
Innovative Hearth Products, LLC

Project # F25-415

Model: Montecito-C

AKA: Bainbridge-B, WCT6920WSS,
WCT4920WSS

Type: Wood Fired Room Heater

Date: July 3, 2025

Revised Date: September 22, 2025

NYSERDA Test Method for Certification of Cordwood-Fired Stoves Under the 2015 New Source Performance Standard (EPA Alternate Test Method)

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Revision Summary

Date: July 3, 2025 – Original Issue

Date: September 22, 2025 – Revised the following items at the request of EPA:

- Added Example Calculations to Appendix A, see page 248 of Non-CBI report.

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Affidavit

PFS-TECO was contracted by International Hearth Products, LLC (IHP) to provide testing services for the Montecito-C Series Wood-Fired Room Heater per the NYSEERDA Test Method for Certification of Cordwood-Fired Stoves Under the 2015 New Source Performance Standard, which was approved for use by EPA under an Alternate Test Method (ATM) in a letter to the manufacturer dated May 21, 2025. All testing and associated procedures were conducted at PFS-TECO's Portland Laboratory beginning on 5/27/2025 and ending on 5/30/2025. PFS-TECO's Portland Laboratory is located at 11785 SE Highway 212 – Suite 305, Clackamas, Oregon 97015. Testing procedures followed EPA Method 28R and ASTM E2780, *Standard Test Method for Determining Particulate Matter Emissions from Wood Heaters*. Particulate sampling was performed per ASTM E2515, *Standard Test Method for Determination of Particulate Matter Emissions Collected by a Dilution Tunnel*.

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 Laboratory Accreditation Certificate Number 4. PFS-TECO is accredited by ANAB to ISO 17020:2012 "Criteria for Bodies Performing Inspections", and ISO 17025:2017 "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, Laboratory Manager

Introduction

IHP contracted with PFS-TECO to perform EPA certification testing on the Montecito-C 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 by the manufacturer at a medium burn setting in accordance with ASTM E2780.
- Prior to start of testing, the dilution tunnel was cleaned with a steel brush.
- A TEOM using TX-40 filters was used to determine 1st hour emissions and integrated emissions in accordance with the ATM for all test runs.
- A total of 4 test runs were completed. Three test runs were included in average emissions results, while a 4th test run was aborted due to an equipment failure. Test runs were performed in accordance with the ATM. All runs have been found to be appropriate, see the Run Narrative section for further detail on each run.
- No fuel pieces were intentionally squared or debarked and met all requirements specified in the ATM. Fuel pieces used for testing had little to no bark due to natural drying, splitting, and impacts caused by multiple moisture measurements. As required, video recording of all runs was performed.
- For the purpose of measuring temperature of the unit, 5 thermocouples were installed on the outer surface of the firebox per the ATM.

Wood Heater Identification and Testing

- Appliance Tested: **Montecito-C**
- PFS Tracking Number: **223**
- Manufacturer: **IHP**
- Catalyst: **No**
- Heat exchange blower: **Integral**
- Type: **Wood Stove**
- Style: **Built-In Fireplace**
- Date Received: **Monday, May 12, 2025**
- Testing Period – Start: **Tuesday, May 27, 2025**
Finish: **Friday, May 30, 2025**
- Test Location: **PFS TECO**
11785 SE Hwy 212
Clackamas, OR 97015
- Elevation: **~131 Feet above sea level**
- Test Technician(s): **Aaron Kravitz**
- Observers: **None**

Test Procedures and Equipment

All Sampling and analytical procedures were performed by Aaron Kravitz. All procedures used are directly from the NYSERDA Method 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
50	Digiweigh DWP12i Platform Scale
129	APEX XC-60-ED Digital Emissions Sampling Box A
130	APEX XC-60-ED Digital Emissions Sampling Box B
137	California Analytical ZRE CO ₂ /CO/O ₂ IR ANALYZER
94	Moisture meter calibration block
95	Anemometer
97	10 lb audit weight
107	Sartorius Analytical Balance
109A/B	Troemner 100mg/200mg Audit Weights
217	Microtector
115	Delmhorst Wood Moisture Meter
190	Mettler 3'x3' floor scale w/digital weight indicator
209	Tape Measure
216	Temperature Logger
DT0042934	Gas Analyzer Calibration Span Gas
CC341544	Gas Analyzer Calibration Mid Gas
EPA B47459	Dichot TEOM – Tunnel Sampling
EPA B47461	Dichot TEOM – Ambient Sampling
134	Mass Flow Meter
Thermo CVK7037	TEOM Calibration Kit

The TEOM instruments were calibrated in accordance with NYSERDA Standard Operation Procedures for Thermo Scientific 1405-D TEOM™ for use in a dilution tunnel, dated September 29, 2022, and the manufacturer's instructions, using mass flow meter ID # 134 and manufacturer-supplied calibration kit serial # CVK7037.

Barometric pressure data was taken from local National Weather Service station KPDX. As PFS and KPDX are at the same altitude, the correction for altitude per ASTM E2515 6.1.2 is 1:1. NWS data was verified with on-site barometer #202, which is calibrated yearly.

Results

A total of 4 test runs were performed on the Montecito-C. Run #3 was aborted during the L2 phase due to the failure of the TEOM sampling pump. The average emissions rate for the test series was measured to be **0.8 g/hr** when measured with a TEOM, or **1.5 g/hr** when measured in accordance with ASTM E2515. With average 1st hour TEOM emissions of **2.1 g/hr**. Average Higher Heating Value efficiency of **61%**. The average CO emission rate for the test series was **0.8 g/min**. The IHP Montecito-C 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 Tables

Run 1

	Burn Phase:	L1	L2	L3	L4	1 st hr	Total
	Burn Time (min):	16	54	59	276		408
	Burn Rate (dry kg/hr):	6.28	3.72	2.63	1.80		2.11
TEOM	Eg:	1.4	0.68	0.73	2.4	2.0	5.2
TEOM	Eg/hr:	5.2	0.75	0.74	0.52	2.0	0.8
TEOM	Eg/kg:	0.84	0.20	0.28	0.35	0.43	0.36
TEOM	Eg/MJ output:	0.067	0.019	0.025	0.034		0.033
TEOM	Elb/mmbtu output:	0.155	0.043	0.058	0.079	0.000	0.077
2515	Eg:						9.1
2515	Eg/hr:						1.3
2515	Eg/kg:						0.63
2515	Eg/MJ output:						0.058
2515	Elb/mmbtu output:						0.135
	CO (g):	26.9	56.2	40.4	170.4		293.9
	CO (g/min):	1.7	1.0	0.7	0.6		0.7
	CO g/hr:	101.0	62.4	41.1	37.0		43.2
	CO g/kg:	16.1	16.8	15.6	20.5		20.5
	CO g/MJ output:	1.3	1.6	1.4	2.4		1.9
	CO lb/mmBTU output:	3.0	3.6	3.2	5.6		4.4
	Output (BTU/hr)	74,385	38,184	28,303	14,463		21,847
	Efficiency (%)	61.1%	55.7%	59.1%	59.4%		58.7%

Run 2

	Burn Phase:	L1	L2	L3	L4	1 st hr	Total
	Burn Time (min):	15	48	63	346		475
	Burn Rate (dry kg/hr):	6.15	4.56	2.28	1.46		1.83
TEOM	Eg:	0.87	0.76	0.55	2.7	1.6	4.9
TEOM	Eg/hr:	3.5	0.95	0.52	0.46	1.6	0.6
TEOM	Eg/kg:	0.6	0.21	0.23	0.39	0.31	0.33
TEOM	Eg/MJ output:	0.043	0.017	0.019	0.029		0.026
TEOM	Elb/mmbtu output:	0.099	0.041	0.043	0.067	0.000	0.061
2515	Eg:						9.3
2515	Eg/hr:						1.2
2515	Eg/kg:						0.64
2515	Eg/MJ output:						0.050
2515	Elb/mmbtu output:						0.116
	CO (g):	25.1	39.4	33.1	284.0		381.6
	CO (g/min):	1.7	0.8	0.5	0.8		0.8
	CO g/hr:	100.5	49.2	31.5	49.2		48.2
	CO g/kg:	16.3	10.8	13.9	33.7		26.3
	CO g/MJ output:	1.2	0.9	1.1	3.1		2.0
	CO lb/mmBTU output:	2.9	2.1	2.6	7.1		4.8
	Output (BTU/hr)	77,400	51,654	26,506	15,252		22,289
	Efficiency (%)	63.8%	61.8%	64.6%	63.8%		63.4%

Run 3

Run 3 results are not reported as the run was aborted due to equipment failure, and thus no results can be computed. See Appendix A for data collected during Run 3.

Run 4

	Burn Phase:	L1	L2	L3	L4	1 st hr	Total
	Burn Time (min):	14	65	65	301		448
	Burn Rate (dry kg/hr):	6.87	3.32	2.39	1.69		1.96
TEOM	Eg:	1.3	1.6	0.56	4.9	2.8	8.3
TEOM	Eg/hr:	5.4	1.5	0.51	0.97	2.8	1.1
TEOM	Eg/kg:	0.8	0.44	0.22	0.71	0.59	0.57
TEOM	Eg/MJ output:	0.063	0.037	0.018	0.058		0.047
TEOM	Elb/mmbtu output:	0.146	0.087	0.041	0.135	0.000	0.108
2515	Eg:						15.2
2515	Eg/hr:						2.0
2515	Eg/kg:						1.03
2515	Eg/MJ output:						0.085
2515	Elb/mmbtu output:						0.198
	CO (g):	38.9	55.8	55.9	285.9		436.5
	CO (g/min):	2.8	0.9	0.86	0.9		1.0
	CO g/hr:	166.6	51.5	51.6	57.0		58.5
	CO g/kg:	24.3	15.5	21.6	33.7		29.8
	CO g/MJ output:	1.9	1.3	1.8	3.4		2.5
	CO lb/mmBTU output:	4.5	3.1	4.2	7.9		5.7
	Output (BTU/hr)	81,385	37,200	27,410	15,865		22,577
	Efficiency (%)	62.3%	61.0%	63.2%	61.7%		61.9%

Test Run Narrative

Run 1

Run 1 was performed on 5/27/2025 as an Integrated Duty Cycle run per the ATM. Emissions sampling began from a cold start ignition of kindling and start-up fuel. L2 test fuel was loaded at 16 minutes, L3 at 71 minutes, and L4 at 131 minutes. The total test time was 408 minutes. The particulate emissions rate from kindling ignition to test completion was 0.77 g/hr as measured by the TEOM, or 1.3 g/hr as measured in accordance with ASTM E2515. No filter change was needed for E2515 sampling. The overall burn rate from ignition to completion was 2.11 kg/hr, and overall efficiency was 58.7%. All test results were appropriate and valid. There were no anomalies, and all test criteria were met. No condensed water was detected in the tunnel at any time. Video was recorded for the entire run.

Run 2

Run 2 was performed on 5/28/2025 as an Integrated Duty Cycle run per the ATM. Emissions sampling began from a cold start ignition of kindling and start-up fuel. L2 test fuel was loaded at 15 minutes, L3 at 64 minutes, and L4 at 128 minutes. The total test time was 475 minutes. The particulate emissions rate from kindling ignition to test completion was 0.61 g/hr as measured by the TEOM, or 1.2 g/hr as measured in accordance with ASTM E2515. No filter change was needed for E2515 sampling. The overall burn rate from ignition to completion was 1.83 kg/hr, and overall efficiency was 63.4%. All test results were appropriate and valid. There were no anomalies, and all test criteria were met. No condensed water was detected in the tunnel at any time. Video was recorded for the entire run.

Run 3

Run 3 was performed on 5/29/2025 as an Integrated Duty Cycle run per the ATM. Emissions sampling began from a cold start ignition of kindling and start-up fuel. L2 test fuel was loaded at 14 minutes. Prior to loading L3, the technician observed that the TEOM instrument had no sample flow, and this was traced to a failed sample pump. Due to this failure, no TEOM emissions data was recorded for the duration of L2, rendering the test run invalid. The test run was therefore aborted at 55 minutes. No results are reported for this incomplete run, but all data collected is reported in Appendix A.

Run 4

Run 4 was performed on 5/30/2025 as an Integrated Duty Cycle run per the ATM. Emissions sampling began from a cold start ignition of kindling and start-up fuel. L2 test fuel was loaded at 14 minutes, L3 at 80 minutes, and L4 at 146 minutes. The total test time was 448 minutes. The particulate emissions rate from kindling ignition to test

completion was 1.1 g/hr as measured by the TEOM, or 2.0 g/hr as measured in accordance with ASTM E2515. No filter change was needed for E2515 sampling. The overall burn rate from ignition to completion was 1.96 kg/hr, and overall efficiency was 61.9%. All test results were appropriate and valid. There were no anomalies, and all test criteria were met. No condensed water was detected in the tunnel at any time. Video was recorded for the entire run.

Test Conditions Summary

Testing conditions for all runs fell within allowable specifications of the ASTM 2780 and ASTM E2515. A summary of facility conditions, fuel burned, and run times is listed below.

Run	Ambient (°F)		Relative Humidity (%)		Average Barometric Pressure (In. Hg.)	Test Run Time (Min)
	Pre	Post	Pre	Post		
1	66.9	74.2	40.6	30.2	29.87	408
2	71.7	74.5	36.5	31.7	29.80	475
3*	69.0	71.0	35.4	36.7	30.01	55
4	65.1	66.0	27.3	31.6	29.65	448

*Run Aborted

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

	L1 Settings	L2 Settings	L3 Settings	L4 Settings
Run 1	Air control fully open Fan on auto	Air control fully open until 50% fuel consumption, then set to fully closed. Fan on auto	Air control fully closed Fan on auto	Air control fully closed Fan on auto
Run 2	Air control fully open Fan on auto	Air control fully open until 50% fuel consumption, then set to fully closed. Fan on auto	Air control fully closed Fan on auto	Air control fully closed Fan on auto
Run 3	Air control fully open Fan on auto	Air control fully open until 50% fuel consumption, then set to fully closed. Fan on auto	N/A – Run aborted	N/A – Run aborted Fan on auto
Run 4	Air control fully open Fan on auto	Air control fully open until 50% fuel consumption, then set to fully closed. Fan on auto	Air control fully closed Fan on auto	Air control fully closed Fan on auto

Appliance Description

Models: The Montecito-C is part of the Montecito-C Series, all of which are identical with respect to all parts that may impact emissions performance as specified by 40 CFR 60 § 60.533(k). The models are only different with respect to branding, decorative features, and support method. Drawings for all models are in Appendix D. See below for model list:

- Montecito-C, Bainbridge-B, WCT6920WSS, WCT4920WSS

Appliance Type: Built-In Wood-Fired Room Heater

Total Firebox Volume: 2.19 ft³

Usable Firebox Volume: 1.52 ft³, see ATM document in Appendix A for further detail on Total versus Usable Firebox Volume.

Air Introduction System: Primary Air enters the firebox through an inlet box at the lower left of the appliance and is channeled up the sides of the appliance and down through the air wash, as well as through a fixed pilot air opening in the front of the firebox. Primary air is controlled via a damper arm located at the lower left of the loading door which moves left and out (open) or right and in (closed). Secondary air is pulled through an opening in the side of the appliance and channeled up through the secondary air baffle, and enters the firebox through four perforated secondary air tubes at the top of the firebox. Dimensions on all these features can be found in Appendix D.

Baffles: A fiberboard baffle panel is located on top of the secondary air tubes to route combustion products to the front of the firebox.

Catalytic Combustor: None

Refractory Insulation: The firebox is lined with 1.25" thick poured refractory cement.

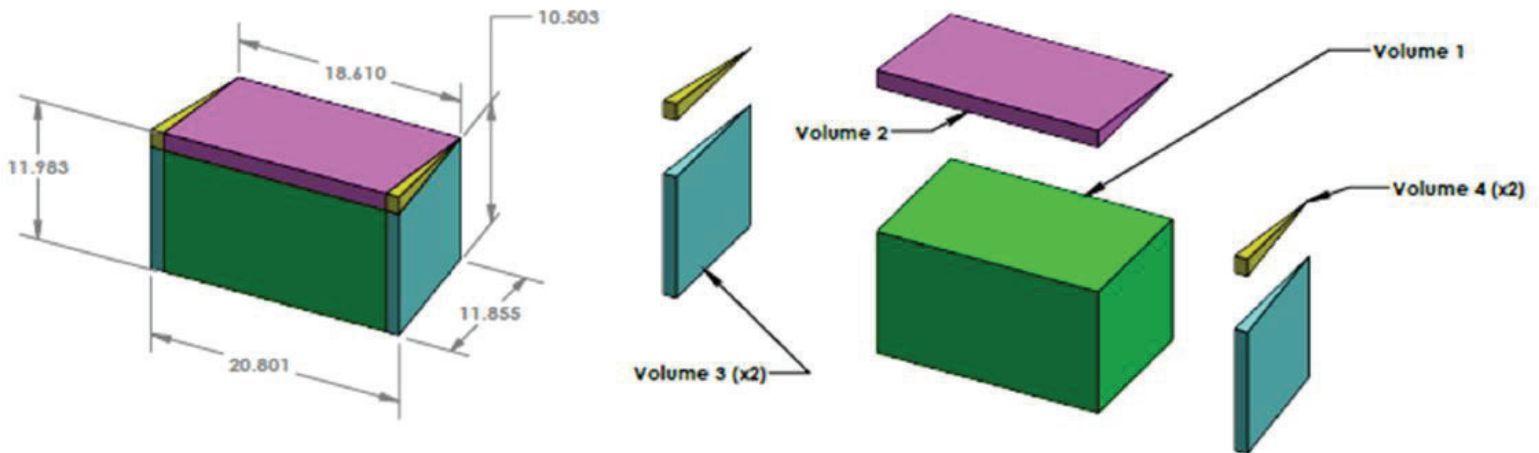
Flue Outlet: 6-inch exhaust outlet located on the top of the appliance.

Fan: A factory-installed thermostat-controlled convection fan is mounted to the bottom of the appliance.

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

Firebox Volume Dimension

Usable Firebox Volume:



$$V1 = 18.610 \times 11.855 \times 10.503 \\ = 2317.239 \text{ in}^3$$

$$V2 = \frac{1}{2} (11.983 - 10.503) \times 11.855 \times 18.61 \\ = 163.254 \text{ in}^3$$

$$V3 = \frac{1}{2} (20.801 - 18.610) \times \frac{1}{2} \times 11.855 \times 10.503 \\ = 68.220 \text{ in}^3$$

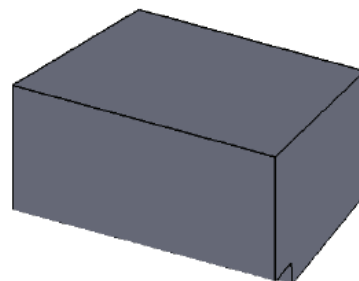
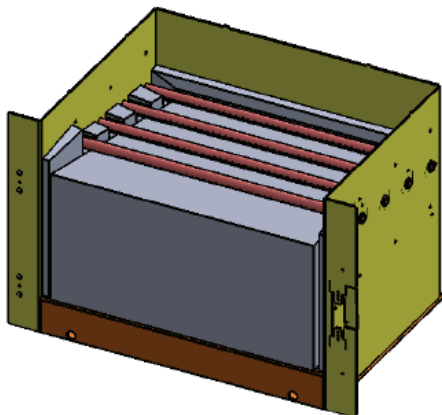
$$V4 = \frac{1}{2} (20.801 - 18.610) \times (11.983 - 10.503) \times 11.855 / 3 \\ = 6.408 \text{ in}^3$$

$$\text{Total Useable Firebox Volume: } V1 + V2 + 2V3 + 2V4 \\ = 2629.749 \text{ in}^3 \\ = 1.52 \text{ ft}^3$$

NYSDA Firebox Volume Calculator
(using avg height and width)

1.3 Firebox Information		
Firebox Shape:	☒ Cubic	☐ Cylindrica
Firebox width:	19.71	in.
Firebox depth:	11.86	in.
Firebox height:	11.24	in.
Volume adjustment:		ft ³
Firebox Net Volume:	1.520	ft ³

Total Firebox Volume:



CAD generated (approximate) overall FireBox Volume: 2.19 ft³

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. No kiln-drying was used. Fuel is sourced locally in Oregon. Fuel was not debarked, though bark frequently fell off of fuel pieces in the course of splitting to final size. Fuel was free of decay, fungus or other contaminants. No moisture was added to the fuel. Test fuel moisture was measured within 24h from loading. The fuel was stored in the same ambient condition than the laboratory. As per the Fuel Load Calculator, all pieces of fuel were cut to 18.5 inches long.

While splitting test fuel, it was verified that every piece of test fuel with 4 sides were verified to meet the 70% rule in the ATM. No pieces were intentionally squared. Typical fuel loads are pictured below:



L1 Fuel Load



L2 Fuel Load



L3 Fuel Load



L4 Fuel Load

Sample Collection:

Verified – Yes:☒ No:☐ (if No Explain)

ASTM E2515-11

Four separate, complete particulate sampling trains were used for each run. Filter face velocity at no time exceeded 150mm/sec during any test run. The dry gas meters were calibrated for the flow rates encountered during the test runs.

The 47mm filter holder assemblies consist of an aluminum front housing and polycarbonate rear housing, with the rear housing located 75mm downstream from the front housing. The front filter support frit is stainless steel.

Probe assemblies are constructed from 316 grade stainless steel tubing with an outside diameter of 6.35mm and 310mm length.

A type K thermocouple filter temperature monitor probe is installed behind the front filter housing with its tip directly exposed to the sample gas.

Sample gas drying systems are located prior to each metering system and include temperature sensors.

The metering systems include vacuum gauges, leak-free diaphragm-type pumps, and type K thermocouple temperature sensors. The gas meters have a resolution of 0.001 cubic feet.

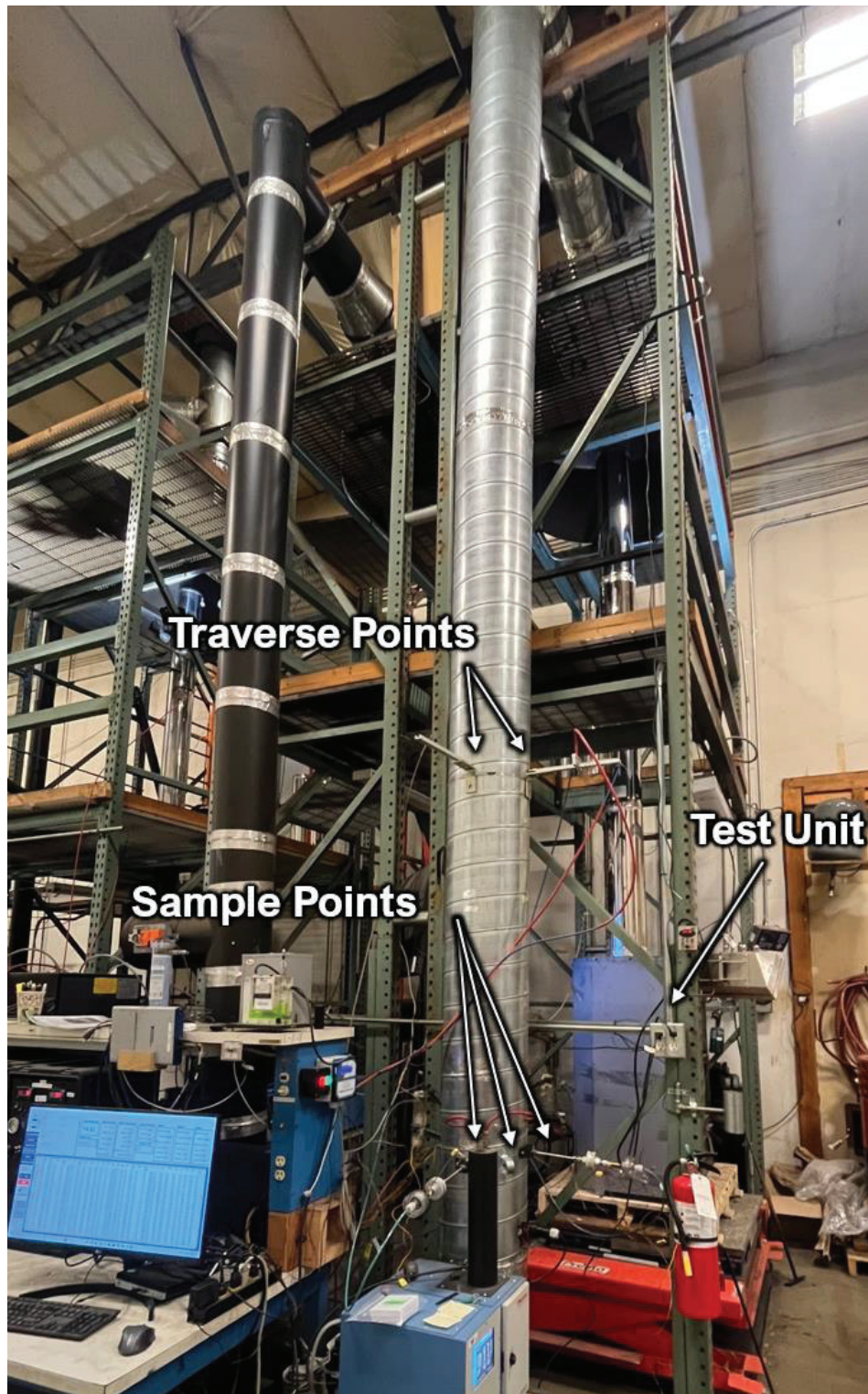
Barometric pressure data was taken from local National Weather Service station KPDX. As PFS and KPDX are at the same altitude, the correction for altitude per ASTM E2515-11 6.1.2 is 1:1.

