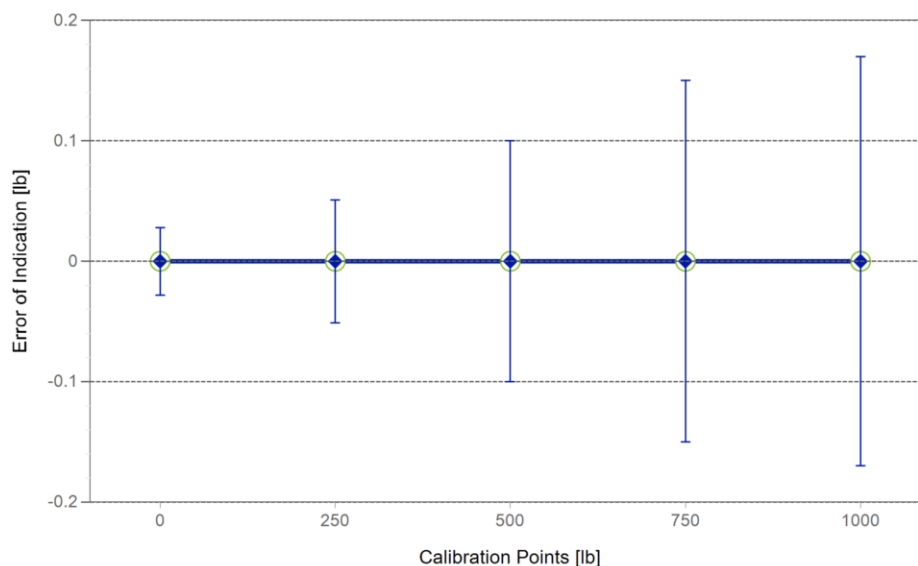
As Found

	Reference Value	Indication	Error of Indication	Expanded Uncertainty	k
1	0 lb	0.00 lb	0.00 lb	N/A	N/A
2 ¹	250 lb	250.00 lb	0.00 lb	N/A	N/A
3 ¹	500 lb	500.00 lb	0.00 lb	N/A	N/A
4 ¹	750 lb	750.00 lb	0.00 lb	N/A	N/A
5	1000 lb	1000.00 lb	0.00 lb	N/A	N/A
6 ¹	750 lb	750.00 lb	0.00 lb	N/A	N/A
7 ¹	500 lb	500.00 lb	0.00 lb	N/A	N/A
8 ¹	250 lb	250.00 lb	0.00 lb	N/A	N/A
9	0 lb	0.00 lb	0.00 lb	N/A	N/A

As Left

	Reference Value	Indication	Error of Indication	Expanded Uncertainty	k
1	0 lb	0.00 lb	0.00 lb	0.028 lb	2.37
2 ¹	250 lb	250.00 lb	0.00 lb	0.051 lb	2
3 ¹	500 lb	500.00 lb	0.00 lb	0.10 lb	2
4 ¹	750 lb	750.00 lb	0.00 lb	0.15 lb	2
5	1000 lb	1000.00 lb	0.00 lb	0.17 lb	2.05
6 ¹	750 lb	750.00 lb	0.00 lb	0.15 lb	2
7 ¹	500 lb	500.00 lb	0.00 lb	0.10 lb	2
8 ¹	250 lb	250.00 lb	0.00 lb	0.051 lb	2
9	0 lb	0.00 lb	0.00 lb	0.028 lb	2.37

¹The calculated uncertainty was replaced by the CMC (Calibration and Measurement Capabilities) value because the calculated uncertainty was smaller than the CMC value.



○ As Found

◆ As Left

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

The uncertainty stated is the expanded uncertainty at calibration obtained by multiplying the standard combined uncertainty by the coverage factor k - which can be larger than 2 according to ASTM E898 and EURAMET cg-18. The value of the measurand lies within the assigned range of values with a probability of approximately 95%.

The user is responsible for maintaining environmental conditions and the settings of the weighing instrument when it was calibrated.

Test Equipment

All weights used for metrological testing are traceable to national or international standards. The weights were calibrated and certified by an accredited calibration laboratory.

Weight Set 1: NIST NIST-F

Weight Set No.:	182 50's & 25's	Date of Issue:	25-Jun-2019
Certificate Number:	OR-19-186-F	Calibration Due Date:	30-Jun-2021

Remarks

Equipment condition: Good

Calibration after installation

The recording of false fictitious or fraudulent statements or entries on this document may be punishable as a felony under federal Statute

End of Accredited Section

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

Measurement Uncertainty of the Weighing Instrument in Use

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

Temperature coefficient for the evaluation of the measurement uncertainty in use: $10.0 \cdot 10^{-6} / K$

Temperature range on site for the evaluation of the measurement uncertainty in use: 10 K

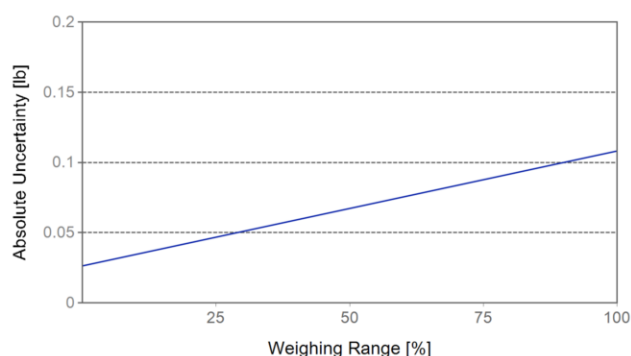
Linearization of Uncertainty Equation

Range			As Found	As Left
	d	Max		
1	0.02 lb	1000 lb	N/A	$U_1 = 0.026 \text{ lb} + 0.0000818 \text{ lb/lb} \cdot R$

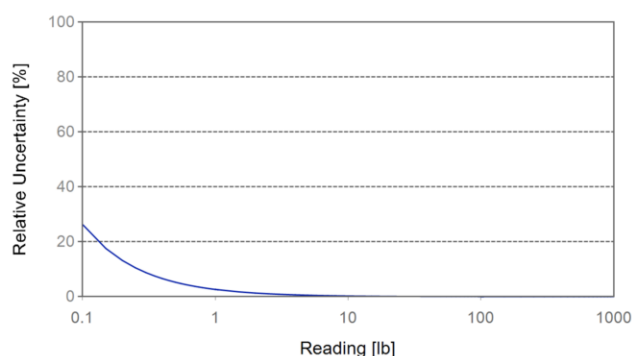
To optimize the stability of the linearization, besides of the zero load only increasing measurement points with a test load of 5% of the measurement range or larger are taken for the calculation of the linear equation.

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

Net Indication	As Found		As Left	
1.00 lb	N/A	N/A	0.026 lb	2.6%
10.00 lb	N/A	N/A	0.027 lb	0.27%
100.00 lb	N/A	N/A	0.034 lb	0.034%
500.00 lb	N/A	N/A	0.067 lb	0.013%
1000.00 lb	N/A	N/A	0.11 lb	0.011%



As Found



As Left

Handbook 44 Tolerance Assessment(Acceptance)

Assessment done without considering measurement uncertainty.

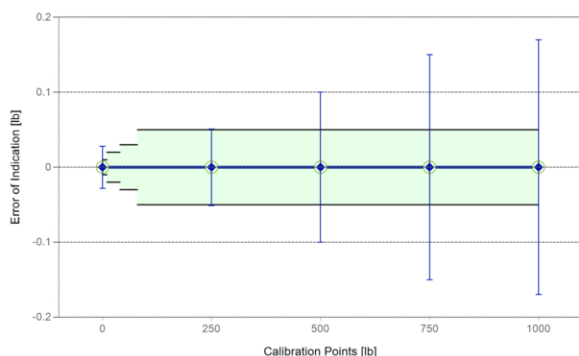
The measurements from the attached calibration certificate were assessed against the Tolerances defined by NIST Handbook 44.