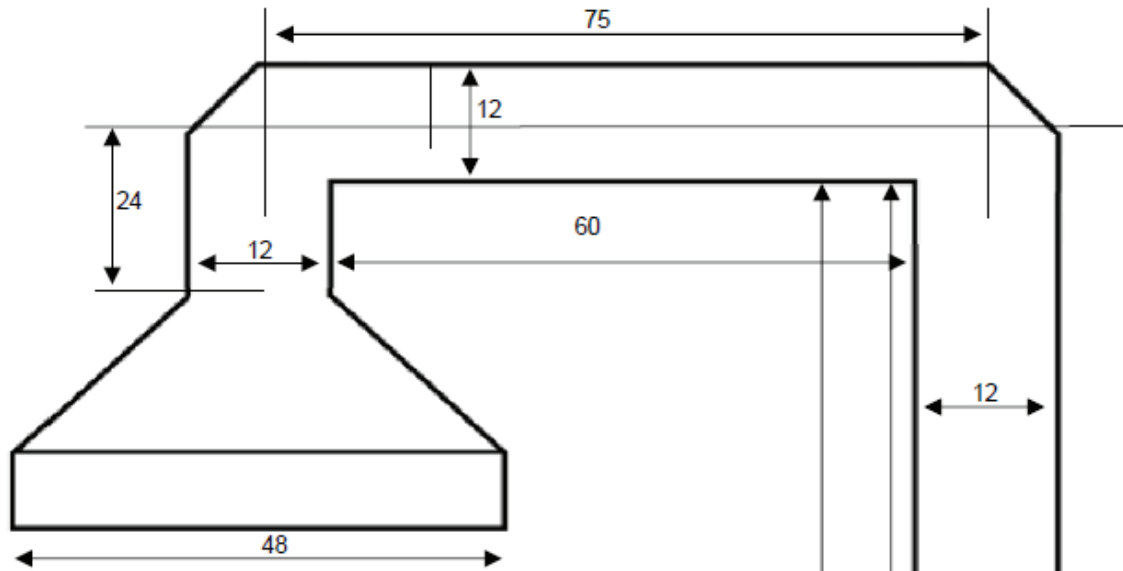
Dilution tunnel temperature was measured by a type K thermocouple probe.

Dilution tunnel velocity was measured prior to each run by performing a velocity traverse and monitored throughout each run by measuring pitot pressure at the tunnel centroid. Traverses were performed using a Dwyer Model 1430 Microtector in accordance with the instrument owners' manual. This includes leveling and zeroing the instrument prior to each use and performing pre- and post-test leak checks on the pitot tubing.

To monitor and log centroid pitot pressure, the pressure transducer of an Apex Instruments XC-60-DIR sample box was used. Both pieces of equipment offer precision in excess of the ± 0.001 " specified in section 6.1.5 of ASTM E2515-11, and are therefore suitable for use with flows under 800 ft/min. Both pieces of equipment are plumbed to the same pitot tube, which is in accordance with the design shown in Appendix X2 of ASTM E2515-11.

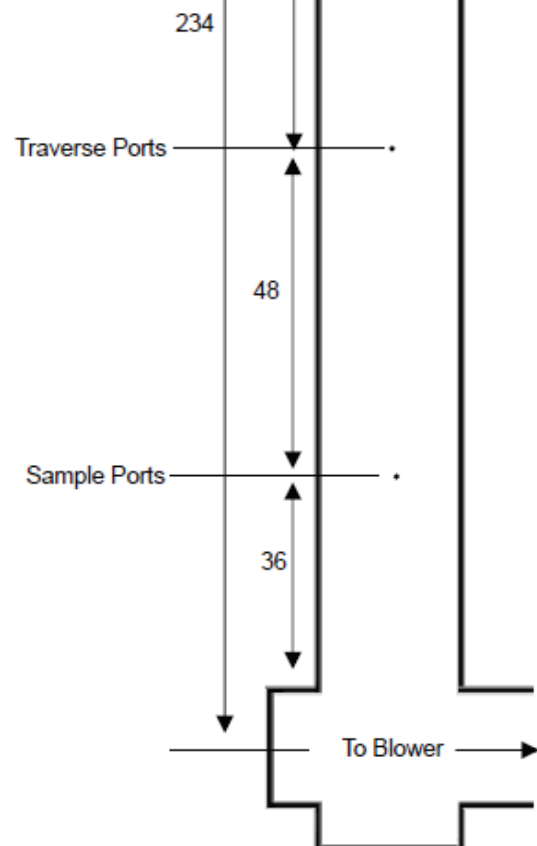
The dilution tunnel is constructed in accordance with the requirements of ASTM E2515-11, as shown below:





Booth #2 Tunnel Schematic

All dimensions are in inches



PM measurement sample ports are located 16.5 feet downstream from any disturbances and 3.5 feet upstream from any disturbances. Flow rate traverse data was collected 8 feet downstream from any disturbances and 4 feet upstream from any disturbances.

Flow is induced and maintained by a centrifugal-type blower.

Test facility temperature is monitored by a type T thermocouple probe, located in a 150mm long, 50mm diameter pipe shield located in the 90-degree arc in front of the test unit, between 1-2m away, and in the horizontal plane of the test unit air intake.

Test facility airflow was measured with an anemometer capable of measuring velocities less than 20 ft/min.

Reagents and Standards:

Verified – Yes:☒ No:☐ (if No Explain)

Pall Type A/E Glass fiber 47mm filters having at least 99.95% efficiency at 0.3-micron particles were used.

Test samples were conditioned in an airtight desiccator containing calcium sulfate desiccant, with specific humidity of less than 0.005 g/liter prior to and after the testing.

Acetone was used to clean probe assemblies both prior to pretest desiccation and prior to post-test desiccation.

Calibration and Standardization:

Verified – Yes:☒ No:☐ (if No Explain)

The gas metering system is calibrated every six months traceable to NIST and demonstrating an uncertainty of +/- 0.75% of the measured volume.

All thermocouples discussed in this report are calibrated traceable to NIST every six months.

The analytical balance has a resolution of 0.1mg and is calibrated traceable to NIST every six months. Before each test and before each weighing of samples, the balance is audited with a calibrated 200mg weight.

All other measurement equipment used for this test is calibrated traceable to NIST at an appropriate interval. See Appendix C for all calibration records.

Procedures:

Verified – Yes:☒ No:☐ (if No Explain)

The following procedures were performed and/or observed prior to testing:

- The dilution tunnel was cleaned with an appropriately sized steel brush.
- Induced draft was evaluated by measuring flue static pressure with the dilution tunnel blower operating and no fire in the appliance. No induced static pressure was observed (all readings <0.005 " H₂O) in any appliance door/air damper configuration.
- Smoke capture was evaluated by operating the appliance at a high burn rate and visually monitoring smoke collection by the hood. No less than 100% smoke collection was observed at the minimum tunnel flow rate.

Prior to ignition for each run, a velocity traverse was conducted to determine dilution tunnel velocity. Traverse points were determined in accordance with Figures 5 and 6 of ASTM E2515-11, and velocity calculated in accordance with section 9.3.2, excluding center readings. The pitot tube was placed in the center of the tunnel for the duration of each test run.

Prior to tare analysis, probes were cleaned with acetone, O-rings cleaned of any residue, and filters were visually check for pinhole leaks or irregularities. Filters, O-rings, and probes were desiccated at $20 \pm 5^\circ\text{C}$ for at least 24 hours and weighed at intervals of not less than 6 hours until constant weight was attained. Filters and O-rings were both weighed in pairs.

Tared samples were assembled into three dual filter holder assemblies (A, B, and first hour) and the single ambient filter assembly. Blunt tweezers and surgical gloves were used to avoid damage or contamination of the samples. The three dual filter assemblies were inserted to the appropriate depth in the tunnel (within the 2" diameter centroid, no closer than 1" apart).

Leak checks were performed on sampling systems as follows:

- Leak checks were performed on the pitot tube lines before and after each test run by applying a pressure differential of at least 3" H₂O and sealing the pitot tube opening. Pressure remained stable for at least 15 seconds all checks of both the pressure and suction sides, confirming that no leaks were present.
- All four sampling trains were leak-checked before and after each test run. Pre-test leak checks were conducted at the vacuum level corresponding to each sample pump's flow setting, in accordance with Note 5 of ASTM E2515-11. Post-test checks were conducted at the highest vacuum level encountered during the test, or the pre-test vacuum level, whichever was greater. Of the leak rate limits (0.01 cfm or 4% of sample rate), 4% of the sample rate is lower, and at no point was the measured leakage rate greater than this.

- The portion of the sampling trains from the pumps to the dry gas meters (that is, the positive pressure section of the metering system) was leak checked semiannually during calibration. This check was performed by closing the main inlet valve and pressurizing the outlet of the dry gas meter to at least 7" H₂O, and ensuring the pressure remained stable for at least 1 minute.

Sampling began at the start of each test run as defined by the applicable procedure and continued until the defined end of the test run. Readings were collected at 1-minute intervals. During all test runs, the following conditions were maintained:

- Test facility temperature was between 55 and 90 F.
- Air velocities were less than 50ft/min within 2ft of the appliance
- Filter holder temperatures were between 80-90F
- Sample flow rates were maintained within 10% of the initial proportionality ratio.

Following each test run and its associated leak checks, samples were recovered by disassembling the filter holder components and replacing them in the desiccator. The outside of the probes was cleaned with acetone prior to desiccation.

Sample weights were determined using the same analytical balance and procedures used for tare weights. Filters, O-rings, and probes were desiccated at 20+/-5C for at least 24 hours and weighed at intervals of not less than 6 hours until constant weight was attained. Filters and O-rings were both weighed in pairs. Components were not exposed to laboratory atmosphere for more than 2 minutes per weighing.

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: 1769 Lawrence St. E, Russellville, AL 35654, 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 Example Calculations – Non-CBI pdf page 27

Appendix B – Labels and Manuals – Non-CBI pdf page 300

Appendix C –Equipment Calibration Records – Non-CBI pdf page 340

Appendix D – Design Drawings (CBI Report Only)

Appendix E – Manufacturer QAP (CBI Report Only)

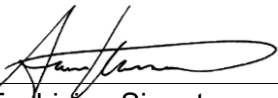
Appendix A: Test Run Data

WOOD STOVE TEST DATA PACKET
IDC / ASTM E2515



Run 1 Data Summary

Client:	IHP
Model:	Montecito-C
Job #:	25-416
Tracking #:	223
Test Date:	5/27/2025



Technician Signature

6/27/2025

Date

Run 1 Results Summary

Test Segments

	Clock	ET(min)
L1 Ignition	10:41 AM	0
L1 End	11:29 AM	16
L1 Duration		16
Fuel Consumed (lbs-wet)		4.52
Fuel Consumed (lbs-dry)		3.69

L2 Loaded	11:30 AM	17
L2 End	12:27 PM	71
L2 Duration		54
Fuel Consumed (lbs-wet)		9.29
Fuel Consumed (lbs-dry)		7.37

L3 Loaded	12:28 PM	72
L3 End	1:31 AM	131
L3 Duration		59
Fuel Consumed (lbs-wet)		7.18
Fuel Consumed (lbs-dry)		5.70

L4 Loaded	1:32 AM	132
L4 End	5:45 AM	408
L4 Duration		276
Fuel Consumed (lbs-wet)		18.29
Fuel Consumed (lbs-dry)		14.91

Total Fuel Burned (lbs-wet) 39.28

Total Fuel Burned (lbs-dry) 31.67 14.37 (kg-dry) 2.11 kg/hr dry

Firebox Avg Temps (F)

L1TS _{avg(i)}	66
L1TS _{avg(f)}	309
L2TS _{avg(i)}	313
L2TS _{avg(f)}	392
L3TS _{avg(i)}	390
L3TS _{avg(f)}	399
L4TS _{avg(i)}	396
L14TS _{avg(f)}	248

Burn Time Rating (hrs)

BTR	5
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Burn Rate (lbs-wet/hr) (dry kg/hr)

BR _{L2}	16.95	6.28
BR _{L2}	10.32	3.72
BR _{L3}	7.30	2.63
BR _{L4}	3.98	1.80
OVERALL	5.78	2.11

1st hr Loaded	10:41 AM	0
1st hr End	11:41 AM	60
L4 Duration		60
Fuel Consumed (lbs-wet)		12.66
Fuel Consumed (lbs-dry)		10.31

PM Results

Burn Phase:	L1	L2	L3	L4	1st Hr	Total
E _T :	1.4	0.7	0.7	2.4	2.0	5.2
E _{g/hr} :	5.2	0.8	0.7	0.52	2.01	0.77
E _{g/kg} :	0.84	0.20	0.28	0.35	0.43	0.36
E _{g/MJ output} :	0.07	0.02	0.02	0.03		0.03
E _{lb/mmbtu output} :	0.16	0.04	0.06	0.08	-	0.08
CO (g):	26.9	56.2	40.4	170.4		293.9
CO (g/min):	1.68	1.04	0.68	0.62		0.72
Output (BTU/hr)	74,385	38,184	28,303	14,463		21,847
Efficiency (%)	61.1%	55.7%	59.1%	59.4%		58.7%

Rolling Average Max Values

	1-min Avg.	5-min Avg.	60-min Avg.
PM (g/hr)	36.1	13.2	2.1

Quality Checks

Requirement

Observer Pass/Fail

Filter/Dewpt. Temp	Dewpoint must never exceed filter temp	Max Δ -31.4	PASS
Filter Temp	Must be between 80 and 90F at all times	80.9 / 87.2	PASS
Ambient Temp	Must be between 65 and 90F at all times	66.8 / 77.2	PASS
Minimum Tunnel Flow	>600 CFM	766.3	PASS
Weight Loss	Must be >0.1 lb per 20 min	Min -0.25 lb.	PASS

Test Input Data

Client: IHP
 Model: Montecito-C
 Run #: 1

Job #: 25-416
 Tracking #: 223
 Technician: AK
 Date: 5/27/2025

Traverse Data

pt	dP (in WC)
1	0.064
2	0.080
3	0.072
4	0.078
5	0.069
6	0.056
7	0.060
8	0.074
9	0.072
10	0.072
11	0.072
12	0.064
Center	0.072

Tunnel Data

Tunnel dia. (in):	12
Pitot Cp	0.99
Vs,cent (ft/s):	17.75
Vs, trav (ft/s):	17.41
Fp	0.981

	Pre-Test	Post Test
Barometric Pressure (in. Hg)	29.99	29.74
Lab Relative Humidity (%)	40.6	30.2

Traverse Temp:	67
Static Pressure:	-0.226

Fuel Data

Fuel Properties

Species	Maple
HHV (Btu/lb)	8587
%C	50.84%
%H	6.02%
%O	41.74%

	Wet Weight	MC (%db)	Dry Weight (lbs)
Kindling	1.56		
Starter	4.73	21.29	3.90
L2	10.32	22.82	8.40
L3	7.80	23.41	6.32
L4 _s	6.32	22.45	5.16
L4 _b	11.98	22.80	9.76
Avg. Moisture (%db)		22.55	

L1 Efficiency Results

Manufacturer: IHP
Model: Montecito-C
Date: 05/27/25
Run: 1
Control #: 223
Test Duration: 16
Output Category: L1

Test Results in Accordance with CSA B415.1-10

	HHV Basis	LHV Basis
Overall Efficiency	61.1%	65.3%
Combustion Efficiency	99.1%	99.1%
Heat Transfer Efficiency	61.6%	65.9%

Output Rate (kJ/h)	78,415	74,385	(Btu/h)
Burn Rate (kg/h)	6.43	14.17	(lb/h)
Input (kJ/h)	128,443	121,842	(Btu/h)

Test Load Weight (dry kg)	1.71	3.78	dry lb
MC wet (%)	18.37		
MC dry (%)	22.50		
Particulate (g)	N/A		
CO (g)	27		
Test Duration (h)	0.27		

Emissions	Particulate	CO
g/MJ Output	N/A	1.29
g/kg Dry Fuel	N/A	15.70
g/h	N/A	100.98
g/min	N/A	1.68
lb/MM Btu Output	N/A	2.99

Air/Fuel Ratio (A/F)	10.94
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VERSION:

2.4

4/15/2010

L2 Efficiency Results

Manufacturer: IHP
Model: Montecito-C
Date: 5/27/2025
Run: 1
Control #: 223
Test Duration: 54
Output Category: L2

Test Results in Accordance with CSA B415.1-10

	HHV Basis	LHV Basis
Overall Efficiency	55.7%	59.6%
Combustion Efficiency	99.1%	99.1%
Heat Transfer Efficiency	56.2%	60.1%

Output Rate (kJ/h)	40,252	38,184	(Btu/h)
Burn Rate (kg/h)	3.62	7.97	(lb/h)
Input (kJ/h)	72,238	68,526	(Btu/h)

Test Load Weight (dry kg)	3.26	7.17	dry lb
MC wet (%)	20.64		
MC dry (%)	26.01		
Particulate (g)	N/A		
CO (g)	56		
Test Duration (h)	0.90		

Emissions	Particulate	CO
g/MJ Output	N/A	1.55
g/kg Dry Fuel	N/A	17.27
g/h	N/A	62.45
g/min	N/A	1.04
lb/MM Btu Output	N/A	3.61

Air/Fuel Ratio (A/F)	14.13
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VERSION:

2.4

4/15/2010

L3 Efficiency Results

Manufacturer: IHP
Model: Montecito-C
Date: 05/27/25
Run: 1
Control #: 223
Test Duration: 59
Output Category: L3

Test Results in Accordance with CSA B415.1-10

	HHV Basis	LHV Basis
Overall Efficiency	59.1%	63.2%
Combustion Efficiency	99.3%	99.3%
Heat Transfer Efficiency	59.5%	63.7%

Output Rate (kJ/h)	29,837	28,303	(Btu/h)
Burn Rate (kg/h)	2.53	5.57	(lb/h)
Input (kJ/h)	50,486	47,891	(Btu/h)

Test Load Weight (dry kg)	2.49	5.48	dry lb
MC wet (%)	20.61		
MC dry (%)	25.96		
Particulate (g)	N/A		
CO (g)	40		
Test Duration (h)	0.98		

Emissions	Particulate	CO
g/MJ Output	N/A	1.38
g/kg Dry Fuel	N/A	16.24
g/h	N/A	41.06
g/min	N/A	0.68
lb/MM Btu Output	N/A	3.20

Air/Fuel Ratio (A/F)	15.98
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VERSION:

2.4

4/15/2010

L4 Efficiency Results

Manufacturer: IHP
Model: Montecito-C
Date: 05/27/25
Run: 1
Control #: 223
Test Duration: 276
Output Category: L4

Test Results in Accordance with CSA B415.1-10

	HHV Basis	LHV Basis
Overall Efficiency	59.4%	63.5%
Combustion Efficiency	98.5%	98.5%
Heat Transfer Efficiency	60.3%	64.5%

Output Rate (kJ/h)	15,246	14,463	(Btu/h)
Burn Rate (kg/h)	1.29	2.83	(lb/h)
Input (kJ/h)	25,675	24,355	(Btu/h)

Test Load Weight (dry kg)	5.91	13.03	dry lb
MC wet (%)	18.50		
MC dry (%)	22.69		
Particulate (g)	N/A		
CO (g)	170		
Test Duration (h)	4.60		

Emissions	Particulate	CO
g/MJ Output	N/A	2.43
g/kg Dry Fuel	N/A	28.81
g/h	N/A	37.04
g/min	N/A	0.62
lb/MM Btu Output	N/A	5.65

Air/Fuel Ratio (A/F)	20.87
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VERSION:

2.4

4/15/2010

Run 1 TEOM Data

ET (min)	Ci - 1-min avg PM (ug/m ³)	Tunnel dP (in WC)	sqrtdP	Tunnel Temp (F)	Tunnel Temp - 10 minute Avg. (F)	Tunnel RH - 10 minute avg. (%)	Tunnel Velocity - Vsi (ft/s)	Tunnel Flow - Q _{sdi} (m ³ /min)	E _i (mg)	E _{g/hr, i} (g/hr)	PM 5-min Rolling Avg (g/hr)	PM 30-min Rolling Avg (g/hr)	PM (cumulative g)
0	-179	0.073	0.2702	68.5	-	-	17.589	23.381	-4.183	-0.25	-	-	0.00
1	3446	0.072	0.2683	72.5	-	-	17.535	23.133	79.724	4.78	-	-	0.08
2	25089	0.071	0.2665	79.9	-	-	17.533	22.813	572.375	34.34	-	-	0.65
3	7323	0.070	0.2646	80	-	-	17.411	22.650	165.865	9.95	-	-	0.81
4	6583	0.072	0.2683	81.8	-	-	17.687	22.933	150.975	9.06	11.58	-	0.96
5	4285	0.072	0.2683	83.5	-	-	17.715	22.897	98.104	5.89	12.80	-	1.06
6	2199	0.071	0.2665	85.1	-	-	17.617	22.704	49.927	3.00	12.45	-	1.11
7	2910	0.073	0.2702	87.2	-	-	17.898	22.978	66.856	4.01	6.38	-	1.18
8	1893	0.072	0.2683	88.4	-	-	17.794	22.795	43.145	2.59	4.91	-	1.22
9	610	0.070	0.2646	90.1	81.7	144.45	17.573	22.441	13.698	0.82	3.26	-	1.24
10	981	0.070	0.2646	91	83.95	161.94	17.587	22.423	22.006	1.32	2.35	-	1.26
11	412	0.070	0.2646	92.1	85.91	179.94	17.605	22.400	9.240	0.55	1.86	-	1.27
12	692	0.070	0.2646	93.2	87.24	197.56	17.622	22.378	15.492	0.93	1.24	-	1.28
13	578	0.071	0.2665	95.1	88.75	213.87	17.778	22.499	12.998	0.78	0.88	-	1.30
14	1216	0.071	0.2665	96.6	90.23	228.6	17.802	22.468	27.313	1.64	1.04	-	1.32
15	1854	0.070	0.2646	96.5	91.53	242.36	17.675	22.311	41.371	2.48	1.28	-	1.36
16	1465	0.070	0.2646	97.4	92.76	255.51	17.689	22.293	32.665	1.96	1.56	-	1.40
17	7797	0.069	0.2627	105.5	94.59	267.16	17.689	21.974	171.327	10.28	3.43	-	1.57
18	6064	0.068	0.2608	102.5	96	278.07	17.514	21.873	132.634	7.96	4.86	-	1.70
19	1043	0.071	0.2665	103.7	97.36	288.5	17.915	22.326	23.293	1.40	4.82	-	1.72
20	392	0.071	0.2665	104	98.66	298.62	17.920	22.320	8.752	0.53	4.42	-	1.73
21	286	0.070	0.2646	105.1	99.96	308.98	17.811	22.141	6.326	0.38	4.11	-	1.74
22	530	0.070	0.2646	105.2	101.16	319.73	17.812	22.139	11.731	0.70	2.19	-	1.75
23	1175	0.069	0.2627	107.1	102.36	330.87	17.714	21.943	25.789	1.55	0.91	-	1.78
24	2016	0.070	0.2646	109.5	103.65	342.42	17.880	22.055	44.455	2.67	1.16	-	1.82
25	1030	0.070	0.2646	110	105	354	17.888	22.045	22.703	1.36	1.33	-	1.84
26	631	0.068	0.2608	111.5	106.41	365.52	17.654	21.700	13.699	0.82	1.42	-	1.86
27	363	0.069	0.2627	112.2	107.08	377.63	17.794	21.845	7.938	0.48	1.38	-	1.87
28	331	0.071	0.2665	112.7	108.1	389.69	18.058	22.150	7.329	0.44	1.15	-	1.87
29	414	0.069	0.2627	113.7	109.1	401.61	17.817	21.817	9.034	0.54	0.73	-	1.88
30	753	0.070	0.2646	113.6	110.06	411.61	17.944	21.976	16.547	0.99	0.65	-	1.90
31	471	0.071	0.2665	105.5	110.1	419.74	17.944	22.290	10.490	0.63	0.62	-	1.91
32	-246	0.071	0.2665	100.6	109.64	425.79	17.866	22.388	-5.511	-0.33	0.45	-	1.90
33	-225	0.072	0.2683	99.8	108.91	429.58	17.978	22.561	-5.074	-0.30	0.31	-	1.90
34	-281	0.070	0.2646	98.6	107.82	431.17	17.708	22.269	-6.259	-0.38	0.12	-	1.89
35	150	0.069	0.2627	97.6	106.58	430.83	17.565	22.130	3.314	0.20	-0.04	-	1.90
36	970	0.072	0.2683	96.7	105.1	428.85	17.929	22.624	21.938	1.32	0.10	-	1.92
37	1135	0.071	0.2665	95	103.38	425.43	17.776	22.501	25.549	1.53	0.47	-	1.94
38	1091	0.070	0.2646	93.7	101.48	420.71	17.630	22.368	24.410	1.46	0.83	-	1.97
39	619	0.070	0.2646	93.4	99.45	414.9	17.625	22.374	13.851	0.83	1.07	-	1.98
40	253	0.072	0.2683	92.5	97.34	409.66	17.861	22.710	5.740	0.34	1.10	-	1.99
41	131	0.072	0.2683	91.9	95.98	404.79	17.851	22.722	2.966	0.18	0.87	-	1.99
42	136	0.071	0.2665	91.1	95.03	400.47	17.714	22.580	3.067	0.18	0.60	-	1.99
43	-49	0.070	0.2646	91.5	94.2	396.76	17.595	22.412	-1.093	-0.07	0.29	-	1.99
44	110	0.071	0.2665	91	93.44	393.56	17.712	22.582	2.493	0.15	0.16	-	2.00
45	71	0.072	0.2683	90.6	92.74	390.9	17.830	22.749	1.621	0.10	0.11	-	2.00
46	-4	0.071	0.2665	90	92.07	388.77	17.696	22.603	-0.100	-0.01	0.07	-	2.00
47	40	0.071	0.2665	89.8	91.55	387.14	17.693	22.607	0.908	0.05	0.05	-	2.00
48	-12	0.072	0.2683	89.3	91.11	385.96	17.809	22.776	-0.273	-0.02	0.06	-	2.00
49	93	0.073	0.2702	88.7	90.64	385.08	17.922	22.946	2.129	0.13	0.05	-	2.00
50	65	0.070	0.2646	88.8	90.27	384.47	17.552	22.468	1.455	0.09	0.05	-	2.00
51	60	0.072	0.2683	88.1	89.89	384.03	17.790	22.801	1.359	0.08	0.07	-	2.00
52	54	0.071	0.2665	88.4	89.62	383.73	17.670	22.636	1.221	0.07	0.07	-	2.00
53	-33	0.072	0.2683	87.7	89.24	383.54	17.783	22.809	-0.744	-0.04	0.07	-	2.00
54	83	0.073	0.2702	87.4	88.88	383.47	17.901	22.973	1.898	0.11	0.06	-	2.00
55	86	0.070	0.2646	87.1	88.53	383.51	17.525	22.503	1.928	0.12	0.07	-	2.01
56	21	0.071	0.2665	87	88.23	383.56	17.648	22.665	0.478	0.03	0.06	-	2.01
57	58	0.072	0.2683	87.1	87.96	383.57	17.773	22.822	1.320	0.08	0.06	-	2.01
58	-16	0.072	0.2683	86.5	87.68	383.6	17.764	22.834	-0.358	-0.02	0.06	-	2.01
59	111	0.073	0.2702	86.7	87.48	383.7	17.890	22.988	2.563	0.15	0.07	2.08	2.01
60	69	0.072	0.2683	86.8	87.28	383.87	17.768	22.828	1.575	0.09	0.07	2.08	2.01
61	-68	0.071	0.2665	86.1	87.08	384.01	17.633	22.683	-1.536	-0.09	0.04	2.00	2.01
62	187	0.071	0.2665	85.9	86.83	384.13	17.630	22.688	4.238	0.25	0.08	1.41	2.01
63	21	0.071	0.2665	86.1	86.67	384.32	17.633	22.683	0.465	0.03	0.09	1.24	2.02
64	91	0.071	0.2665	86.1	86.54	384.66	17.633	22.683	2.062	0.12	0.08	1.09	2.02
65	116	0.072	0.2683	85.7	86.4	385.08	17.751	22.851	2.660	0.16	0.09	0.99	2.02
66		0.071	0.2665	86.7	86.37	385.62					0.14		0.94
67		0.072	0.2683	86.7	86.33	386.27					0.10		0.87
68		0.072	0.2683	86.9	86.37	386.91					0.14		0.84
69	412	0.073	0.2702	86.8	86.38	387.51	17.891	22.986	9.476	0.57	0.36	0.84	2.03
70	385	0.071	0.2665	86.2	86.32	388.07	17.635	22.681	8.742	0.52	0.55	0.83	2.04
71	1629	0.072	0.2683	86.6	86.37	388.73	17.765	22.832	37.182	2.23	1.11	0.83	2.08
72	2760	0.070	0.2646	94.8	87.26	389.27	17.648	22.346	61.664	3.70	1.76	0.82	2.14
73	2340	0.071	0.2665	96.6	88.31	390.74	17.802	22.468	52.571	3.15	2.04	0.85	2.19
74	2410	0.070	0.2646	98.2	89.52	393.57	17.702	22.277	53.690	3.22	2.57	0.89	2.24
75	1514	0.069	0.2627	98.9	90.84	397.57	17.586	22.104	33.476	2.01	2.86	0.90	2.28
76	1000	0.069	0.2627	95.9	91.76	401.89	17.538	22.163	22.160	1.33	2.68	0.92	2.30
77	925	0.071	0.2665	94	92.49	406.3	17.760	22.521	20.831	1.25	2.19	0.77	2.32
78	799	0.072	0.2683	93.5	93.15	410.81	17.877	22.689	18.128	1.09	1.78	0.65	2.34
79	933	0.072	0.2683	92.7	93.74	415.45	17.864	22.706	21.185	1.27	1.39	0.65	2.36
80	698	0.072	0.2683	92.6	94.38	420.15	17.862	22.708	15.859	0.95	1.18	0.66	2.37
81	537	0.071	0.2665	93.6	95.08	424.79	17.754	22.529	12.097	0.73	1.06	0.68	2.39
82	755	0.070	0.2646	92.8	94.88	429.44	17.616	22.386	16.891	1.01	1.01	0.68	2.40
83	509	0.071	0.2665	92.3	94.45	432.96	17.733	22.556	11.481	0.69	0.93	0.66	2.42
84	531	0.072	0.2683	92.1	93.84	434.84	17.854	22.718	12.073	0.72	0.82	0.63	2.43

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85	347	0.072	0.2683	92.1	93.16	435.39	17.854	22.718	7.873	0.47	0.72	0.62	2.44
86	310	0.073	0.2702	91.9	92.76	435.45	17.975	22.879	7.084	0.43	0.66	0.62	2.44
87	436	0.072	0.2683	92	92.56	435.29	17.853	22.720	9.899	0.59	0.58	0.62	2.45
88	544	0.070	0.2646	92.1	92.42	434.97	17.605	22.400	12.190	0.73	0.59	0.62	2.46
89	1163	0.072	0.2683	92.7	92.42	434.61	17.864	22.706	26.406	1.58	0.76	0.62	2.49
90	781	0.074	0.2720	92.4	92.4	434.28	18.106	23.025	17.975	1.08	0.88	0.62	2.51
91	369	0.072	0.2683	92.5	92.29	434.04	17.861	22.710	8.389	0.50	0.90	0.63	2.52
92	354	0.071	0.2665	91.6	92.17	433.9	17.722	22.570	8.000	0.48	0.88	0.66	2.53
93	208	0.072	0.2683	92.8	92.22	433.88	17.866	22.704	4.727	0.28	0.79	0.67	2.53
94	326	0.072	0.2683	92.4	92.25	433.94	17.859	22.712	7.393	0.44	0.56	0.69	2.54
95	301	0.071	0.2665	92	92.24	433.98	17.728	22.562	6.787	0.41	0.42	0.69	2.54
96	223	0.072	0.2683	92	92.25	433.91	17.853	22.720	5.066	0.30	0.38	0.68	2.55
97	369	0.070	0.2646	91.5	92.2	433.71	17.595	22.412	8.270	0.50	0.39	0.66	2.56
98	200	0.072	0.2683	90.8	92.07	433.33	17.833	22.745	4.551	0.27	0.38	0.63	2.56
99	381	0.071	0.2665	90.6	91.86	432.63	17.706	22.590	8.606	0.52	0.40	0.63	2.57
100	265	0.070	0.2646	90.9	91.71	431.61	17.585	22.425	5.945	0.36	0.39	0.63	2.58
101	239	0.073	0.2702	90.7	91.53	430.31	17.955	22.904	5.481	0.33	0.39	0.63	2.58
102	398	0.072	0.2683	90.6	91.43	428.82	17.830	22.749	9.047	0.54	0.40	0.64	2.59
103	157	0.071	0.2665	90.2	91.17	427.2	17.699	22.599	3.544	0.21	0.39	0.64	2.59
104	327	0.071	0.2665	90.4	90.97	425.5	17.703	22.595	7.383	0.44	0.38	0.65	2.60
105	179	0.071	0.2665	90.8	90.85	423.69	17.709	22.586	4.041	0.24	0.35	0.65	2.61
106	359	0.071	0.2665	89.9	90.64	421.89	17.695	22.605	8.116	0.49	0.39	0.66	2.61
107	350	0.072	0.2683	89.6	90.45	420.16	17.814	22.770	7.965	0.48	0.37	0.66	2.62
108	189	0.072	0.2683	88.7	90.24	418.46	17.799	22.788	4.310	0.26	0.38	0.67	2.63
109	377	0.070	0.2646	89.2	90.1	416.84	17.558	22.459	8.462	0.51	0.39	0.68	2.63
110	286	0.071	0.2665	88.5	89.86	415.3	17.672	22.634	6.469	0.39	0.42	0.68	2.64
111	157	0.071	0.2665	88.8	89.67	413.86	17.677	22.628	3.552	0.21	0.37	0.69	2.64
112	281	0.071	0.2665	88.3	89.44	412.52	17.669	22.638	6.372	0.38	0.35	0.70	2.65
113	145	0.070	0.2646	88.3	89.25	411.22	17.544	22.478	3.249	0.19	0.34	0.70	2.65
114	307	0.072	0.2683	88	89.01	409.97	17.788	22.803	7.000	0.42	0.32	0.71	2.66
115	250	0.072	0.2683	89.1	88.84	408.87	17.806	22.780	5.702	0.34	0.31	0.71	2.67
116	454	0.071	0.2665	89.1	88.76	407.86	17.682	22.621	10.271	0.62	0.39	0.71	2.68
117	313	0.073	0.2702	88.5	88.65	406.91	17.919	22.950	7.193	0.43	0.40	0.72	2.68
118	83	0.071	0.2665	87.7	88.55	406.08	17.659	22.650	1.873	0.11	0.38	0.73	2.69
119	250	0.071	0.2665	87.8	88.41	405.37	17.661	22.648	5.669	0.34	0.37	0.74	2.69
120	210	0.070	0.2646	88	88.36	404.7	17.539	22.484	4.723	0.28	0.36	0.74	2.70
121	292	0.072	0.2683	87.5	88.23	404.03	17.780	22.813	6.666	0.40	0.31	0.74	2.70
122	301	0.071	0.2665	87.4	88.14	403.42	17.654	22.656	6.816	0.41	0.31	0.74	2.71
123	253	0.071	0.2665	87.1	88.02	402.88	17.649	22.663	5.738	0.34	0.36	0.75	2.72
124		0.073	0.2702	87.3	87.95	402.42					0.36	0.76	
125		0.072	0.2683	87.8	87.82	401.94					0.38	0.76	
126		0.071	0.2665	87.8	87.69	401.49					0.38	0.76	
127		0.069	0.2627	87.4	87.58	401.08					0.34	0.76	
128	340	0.071	0.2665	87.3	87.54	400.69	17.653	22.659	7.705	0.46	0.46	0.76	2.72
129	303	0.072	0.2683	87.2	87.48	400.29	17.775	22.820	6.924	0.42	0.44	0.76	2.73
130	476	0.072	0.2683	87.6	87.44	399.93	17.781	22.811	10.848	0.65	0.51	0.76	2.74
131	2774	0.071	0.2665	87.9	87.48	399.69	17.662	22.646	62.824	3.77	1.32	0.73	2.80
132	26981	0.070	0.2646	97.8	88.52	399.19	17.695	22.285	601.276	36.08	8.27	0.67	3.41
133	15116	0.068	0.2608	101.1	89.92	398.28	17.492	21.900	331.032	19.86	12.15	0.68	3.74
134	2812	0.068	0.2608	96.9	90.88	397.58	17.427	21.982	61.820	3.71	12.81	1.29	3.80
135	2013	0.070	0.2646	97.7	91.87	397.64	17.694	22.287	44.868	2.69	13.22	1.62	3.84
136	1297	0.071	0.2665	100.2	93.11	398.74	17.860	22.396	29.037	1.74	12.82	1.67	3.87
137	421	0.070	0.2646	96.8	94.05	400.58	17.679	22.305	9.387	0.56	5.71	1.69	3.88
138	1975	0.071	0.2665	94.3	94.75	402.84	17.765	22.515	44.468	2.67	2.27	1.71	3.93
139	1079	0.072	0.2683	92.8	95.31	405.29	17.866	22.704	24.499	1.47	1.83	1.69	3.95
140	520	0.072	0.2683	92.8	95.83	407.98	17.866	22.704	11.816	0.71	1.43	1.72	3.96
141	370	0.070	0.2646	93.3	96.37	410.88	17.624	22.376	8.271	0.50	1.18	1.74	3.97
142	429	0.070	0.2646	93.6	95.95	414.31	17.629	22.370	9.596	0.58	1.18	1.73	3.98
143	141	0.071	0.2665	93.4	95.18	418.47	17.751	22.533	3.182	0.19	0.69	1.73	3.98
144	10	0.069	0.2627	93.7	94.86	422.63	17.504	22.207	0.215	0.01	0.40	1.73	3.98
145	259	0.069	0.2627	94	94.49	426.18	17.508	22.201	5.759	0.35	0.32	1.72	3.99
146	213	0.070	0.2646	94	93.87	428.73	17.635	22.362	4.764	0.29	0.28	1.71	3.99
147	365	0.069	0.2627	94.1	93.6	430.53	17.510	22.199	8.107	0.49	0.26	1.71	4.00
148	394	0.070	0.2646	94.1	93.58	431.88	17.636	22.360	8.813	0.53	0.33	1.70	4.01
149	155	0.069	0.2627	93.5	93.65	432.99	17.501	22.212	3.441	0.21	0.37	1.68	4.01
150	320	0.070	0.2646	93.7	93.74	433.81	17.630	22.368	7.159	0.43	0.39	1.67	4.02
151	122	0.071	0.2665	93.7	93.78	434.36	17.756	22.527	2.745	0.16	0.36	1.66	4.02
152	351	0.069	0.2627	94.7	93.89	434.58	17.520	22.187	7.779	0.47	0.36	1.66	4.03
153	159	0.070	0.2646	94.3	93.98	434.49	17.640	22.356	3.550	0.21	0.30	1.66	4.04
154	234	0.070	0.2646	93.5	93.96	434.17	17.627	22.372	5.236	0.31	0.32	1.66	4.04
155	409	0.070	0.2646	94.1	93.97	433.71	17.636	22.360	9.145	0.55	0.34	1.66	4.05
156	263	0.071	0.2665	94.7	94.04	433.25	17.772	22.507	5.913	0.35	0.38	1.66	4.06
157	58	0.070	0.2646	94.7	94.1	432.78	17.646	22.348	1.306	0.08	0.30	1.66	4.06
158	145	0.070	0.2646	93.9	94.08	432.32	17.633	22.364	3.246	0.19	0.30	1.66	4.06
159	171	0.071	0.2665	94.5	94.18	431.79	17.768	22.511	3.846	0.23	0.28	1.65	4.06
160	267	0.071	0.2665	94.1	94.22	431.12	17.762	22.519	6.015	0.36	0.24	1.65	4.07
161	119	0.069	0.2627	93.5	94.2	430.23	17.501	22.212	2.646	0.16	0.20	1.65	4.07
162	308	0.070	0.2646	93.7	94.1	429.19	17.630	22.368	6.883	0.41	0.27	1.64	4.08
163	237	0.070	0.2646	94.3	94.1	427.94	17.640	22.356	5.294	0.32	0.30	1.64	4.09
164	384	0.071	0.2665	93.5	94.1	426.51	17.752	22.531	8.660	0.52	0.35	1.64	4.09
165	55	0.070	0.2646	94.1	94.1	424.93	17.636	22.360	1.229	0.07	0.30	1.64	4.10
166	266	0.070	0.2646	93.4	93.97	423.15	17.625	22.374	5.950	0.36	0.34	1.64	4.10
167	326	0.070	0.2646	93.5	93.85	421.2	17.627	22.372	7.288	0.44	0.34	1.64	4.11
168	121	0.070	0.2646	93.1	93.77	419.15	17.621	22.380	2.717	0.16	0.31	1.64	4.11
169	224	0.070	0.2646	92.8	93.6	417.07	17.616	22.386	5.009	0.30	0.27	1.64	4.12
170	73	0.071	0.2665	93.1	93.5	415.06	17.746	22.539	1.655	0.10	0.27	1.63	4.12
171	278	0.072	0.2683	92.8	93.43	413.13	17.866	22.704	6.310	0.38	0.28	1.64	4.12
172	265	0.073	0.2702	92.3	93.29	411.35	17.981	22.871	6.062	0.36	0.26	1.63	4.13