The range of measurements for both Eccentricity and Repeatability (if performed) tests is assessed against Maintenance Tolerances.

Overall
As Found
As Left
✓ = Passed
✗ = Failed

Weighing Device

Range	Max. Capacity	Readability (d)	Verification Scale Interval (e)	Class
1	1000 lb	0.02 lb	0.02 lb	III



Tolerances according to NIST Handbook 44

Test Load		Tolerance
From	To	
0.00 lb	0.00 lb	0.005 lb
0.02 lb	10.00 lb	0.01 lb
10.02 lb	40.00 lb	0.02 lb
40.02 lb	80.00 lb	0.03 lb
80.02 lb	1000.00 lb	0.05 lb

○ As Found

◆ As Left

— Tolerance

Eccentricity and Repeatability

Test	Test Load	Tolerance	As Found		As Left	
			Max. Error / Range	Result	Max. Error / Range	Result
Eccentricity (Max. Error)	325 lb	0.05 lb	0.00 lb	✓	0.00 lb	✓
Eccentricity (Range)	325 lb	0.1 lb	0.00 lb	✓	0.00 lb	✓
Repeatability (Max. Error)	500 lb	0.05 lb	N/A	N/A	0.02 lb	✓
Repeatability (Range)	500 lb	0.10 lb	N/A	N/A	0.02 lb	✓

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

Range: Difference between largest and smallest measurement value.

Error of Indication

	Reference Value	Tolerance	As Found		As Left	
			Error of Indication	Result	Error of Indication	Result
1	0 lb	0.01 lb	0.00 lb	✓	0.00 lb	✓
2	250 lb	0.05 lb	0.00 lb	✓	0.00 lb	✓
3	500 lb	0.05 lb	0.00 lb	✓	0.00 lb	✓
4	750 lb	0.05 lb	0.00 lb	✓	0.00 lb	✓
5	1000 lb	0.05 lb	0.00 lb	✓	0.00 lb	✓
6	750 lb	0.05 lb	0.00 lb	✓	0.00 lb	✓
7	500 lb	0.05 lb	0.00 lb	✓	0.00 lb	✓
8	250 lb	0.05 lb	0.00 lb	✓	0.00 lb	✓
9	0 lb	0.01 lb	0.00 lb	✓	0.00 lb	✓



CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

Customer & Order Information

PXPKG TUALATIN OR H
10450 SW TUALATIN SHERWOOD ROAD
TUALATIN OR 97062-9547

Certificate Issuance Date: 10/16/2019

Praxair Order Number: 71120745

Part Number: NI CD17C08E-AS

Customer PO Number: 79106732

Fill Date: 10/07/2019

Lot Number: 70086928009

Cylinder Style & Outlet: AS

CGA 590

Cylinder Pressure and Volume: 1300 psig 99 ft3

Certified Concentration

Expiration Date:	10/16/2027	NIST Traceable
Cylinder Number:	CC106574	Expanded Uncertainty
17.00 %	Carbon dioxide	± 0.5 %
4.31 %	Carbon monoxide	± 0.6 %
16.95 %	Oxygen	± 0.2 %
Balance	Nitrogen	

ProSpec EZ Cert



Certification Information:

Certification Date: 10/16/2019

Term: 96 Months

Expiration Date: 10/16/2027

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: 09/18/2019

First Analysis Data:				Date
Z:	0	R:	19.98	C: 17
R:	19.98	Z:	0	C: 17
Z:	0	C:	17.01	R: 19.99
UOM:	%	Mean Test Assay:	17	%

Reference Standard:

Type / Cylinder #: GMIS / CC149981

Concentration / Uncertainty: 19.98 % ±0.279%

Expiration Date: 06/07/2026

Traceable to: SRM # / Sample # / Cylinder #: RGM#CC28033 / N/A / RGM#CC28033

SRM Concentration / Uncertainty: 19.67 % ±0.04%

SRM Expiration Date: 07/15/2021

Second Analysis Data:				Date
Z:	0	R:	0	C: 0
R:	0	Z:	0	C: 0
Z:	0	C:	0	R: 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: 09/19/2019

First Analysis Data:				Date
Z:	0	R:	5	C: 4.31
R:	5	Z:	0	C: 4.31
Z:	0	C:	4.32	R: 5.01
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
R:	0	Z:	0	C: 0
Z:	0	C:	0	R: 0
UOM:	%	Mean Test Assay:		%

3. Component:

Oxygen

Requested Concentration: 17 %
Certified Concentration: 16.95 %
Instrument Used: OXYMAT 5E
Analytical Method: Paramagnetic
Last Multipoint Calibration: 09/18/2019

First Analysis Data:				Date
Z:	0	R:	20.88	C: 16.96
R:	20.88	Z:	0	C: 16.96
Z:	0	C:	16.97	R: 20.9
UOM:	%	Mean Test Assay:	16.95	%

Reference Standard:

Type / Cylinder #: GMIS / CC506521

Concentration / Uncertainty: 20.87 % ±0.108%

Expiration Date: 12/14/2026

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
R:	0	Z:	0	C: 0
Z:	0	C:	0	R: 0
UOM:	%	Mean Test Assay:		%

Analyzed By

Jose Vasquez

Certified By

Jenna Lockman



ISO 17025
ACCREDITED LABORATORY

55 N. 4th Street
Beaumont, TX 77701

Certificate of Analysis – EPA Protocol Gas

Customer:
Inter-Mountain Labs
555 Absaraka St.
Sheridan, WY 82801

PO Number: 196148
Reference#: CGS-10-20029 (2 of 2)
Date Filled:
Customer Part #:

Cylinder Number	Size	Concentration Basis	Standard type	Certificate ID
91005049	ALS	Mole	EPA Protocol	02-03112002

Certified Concentration

Carbon Monoxide=	2.47%	+/- 0.018%
Carbon Dioxide=	9.9%	+/- 0.1%
Oxygen=	10.37%	+/- 0.06%
Nitrogen =	Balance Gas	

Analytical Information

Component	Analyzer Make/Model/SN	Analytical Principle	Last Calibration Date
Carbon Monoxide	MKS/2031DJG2EKVS13T/017146467	FT-IR	3/13/2020
Carbon Dioxide	Thermo 410I/1162980025	NDIR	3/4/2020
Oxygen	Thermo 410I/1162980025	MPA	2/11/2020

First Assay Date 3/13/2020

Reference Standard(s)

Component	GMS #	Cylinder #	NIST Reference	Concentration	Uncertainty	Exp Date
Carbon Monoxide	CC219495.20151013g	CC219495	2642a	2.488%	+/- 0.015%	1/11/2024
Carbon Dioxide	EB007908.20190327	EB007908	C1579010.02	9.5%	+/- 0.02%	6/18/2027
Oxygen	EB0080793.20180118	EB0080793	071001	11.97%	+/- 0.06%	7/21/2026
Oxygen	EB0087693.20180504	EB0087693	071001	12%	+/- 0.12%	7/21/2026
Carbon Dioxide	EB0097897.20171018	EB0097897	C1309410.01	24.9%	+/- 0.10%	2/6/2026
Nitrogen				Balance Gas		

This calibration standard has been certified per the 2012 EPA Traceability Protocol, Document EPA 600/R-12/531, using the procedure G1.

Do Not Use This Standard Below 100 psig (0.7 Megapascals).

Valve Outlet Connection CGA: 660
Mix Pressure (psig) @ 70F: 2000
Certification Date: 3/13/2020
Shelf Life: 8 years
Expiration Date: 3/11/2028

Certified By:

Jennifer Healy

Reviewed By:

Kelly Ray

Produced By:
Red Ball Technical Gas Service Phone: 800-551-8150
555 Craig Kennedy Way Shreveport, LA 71107
Red Ball Technical Gas Service PGVP Vendor ID: G12020