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173	246	0.070	0.2646	92.8	93.14	409.68	17.616	22.386	5.499	0.33	0.29	1.63	4.14
174	364	0.070	0.2646	92.8	93.07	408.09	17.616	22.386	8.153	0.49	0.33	1.63	4.14
175	237	0.070	0.2646	92.6	92.92	406.6	17.613	22.390	5.297	0.32	0.38	1.63	4.15
176	253	0.072	0.2683	92.6	92.84	405.25	17.862	22.708	5.756	0.35	0.37	1.63	4.16
177	291	0.071	0.2665	92.3	92.72	403.99	17.733	22.556	6.562	0.39	0.38	1.63	4.16
178	349	0.072	0.2683	92.1	92.62	402.79	17.854	22.718	7.921	0.48	0.40	1.63	4.17
179	412	0.072	0.2683	91.4	92.48	401.68	17.843	22.732	9.365	0.56	0.42	1.63	4.18
180	242	0.071	0.2665	92	92.37	400.62	17.728	22.562	5.464	0.33	0.42	1.64	4.18
181	343	0.070	0.2646	92.5	92.34	399.65	17.611	22.392	7.681	0.46	0.44	1.64	4.19
182	236	0.071	0.2665	92.1	92.32	398.73	17.730	22.560	5.328	0.32	0.43	1.64	4.20
183	265	0.072	0.2683	91.9	92.23	397.87	17.851	22.722	6.029	0.36	0.41	1.64	4.20
184	295	0.070	0.2646	92.1	92.16	397.09	17.605	22.400	6.610	0.40	0.37	1.62	4.21
185	275	0.072	0.2683	92.1	92.11	396.39	17.854	22.718	6.252	0.38	0.38	1.59	4.22
186	171	0.069	0.2627	91.9	92.04	395.77	17.475	22.244	3.806	0.23	0.34	1.57	4.22
187	305	0.071	0.2665	92.6	92.07	395.3	17.738	22.549	6.872	0.41	0.35	1.55	4.23
188	281	0.070	0.2646	91.9	92.05	394.94	17.601	22.404	6.298	0.38	0.36	1.55	4.23
189	425	0.071	0.2665	91.6	92.07	394.69	17.722	22.570	9.590	0.58	0.39	1.55	4.24
190	190	0.069	0.2627	92	92.07	394.54	17.477	22.242	4.223	0.25	0.37	1.54	4.25
191	191	0.071	0.2665	91.6	91.98	394.47	17.722	22.570	4.309	0.26	0.38	1.49	4.25
192	415	0.071	0.2665	92	91.97	394.45	17.728	22.562	9.359	0.56	0.41	0.87	4.26
193	348	0.071	0.2665	91.6	91.94	394.48	17.722	22.570	7.849	0.47	0.42	0.53	4.27
194	344	0.071	0.2665	91.8	91.91	394.56	17.725	22.566	7.753	0.47	0.40	0.48	4.28
195	338	0.072	0.2683	91.8	91.88	394.69	17.849	22.724	7.677	0.46	0.44	0.44	4.28
196	347	0.071	0.2665	91.9	91.88	394.86	17.727	22.564	7.828	0.47	0.49	0.42	4.29
197	449	0.070	0.2646	92.3	91.85	395.03	17.608	22.396	10.058	0.60	0.49	0.42	4.30
198	427	0.071	0.2665	92.2	91.88	395.21	17.732	22.558	9.623	0.58	0.52	0.38	4.31
199	428	0.073	0.2702	92.9	92.01	395.43	17.991	22.859	9.779	0.59	0.54	0.36	4.32
200	352	0.071	0.2665	92.7	92.08	395.67	17.740	22.547	7.940	0.48	0.54	0.36	4.33
201	469	0.070	0.2646	92.7	92.19	396	17.614	22.388	10.491	0.63	0.57	0.36	4.34
202	446	0.071	0.2665	92.1	92.2	396.4	17.730	22.560	10.051	0.60	0.57	0.36	4.35
203	309	0.070	0.2646	92.3	92.27	396.89	17.608	22.396	6.923	0.42	0.54	0.37	4.36
204	686	0.071	0.2665	92.2	92.31	397.44	17.732	22.558	15.481	0.93	0.61	0.38	4.37
205	436	0.071	0.2665	92.3	92.36	397.99	17.733	22.556	9.827	0.59	0.63	0.38	4.38
206	671	0.070	0.2646	92.8	92.45	398.56	17.616	22.386	15.031	0.90	0.69	0.39	4.40
207	825	0.070	0.2646	92.5	92.47	399.09	17.611	22.392	18.478	1.11	0.79	0.39	4.42
208	540	0.071	0.2665	93.1	92.56	399.6	17.746	22.539	12.179	0.73	0.85	0.40	4.43
209	656	0.069	0.2627	93.2	92.59	400.07	17.496	22.218	14.564	0.87	0.84	0.41	4.44
210	679	0.072	0.2683	93	92.62	400.56	17.869	22.700	15.423	0.93	0.91	0.42	4.46
211	903	0.071	0.2665	92.8	92.63	401.01	17.741	22.545	20.354	1.22	0.97	0.43	4.48
212	804	0.070	0.2646	92.8	92.7	401.46	17.616	22.386	18.004	1.08	0.97	0.44	4.50
213	919	0.070	0.2646	93.5	92.82	401.88	17.627	22.372	20.552	1.23	1.07	0.46	4.52
214	554	0.070	0.2646	93.4	92.94	402.3	17.625	22.374	12.404	0.74	1.04	0.47	4.53
215	529	0.071	0.2665	93.2	93.03	402.75	17.748	22.537	11.924	0.72	1.00	0.48	4.54
216	498	0.071	0.2665	93.1	93.06	403.19	17.746	22.539	11.217	0.67	0.89	0.49	4.55
217	467	0.070	0.2646	93.6	93.17	403.68	17.629	22.370	10.440	0.63	0.80	0.50	4.56
218	396	0.071	0.2665	93.4	93.2	404.25	17.751	22.533	8.926	0.54	0.66	0.51	4.57
219	582	0.071	0.2665	92.8	93.16	404.8	17.741	22.545	13.120	0.79	0.67	0.52	4.58
220	506	0.069	0.2627	93.9	93.25	405.32	17.507	22.203	11.245	0.67	0.66	0.52	4.60
221	574	0.070	0.2646	93.6	93.33	405.84	17.629	22.370	12.849	0.77	0.68	0.53	4.61
222	346	0.069	0.2627	93.5	93.4	406.4	17.501	22.212	7.676	0.46	0.65	0.53	4.62
223	365	0.071	0.2665	93.6	93.41	406.97	17.754	22.529	8.221	0.49	0.64	0.54	4.62
224	278	0.072	0.2683	93.6	93.43	407.53	17.879	22.687	6.301	0.38	0.56	0.54	4.63
225	239	0.070	0.2646	94.2	93.53	408.01	17.638	22.358	5.349	0.32	0.48	0.55	4.64
226	236	0.070	0.2646	93.5	93.57	408.4	17.627	22.372	5.279	0.32	0.39	0.55	4.64
227	183	0.071	0.2665	93.4	93.55	408.64	17.751	22.533	4.113	0.25	0.35	0.55	4.65
228	199	0.070	0.2646	92.7	93.48	408.72	17.614	22.388	4.446	0.27	0.31	0.55	4.65
229	184	0.069	0.2627	93.1	93.51	408.66	17.494	22.220	4.099	0.25	0.28	0.55	4.65
230	418	0.072	0.2683	92.8	93.4	408.47	17.866	22.704	9.483	0.57	0.33	0.55	4.66
231	218	0.071	0.2665	92.3	93.27	408.13	17.733	22.556	4.914	0.29	0.32	0.55	4.67
232	144	0.070	0.2646	92.4	93.16	407.61	17.609	22.394	3.234	0.19	0.31	0.55	4.67
233	305	0.070	0.2646	92.8	93.08	406.98	17.616	22.386	6.836	0.41	0.34	0.55	4.68
234	220	0.071	0.2665	92.4	92.96	406.28	17.735	22.554	4.963	0.30	0.35	0.55	4.68
235	379	0.070	0.2646	92.6	92.8	405.52	17.613	22.390	8.494	0.51	0.34	0.55	4.69
236	419	0.071	0.2665	92.2	92.67	404.71	17.732	22.558	9.451	0.57	0.40	0.55	4.70
237	484	0.071	0.2665	92.6	92.59	403.93	17.738	22.549	10.920	0.66	0.49	0.55	4.71
238	525	0.071	0.2665	92.2	92.54	403.15	17.732	22.558	11.833	0.71	0.55	0.55	4.72
239	230	0.071	0.2665	92.1	92.44	402.39	17.730	22.560	5.184	0.31	0.55	0.55	4.73
240	460	0.072	0.2683	92.2	92.38	401.65	17.856	22.716	10.454	0.63	0.57	0.56	4.74
241	444	0.070	0.2646	91.8	92.33	400.89	17.600	22.406	9.945	0.60	0.58	0.56	4.75
242	403	0.071	0.2665	91.8	92.27	400.05	17.725	22.566	9.094	0.55	0.56	0.56	4.76
243	288	0.071	0.2665	91.6	92.15	399.11	17.722	22.570	6.496	0.39	0.49	0.57	4.77
244	214	0.071	0.2665	91.4	92.05	398.06	17.719	22.574	4.825	0.29	0.49	0.57	4.77
245	282	0.073	0.2702	90.7	91.86	396.98	17.955	22.904	6.470	0.39	0.44	0.57	4.78
246	168	0.070	0.2646	90.3	91.67	395.83	17.576	22.437	3.769	0.23	0.37	0.57	4.78
247	62	0.072	0.2683	90.7	91.48	394.57	17.832	22.747	1.415	0.08	0.28	0.57	4.78
248	231	0.070	0.2646	90.5	91.31	393.23	17.579	22.433	5.185	0.31	0.26	0.57	4.79
249	310	0.072	0.2683	90.4	91.14	391.87	17.827	22.753	7.054	0.42	0.29	0.56	4.79
250	334	0.071	0.2665	90	90.92	390.5	17.696	22.603	7.555	0.45	0.30	0.56	4.80
251	300	0.071	0.2665	90.4	90.78	389.11	17.703	22.595	6.789	0.41	0.34	0.56	4.81
252	399	0.070	0.2646	90.2	90.62	387.73	17.574	22.439	8.946	0.54	0.43	0.56	4.82
253	225	0.072	0.2683	90.3	90.49	386.34	17.825	22.755	5.112	0.31	0.43	0.56	4.82
254	407	0.073	0.2702	90.1	90.36	384.97	17.945	22.917	9.321	0.56	0.45	0.56	4.83
255	269	0.070	0.2646	90.3	90.32	383.6	17.576	22.437	6.032	0.36	0.43	0.56	4.84
256	466	0.070	0.2646	90	90.29	382.24	17.571	22.443	10.461	0.63	0.48	0.56	4.85
257	300	0.071	0.2665	90.2	90.24	380.98	17.699	22.599	6.773	0.41	0.45	0.55	4.86
258	400	0.071	0.2665	89.8	90.17	379.77	17.693	22.607	9.045	0.54	0.50	0.56	4.86
259	540	0.070	0.2646	89.5	90.08	378.59	17.563	22.453	12.116	0.73	0.53	0.55	4.88
260	639	0.072	0.2683	89.7	90.05	377.36	17.815	22.768	14.551	0.87	0.64	0.55	4.89

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261	441	0.071	0.2665	89.7	89.98	376.15	17.691	22.609	9.964	0.60	0.63	0.56	4.90
262	473	0.069	0.2627	89.6	89.92	374.98	17.439	22.290	10.550	0.63	0.67	0.56	4.91
263	334	0.071	0.2665	89.6	89.85	373.86	17.690	22.611	7.545	0.45	0.66	0.56	4.92
264	374	0.069	0.2627	89.5	89.79	372.71	17.437	22.292	8.348	0.50	0.61	0.56	4.93
265	508	0.071	0.2665	89.5	89.71	371.58	17.688	22.613	11.491	0.69	0.57	0.56	4.94
266	175	0.072	0.2683	89.7	89.68	370.48	17.815	22.768	3.980	0.24	0.50	0.55	4.94
267	243	0.071	0.2665	89.1	89.57	369.35	17.682	22.621	5.487	0.33	0.44	0.54	4.95
268	410	0.071	0.2665	89.3	89.52	368.21	17.685	22.617	9.280	0.56	0.46	0.53	4.96
269	213	0.072	0.2683	89	89.47	367.09	17.804	22.782	4.846	0.29	0.42	0.52	4.96
270	347	0.070	0.2646	89.3	89.43	366.02	17.560	22.457	7.785	0.47	0.38	0.52	4.97
271	205	0.070	0.2646	89.1	89.37	364.99	17.557	22.461	4.601	0.28	0.38	0.50	4.97
272	238	0.071	0.2665	89.4	89.35	364.02	17.687	22.615	5.384	0.32	0.38	0.49	4.98
273	113	0.071	0.2665	88.9	89.28	363.08	17.678	22.625	2.558	0.15	0.30	0.47	4.98
274	214	0.073	0.2702	88.6	89.19	362.2	17.921	22.948	4.913	0.29	0.30	0.47	4.99
275	245	0.070	0.2646	89.3	89.17	361.33	17.560	22.457	5.512	0.33	0.28	0.46	4.99
276	162	0.072	0.2683	89.1	89.11	360.53	17.806	22.780	3.692	0.22	0.26	0.45	5.00
277	410	0.070	0.2646	88.7	89.07	359.79	17.550	22.470	9.223	0.55	0.31	0.45	5.01
278	214	0.071	0.2665	88.6	89	359.12	17.674	22.632	4.840	0.29	0.34	0.44	5.01
279	67	0.071	0.2665	88.5	88.95	358.43	17.672	22.634	1.516	0.09	0.30	0.44	5.01
280	144	0.070	0.2646	88.4	88.86	357.75	17.546	22.476	3.230	0.19	0.27	0.43	5.02
281	171	0.071	0.2665	88	88.75	357.04	17.664	22.644	3.865	0.23	0.27	0.42	5.02
282	87	0.071	0.2665	88.4	88.65	356.27	17.670	22.636	1.980	0.12	0.19	0.41	5.02
283	168	0.070	0.2646	88.4	88.6	355.47	17.546	22.476	3.776	0.23	0.17	0.41	5.03
284	129	0.070	0.2646	88.2	88.56	354.62	17.542	22.480	2.902	0.17	0.19	0.40	5.03
285	157	0.070	0.2646	88.5	88.48	353.72	17.547	22.474	3.532	0.21	0.19	0.40	5.03
286	296	0.072	0.2683	88.4	88.41	352.74	17.794	22.795	6.738	0.40	0.23	0.40	5.04
287	190	0.071	0.2665	88	88.34	351.75	17.664	22.644	4.296	0.26	0.25	0.40	5.04
288	163	0.071	0.2665	88	88.28	350.68	17.664	22.644	3.688	0.22	0.25	0.40	5.05
289	184	0.069	0.2627	87.7	88.2	349.6	17.409	22.329	4.099	0.25	0.27	0.40	5.05
290	327	0.069	0.2627	87.7	88.13	348.5	17.409	22.329	7.301	0.44	0.31	0.40	5.06
291	126	0.071	0.2665	87.7	88.1	347.4	17.659	22.650	2.860	0.17	0.27	0.40	5.06
292	159	0.070	0.2646	87.8	88.04	346.3	17.536	22.488	3.573	0.21	0.26	0.40	5.06
293	172	0.072	0.2683	87.6	87.96	345.21	17.781	22.811	3.927	0.24	0.26	0.40	5.07
294	216	0.070	0.2646	87.5	87.89	344.16	17.531	22.494	4.867	0.29	0.27	0.39	5.07
295	142	0.071	0.2665	87.6	87.8	343.17	17.658	22.652	3.211	0.19	0.22	0.39	5.08
296	90	0.072	0.2683	87.5	87.71	342.24	17.780	22.813	2.045	0.12	0.21	0.38	5.08
297	111	0.070	0.2646	87.4	87.65	341.33	17.530	22.496	2.490	0.15	0.20	0.38	5.08
298	159	0.070	0.2646	87.3	87.58	340.43	17.528	22.498	3.567	0.21	0.19	0.37	5.08
299	155	0.070	0.2646	87.5	87.56	339.57	17.531	22.494	3.484	0.21	0.18	0.36	5.09
300	125	0.071	0.2665	87.5	87.54	338.77	17.656	22.654	2.841	0.17	0.17	0.36	5.09
301	112	0.070	0.2646	87.2	87.49	338.02	17.526	22.500	2.531	0.15	0.18	0.35	5.09
302	280	0.072	0.2683	87.2	87.43	337.28	17.775	22.820	6.379	0.38	0.23	0.34	5.10
303	94	0.072	0.2683	87	87.37	336.57	17.772	22.824	2.149	0.13	0.21	0.34	5.10
304	199	0.070	0.2646	87.1	87.33	335.88	17.525	22.503	4.479	0.27	0.22	0.34	5.11
305	454	0.071	0.2665	87	87.27	335.18	17.648	22.665	10.299	0.62	0.31	0.34	5.12
306	182	0.070	0.2646	87.2	87.24	334.47	17.526	22.500	4.092	0.25	0.33	0.34	5.12
307	111	0.072	0.2683	87.4	87.24	333.72	17.778	22.815	2.527	0.15	0.28	0.35	5.12
308	98	0.071	0.2665	87.1	87.22	332.99	17.649	22.663	2.220	0.13	0.28	0.34	5.13
309	78	0.072	0.2683	87	87.17	332.24	17.772	22.824	1.782	0.11	0.25	0.34	5.13
310	150	0.070	0.2646	87.1	87.13	331.45	17.525	22.503	3.365	0.20	0.17	0.33	5.13
311	53	0.070	0.2646	87.1	87.12	330.6	17.525	22.503	1.193	0.07	0.13	0.33	5.13
312	-45	0.070	0.2646	87.2	87.12	329.72	17.526	22.500	-1.015	-0.06	0.09	0.32	5.13
313	58	0.071	0.2665	87.2	87.14	328.8	17.651	22.661	1.319	0.08	0.08	0.32	5.13
314	44	0.071	0.2665	87	87.13	327.83	17.648	22.665	1.000	0.06	0.07	0.31	5.13
315	88	0.072	0.2683	86.6	87.09	326.82	17.765	22.832	2.007	0.12	0.05	0.30	5.14
316	102	0.070	0.2646	86.7	87.04	325.74	17.518	22.511	2.299	0.14	0.07	0.29	5.14
317	9	0.069	0.2627	86.6	86.96	324.62	17.391	22.351	0.204	0.01	0.08	0.29	5.14
318	27	0.070	0.2646	86.3	86.88	323.47	17.512	22.519	0.619	0.04	0.07	0.28	5.14
319	-25	0.070	0.2646	86.2	86.8	322.28	17.510	22.521	-0.567	-0.03	0.05	0.27	5.14
320	48	0.071	0.2665	86.5	86.74	321.06	17.640	22.675	1.082	0.06	0.04	0.26	5.14
321	36	0.069	0.2627	86.2	86.65	319.83	17.385	22.360	0.794	0.05	0.03	0.24	5.14
322	-12	0.071	0.2665	86.1	86.54	318.58	17.633	22.683	-0.269	-0.02	0.02	0.24	5.14
323	53	0.071	0.2665	86	86.42	317.32	17.632	22.686	1.204	0.07	0.03	0.23	5.14
324	152	0.071	0.2665	86.1	86.33	316.07	17.633	22.683	3.456	0.21	0.08	0.22	5.14
325	124	0.071	0.2665	85.7	86.24	314.82	17.627	22.692	2.821	0.17	0.10	0.21	5.15
326	-88	0.070	0.2646	85.6	86.13	313.6	17.501	22.533	-1.992	-0.12	0.06	0.21	5.14
327	30	0.071	0.2665	85.6	86.03	312.38	17.625	22.694	0.685	0.04	0.07	0.21	5.15
328	65	0.071	0.2665	85.7	85.97	311.16	17.627	22.692	1.472	0.09	0.08	0.19	5.15
329	11	0.072	0.2683	85.6	85.91	309.95	17.749	22.853	0.258	0.02	0.04	0.19	5.15
330	-27	0.070	0.2646	85.5	85.81	308.75	17.499	22.536	-0.612	-0.04	0.00	0.18	5.15
331	50	0.070	0.2646	85.5	85.74	307.58	17.499	22.536	1.127	0.07	0.04	0.18	5.15
332	216	0.069	0.2627	85.1	85.64	306.43	17.367	22.382	4.827	0.29	0.08	0.17	5.15
333	67	0.070	0.2646	85.2	85.56	305.28	17.494	22.542	1.504	0.09	0.09	0.17	5.15
334	-9	0.070	0.2646	85.2	85.47	304.13	17.494	22.542	-0.203	-0.01	0.08	0.17	5.15
335	12	0.069	0.2627	84.9	85.39	303	17.364	22.386	0.262	0.02	0.09	0.17	5.15
336	59	0.071	0.2665	84.9	85.32	301.89	17.614	22.708	1.348	0.08	0.09	0.16	5.16
337	47	0.070	0.2646	85	85.26	300.81	17.491	22.546	1.069	0.06	0.05	0.15	5.16
338	-34	0.072	0.2683	84.8	85.17	299.74	17.736	22.870	-0.779	-0.05	0.02	0.15	5.16
339	101	0.071	0.2665	84.8	85.09	298.68	17.612	22.711	2.298	0.14	0.05	0.15	5.16
340	1	0.070	0.2646	84.6	85	297.64	17.485	22.554	0.019	0.00	0.05	0.14	5.16
341	9	0.070	0.2646	84.8	84.93	296.6	17.488	22.550	0.207	0.01	0.03	0.14	5.16
342	51	0.069	0.2627	84.5	84.87	295.59	17.358	22.395	1.133	0.07	0.03	0.14	5.16
343	121	0.071	0.2665	84.3	84.78	294.6	17.604	22.721	2.761	0.17	0.08	0.14	5.16
344	157	0.071	0.2665	84.6	84.72	293.64	17.609	22.715	3.556	0.21	0.09	0.14	5.17
345	-9	0.070	0.2646	84.4	84.67	292.7	17.481	22.558	-0.201	-0.01	0.09	0.13	5.17
346	77	0.069	0.2627	84.6	84.64	291.77	17.359	22.392	1.715	0.10	0.11	0.13	5.17
347	-14	0.070	0.2646	84.7	84.61	290.85	17.486	22.552	-0.313	-0.02	0.09	0.13	5.17
348	8	0.071	0.2665	84.2	84.55	289.97	17.603	22.723	0.171	0.01	0.06	0.12	5.17

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349	134	0.070	0.2646	84.3	84.5	289.14	17.480	22.560	3.014	0.18	0.05	0.12	5.17
350	-45	0.071	0.2665	84.1	84.45	288.31	17.601	22.725	-1.026	-0.06	0.04	0.11	5.17
351	59	0.069	0.2627	84.2	84.39	287.52	17.353	22.401	1.316	0.08	0.04	0.11	5.17
352	55	0.070	0.2646	84.2	84.36	286.75	17.478	22.562	1.242	0.07	0.06	0.11	5.17
353	105	0.070	0.2646	84.3	84.36	286.02	17.480	22.560	2.358	0.14	0.08	0.11	5.17
354	89	0.071	0.2665	84.2	84.32	285.3	17.603	22.723	2.012	0.12	0.07	0.10	5.18
355	-293	0.070	0.2646	84.2	84.3	284.59	17.478	22.562	-6.613	-0.40	0.00	0.10	5.17
356	-80	0.070	0.2646	84	84.24	283.89	17.475	22.567	-1.800	-0.11	-0.03	0.10	5.17
357	29	0.070	0.2646	84.1	84.18	283.2	17.477	22.565	0.659	0.04	-0.04	0.09	5.17
358	49	0.072	0.2683	84.2	84.18	282.5	17.726	22.883	1.118	0.07	-0.06	0.09	5.17
359	37	0.070	0.2646	83.9	84.14	281.8	17.473	22.569	0.828	0.05	-0.07	0.08	5.17
360	-29	0.070	0.2646	83.7	84.1	281.11	17.470	22.573	-0.661	-0.04	0.00	0.08	5.17
361	26	0.070	0.2646	83.8	84.06	280.42	17.472	22.571	0.584	0.04	0.03	0.08	5.17
362	-64	0.070	0.2646	83.7	84.01	279.72	17.470	22.573	-1.435	-0.09	0.01	0.07	5.17
363	-36	0.071	0.2665	83.8	83.96	279.02	17.596	22.731	-0.822	-0.05	-0.02	0.07	5.17
364	-113	0.070	0.2646	83.7	83.91	278.31	17.470	22.573	-2.552	-0.15	-0.06	0.06	5.17
365	185	0.070	0.2646	83.6	83.85	277.6	17.469	22.575	4.184	0.25	0.00	0.05	5.17
366	-121	0.069	0.2627	83.4	83.79	276.88	17.340	22.417	-2.710	-0.16	-0.04	0.05	5.17
367	-14	0.071	0.2665	83.5	83.73	276.17	17.591	22.738	-0.319	-0.02	-0.03	0.05	5.17
368	10	0.071	0.2665	83.7	83.68	275.47	17.595	22.734	0.217	0.01	-0.01	0.04	5.17
369	-20	0.070	0.2646	83.5	83.64	274.74	17.467	22.577	-0.453	-0.03	0.01	0.04	5.17
370	26	0.071	0.2665	83.4	83.61	274.04	17.590	22.740	0.587	0.04	-0.03	0.04	5.17
371	76	0.070	0.2646	83.4	83.57	273.32	17.465	22.579	1.727	0.10	0.02	0.04	5.17
372	119	0.070	0.2646	83.4	83.54	272.61	17.465	22.579	2.681	0.16	0.06	0.04	5.17
373	-75	0.069	0.2627	83.3	83.49	271.89	17.339	22.419	-1.683	-0.10	0.03	0.04	5.17
374	-62	0.070	0.2646	83.4	83.46	271.19	17.465	22.579	-1.396	-0.08	0.02	0.04	5.17
375	225	0.070	0.2646	83.4	83.44	270.48	17.465	22.579	5.088	0.31	0.08	0.04	5.17
376	-15	0.071	0.2665	83.2	83.42	269.78	17.586	22.744	-0.347	-0.02	0.05	0.03	5.17
377	116	0.070	0.2646	83.3	83.4	269.08	17.464	22.581	2.628	0.16	0.05	0.04	5.18
378	17	0.070	0.2646	83.3	83.36	268.39	17.464	22.581	0.388	0.02	0.08	0.04	5.18
379	7	0.070	0.2646	83.1	83.32	267.72	17.461	22.585	0.158	0.01	0.09	0.04	5.18
380	93	0.070	0.2646	83	83.28	267.03	17.459	22.587	2.102	0.13	0.06	0.04	5.18
381	57	0.071	0.2665	83.1	83.25	266.35	17.585	22.746	1.306	0.08	0.08	0.04	5.18
382	-19	0.070	0.2646	82.9	83.2	265.68	17.457	22.589	-0.431	-0.03	0.04	0.04	5.18
383	14	0.070	0.2646	83.2	83.19	265.03	17.462	22.583	0.320	0.02	0.04	0.04	5.18
384	70	0.070	0.2646	83	83.15	264.38	17.459	22.587	1.585	0.10	0.06	0.04	5.18
385	85	0.070	0.2646	83	83.11	263.76	17.459	22.587	1.925	0.12	0.06	0.03	5.18
386	113	0.070	0.2646	82.9	83.08	263.14	17.457	22.589	2.544	0.15	0.07	0.04	5.19
387	13	0.071	0.2665	82.9	83.04	262.53	17.582	22.750	0.302	0.02	0.08	0.04	5.19
388	87	0.070	0.2646	82.9	83	261.92	17.457	22.589	1.961	0.12	0.10	0.04	5.19
389	46	0.071	0.2665	82.6	82.95	261.33	17.577	22.757	1.044	0.06	0.09	0.04	5.19
390	387	0.071	0.2665	82.7	82.92	260.77	17.578	22.754	8.797	0.53	0.18	0.04	5.20
391	21	0.069	0.2627	82.6	82.87	260.22	17.327	22.434	0.469	0.03	0.15	0.04	5.20
392	-21	0.071	0.2665	82.6	82.84	259.67	17.577	22.757	-0.474	-0.03	0.14	0.05	5.20
393	-17	0.071	0.2665	82.7	82.79	259.12	17.578	22.754	-0.380	-0.02	0.11	0.05	5.20
394	135	0.070	0.2646	82.6	82.75	258.58	17.452	22.596	3.043	0.18	0.14	0.05	5.20
395	68	0.072	0.2683	82.5	82.7	258.03	17.698	22.918	1.560	0.09	0.05	0.04	5.20
396	-39	0.071	0.2665	82.6	82.67	257.5	17.577	22.757	-0.882	-0.05	0.03	0.05	5.20
397	-27	0.070	0.2646	82.5	82.63	256.95	17.451	22.598	-0.621	-0.04	0.03	0.05	5.20
398	24	0.071	0.2665	82.4	82.58	256.4	17.573	22.761	0.557	0.03	0.04	0.05	5.20
399	71	0.072	0.2683	82.6	82.58	255.85	17.700	22.916	1.629	0.10	0.03	0.04	5.20
400	0	0.072	0.2683	82.4	82.55	255.28	17.697	22.920	-0.011	0.00	0.01	0.04	5.20
401	-6	0.072	0.2683	82.4	82.53	254.72	17.697	22.920	-0.130	-0.01	0.02	0.05	5.20
402	-15	0.071	0.2665	82.2	82.49	254.18	17.570	22.765	-0.351	-0.02	0.02	0.04	5.20
403	-23	0.071	0.2665	82.3	82.45	253.62	17.572	22.763	-0.530	-0.03	0.01	0.04	5.20
404	-12	0.071	0.2665	82.3	82.42	253.06	17.572	22.763	-0.264	-0.02	-0.02	0.04	5.20
405	52	0.070	0.2646	82.2	82.39	252.49	17.446	22.604	1.168	0.07	0.00	0.04	5.20
406	26	0.072	0.2683	82.2	82.35	251.92	17.694	22.925	0.585	0.04	0.01	0.04	5.20
407	-4	0.071	0.2665	82.2	82.32	251.37	17.570	22.765	-0.092	-0.01	0.01	0.04	5.20
408		0.072	0.2683	82.2	82.3	250.83					0.02	0.04	

TEST RESULTS - ASTM E2780 / ASTM E2515

Client: IHP

Model: Montecito-C

Run #: 1

Job #: 25-416

Tracking #: 223

Technician: AK

Date: 5/27/2025

Total Fuel Burned (kg-dry) 14.37

	Ambient Sample	Sample Train A	Sample Train B	1st Hour Filter
Total Sample Volume (ft ³)	99.214	63.752	64.717	-
Average Gas Velocity in Dilution Tunnel (ft/sec)	17.7			
Average Gas Flow Rate in Dilution Tunnel (dscf/hr)	46877.3			
Average Gas Meter Temperature (°F)	74.1	87.4	87.3	-
Total Sample Volume (dscf)	99.041	61.825	63.156	-
Average Tunnel Temperature (°F)	89.9			
Total Time of Test (min)	408			
Total Particulate Catch (mg)	0.1	1.8	1.9	-
Particulate Concentration, dry-standard (g/dscf)	0.0000010	0.0000291	0.0000301	-
Total PM Emissions (g)	0.32	8.96	9.27	-
Particulate Emission Rate (g/hr)	0.05	1.32	1.36	-
Emissions Factor (g/kg)	-	0.62	0.64	-
Difference from Average Total Particulate Emissions (g)	-	0.15	0.15	-
Difference from Average Total Particulate Emissions (%)	-	1.7%	1.7%	-
Difference from Average Emissions Factor (g/kg)	-	0.01	0.01	-

Final Average Results	
Total Particulate Emissions (g)	9.11
Particulate Emission Rate (g/hr)	1.34
Emissions Factor (g/kg)	0.63

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	<90 °F	87.2	OK
Face Velocity	< 30 ft/min	9.3	OK
Leakage Rate	Less than 4% of average sample rate	0.001 cfm	OK
Ambient Temp	55-90 °F	Min:66.8/Max:77.2	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

DILUTION TUNNEL & MISC. DATA - ASTM E2780 / E2515

Client: IHP
 Model: Montecito-C
 Run #: 1
 Test Start Time: 10:41

Job #: 25-416
 Tracking #: 223
 Technician: AK
 Date: 5/27/2025

Total Sampling Time (min): 408
 Recording Interval (min): 1

Meter Box γ Factor: 1.005 (A)
 Meter Box γ Factor: 1.011 (B)
 Meter Box γ Factor: - (C)
 Meter Box γ Factor: 1.012 (Ambient)

	Pre-Test	Post Test	Avg.
Barometric Pressure (in. Hg)	29.99	29.74	29.87
Relative Humidity (%)	40.6	30.2	
Room Air Velocity (ft/min)	<50	<50	
Pitot Tube Leak Check	0	0	
Ambient Sample Volume:		99.214	ft ³

Sample Train Leak Checks

	Pre-test	Post-test		
Induced Draft Check (in. H ₂ O):	0	(A) 0.000	cfm @	-7 in. Hg
Smoke Capture Check (%):	100%	(B) 0.000	cfm @	-8 in. Hg
Date Flue Pipe Last Cleaned:	5/26/2025	(C) -	cfm @	- in. Hg
Test Fuel Scale Audit (lbs)	10.00	(Ambient) 0.000	cfm @	-12 in. Hg
Platform Scale Audit (lbs)	10.0			

DILUTION TUNNEL FLOW

Traverse Data

Point	dP (in H ₂ O)	Temp (°F)
1	0.064	67
2	0.080	67
3	0.072	67
4	0.078	67
5	0.069	67
6	0.056	67
7	0.060	67
8	0.074	67
9	0.072	67
10	0.072	67
11	0.072	67
12	0.064	67
Center	0.072	67

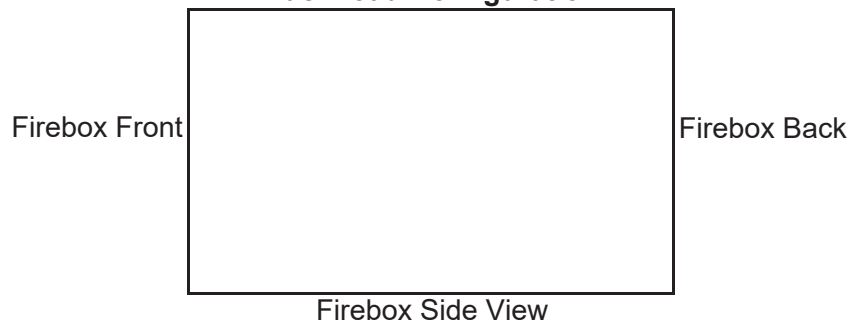
Dilution Tunnel H₂O: 2.00 percent
 Tunnel Diameter: 12 inches
 Pitot Tube Cp: 0.99 [unitless]
 Dilution Tunnel MW(dry): 29.00 lb/lb-mole
 Dilution Tunnel MW(wet): 28.78 lb/lb-mole
 Tunnel Area: 0.7854 ft²

V_{strav} : 17.41 ft/sec
 V_{scent} : 17.75 ft/sec
 F_p : 0.981 [ratio]
 Initial Tunnel Flow: 805.2 scf/min

Static Pressure: -0.202 in. H₂O

TEST FUEL PROPERTIES

Fuel Load Configuration



Actual Fuel Used Properties

Fuel Type: D. Fir
 HHV (kJ/kg): 19,810
 %C: 48.73
 %H: 6.87
 %O: 43.9
 %Ash: 0.5
 MC (%DB): #DIV/0!

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: IHPJob #: 25-416Model: Montecito-CTracking #: 223Run #: 1Technician: AKDate: 5/27/2025

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	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	-0.017		0.073	0.74	69	-1.4		6.40		69	67	82	67
1	0.143	0.160	0.072	1.30	70	-1.4	-	6.10	-0.30	73	206	83	67
2	0.317	0.174	0.071	1.30	70	-1.2	-	5.76	-0.34	80	422	84	67
3	0.483	0.166	0.070	1.09	70	-1.1	-	5.47	-0.29	80	539	84	67
4	0.640	0.157	0.072	1.08	70	-1.0	-	5.19	-0.28	82	616	83	67
5	0.798	0.158	0.072	1.09	71	-1.0	-	4.92	-0.27	84	658	82	67
6	0.956	0.158	0.071	1.08	71	-1.0	-	4.63	-0.29	85	688	82	67
7	1.112	0.156	0.073	1.09	71	-1.0	-	4.31	-0.32	87	738	83	67
8	1.270	0.158	0.072	1.07	71	-0.9	-	4.01	-0.30	88	750	83	67
9	1.426	0.156	0.070	1.06	72	-1.1	-	3.71	-0.30	90	770	84	67
10	1.583	0.157	0.070	1.08	72	-1.0	104	3.42	-0.29	91	788	84	68
11	1.741	0.158	0.070	1.08	73	-1.0	-	3.17	-0.25	92	789	83	68
12	1.896	0.155	0.070	1.07	73	-1.0	-	2.93	-0.24	93	799	82	68
13	2.052	0.156	0.071	1.07	73	-1.0	-	2.63	-0.30	95	840	82	68
14	2.209	0.157	0.071	1.07	74	-1.0	-	2.33	-0.30	97	870	83	68
15	2.363	0.154	0.070	1.07	74	-1.1	-	2.03	-0.30	97	887	84	68
16	2.520	0.157	0.070	1.07	74	-1.0	-	1.77	-0.26	97	887	84	68
17	2.676	0.156	0.069	1.07	75	-1.0	-	11.84	10.07	106	782	83	68
18	2.830	0.154	0.068	1.07	75	-1.0	-	11.51	-0.33	103	858	82	68
19	2.986	0.156	0.071	1.06	75	-1.1	-	11.17	-0.34	104	897	82	69
20	3.141	0.155	0.071	1.07	76	-1.1	103	10.81	-0.36	104	937	83	69
21	3.295	0.154	0.070	1.05	76	-1.1	-	10.45	-0.36	105	970	84	69
22	3.451	0.156	0.070	1.07	76	-1.1	-	10.08	-0.37	105	1,002	84	69
23	3.606	0.155	0.069	1.06	76	-1.1	-	9.72	-0.36	107	1,042	83	69
24	3.760	0.154	0.070	1.06	77	-1.1	-	9.36	-0.36	110	1,058	83	69
25	3.915	0.155	0.070	1.06	77	-1.1	-	9.03	-0.33	110	1,050	82	69
26	4.070	0.155	0.068	1.06	77	-1.1	-	8.73	-0.30	112	1,044	83	69
27	4.226	0.156	0.069	1.06	78	-1.2	-	8.42	-0.31	112	1,042	83	69
28	4.379	0.153	0.071	1.06	78	-1.1	-	8.13	-0.29	113	1,037	83	70
29	4.534	0.155	0.069	1.06	78	-1.2	-	7.85	-0.28	114	1,036	83	70
30	4.690	0.156	0.070	1.05	79	-1.1	103	7.56	-0.29	114	1,043	83	70
31	4.844	0.154	0.071	1.06	79	-1.1	-	7.38	-0.18	106	980	83	70

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: IHP

Job #: 25-416

Model: Montecito-C

Tracking #: 223

Run #: 1

Technician: AK

Date: 5/27/2025

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	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
32	4.999	0.155	0.071	1.05	79	-1.2	-	7.21	-0.17	101	929	84	70
33	5.155	0.156	0.072	1.06	79	-1.1	-	7.07	-0.14	100	890	84	70
34	5.310	0.155	0.070	1.07	80	-1.1	-	6.95	-0.12	99	854	84	70
35	5.464	0.154	0.069	1.07	79	-1.1	-	6.84	-0.11	98	819	83	70
36	5.621	0.157	0.072	1.06	79	-1.1	-	6.70	-0.14	97	787	82	70
37	5.776	0.155	0.071	1.06	80	-1.2	-	6.56	-0.14	95	760	82	70
38	5.930	0.154	0.070	1.06	80	-1.2	-	6.44	-0.12	94	740	83	70
39	6.086	0.156	0.070	1.06	81	-1.2	-	6.32	-0.12	93	723	83	70
40	6.243	0.157	0.072	1.06	81	-1.2	102	6.20	-0.12	93	710	84	70
41	6.396	0.153	0.072	1.05	81	-1.2	-	6.06	-0.14	92	700	83	70
42	6.552	0.156	0.071	1.06	80	-1.3	-	5.92	-0.14	91	694	83	70
43	6.709	0.157	0.070	1.05	81	-1.3	-	5.79	-0.13	92	689	82	70
44	6.863	0.154	0.071	1.05	81	-1.3	-	5.68	-0.11	91	682	83	70
45	7.019	0.156	0.072	1.06	81	-1.3	-	5.55	-0.13	91	674	84	70
46	7.176	0.157	0.071	1.07	81	-1.3	-	5.42	-0.13	90	667	84	70
47	7.330	0.154	0.071	1.06	81	-1.4	-	5.30	-0.12	90	663	85	70
48	7.486	0.156	0.072	1.06	82	-1.3	-	5.16	-0.14	89	658	85	70
49	7.643	0.157	0.073	1.07	82	-1.4	-	5.05	-0.11	89	653	84	70
50	7.797	0.154	0.070	1.07	83	-1.4	100	4.95	-0.10	89	651	82	70
51	7.953	0.156	0.072	1.06	82	-1.4	-	4.83	-0.12	88	647	82	70
52	8.110	0.157	0.071	1.06	82	-1.4	-	4.73	-0.10	88	643	82	71
53	8.265	0.155	0.072	1.06	82	-1.5	-	4.61	-0.12	88	640	83	71
54	8.421	0.156	0.073	1.06	82	-1.5	-	4.49	-0.12	87	637	84	71
55	8.578	0.157	0.070	1.07	83	-1.5	-	4.39	-0.10	87	635	85	71
56	8.732	0.154	0.071	1.06	84	-1.6	-	4.27	-0.12	87	631	84	71
57	8.889	0.157	0.072	1.06	83	-1.6	-	4.16	-0.11	87	628	83	71
58	9.046	0.157	0.072	1.06	84	-1.5	-	4.06	-0.10	87	626	83	71
59	9.200	0.154	0.073	1.06	84	-1.5	-	3.95	-0.11	87	625	82	71
60	9.357	0.157	0.072	1.07	84	-1.5	100	3.85	-0.10	87	626	83	71
61	9.514	0.157	0.071	1.06	83	-1.7	-	3.74	-0.11	86	626	83	71
62	9.668	0.154	0.071	1.07	83	-1.6	-	3.62	-0.12	86	627	84	71
63	9.825	0.157	0.071	1.06	83	-1.7	-	3.52	-0.10	86	629	84	71

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: IHP

Job #: 25-416

Model: Montecito-C

Tracking #: 223

Run #: 1

Technician: AK

Date: 5/27/2025

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	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
64	9.982	0.157	0.071	1.06	85	-1.6	-	3.41	-0.11	86	630	83	71
65	10.137	0.155	0.072	1.06	84	-1.6	-	3.31	-0.10	86	629	82	71
66	10.293	0.156	0.071	1.05	84	-1.6	-	3.22	-0.09	87	630	82	71
67	10.450	0.157	0.072	1.06	84	-1.7	-	3.13	-0.09	87	628	83	71
68	10.605	0.155	0.072	1.05	84	-1.7	-	3.03	-0.10	87	625	84	71
69	10.762	0.157	0.073	1.06	85	-1.8	-	2.94	-0.09	87	622	84	71
70	10.918	0.156	0.071	1.06	85	-1.7	100	2.84	-0.10	86	620	84	71
71	11.074	0.156	0.072	1.05	84	-1.7	-	2.80	-0.04	87	618	83	71
72	11.231	0.157	0.070	1.06	84	-1.8	-	10.32	7.52	95	610	83	72
73	11.386	0.155	0.071	1.05	84	-1.7	-	10.02	-0.30	97	794	82	72
74	11.541	0.155	0.070	1.04	85	-1.8	-	9.70	-0.32	98	881	83	72
75	11.698	0.157	0.069	1.06	84	-1.8	-	9.40	-0.30	99	880	84	72
76	11.853	0.155	0.069	1.05	84	-1.8	-	9.17	-0.23	96	818	84	72
77	12.009	0.156	0.071	1.05	84	-1.7	-	8.97	-0.20	94	800	85	72
78	12.166	0.157	0.072	1.06	85	-1.8	-	8.79	-0.18	94	791	85	72
79	12.321	0.155	0.072	1.05	85	-1.8	-	8.61	-0.18	93	786	85	72
80	12.477	0.156	0.072	1.06	85	-1.8	100	8.44	-0.17	93	776	85	72
81	12.634	0.157	0.071	1.04	86	-1.8	-	8.28	-0.16	94	764	84	72
82	12.789	0.155	0.070	1.05	85	-1.8	-	8.14	-0.14	93	752	83	72
83	12.945	0.156	0.071	1.05	86	-1.8	-	7.98	-0.16	92	742	82	72
84	13.102	0.157	0.072	1.06	85	-1.7	-	7.84	-0.14	92	734	83	72
85	13.257	0.155	0.072	1.06	86	-1.7	-	7.70	-0.14	92	727	84	72
86	13.414	0.157	0.073	1.05	86	-1.7	-	7.56	-0.14	92	722	84	73
87	13.571	0.157	0.072	1.06	86	-1.7	-	7.40	-0.16	92	718	83	73
88	13.725	0.154	0.070	1.06	85	-1.8	-	7.29	-0.11	92	718	83	73
89	13.882	0.157	0.072	1.06	86	-1.7	-	7.14	-0.15	93	725	83	73
90	14.039	0.157	0.074	1.05	86	-1.7	99	6.96	-0.18	92	726	83	73
91	14.194	0.155	0.072	1.06	87	-1.7	-	6.83	-0.13	93	722	84	73
92	14.351	0.157	0.071	1.06	86	-1.8	-	6.67	-0.16	92	716	84	73
93	14.508	0.157	0.072	1.06	87	-1.8	-	6.55	-0.12	93	712	83	73
94	14.663	0.155	0.072	1.06	86	-1.8	-	6.43	-0.12	92	704	83	73
95	14.819	0.156	0.071	1.06	86	-1.7	-	6.32	-0.11	92	697	83	73

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: IHPJob #: 25-416Model: Montecito-CTracking #: 223Run #: 1Technician: AKDate: 5/27/2025

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	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
96	14.976	0.157	0.072	1.05	86	-1.7	-	6.19	-0.13	92	687	84	73
97	15.131	0.155	0.070	1.05	85	-1.8	-	6.10	-0.09	92	677	84	73
98	15.288	0.157	0.072	1.06	87	-1.8	-	5.99	-0.11	91	668	85	73
99	15.444	0.156	0.071	1.06	85	-1.7	-	5.90	-0.09	91	660	85	73
100	15.600	0.156	0.070	1.05	87	-1.8	99	5.80	-0.10	91	652	84	73
101	15.757	0.157	0.073	1.06	87	-1.7	-	5.70	-0.10	91	645	84	73
102	15.913	0.156	0.072	1.06	86	-1.7	-	5.61	-0.09	91	638	83	73
103	16.069	0.156	0.071	1.05	87	-1.8	-	5.53	-0.08	90	633	82	73
104	16.226	0.157	0.071	1.04	87	-1.8	-	5.44	-0.09	90	628	83	73
105	16.381	0.155	0.071	1.06	87	-1.8	-	5.34	-0.10	91	622	84	73
106	16.538	0.157	0.071	1.05	87	-1.8	-	5.25	-0.09	90	618	84	73
107	16.695	0.157	0.072	1.06	87	-1.8	-	5.16	-0.09	90	614	84	73
108	16.850	0.155	0.072	1.06	88	-1.9	-	5.07	-0.09	89	608	83	73
109	17.007	0.157	0.070	1.06	87	-1.8	-	4.99	-0.08	89	605	83	73
110	17.164	0.157	0.071	1.06	88	-1.8	100	4.90	-0.09	89	602	83	73
111	17.319	0.155	0.071	1.06	86	-1.8	-	4.82	-0.08	89	600	84	73
112	17.476	0.157	0.071	1.06	87	-1.8	-	4.74	-0.08	88	597	84	73
113	17.633	0.157	0.070	1.07	87	-1.9	-	4.65	-0.09	88	594	84	73
114	17.788	0.155	0.072	1.05	87	-1.9	-	4.58	-0.07	88	591	83	73
115	17.946	0.158	0.072	1.06	86	-1.9	-	4.52	-0.06	89	589	83	74
116	18.102	0.156	0.071	1.06	86	-1.9	-	4.44	-0.08	89	587	83	74
117	18.257	0.155	0.073	1.06	87	-2.0	-	4.37	-0.07	89	585	84	74
118	18.415	0.158	0.071	1.06	88	-1.9	-	4.30	-0.07	88	582	84	74
119	18.570	0.155	0.071	1.05	88	-1.9	-	4.22	-0.08	88	581	84	74
120	18.727	0.157	0.070	1.06	88	-1.9	100	4.13	-0.09	88	579	83	74
121	18.884	0.157	0.072	1.05	88	-1.9	-	4.08	-0.05	88	577	83	74
122	19.039	0.155	0.071	1.06	88	-2.0	-	4.01	-0.07	87	575	83	74
123	19.196	0.157	0.071	1.05	89	-2.0	-	3.93	-0.08	87	573	84	74
124	19.353	0.157	0.073	1.05	89	-1.9	-	3.86	-0.07	87	572	84	74
125	19.508	0.155	0.072	1.07	88	-2.0	-	3.81	-0.05	88	571	84	74
126	19.665	0.157	0.071	1.07	87	-2.0	-	3.74	-0.07	88	569	84	74
127	19.822	0.157	0.069	1.06	87	-2.0	-	3.68	-0.06	87	568	85	74

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: IHP
 Model: Montecito-C
 Run #: 1

Job #: 25-416
 Tracking #: 223
 Technician: AK
 Date: 5/27/2025

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	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
128	19.977	0.155	0.071	1.05	89	-2.0	-	3.61	-0.07	87	565	84	74
129	20.134	0.157	0.072	1.06	88	-2.1	-	3.54	-0.07	87	564	84	74
130	20.290	0.156	0.072	1.05	87	-2.0	100	3.49	-0.05	88	565	83	74
131	20.446	0.156	0.071	1.06	88	-2.1	-	3.42	-0.07	88	564	82	74
132	20.603	0.157	0.070	1.05	88	-2.1	-	19.42	16.00	98	439	83	74
133	20.759	0.156	0.068	1.05	88	-2.1	-	21.42	2.00	101	486	84	75
134	20.915	0.156	0.068	1.06	89	-2.1	-	21.17	-0.25	97	610	84	75
135	21.072	0.157	0.070	1.05	88	-2.1	-	20.87	-0.30	98	724	84	75
136	21.227	0.155	0.071	1.06	89	-2.1	-	20.57	-0.30	100	795	84	75
137	21.384	0.157	0.070	1.06	87	-2.1	-	20.36	-0.21	97	730	83	75
138	21.541	0.157	0.071	1.05	90	-2.1	-	20.16	-0.20	94	704	83	74
139	21.696	0.155	0.072	1.06	90	-2.1	-	19.99	-0.17	93	696	83	74
140	21.853	0.157	0.072	1.06	89	-2.1	99	19.81	-0.18	93	703	84	75
141	22.010	0.157	0.070	1.05	88	-2.1	-	19.61	-0.20	93	712	84	74
142	22.165	0.155	0.070	1.06	88	-2.0	-	19.42	-0.19	94	718	84	75
143	22.323	0.158	0.071	1.06	88	-2.1	-	19.23	-0.19	93	727	84	75
144	22.479	0.156	0.069	1.06	88	-2.1	-	19.05	-0.18	94	731	84	75
145	22.635	0.156	0.069	1.05	88	-2.1	-	18.86	-0.19	94	731	83	75
146	22.792	0.157	0.070	1.05	89	-2.0	-	18.69	-0.17	94	731	83	75
147	22.948	0.156	0.069	1.06	89	-2.0	-	18.53	-0.16	94	730	83	75
148	23.105	0.157	0.070	1.06	89	-2.0	-	18.37	-0.16	94	729	84	75
149	23.262	0.157	0.069	1.06	89	-1.9	-	18.19	-0.18	94	727	84	75
150	23.417	0.155	0.070	1.05	90	-1.9	100	18.04	-0.15	94	728	84	75
151	23.574	0.157	0.071	1.05	89	-1.9	-	17.85	-0.19	94	729	84	75
152	23.731	0.157	0.069	1.06	88	-1.9	-	17.70	-0.15	95	728	83	75
153	23.887	0.156	0.070	1.05	90	-1.9	-	17.49	-0.21	94	730	83	75
154	24.044	0.157	0.070	1.06	90	-1.9	-	17.34	-0.15	94	734	83	75
155	24.201	0.157	0.070	1.06	88	-1.8	-	17.17	-0.17	94	737	83	75
156	24.356	0.155	0.071	1.05	89	-1.9	-	16.99	-0.18	95	738	84	75
157	24.513	0.157	0.070	1.06	89	-1.8	-	16.82	-0.17	95	735	85	75
158	24.669	0.156	0.070	1.06	89	-1.8	-	16.64	-0.18	94	732	85	75
159	24.825	0.156	0.071	1.06	89	-1.8	-	16.52	-0.12	95	727	84	75

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: IHP
 Model: Montecito-C
 Run #: 1

Job #: 25-416
 Tracking #: 223
 Technician: AK
 Date: 5/27/2025

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	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
160	24.982	0.157	0.071	1.05	90	-1.8	100	16.37	-0.15	94	720	83	75
161	25.138	0.156	0.069	1.05	89	-1.8	-	16.22	-0.15	94	714	83	75
162	25.295	0.157	0.070	1.06	89	-1.8	-	16.07	-0.15	94	708	83	75
163	25.452	0.157	0.070	1.06	88	-1.7	-	15.95	-0.12	94	702	84	76
164	25.607	0.155	0.071	1.06	89	-1.9	-	15.82	-0.13	94	696	84	76
165	25.764	0.157	0.070	1.05	88	-1.8	-	15.68	-0.14	94	691	85	76
166	25.921	0.157	0.070	1.05	89	-1.8	-	15.54	-0.14	93	687	85	76
167	26.076	0.155	0.070	1.05	90	-1.8	-	15.41	-0.13	94	682	85	76
168	26.233	0.157	0.070	1.05	90	-1.8	-	15.28	-0.13	93	678	84	76
169	26.390	0.157	0.070	1.05	89	-1.9	-	15.15	-0.13	93	675	84	76
170	26.546	0.156	0.071	1.05	90	-1.9	100	15.03	-0.12	93	672	83	76
171	26.703	0.157	0.072	1.06	90	-1.8	-	14.91	-0.12	93	669	83	76
172	26.859	0.156	0.073	1.05	90	-1.8	-	14.77	-0.14	92	666	83	76
173	27.015	0.156	0.070	1.06	90	-1.8	-	14.64	-0.13	93	663	84	76
174	27.173	0.158	0.070	1.05	90	-1.9	-	14.52	-0.12	93	659	84	76
175	27.328	0.155	0.070	1.06	90	-1.8	-	14.39	-0.13	93	657	84	75
176	27.485	0.157	0.072	1.06	91	-1.8	-	14.28	-0.11	93	654	84	75
177	27.642	0.157	0.071	1.06	90	-1.9	-	14.15	-0.13	92	652	85	75
178	27.793	0.151	0.072	1.06	91	-1.8	-	14.05	-0.10	92	651	84	75
179	27.949	0.156	0.072	1.06	90	-1.9	-	13.94	-0.11	91	649	84	75
180	28.106	0.157	0.071	1.06	89	-1.9	100	13.82	-0.12	92	648	83	75
181	28.262	0.156	0.070	1.05	91	-1.9	-	13.70	-0.12	93	648	83	75
182	28.419	0.157	0.071	1.05	91	-1.9	-	13.58	-0.12	92	647	83	75
183	28.576	0.157	0.072	1.06	89	-2.0	-	13.46	-0.12	92	647	84	75
184	28.734	0.158	0.070	1.05	88	-1.9	-	13.33	-0.13	92	647	84	75
185	28.888	0.154	0.072	1.06	89	-1.9	-	13.21	-0.12	92	648	84	75
186	29.046	0.158	0.069	1.05	89	-2.0	-	13.09	-0.12	92	649	84	75
187	29.201	0.155	0.071	1.05	90	-1.9	-	12.97	-0.12	93	651	84	76
188	29.361	0.160	0.070	1.05	91	-2.0	-	12.83	-0.14	92	652	83	76
189	29.514	0.153	0.071	1.06	91	-1.9	-	12.72	-0.11	92	651	83	76
190	29.673	0.159	0.069	1.06	89	-1.9	101	12.59	-0.13	92	651	83	76
191	29.828	0.155	0.071	1.06	90	-1.9	-	12.47	-0.12	92	651	84	76

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: IHP

Job #: 25-416

Model: Montecito-C

Tracking #: 223

Run #: 1

Technician: AK

Date: 5/27/2025

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	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
192	29.983	0.155	0.071	1.05	90	-1.9	-	12.35	-0.12	92	652	84	76
193	30.140	0.157	0.071	1.05	91	-2.0	-	12.22	-0.13	92	652	84	76
194	30.297	0.157	0.071	1.05	90	-2.0	-	12.10	-0.12	92	653	84	76
195	30.452	0.155	0.072	1.04	91	-2.0	-	11.98	-0.12	92	653	83	76
196	30.613	0.161	0.071	1.05	91	-2.0	-	11.86	-0.12	92	655	83	76
197	30.767	0.154	0.070	1.05	89	-2.0	-	11.75	-0.11	92	657	83	76
198	30.922	0.155	0.071	1.05	90	-2.0	-	11.61	-0.14	92	659	84	76
199	31.079	0.157	0.073	1.05	89	-2.0	-	11.51	-0.10	93	660	84	76
200	31.236	0.157	0.071	1.06	91	-2.0	100	11.38	-0.13	93	662	84	76
201	31.391	0.155	0.070	1.05	92	-2.0	-	11.25	-0.13	93	664	84	76
202	31.549	0.158	0.071	1.05	92	-2.0	-	11.13	-0.12	92	666	84	76
203	31.705	0.156	0.070	1.06	91	-2.0	-	11.02	-0.11	92	667	84	76
204	31.864	0.159	0.071	1.05	91	-2.0	-	10.89	-0.13	92	670	83	76
205	32.018	0.154	0.071	1.05	90	-2.1	-	10.78	-0.11	92	671	83	76
206	32.176	0.158	0.070	1.05	91	-2.0	-	10.65	-0.13	93	672	83	76
207	32.333	0.157	0.070	1.05	90	-2.0	-	10.54	-0.11	93	673	84	76
208	32.488	0.155	0.071	1.06	90	-2.0	-	10.42	-0.12	93	673	84	76
209	32.643	0.155	0.069	1.06	91	-2.0	-	10.30	-0.12	93	675	85	76
210	32.800	0.157	0.072	1.04	91	-2.0	99	10.17	-0.13	93	677	84	76
211	32.957	0.157	0.071	1.05	89	-2.1	-	10.05	-0.12	93	679	84	76
212	33.112	0.155	0.070	1.05	90	-2.0	-	9.93	-0.12	93	680	84	76
213	33.269	0.157	0.070	1.05	89	-2.1	-	9.81	-0.12	94	683	83	76
214	33.426	0.157	0.070	1.06	90	-2.0	-	9.70	-0.11	93	684	83	76
215	33.581	0.155	0.071	1.04	91	-2.1	-	9.56	-0.14	93	685	83	76
216	33.738	0.157	0.071	1.06	90	-2.1	-	9.44	-0.12	93	684	84	76
217	33.894	0.156	0.070	1.05	90	-2.1	-	9.32	-0.12	94	683	84	76
218	34.050	0.156	0.071	1.04	91	-2.1	-	9.21	-0.11	93	684	85	76
219	34.207	0.157	0.071	1.05	91	-2.0	-	9.10	-0.11	93	683	85	76
220	34.362	0.155	0.069	1.04	89	-2.1	100	8.99	-0.11	94	684	85	76
221	34.519	0.157	0.070	1.04	91	-2.0	-	8.86	-0.13	94	686	85	76
222	34.676	0.157	0.069	1.05	91	-2.1	-	8.75	-0.11	94	686	85	76
223	34.831	0.155	0.071	1.04	91	-2.0	-	8.64	-0.11	94	683	85	76

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: IHP

Job #: 25-416

Model: Montecito-C

Tracking #: 223

Run #: 1

Technician: AK

Date: 5/27/2025

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	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
224	34.990	0.159	0.072	1.04	91	-2.1	-	8.54	-0.10	94	679	84	76
225	35.145	0.155	0.070	1.05	90	-2.0	-	8.44	-0.10	94	674	83	76
226	35.300	0.155	0.070	1.05	90	-2.1	-	8.37	-0.07	94	669	83	76
227	35.456	0.156	0.071	1.04	91	-2.1	-	8.27	-0.10	93	664	83	77
228	35.613	0.157	0.070	1.04	92	-2.1	-	8.19	-0.08	93	658	84	77
229	35.768	0.155	0.069	1.05	89	-2.1	-	8.11	-0.08	93	653	84	76
230	35.925	0.157	0.072	1.05	89	-2.1	100	8.03	-0.08	93	649	85	77
231	36.082	0.157	0.071	1.04	92	-2.1	-	7.94	-0.09	92	645	85	77
232	36.237	0.155	0.070	1.04	90	-2.2	-	7.88	-0.06	92	642	85	77
233	36.394	0.157	0.070	1.06	90	-2.2	-	7.79	-0.09	93	640	85	77
234	36.550	0.156	0.071	1.05	91	-2.1	-	7.71	-0.08	92	637	85	77
235	36.706	0.156	0.070	1.05	89	-2.1	-	7.65	-0.06	93	633	85	77
236	36.863	0.157	0.071	1.05	91	-2.1	-	7.58	-0.07	92	629	84	77
237	37.018	0.155	0.071	1.05	92	-2.1	-	7.51	-0.07	93	626	84	77
238	37.174	0.156	0.071	1.05	92	-2.1	-	7.45	-0.06	92	624	83	77
239	37.331	0.157	0.071	1.04	90	-2.1	-	7.38	-0.07	92	620	83	77
240	37.486	0.155	0.072	1.05	90	-2.1	99	7.33	-0.05	92	616	83	77
241	37.643	0.157	0.070	1.05	92	-2.1	-	7.26	-0.07	92	613	84	77
242	37.800	0.157	0.071	1.05	90	-2.2	-	7.20	-0.06	92	607	84	77
243	37.955	0.155	0.071	1.05	90	-2.2	-	7.14	-0.06	92	603	84	77
244	38.112	0.157	0.071	1.05	92	-2.2	-	7.07	-0.07	91	599	85	77
245	38.271	0.159	0.073	1.05	93	-2.3	-	7.00	-0.07	91	594	85	77
246	38.424	0.153	0.070	1.04	91	-2.2	-	6.97	-0.03	90	588	85	77
247	38.580	0.156	0.072	1.04	90	-2.2	-	6.92	-0.05	91	582	86	77
248	38.737	0.157	0.070	1.05	91	-2.3	-	6.87	-0.05	91	577	86	77
249	38.895	0.158	0.072	1.05	92	-2.3	-	6.80	-0.07	90	574	86	77
250	39.049	0.154	0.071	1.05	93	-2.3	99	6.75	-0.05	90	569	86	77
251	39.205	0.156	0.071	1.05	93	-2.3	-	6.70	-0.05	90	566	85	77
252	39.360	0.155	0.070	1.05	92	-2.3	-	6.66	-0.04	90	562	84	77
253	39.520	0.160	0.072	1.04	90	-2.3	-	6.62	-0.04	90	560	84	77
254	39.674	0.154	0.073	1.04	91	-2.4	-	6.57	-0.05	90	557	83	77
255	39.829	0.155	0.070	1.05	90	-2.3	-	6.53	-0.04	90	555	83	77

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: IHP

Job #: 25-416

Model: Montecito-C

Tracking #: 223

Run #: 1

Technician: AK

Date: 5/27/2025

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	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
256	39.986	0.157	0.070	1.05	91	-2.3	-	6.49	-0.04	90	552	83	77
257	40.142	0.156	0.071	1.04	91	-2.3	-	6.44	-0.05	90	549	84	77
258	40.298	0.156	0.071	1.04	92	-2.3	-	6.40	-0.04	90	546	84	77
259	40.455	0.157	0.070	1.04	92	-2.3	-	6.34	-0.06	90	543	84	77
260	40.613	0.158	0.072	1.04	90	-2.4	99	6.30	-0.04	90	540	84	77
261	40.767	0.154	0.071	1.05	91	-2.4	-	6.26	-0.04	90	537	85	77
262	40.924	0.157	0.069	1.06	92	-2.4	-	6.21	-0.05	90	534	85	77
263	41.078	0.154	0.071	1.05	92	-2.5	-	6.17	-0.04	90	532	85	77
264	41.235	0.157	0.069	1.04	91	-2.4	-	6.14	-0.03	90	531	86	77
265	41.392	0.157	0.071	1.04	90	-2.4	-	6.09	-0.05	90	529	86	77
266	41.550	0.158	0.072	1.05	90	-2.4	-	6.06	-0.03	90	527	87	77
267	41.704	0.154	0.071	1.04	92	-2.4	-	6.01	-0.05	89	526	87	77
268	41.861	0.157	0.071	1.04	91	-2.5	-	5.96	-0.05	89	523	87	77
269	42.015	0.154	0.072	1.04	91	-2.5	-	5.93	-0.03	89	522	87	77
270	42.172	0.157	0.070	1.04	91	-2.5	99	5.88	-0.05	89	519	86	77
271	42.329	0.157	0.070	1.05	91	-2.4	-	5.83	-0.05	89	518	85	77
272	42.484	0.155	0.071	1.05	92	-2.4	-	5.79	-0.04	89	517	84	77
273	42.640	0.156	0.071	1.05	91	-2.5	-	5.76	-0.03	89	516	84	77
274	42.797	0.157	0.073	1.03	91	-2.6	-	5.72	-0.04	89	515	83	77
275	42.952	0.155	0.070	1.05	90	-2.5	-	5.68	-0.04	89	513	83	77
276	43.109	0.157	0.072	1.05	92	-2.5	-	5.65	-0.03	89	513	83	77
277	43.265	0.156	0.070	1.05	92	-2.6	-	5.59	-0.06	89	513	84	77
278	43.420	0.155	0.071	1.04	92	-2.5	-	5.56	-0.03	89	511	84	77
279	43.577	0.157	0.071	1.05	90	-2.6	-	5.53	-0.03	89	507	84	77
280	43.733	0.156	0.070	1.05	91	-2.5	100	5.51	-0.02	88	502	85	77
281	43.888	0.155	0.071	1.03	91	-2.6	-	5.48	-0.03	88	499	85	77
282	44.045	0.157	0.071	1.04	91	-2.7	-	5.46	-0.02	88	495	86	77
283	44.201	0.156	0.070	1.04	93	-2.6	-	5.44	-0.02	88	491	86	77
284	44.357	0.156	0.070	1.04	91	-2.7	-	5.42	-0.02	88	488	86	77
285	44.514	0.157	0.070	1.05	91	-2.7	-	5.40	-0.02	89	486	85	77
286	44.669	0.155	0.072	1.04	91	-2.6	-	5.38	-0.02	88	484	84	77
287	44.825	0.156	0.071	1.04	92	-2.7	-	5.35	-0.03	88	481	84	77

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: IHP

Job #: 25-416

Model: Montecito-C

Tracking #: 223

Run #: 1

Technician: AK

Date: 5/27/2025

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	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
288	44.982	0.157	0.071	1.04	92	-2.7	-	5.32	-0.03	88	478	83	77
289	45.140	0.158	0.069	1.06	93	-2.7	-	5.29	-0.03	88	477	83	77
290	45.294	0.154	0.069	1.05	92	-2.6	100	5.27	-0.02	88	476	83	77
291	45.451	0.157	0.071	1.05	90	-2.7	-	5.26	-0.01	88	474	84	77
292	45.605	0.154	0.070	1.06	91	-2.8	-	5.25	-0.01	88	473	84	77
293	45.762	0.157	0.072	1.04	90	-2.8	-	5.22	-0.03	88	470	85	77
294	45.921	0.159	0.070	1.05	91	-2.7	-	5.20	-0.02	88	470	85	77
295	46.076	0.155	0.071	1.04	92	-2.7	-	5.18	-0.02	88	469	85	77
296	46.234	0.158	0.072	1.05	91	-2.7	-	5.16	-0.02	88	467	85	77
297	46.388	0.154	0.070	1.06	92	-2.7	-	5.12	-0.04	87	466	86	77
298	46.545	0.157	0.070	1.05	91	-2.8	-	5.11	-0.01	87	464	86	77
299	46.702	0.157	0.070	1.05	91	-2.7	-	5.09	-0.02	88	463	86	77
300	46.857	0.155	0.071	1.05	92	-2.8	100	5.06	-0.03	88	462	85	77
301	47.010	0.153	0.070	1.04	92	-2.8	-	5.05	-0.01	87	459	84	77
302	47.170	0.160	0.072	1.04	91	-2.9	-	5.03	-0.02	87	458	84	77
303	47.324	0.154	0.072	1.04	91	-2.7	-	5.00	-0.03	87	457	84	77
304	47.482	0.158	0.070	1.04	92	-2.8	-	4.98	-0.02	87	456	83	77
305	47.636	0.154	0.071	1.05	92	-2.8	-	4.96	-0.02	87	454	83	77
306	47.792	0.156	0.070	1.05	90	-2.8	-	4.94	-0.02	87	453	83	77
307	47.947	0.155	0.072	1.04	91	-2.9	-	4.91	-0.03	87	449	83	76
308	48.107	0.160	0.071	1.05	92	-2.8	-	4.89	-0.02	87	443	84	76
309	48.260	0.153	0.072	1.04	91	-2.9	-	4.88	-0.01	87	439	84	76
310	48.417	0.157	0.070	1.04	90	-2.9	99	4.86	-0.02	87	436	84	76
311	48.574	0.157	0.070	1.04	91	-2.9	-	4.84	-0.02	87	432	84	76
312	48.728	0.154	0.070	1.04	91	-2.9	-	4.82	-0.02	87	429	84	76
313	48.888	0.160	0.071	1.05	90	-2.8	-	4.79	-0.03	87	427	83	76
314	49.042	0.154	0.071	1.04	90	-2.9	-	4.78	-0.01	87	423	83	76
315	49.198	0.156	0.072	1.05	90	-3.0	-	4.76	-0.02	87	420	84	76
316	49.354	0.156	0.070	1.05	91	-2.9	-	4.75	-0.01	87	418	84	75
317	49.512	0.158	0.069	1.05	91	-2.9	-	4.73	-0.02	87	416	84	75
318	49.667	0.155	0.070	1.05	90	-3.0	-	4.71	-0.02	86	413	83	75
319	49.824	0.157	0.070	1.05	90	-3.0	-	4.69	-0.02	86	410	83	75

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: IHP

Job #: 25-416

Model: Montecito-C

Tracking #: 223

Run #: 1

Technician: AK

Date: 5/27/2025

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	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
320	49.980	0.156	0.071	1.05	90	-3.0	99	4.67	-0.02	87	408	83	75
321	50.136	0.156	0.069	1.04	90	-2.9	-	4.66	-0.01	86	405	84	75
322	50.296	0.160	0.071	1.04	91	-3.0	-	4.64	-0.02	86	403	84	75
323	50.451	0.155	0.071	1.04	90	-3.0	-	4.62	-0.02	86	401	85	75
324	50.605	0.154	0.071	1.04	90	-3.0	-	4.61	-0.01	86	399	85	75
325	50.762	0.157	0.071	1.04	89	-3.0	-	4.59	-0.02	86	397	85	75
326	50.917	0.155	0.070	1.05	90	-2.9	-	4.57	-0.02	86	396	86	75
327	51.074	0.157	0.071	1.05	89	-3.1	-	4.56	-0.01	86	394	86	75
328	51.231	0.157	0.071	1.05	89	-3.0	-	4.54	-0.02	86	393	86	75
329	51.386	0.155	0.072	1.04	89	-3.1	-	4.53	-0.01	86	391	86	75
330	51.543	0.157	0.070	1.04	89	-2.9	99	4.51	-0.02	86	389	85	75
331	51.700	0.157	0.070	1.05	90	-3.1	-	4.50	-0.01	86	388	84	75
332	51.855	0.155	0.069	1.05	89	-3.1	-	4.48	-0.02	85	385	83	75
333	52.012	0.157	0.070	1.05	90	-3.1	-	4.46	-0.02	85	384	83	75
334	52.171	0.159	0.070	1.04	89	-3.0	-	4.45	-0.01	85	382	83	75
335	52.324	0.153	0.069	1.05	90	-3.0	-	4.43	-0.02	85	381	84	75
336	52.485	0.161	0.071	1.06	89	-3.1	-	4.41	-0.02	85	380	84	75
337	52.638	0.153	0.070	1.05	89	-3.1	-	4.40	-0.01	85	378	84	75
338	52.794	0.156	0.072	1.05	89	-3.0	-	4.38	-0.02	85	376	84	75
339	52.951	0.157	0.071	1.05	90	-3.0	-	4.36	-0.02	85	375	85	75
340	53.106	0.155	0.070	1.05	91	-3.1	100	4.35	-0.01	85	374	84	75
341	53.266	0.160	0.070	1.05	89	-3.0	-	4.33	-0.02	85	373	84	75
342	53.423	0.157	0.069	1.05	88	-3.1	-	4.32	-0.01	85	371	83	75
343	53.578	0.155	0.071	1.04	88	-3.1	-	4.30	-0.02	84	370	83	75
344	53.735	0.157	0.071	1.05	89	-3.1	-	4.29	-0.01	85	369	83	75
345	53.892	0.157	0.070	1.04	90	-3.1	-	4.27	-0.02	84	368	84	74
346	54.045	0.153	0.069	1.05	90	-3.0	-	4.25	-0.02	85	368	85	75
347	54.205	0.160	0.070	1.05	90	-3.1	-	4.24	-0.01	85	367	85	75
348	54.360	0.155	0.071	1.05	89	-3.1	-	4.22	-0.02	84	366	84	75
349	54.516	0.156	0.070	1.04	89	-3.1	-	4.21	-0.01	84	365	83	75
350	54.674	0.158	0.071	1.04	89	-3.1	100	4.20	-0.01	84	364	83	75
351	54.827	0.153	0.069	1.04	89	-3.0	-	4.18	-0.02	84	362	83	75

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: IHP Job #: 25-416
 Model: Montecito-C Tracking #: 223
 Run #: 1 Technician: AK
 Date: 5/27/2025

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	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
352	54.986	0.159	0.070	1.06	89	-3.1	-	4.16	-0.02	84	362	84	75
353	55.143	0.157	0.070	1.05	89	-3.1	-	4.15	-0.01	84	360	84	74
354	55.298	0.155	0.071	1.05	89	-3.1	-	4.13	-0.02	84	359	85	75
355	55.455	0.157	0.070	1.06	90	-3.0	-	4.12	-0.01	84	358	84	74
356	55.609	0.154	0.070	1.05	89	-3.1	-	4.11	-0.01	84	357	84	74
357	55.767	0.158	0.070	1.04	89	-3.1	-	4.09	-0.02	84	356	83	74
358	55.924	0.157	0.072	1.04	88	-3.1	-	4.08	-0.01	84	356	83	74
359	56.081	0.157	0.070	1.05	88	-3.1	-	4.06	-0.02	84	355	83	74
360	56.236	0.155	0.070	1.04	89	-3.1	99	4.05	-0.01	84	354	84	74
361	56.393	0.157	0.070	1.05	90	-3.0	-	4.03	-0.02	84	351	84	74
362	56.549	0.156	0.070	1.05	89	-3.1	-	4.02	-0.01	84	350	83	74
363	56.705	0.156	0.071	1.05	89	-3.1	-	4.01	-0.01	84	349	83	74
364	56.862	0.157	0.070	1.05	89	-3.1	-	3.99	-0.02	84	348	83	74
365	57.017	0.155	0.070	1.04	89	-3.0	-	3.98	-0.01	84	348	84	74
366	57.174	0.157	0.069	1.05	89	-3.1	-	3.97	-0.01	83	347	84	74
367	57.331	0.157	0.071	1.05	90	-3.1	-	3.95	-0.02	84	347	85	74
368	57.486	0.155	0.071	1.04	87	-3.1	-	3.94	-0.01	84	346	85	74
369	57.643	0.157	0.070	1.05	89	-3.0	-	3.93	-0.01	84	344	85	74
370	57.800	0.157	0.071	1.04	89	-3.0	99	3.92	-0.01	83	343	84	74
371	57.955	0.155	0.070	1.05	88	-3.1	-	3.90	-0.02	83	342	83	74
372	58.111	0.156	0.070	1.05	89	-3.1	-	3.89	-0.01	83	342	83	74
373	58.269	0.158	0.069	1.05	90	-3.0	-	3.87	-0.02	83	341	83	74
374	58.423	0.154	0.070	1.05	89	-3.1	-	3.86	-0.01	83	340	84	74
375	58.580	0.157	0.070	1.06	88	-3.1	-	3.84	-0.02	83	339	84	74
376	58.737	0.157	0.071	1.04	89	-3.1	-	3.83	-0.01	83	339	84	74
377	58.892	0.155	0.070	1.05	88	-3.0	-	3.82	-0.01	83	338	84	74
378	59.050	0.158	0.070	1.06	89	-3.0	-	3.80	-0.02	83	337	83	74
379	59.205	0.155	0.070	1.05	89	-3.1	-	3.79	-0.01	83	336	83	74
380	59.361	0.156	0.070	1.05	88	-3.0	99	3.78	-0.01	83	335	83	74
381	59.518	0.157	0.071	1.05	88	-3.0	-	3.76	-0.02	83	335	83	74
382	59.674	0.156	0.070	1.05	89	-3.0	-	3.75	-0.01	83	333	84	74
383	59.830	0.156	0.070	1.04	88	-3.1	-	3.74	-0.01	83	333	85	74

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: IHPJob #: 25-416Model: Montecito-CTracking #: 223Run #: 1Technician: AKDate: 5/27/2025

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	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
384	59.987	0.157	0.070	1.05	89	-3.0	-	3.73	-0.01	83	333	85	74
385	60.142	0.155	0.070	1.05	88	-3.1	-	3.71	-0.02	83	332	85	74
386	60.299	0.157	0.070	1.05	89	-3.1	-	3.70	-0.01	83	332	85	74
387	60.456	0.157	0.071	1.05	88	-3.1	-	3.68	-0.02	83	331	84	74
388	60.611	0.155	0.070	1.05	89	-3.1	-	3.67	-0.01	83	330	84	74
389	60.768	0.157	0.071	1.05	88	-3.1	-	3.66	-0.01	83	329	83	74
390	60.925	0.157	0.071	1.04	89	-3.0	99	3.65	-0.01	83	329	83	74
391	61.080	0.155	0.069	1.04	89	-3.0	-	3.64	-0.01	83	328	83	74
392	61.237	0.157	0.071	1.05	89	-3.0	-	3.62	-0.02	83	327	84	74
393	61.394	0.157	0.071	1.04	87	-3.1	-	3.61	-0.01	83	327	84	74
394	61.549	0.155	0.070	1.05	89	-3.1	-	3.60	-0.01	83	326	84	74
395	61.706	0.157	0.072	1.05	88	-3.1	-	3.59	-0.01	83	325	84	74
396	61.862	0.156	0.071	1.04	89	-3.1	-	3.57	-0.02	83	325	83	74
397	62.017	0.155	0.070	1.05	88	-3.0	-	3.56	-0.01	83	324	83	74
398	62.175	0.158	0.071	1.05	88	-3.0	-	3.54	-0.02	82	324	83	74
399	62.330	0.155	0.072	1.04	88	-3.0	-	3.53	-0.01	83	324	84	74
400	62.486	0.156	0.072	1.04	88	-3.0	98	3.52	-0.01	82	323	85	74
401	62.643	0.157	0.072	1.05	89	-3.0	-	3.51	-0.01	82	323	85	74
402	62.798	0.155	0.071	1.05	90	-3.1	-	3.50	-0.01	82	322	85	74
403	62.955	0.157	0.071	1.04	89	-3.1	-	3.49	-0.01	82	321	84	74
404	63.112	0.157	0.071	1.03	89	-3.0	-	3.48	-0.01	82	321	83	74
405	63.267	0.155	0.070	1.04	89	-3.1	-	3.46	-0.02	82	320	83	74
406	63.424	0.157	0.072	1.04	89	-3.0	-	3.45	-0.01	82	319	83	74
407	63.580	0.156	0.071	1.05	89	-3.0	-	3.44	-0.01	82	319	84	74
408	63.735	0.155	0.072	1.05	88	-3.0	99	3.43	-0.01	82	318	84	74
Avg/Tot	63.752	0.156	0.071	1.05	87.4	-2.2	100			89.9	580.9	83.8	74.1

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: IHP
 Model: Montecito-C
 Run #: 1

Job #: 25-416
 Tracking #: 223
 Technician: AK
 Date: 5/27/2025

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	-0.020		0.75	68	-1.5		81	0.004	0.07	0.008
1	0.134	0.154	1.33	68	-1.5	-	81	0.001	2.77	0.232
2	0.303	0.169	1.28	68	-1.5	-	82	0.001	5.32	0.261
3	0.464	0.161	1.19	68	-1.5	-	82	0.002	9.66	0.196
4	0.624	0.160	1.19	68	-1.5	-	82	0.002	10.24	0.287
5	0.784	0.160	1.19	68	-1.4	-	83	0.005	10.25	0.178
6	0.944	0.160	1.17	68	-1.5	-	84	0.007	9.91	0.136
7	1.103	0.159	1.19	68	-1.3	-	84	0.002	11.42	0.183
8	1.263	0.160	1.19	68	-1.4	-	85	0.004	11.19	0.106
9	1.422	0.159	1.18	69	-1.5	-	85	0.005	11.73	0.095
10	1.580	0.158	1.18	69	-1.4	103	84	0.004	11.67	0.113
11	1.739	0.159	1.17	69	-1.3	-	85	0.002	10.70	0.050
12	1.896	0.157	1.17	69	-1.4	-	84	0.002	10.29	0.060
13	2.056	0.160	1.16	69	-1.5	-	83	0.000	12.87	0.055
14	2.212	0.156	1.15	70	-1.3	-	85	0.003	13.28	0.132
15	2.372	0.160	1.14	70	-1.5	-	85	0.004	12.85	0.136
16	2.528	0.156	1.14	69	-1.3	-	85	0.010	12.18	0.079
17	2.686	0.158	1.14	70	-1.4	-	86	0.003	4.02	0.231
18	2.844	0.158	1.15	70	-1.3	-	86	0.002	10.98	0.511
19	3.000	0.156	1.15	70	-1.4	-	85	0.002	11.91	0.145
20	3.158	0.158	1.17	70	-1.4	104	85	0.002	12.93	0.075
21	3.314	0.156	1.17	71	-1.5	-	86	0.003	13.38	0.087
22	3.472	0.158	1.14	71	-1.5	-	87	0.005	13.68	0.087
23	3.629	0.157	1.13	72	-1.4	-	87	0.005	13.90	0.128
24	3.785	0.156	1.15	72	-1.3	-	87	0.005	13.89	0.118
25	3.943	0.158	1.13	72	-1.5	-	87	0.007	12.50	0.060
26	4.099	0.156	1.14	72	-1.4	-	86	0.004	11.83	0.043
27	4.255	0.156	1.14	72	-1.3	-	86	0.001	11.58	0.031
28	4.413	0.158	1.14	72	-1.4	-	86	-0.003	11.10	0.027
29	4.568	0.155	1.13	73	-1.3	-	86	0.006	10.79	0.025
30	4.726	0.158	1.15	73	-1.4	104	86	0.005	11.56	0.036
31	4.883	0.157	1.14	73	-1.5	-	86	0.006	12.17	0.285

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: IHP
 Model: Montecito-C
 Run #: 1

Job #: 25-416
 Tracking #: 223
 Technician: AK
 Date: 5/27/2025

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 (%)
32	5.039	0.156	1.12	73	-1.4	-	85	0.007	9.19	0.067
33	5.197	0.158	1.16	74	-1.4	-	86	0.002	8.02	0.119
34	5.353	0.156	1.16	74	-1.4	-	86	0.001	7.31	0.228
35	5.510	0.157	1.15	74	-1.5	-	86	0.008	6.59	0.414
36	5.668	0.158	1.17	75	-1.4	-	86	0.004	6.41	0.414
37	5.824	0.156	1.14	75	-1.4	-	86	0.007	6.51	0.389
38	5.982	0.158	1.15	75	-1.4	-	85	0.010	6.60	0.331
39	6.138	0.156	1.13	76	-1.3	-	85	0.008	6.87	0.265
40	6.296	0.158	1.16	75	-1.4	102	85	0.004	7.14	0.208
41	6.454	0.158	1.14	76	-1.4	-	85	0.002	7.23	0.188
42	6.610	0.156	1.14	76	-1.4	-	84	0.007	7.56	0.136
43	6.768	0.158	1.14	76	-1.4	-	83	0.006	7.80	0.158
44	6.925	0.157	1.15	77	-1.3	-	84	0.009	7.74	0.140
45	7.083	0.158	1.15	77	-1.4	-	84	0.005	7.66	0.109
46	7.241	0.158	1.15	77	-1.4	-	85	0.007	7.69	0.126
47	7.397	0.156	1.15	77	-1.4	-	85	0.002	7.64	0.119
48	7.556	0.159	1.16	78	-1.4	-	86	0.003	7.67	0.092
49	7.712	0.156	1.14	78	-1.3	-	87	0.005	7.62	0.108
50	7.871	0.159	1.16	78	-1.4	101	86	0.010	7.58	0.124
51	8.028	0.157	1.14	78	-1.4	-	85	0.006	7.58	0.117
52	8.186	0.158	1.16	79	-1.4	-	85	0.004	7.49	0.145
53	8.344	0.158	1.16	79	-1.3	-	85	0.009	7.51	0.109
54	8.500	0.156	1.17	79	-1.4	-	85	0.008	7.60	0.097
55	8.659	0.159	1.16	79	-1.4	-	84	0.003	7.39	0.074
56	8.816	0.157	1.16	79	-1.4	-	85	0.006	7.28	0.081
57	8.975	0.159	1.16	79	-1.4	-	86	0.007	7.33	0.089
58	9.133	0.158	1.16	79	-1.4	-	85	0.008	7.46	0.074
59	9.290	0.157	1.14	80	-1.4	-	86	0.012	7.54	0.068
60	9.449	0.159	1.14	81	-1.4	101	86	0.008	7.51	0.070
61	9.605	0.156	1.13	80	-1.4	-	84	0.005	7.62	0.080
62	9.764	0.159	1.14	80	-1.4	-	85	0.011	7.65	0.069
63	9.921	0.157	1.14	80	-1.4	-	84	0.005	7.69	0.047

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: IHP
 Model: Montecito-C
 Run #: 1

Job #: 25-416
 Tracking #: 223
 Technician: AK
 Date: 5/27/2025

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 (%)
64	10.080	0.159	1.16	81	-1.3	-	85	0.004	7.80	0.043
65	10.238	0.158	1.18	81	-1.3	-	84	0.002	7.74	0.037
66	10.396	0.158	1.16	81	-1.4	-	85	0.007	7.70	0.042
67	10.555	0.159	1.14	81	-1.3	-	85	0.007	7.51	0.054
68	10.712	0.157	1.16	82	-1.3	-	85	0.007	7.37	0.064
69	10.871	0.159	1.18	82	-1.4	-	85	0.002	7.19	0.075
70	11.028	0.157	1.15	82	-1.3	100	85	0.007	7.21	0.081
71	11.188	0.160	1.16	81	-1.4	-	85	0.003	7.15	0.089
72	11.344	0.156	1.16	82	-1.4	-	86	0.008	2.79	0.135
73	11.503	0.159	1.17	82	-1.4	-	87	0.006	10.88	0.066
74	11.661	0.158	1.17	82	-1.4	-	86	0.003	12.58	0.101
75	11.818	0.157	1.16	82	-1.4	-	87	0.014	12.60	0.063
76	11.977	0.159	1.16	82	-1.4	-	86	0.003	11.45	0.130
77	12.134	0.157	1.15	83	-1.4	-	85	0.006	10.99	0.096
78	12.293	0.159	1.17	83	-1.4	-	85	0.006	11.04	0.087
79	12.450	0.157	1.16	83	-1.4	-	85	0.008	10.69	0.087
80	12.608	0.158	1.14	83	-1.4	100	85	0.005	10.17	0.082
81	12.767	0.159	1.15	84	-1.4	-	87	0.008	9.42	0.066
82	12.924	0.157	1.17	83	-1.4	-	86	0.008	9.12	0.049
83	13.083	0.159	1.15	84	-1.4	-	86	0.005	8.87	0.055
84	13.240	0.157	1.15	83	-1.4	-	85	0.002	8.85	0.050
85	13.400	0.160	1.16	84	-1.4	-	86	0.008	8.71	0.044
86	13.556	0.156	1.16	84	-1.4	-	86	0.011	8.77	0.043
87	13.716	0.160	1.15	84	-1.4	-	85	0.006	9.00	0.048
88	13.873	0.157	1.14	84	-1.4	-	85	0.007	9.16	0.061
89	14.032	0.159	1.14	84	-1.4	-	85	0.006	9.58	0.111
90	14.191	0.159	1.18	85	-1.4	99	86	0.005	9.60	0.139
91	14.348	0.157	1.16	84	-1.3	-	85	0.007	9.35	0.089
92	14.507	0.159	1.14	85	-1.3	-	86	0.013	8.99	0.076
93	14.664	0.157	1.15	85	-1.3	-	86	0.009	8.64	0.062
94	14.824	0.160	1.14	85	-1.4	-	86	0.007	8.36	0.056
95	14.981	0.157	1.14	85	-1.4	-	85	0.006	8.03	0.054

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: IHP
 Model: Montecito-C
 Run #: 1

Job #: 25-416
 Tracking #: 223
 Technician: AK
 Date: 5/27/2025

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 (%)
96	15.140	0.159	1.15	85	-1.4	-	86	0.006	7.69	0.057
97	15.297	0.157	1.15	85	-1.4	-	85	0.008	7.42	0.083
98	15.456	0.159	1.16	85	-1.4	-	86	0.010	7.16	0.108
99	15.615	0.159	1.15	85	-1.4	-	85	0.007	7.03	0.126
100	15.773	0.158	1.12	86	-1.4	99	86	0.006	6.91	0.146
101	15.932	0.159	1.15	85	-1.4	-	86	0.014	6.84	0.167
102	16.089	0.157	1.14	85	-1.4	-	86	0.006	6.82	0.183
103	16.249	0.160	1.14	86	-1.3	-	86	-0.001	6.81	0.170
104	16.405	0.156	1.13	86	-1.3	-	85	0.004	6.84	0.176
105	16.564	0.159	1.15	86	-1.4	-	86	0.009	6.92	0.168
106	16.722	0.158	1.16	86	-1.4	-	86	0.005	6.87	0.163
107	16.881	0.159	1.16	86	-1.4	-	86	0.006	6.82	0.170
108	17.039	0.158	1.15	86	-1.4	-	85	0.005	6.84	0.171
109	17.198	0.159	1.14	87	-1.4	-	86	0.008	6.82	0.156
110	17.357	0.159	1.15	87	-1.3	100	86	0.004	6.72	0.141
111	17.514	0.157	1.15	87	-1.4	-	86	0.010	6.72	0.137
112	17.674	0.160	1.14	86	-1.4	-	85	0.008	6.75	0.124
113	17.831	0.157	1.15	86	-1.4	-	85	0.008	6.65	0.124
114	17.991	0.160	1.14	87	-1.4	-	85	0.008	6.53	0.122
115	18.148	0.157	1.15	87	-1.3	-	85	0.007	6.52	0.132
116	18.308	0.160	1.14	87	-1.4	-	85	0.011	6.54	0.133
117	18.465	0.157	1.15	87	-1.3	-	85	0.009	6.54	0.125
118	18.625	0.160	1.13	87	-1.4	-	85	0.007	6.49	0.130
119	18.783	0.158	1.15	87	-1.4	-	85	0.006	6.47	0.123
120	18.942	0.159	1.16	87	-1.3	100	85	0.005	6.48	0.118
121	19.101	0.159	1.15	87	-1.4	-	85	0.008	6.48	0.112
122	19.259	0.158	1.14	88	-1.4	-	85	0.004	6.50	0.105
123	19.419	0.160	1.16	87	-1.4	-	85	0.008	6.46	0.098
124	19.576	0.157	1.15	88	-1.4	-	86	0.010	6.35	0.096
125	19.736	0.160	1.15	87	-1.4	-	86	0.004	6.41	0.085
126	19.893	0.157	1.14	88	-1.4	-	87	0.007	6.39	0.077
127	20.053	0.160	1.14	87	-1.4	-	86	0.007	6.37	0.080

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: IHP
 Model: Montecito-C
 Run #: 1

Job #: 25-416
 Tracking #: 223
 Technician: AK
 Date: 5/27/2025

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 (%)
128	20.210	0.157	1.18	88	-1.4	-	86	0.005	6.34	0.075
129	20.370	0.160	1.15	87	-1.4	-	86	0.009	6.29	0.082
130	20.528	0.158	1.16	88	-1.4	100	86	0.010	6.29	0.076
131	20.687	0.159	1.14	88	-1.4	-	86	0.009	6.11	0.082
132	20.845	0.158	1.16	88	-1.4	-	87	0.008	2.91	0.133
133	21.003	0.158	1.15	88	-1.4	-	87	0.011	2.45	0.194
134	21.163	0.160	1.14	88	-1.4	-	86	0.003	6.36	0.469
135	21.320	0.157	1.14	88	-1.4	-	87	0.007	9.58	0.104
136	21.480	0.160	1.14	89	-1.4	-	87	0.007	10.43	0.083
137	21.637	0.157	1.15	88	-1.4	-	86	0.006	10.71	0.276
138	21.797	0.160	1.16	88	-1.4	-	86	0.007	8.41	0.183
139	21.955	0.158	1.15	88	-1.4	-	86	0.002	8.20	0.340
140	22.115	0.160	1.15	89	-1.4	99	86	0.005	8.98	0.176
141	22.273	0.158	1.13	89	-1.3	-	86	0.005	9.57	0.069
142	22.433	0.160	1.16	89	-1.4	-	87	0.005	9.99	0.064
143	22.591	0.158	1.15	89	-1.4	-	87	0.009	10.11	0.063
144	22.750	0.159	1.12	89	-1.4	-	86	0.007	10.06	0.067
145	22.909	0.159	1.16	88	-1.3	-	86	0.006	9.79	0.077
146	23.068	0.159	1.16	89	-1.4	-	86	0.004	9.64	0.088
147	23.227	0.159	1.15	89	-1.4	-	87	0.011	9.43	0.100
148	23.386	0.159	1.15	89	-1.4	-	86	0.007	9.33	0.093
149	23.545	0.159	1.17	89	-1.4	-	86	0.008	9.33	0.090
150	23.703	0.158	1.14	89	-1.4	100	86	0.007	9.46	0.087
151	23.863	0.160	1.15	89	-1.4	-	85	0.011	9.39	0.081
152	24.021	0.158	1.16	89	-1.4	-	86	0.007	9.37	0.077
153	24.181	0.160	1.15	89	-1.4	-	86	0.002	9.59	0.082
154	24.338	0.157	1.17	89	-1.4	-	86	0.013	9.78	0.072
155	24.499	0.161	1.14	89	-1.3	-	86	0.012	10.11	0.100
156	24.656	0.157	1.16	89	-1.4	-	86	0.005	10.15	0.093
157	24.817	0.161	1.14	90	-1.4	-	87	0.008	9.68	0.082
158	24.974	0.157	1.15	89	-1.4	-	85	0.007	9.36	0.074
159	25.135	0.161	1.15	89	-1.3	-	86	0.008	8.94	0.084

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: IHP
 Model: Montecito-C
 Run #: 1

Job #: 25-416
 Tracking #: 223
 Technician: AK
 Date: 5/27/2025

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 (%)
160	25.292	0.157	1.16	89	-1.4	100	86	0.010	8.67	0.086
161	25.452	0.160	1.15	90	-1.4	-	86	0.006	8.36	0.092
162	25.611	0.159	1.16	89	-1.4	-	86	0.010	8.19	0.104
163	25.770	0.159	1.15	90	-1.4	-	86	0.011	8.05	0.111
164	25.929	0.159	1.14	90	-1.3	-	86	0.005	8.04	0.109
165	26.088	0.159	1.15	90	-1.4	-	87	0.006	7.92	0.122
166	26.247	0.159	1.15	90	-1.4	-	86	0.004	7.91	0.125
167	26.406	0.159	1.16	90	-1.3	-	86	0.006	7.83	0.125
168	26.566	0.160	1.15	90	-1.4	-	86	0.003	7.77	0.127
169	26.724	0.158	1.14	90	-1.3	-	87	0.009	7.73	0.127
170	26.884	0.160	1.14	90	-1.3	100	86	0.006	7.65	0.120
171	27.042	0.158	1.14	90	-1.4	-	87	0.014	7.59	0.129
172	27.202	0.160	1.14	90	-1.4	-	86	0.011	7.54	0.124
173	27.360	0.158	1.16	90	-1.3	-	87	0.013	7.49	0.134
174	27.520	0.160	1.14	90	-1.3	-	87	0.011	7.47	0.134
175	27.678	0.158	1.13	90	-1.4	-	86	0.007	7.48	0.156
176	27.838	0.160	1.16	90	-1.3	-	87	0.005	7.43	0.169
177	27.996	0.158	1.15	90	-1.4	-	87	0.008	7.42	0.156
178	28.151	0.155	1.13	91	-1.5	-	87	0.007	7.43	0.144
179	28.310	0.159	1.16	90	-1.4	-	86	0.007	7.53	0.146
180	28.469	0.159	1.15	90	-1.4	100	86	0.009	7.50	0.134
181	28.628	0.159	1.15	91	-1.4	-	87	0.010	7.53	0.115
182	28.787	0.159	1.16	91	-1.4	-	87	0.004	7.53	0.103
183	28.947	0.160	1.16	90	-1.4	-	86	0.006	7.56	0.109
184	29.108	0.161	1.16	91	-1.4	-	87	0.010	7.60	0.101
185	29.265	0.157	1.17	90	-1.3	-	86	0.004	7.81	0.084
186	29.422	0.157	1.14	90	-1.3	-	86	0.007	7.92	0.079
187	29.583	0.161	1.15	91	-1.4	-	87	0.010	7.95	0.073
188	29.743	0.160	1.16	91	-1.3	-	86	0.009	7.93	0.071
189	29.901	0.158	1.16	90	-1.3	-	86	0.009	7.94	0.073
190	30.062	0.161	1.15	91	-1.3	101	87	0.008	8.01	0.078
191	30.219	0.157	1.14	90	-1.4	-	86	0.006	7.97	0.076

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: IHP
 Model: Montecito-C
 Run #: 1

Job #: 25-416
 Tracking #: 223
 Technician: AK
 Date: 5/27/2025

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 (%)
192	30.377	0.158	1.16	91	-1.4	-	86	0.010	7.93	0.086
193	30.537	0.160	1.15	90	-1.3	-	86	0.005	7.89	0.086
194	30.695	0.158	1.15	91	-1.4	-	87	0.008	7.87	0.084
195	30.855	0.160	1.15	91	-1.3	-	87	0.006	7.86	0.080
196	31.016	0.161	1.15	90	-1.4	-	87	-0.001	7.92	0.078
197	31.173	0.157	1.16	91	-1.4	-	87	0.011	7.85	0.079
198	31.332	0.159	1.14	91	-1.3	-	87	0.010	7.86	0.089
199	31.491	0.159	1.14	90	-1.4	-	86	0.008	7.92	0.084
200	31.650	0.159	1.14	91	-1.4	100	87	0.007	7.90	0.087
201	31.809	0.159	1.15	91	-1.4	-	87	0.004	7.98	0.091
202	31.969	0.160	1.15	91	-1.3	-	87	0.008	7.99	0.096
203	32.128	0.159	1.15	91	-1.4	-	87	0.010	8.12	0.103
204	32.289	0.161	1.16	91	-1.4	-	86	0.005	8.08	0.107
205	32.445	0.156	1.15	91	-1.5	-	86	0.010	8.08	0.103
206	32.608	0.163	1.15	91	-1.5	-	87	0.010	8.08	0.117
207	32.767	0.159	1.17	91	-1.4	-	87	0.006	8.08	0.107
208	32.924	0.157	1.14	91	-1.3	-	86	0.010	8.13	0.103
209	33.081	0.157	1.14	91	-1.3	-	87	0.003	8.26	0.114
210	33.242	0.161	1.16	91	-1.4	99	86	0.011	8.34	0.111
211	33.399	0.157	1.14	91	-1.4	-	86	0.007	8.41	0.100
212	33.560	0.161	1.14	91	-1.4	-	86	0.008	8.47	0.127
213	33.717	0.157	1.14	91	-1.4	-	86	0.009	8.50	0.109
214	33.877	0.160	1.14	91	-1.4	-	86	0.007	8.62	0.112
215	34.035	0.158	1.15	91	-1.4	-	87	0.005	8.64	0.104
216	34.195	0.160	1.15	91	-1.4	-	86	0.005	8.49	0.089
217	34.353	0.158	1.14	91	-1.3	-	87	0.013	8.41	0.087
218	34.513	0.160	1.16	91	-1.4	-	87	0.007	8.51	0.087
219	34.671	0.158	1.16	91	-1.3	-	86	0.008	8.59	0.077
220	34.830	0.159	1.15	91	-1.4	100	86	0.011	8.62	0.095
221	34.989	0.159	1.15	91	-1.4	-	86	0.010	8.76	0.090
222	35.148	0.159	1.15	91	-1.3	-	86	0.008	8.62	0.088
223	35.308	0.160	1.14	91	-1.4	-	86	0.005	8.31	0.084

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: IHP
 Model: Montecito-C
 Run #: 1

Job #: 25-416
 Tracking #: 223
 Technician: AK
 Date: 5/27/2025

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 (%)
224	35.469	0.161	1.16	91	-1.5	-	87	0.003	8.01	0.078
225	35.625	0.156	1.13	91	-1.4	-	87	0.008	7.87	0.075
226	35.783	0.158	1.14	91	-1.4	-	86	0.011	7.61	0.067
227	35.943	0.160	1.16	91	-1.3	-	86	0.004	7.42	0.078
228	36.100	0.157	1.15	91	-1.4	-	87	0.006	7.29	0.079
229	36.261	0.161	1.14	92	-1.5	-	87	0.009	7.10	0.076
230	36.418	0.157	1.16	91	-1.3	100	86	0.005	7.02	0.079
231	36.578	0.160	1.14	91	-1.4	-	86	0.006	6.96	0.073
232	36.736	0.158	1.15	91	-1.4	-	87	0.007	7.05	0.064
233	36.896	0.160	1.15	92	-1.5	-	87	0.008	7.09	0.061
234	37.054	0.158	1.16	91	-1.4	-	86	0.007	6.72	0.078
235	37.213	0.159	1.14	92	-1.3	-	87	0.002	6.59	0.093
236	37.372	0.159	1.16	91	-1.5	-	87	0.011	6.50	0.101
237	37.531	0.159	1.12	92	-1.5	-	87	0.008	6.44	0.099
238	37.690	0.159	1.13	92	-1.4	-	87	0.008	6.33	0.085
239	37.848	0.158	1.15	91	-1.4	-	87	0.004	6.21	0.084
240	38.008	0.160	1.15	92	-1.4	99	87	0.003	6.18	0.089
241	38.166	0.158	1.15	91	-1.3	-	87	0.010	6.19	0.095
242	38.326	0.160	1.15	91	-1.4	-	86	0.007	6.13	0.097
243	38.483	0.157	1.14	92	-1.4	-	87	0.004	6.10	0.101
244	38.643	0.160	1.12	92	-1.4	-	87	0.008	6.07	0.103
245	38.803	0.160	1.14	92	-1.5	-	87	0.007	5.96	0.105
246	38.961	0.158	1.16	91	-1.4	-	86	0.009	5.75	0.111
247	39.118	0.157	1.15	92	-1.5	-	87	0.009	5.64	0.119
248	39.278	0.160	1.15	91	-1.4	-	86	0.006	5.63	0.114
249	39.439	0.161	1.15	92	-1.4	-	86	0.005	5.49	0.128
250	39.596	0.157	1.15	92	-1.4	99	86	0.008	5.50	0.139
251	39.754	0.158	1.14	92	-1.4	-	87	0.010	5.48	0.142
252	39.913	0.159	1.16	92	-1.4	-	87	0.007	5.47	0.128
253	40.074	0.161	1.14	92	-1.4	-	87	0.004	5.50	0.156
254	40.231	0.157	1.16	92	-1.4	-	86	0.007	5.46	0.147
255	40.391	0.160	1.14	92	-1.5	-	87	0.010	5.44	0.130

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: IHP
 Model: Montecito-C
 Run #: 1

Job #: 25-416
 Tracking #: 223
 Technician: AK
 Date: 5/27/2025

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 (%)
256	40.549	0.158	1.15	92	-1.3	-	87	0.006	5.42	0.132
257	40.708	0.159	1.16	92	-1.4	-	87	0.009	5.35	0.155
258	40.866	0.158	1.13	92	-1.3	-	87	0.006	5.30	0.145
259	41.026	0.160	1.16	92	-1.4	-	86	0.008	5.32	0.174
260	41.186	0.160	1.15	92	-1.5	99	87	0.004	5.29	0.191
261	41.344	0.158	1.15	92	-1.4	-	86	0.008	5.26	0.196
262	41.501	0.157	1.13	92	-1.3	-	87	0.009	5.22	0.200
263	41.661	0.160	1.16	92	-1.4	-	87	0.009	5.30	0.195
264	41.819	0.158	1.15	92	-1.4	-	86	0.003	5.28	0.187
265	41.979	0.160	1.15	92	-1.4	-	86	0.005	5.34	0.174
266	42.139	0.160	1.14	92	-1.4	-	87	0.011	5.31	0.172
267	42.296	0.157	1.15	92	-1.4	-	86	0.008	5.32	0.152
268	42.455	0.159	1.13	92	-1.3	-	87	0.009	5.33	0.166
269	42.614	0.159	1.16	92	-1.3	-	86	0.005	5.29	0.159
270	42.773	0.159	1.14	92	-1.5	99	87	0.006	5.34	0.157
271	42.931	0.158	1.15	92	-1.4	-	86	0.006	5.30	0.143
272	43.091	0.160	1.12	92	-1.4	-	87	0.005	5.28	0.146
273	43.248	0.157	1.12	92	-1.4	-	86	0.007	5.21	0.152
274	43.408	0.160	1.15	92	-1.3	-	86	0.009	5.21	0.152
275	43.566	0.158	1.13	92	-1.5	-	87	0.004	5.19	0.143
276	43.726	0.160	1.13	92	-1.5	-	86	0.009	5.25	0.149
277	43.883	0.157	1.15	92	-1.3	-	86	0.005	5.35	0.160
278	44.043	0.160	1.13	92	-1.4	-	87	0.010	5.34	0.156
279	44.201	0.158	1.13	92	-1.4	-	86	0.006	4.93	0.169
280	44.361	0.160	1.15	92	-1.3	100	86	0.005	4.60	0.222
281	44.519	0.158	1.14	92	-1.4	-	86	0.003	4.51	0.242
282	44.678	0.159	1.15	93	-1.3	-	87	0.004	4.48	0.246
283	44.837	0.159	1.13	92	-1.5	-	87	0.013	4.47	0.252
284	44.996	0.159	1.14	93	-1.5	-	87	0.007	4.45	0.240
285	45.155	0.159	1.16	93	-1.4	-	87	0.006	4.50	0.253
286	45.313	0.158	1.14	93	-1.4	-	87	0.008	4.49	0.246
287	45.473	0.160	1.15	92	-1.3	-	87	0.013	4.44	0.251

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: IHP
 Model: Montecito-C
 Run #: 1

Job #: 25-416
 Tracking #: 223
 Technician: AK
 Date: 5/27/2025

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 (%)
288	45.630	0.157	1.16	92	-1.3	-	86	0.009	4.45	0.243
289	45.793	0.163	1.13	92	-1.4	-	86	0.009	4.41	0.243
290	45.948	0.155	1.12	92	-1.4	100	86	0.006	4.38	0.248
291	46.108	0.160	1.13	92	-1.4	-	86	0.009	4.36	0.261
292	46.266	0.158	1.14	93	-1.4	-	86	0.011	4.41	0.261
293	46.426	0.160	1.13	92	-1.4	-	85	0.004	4.38	0.264
294	46.586	0.160	1.14	92	-1.4	-	86	0.005	4.40	0.262
295	46.746	0.160	1.15	92	-1.5	-	86	0.009	4.46	0.277
296	46.904	0.158	1.13	92	-1.3	-	86	0.010	4.45	0.283
297	47.061	0.157	1.14	92	-1.3	-	86	0.005	4.45	0.289
298	47.221	0.160	1.14	92	-1.5	-	86	0.010	4.45	0.282
299	47.382	0.161	1.14	93	-1.4	-	87	0.008	4.43	0.287
300	47.539	0.157	1.15	92	-1.4	100	86	0.007	4.40	0.286
301	47.696	0.157	1.15	93	-1.4	-	86	0.008	4.40	0.297
302	47.857	0.161	1.14	92	-1.4	-	86	0.008	4.34	0.312
303	48.013	0.156	1.14	93	-1.4	-	87	0.004	4.38	0.331
304	48.175	0.162	1.15	93	-1.4	-	86	0.005	4.34	0.333
305	48.331	0.156	1.13	93	-1.3	-	87	0.011	4.37	0.353
306	48.491	0.160	1.13	93	-1.3	-	86	0.005	4.34	0.358
307	48.648	0.157	1.15	93	-1.3	-	86	0.011	4.26	0.378
308	48.811	0.163	1.12	93	-1.3	-	86	0.009	4.23	0.410
309	48.966	0.155	1.15	92	-1.5	-	86	0.010	4.18	0.452
310	49.126	0.160	1.14	92	-1.4	99	85	0.007	4.10	0.478
311	49.284	0.158	1.15	93	-1.5	-	86	0.009	4.12	0.484
312	49.444	0.160	1.16	93	-1.3	-	86	0.008	4.03	0.462
313	49.604	0.160	1.15	93	-1.3	-	87	0.009	4.01	0.450
314	49.761	0.157	1.13	93	-1.5	-	86	0.011	3.99	0.436
315	49.920	0.159	1.15	92	-1.4	-	86	0.006	3.94	0.417
316	50.079	0.159	1.15	93	-1.4	-	86	0.011	3.96	0.406
317	50.238	0.159	1.15	93	-1.4	-	86	0.005	3.90	0.394
318	50.397	0.159	1.14	92	-1.5	-	86	0.006	3.84	0.386
319	50.556	0.159	1.13	92	-1.3	-	86	0.007	3.87	0.381

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: IHP
 Model: Montecito-C
 Run #: 1

Job #: 25-416
 Tracking #: 223
 Technician: AK
 Date: 5/27/2025

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 (%)
320	50.714	0.158	1.15	93	-1.4	99	86	0.008	3.87	0.378
321	50.874	0.160	1.16	93	-1.4	-	87	0.010	3.83	0.376
322	51.035	0.161	1.14	92	-1.3	-	87	0.005	3.87	0.381
323	51.195	0.160	1.15	93	-1.4	-	86	0.013	3.89	0.383
324	51.350	0.155	1.14	93	-1.3	-	86	0.007	3.90	0.380
325	51.510	0.160	1.14	92	-1.4	-	86	0.012	3.84	0.375
326	51.668	0.158	1.16	92	-1.3	-	85	0.007	3.84	0.373
327	51.828	0.160	1.18	92	-1.5	-	85	0.007	3.82	0.366
328	51.985	0.157	1.14	92	-1.4	-	86	0.012	3.86	0.374
329	52.146	0.161	1.16	93	-1.3	-	86	0.004	3.82	0.371
330	52.303	0.157	1.15	92	-1.3	99	85	0.008	3.82	0.367
331	52.463	0.160	1.14	92	-1.3	-	85	0.004	3.86	0.370
332	52.621	0.158	1.15	92	-1.5	-	85	0.008	3.77	0.362
333	52.781	0.160	1.14	92	-1.3	-	86	0.006	3.76	0.362
334	52.942	0.161	1.12	92	-1.3	-	86	0.005	3.77	0.350
335	53.099	0.157	1.17	92	-1.5	-	86	0.009	3.79	0.355
336	53.260	0.161	1.14	92	-1.5	-	87	0.007	3.75	0.351
337	53.417	0.157	1.15	92	-1.5	-	87	0.009	3.75	0.354
338	53.576	0.159	1.12	92	-1.5	-	86	0.007	3.73	0.348
339	53.734	0.158	1.15	92	-1.5	-	86	0.007	3.69	0.345
340	53.894	0.160	1.13	92	-1.3	100	85	0.009	3.69	0.347
341	54.055	0.161	1.15	92	-1.5	-	86	0.009	3.68	0.354
342	54.215	0.160	1.16	92	-1.4	-	86	0.006	3.72	0.362
343	54.372	0.157	1.16	92	-1.3	-	86	0.011	3.69	0.363
344	54.533	0.161	1.15	92	-1.3	-	86	0.007	3.70	0.367
345	54.690	0.157	1.18	92	-1.4	-	86	0.009	3.69	0.363
346	54.848	0.158	1.15	92	-1.4	-	86	0.008	3.70	0.369
347	55.008	0.160	1.13	92	-1.3	-	86	0.007	3.67	0.364
348	55.168	0.160	1.14	91	-1.5	-	86	0.013	3.66	0.363
349	55.326	0.158	1.13	92	-1.5	-	85	0.008	3.65	0.365
350	55.486	0.160	1.14	92	-1.4	99	86	0.007	3.63	0.368
351	55.641	0.155	1.15	92	-1.3	-	85	0.008	3.62	0.369

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: IHP
 Model: Montecito-C
 Run #: 1

Job #: 25-416
 Tracking #: 223
 Technician: AK
 Date: 5/27/2025

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 (%)
352	55.804	0.163	1.13	92	-1.3	-	86	0.008	3.57	0.358
353	55.961	0.157	1.15	91	-1.5	-	86	0.008	3.56	0.351
354	56.121	0.160	1.15	92	-1.5	-	86	0.008	3.56	0.351
355	56.280	0.159	1.13	92	-1.3	-	86	0.009	3.55	0.352
356	56.436	0.156	1.14	92	-1.5	-	86	0.008	3.52	0.347
357	56.598	0.162	1.15	92	-1.4	-	86	0.005	3.55	0.351
358	56.756	0.158	1.16	92	-1.3	-	86	0.004	3.52	0.350
359	56.916	0.160	1.14	91	-1.5	-	85	0.010	3.48	0.343
360	57.073	0.157	1.14	91	-1.5	99	85	0.009	3.45	0.340
361	57.233	0.160	1.13	91	-1.5	-	85	0.009	3.38	0.333
362	57.391	0.158	1.14	91	-1.4	-	85	0.011	3.38	0.337
363	57.551	0.160	1.15	92	-1.3	-	86	0.002	3.37	0.329
364	57.708	0.157	1.13	91	-1.3	-	85	0.007	3.36	0.326
365	57.868	0.160	1.15	92	-1.3	-	86	0.004	3.32	0.319
366	58.026	0.158	1.15	91	-1.4	-	85	0.010	3.35	0.318
367	58.186	0.160	1.15	91	-1.5	-	85	0.009	3.34	0.321
368	58.343	0.157	1.15	92	-1.4	-	86	0.004	3.32	0.322
369	58.503	0.160	1.14	91	-1.4	-	86	0.009	3.31	0.322
370	58.661	0.158	1.14	91	-1.5	99	86	0.003	3.37	0.323
371	58.821	0.160	1.13	91	-1.4	-	86	0.009	3.39	0.331
372	58.979	0.158	1.14	91	-1.3	-	86	0.009	3.39	0.335
373	59.138	0.159	1.13	91	-1.4	-	86	0.007	3.41	0.346
374	59.298	0.160	1.14	91	-1.4	-	86	0.010	3.43	0.349
375	59.455	0.157	1.13	91	-1.4	-	86	0.007	3.40	0.351
376	59.615	0.160	1.14	91	-1.5	-	86	0.008	3.38	0.351
377	59.772	0.157	1.15	91	-1.5	-	86	0.009	3.36	0.357
378	59.933	0.161	1.14	91	-1.3	-	86	0.010	3.41	0.363
379	60.090	0.157	1.13	91	-1.4	-	85	0.005	3.37	0.357
380	60.250	0.160	1.13	91	-1.3	99	85	0.009	3.34	0.352
381	60.408	0.158	1.14	91	-1.4	-	86	0.010	3.35	0.361
382	60.568	0.160	1.12	91	-1.3	-	86	0.009	3.37	0.361
383	60.725	0.157	1.15	91	-1.5	-	85	0.009	3.36	0.363

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: IHP
 Model: Montecito-C
 Run #: 1

Job #: 25-416
 Tracking #: 223
 Technician: AK
 Date: 5/27/2025

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 (%)
384	60.885	0.160	1.13	91	-1.3	-	85	0.009	3.38	0.362
385	61.043	0.158	1.14	91	-1.4	-	85	0.009	3.42	0.385
386	61.203	0.160	1.14	91	-1.4	-	85	0.006	3.39	0.376
387	61.362	0.159	1.15	91	-1.3	-	85	0.010	3.31	0.358
388	61.520	0.158	1.15	91	-1.3	-	86	0.007	3.33	0.351
389	61.680	0.160	1.14	91	-1.4	-	85	0.014	3.31	0.355
390	61.837	0.157	1.16	91	-1.3	99	85	0.010	3.29	0.369
391	61.997	0.160	1.15	91	-1.5	-	86	0.007	3.28	0.368
392	62.155	0.158	1.12	91	-1.5	-	85	0.006	3.26	0.374
393	62.315	0.160	1.14	91	-1.3	-	86	0.008	3.25	0.371
394	62.472	0.157	1.14	91	-1.4	-	85	0.006	3.21	0.370
395	62.632	0.160	1.11	91	-1.4	-	86	0.012	3.23	0.381
396	62.790	0.158	1.15	91	-1.3	-	86	0.007	3.25	0.383
397	62.950	0.160	1.15	91	-1.4	-	86	0.008	3.23	0.380
398	63.107	0.157	1.14	91	-1.4	-	85	0.010	3.22	0.378
399	63.267	0.160	1.14	91	-1.3	-	85	0.010	3.25	0.379
400	63.425	0.158	1.15	91	-1.4	98	86	0.004	3.20	0.385
401	63.585	0.160	1.12	91	-1.4	-	86	0.005	3.19	0.382
402	63.743	0.158	1.13	91	-1.4	-	86	0.007	3.19	0.378
403	63.902	0.159	1.15	91	-1.5	-	86	0.009	3.20	0.378
404	64.062	0.160	1.15	91	-1.4	-	86	0.011	3.17	0.375
405	64.219	0.157	1.15	91	-1.4	-	86	0.008	3.16	0.370
406	64.379	0.160	1.13	91	-1.4	-	85	0.005	3.17	0.372
407	64.537	0.158	1.14	91	-1.4	-	86	0.009	3.16	0.364
408	64.697	0.160	1.13	91	-1.4	98	85	0.005	3.18	0.365
Avg/Tot	64.717	0.159	1.15	87.3	-1.4	100	85.8	0.007	6.56	0.191

WOODSTOVE SURFACE TEMPERATURE DATA

Client: IHP

Job #: 25-416

Model: Montecito-C

Tracking #: 223

Run #: 1

Technician: AK

Date: 5/27/2025

Stove ΔT: 182

Elapsed Time (min)	Temperature Data (°F)						Catalyst Exit
	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	
0	66	66	66	66	66	65.9	N/A
1	66	66	66	95	66	71.7	N/A
2	68	66	68	159	67	85.7	N/A
3	72	67	71	273	68	110.3	N/A
4	76	69	77	397	69	137.5	N/A
5	81	71	83	493	72	160.0	N/A
6	88	75	91	557	77	177.4	N/A
7	96	79	102	621	84	196.1	N/A
8	104	84	113	670	92	212.8	N/A
9	113	90	127	702	102	226.8	N/A
10	120	97	142	734	112	240.9	N/A
11	125	106	156	749	123	251.7	N/A
12	131	114	169	763	133	261.9	N/A
13	137	123	182	783	143	273.4	N/A
14	143	132	187	810	153	284.9	N/A
15	149	143	198	835	164	297.6	N/A
16	157	152	211	851	174	309.0	N/A
17	167	157	226	827	187	312.6	N/A
18	175	167	240	828	201	321.9	N/A
19	183	171	254	832	217	331.1	N/A
20	190	175	270	843	232	342.0	N/A
21	198	184	287	860	248	355.3	N/A
22	205	193	303	883	262	369.4	N/A
23	214	203	319	911	277	384.8	N/A
24	222	213	336	940	291	400.4	N/A
25	231	223	351	956	306	413.4	N/A
26	240	233	366	963	319	424.2	N/A
27	248	242	380	967	332	433.7	N/A
28	257	253	392	968	343	442.5	N/A
29	265	262	404	966	355	450.3	N/A
30	272	273	395	950	320	442.1	N/A
31	280	286	386	932	300	436.7	N/A
32	287	298	379	898	289	429.9	N/A
33	293	308	372	857	283	422.8	N/A
34	298	318	367	819	280	416.3	N/A
35	303	326	363	782	277	410.0	N/A
36	306	333	359	748	276	404.4	N/A
37	309	338	355	721	275	399.5	N/A
38	311	343	351	698	273	395.3	N/A
39	313	348	349	679	273	392.2	N/A
40	314	351	346	666	272	389.7	N/A
41	315	353	344	656	271	387.9	N/A
42	317	356	342	649	270	386.7	N/A
43	317	358	341	640	270	385.5	N/A
44	318	360	341	634	269	384.3	N/A
45	319	362	340	630	268	383.4	N/A
46	319	363	340	627	267	383.1	N/A
47	320	364	339	625	267	383.2	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: IHP

Job #: 25-416

Model: Montecito-C

Tracking #: 223

Run #: 1

Technician: AK

Date: 5/27/2025

Stove ΔT: 182

Elapsed Time (min)	Temperature Data (°F)						
	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
48	321	366	340	624	267	383.5	N/A
49	322	368	340	622	267	383.5	N/A
50	322	370	340	618	268	383.6	N/A
51	323	371	341	617	266	383.6	N/A
52	324	372	341	615	266	383.7	N/A
53	324	374	341	614	266	383.7	N/A
54	325	374	342	612	265	383.6	N/A
55	326	376	343	609	266	383.8	N/A
56	326	377	343	606	266	383.7	N/A
57	327	378	344	601	266	383.3	N/A
58	328	379	345	600	267	383.8	N/A
59	329	380	345	601	267	384.4	N/A
60	330	382	347	599	268	385.3	N/A
61	331	383	347	598	267	384.9	N/A
62	332	383	347	598	264	384.8	N/A
63	333	384	347	599	264	385.6	N/A
64	334	386	349	603	264	387.0	N/A
65	335	387	349	606	263	388.0	N/A
66	336	389	351	606	263	389.0	N/A
67	337	391	351	607	263	389.8	N/A
68	338	392	352	607	262	390.2	N/A
69	339	393	353	606	262	390.4	N/A
70	340	394	354	605	263	390.9	N/A
71	341	396	355	603	263	391.4	N/A
72	343	397	356	591	265	390.3	N/A
73	344	399	357	636	266	400.3	N/A
74	345	400	360	705	267	415.3	N/A
75	346	403	364	759	268	428.0	N/A
76	349	405	367	770	270	432.2	N/A
77	351	408	371	769	271	433.9	N/A
78	354	411	373	766	273	435.3	N/A
79	357	413	374	766	274	436.7	N/A
80	360	416	375	763	275	437.9	N/A
81	363	419	377	753	278	437.9	N/A
82	366	421	376	742	279	436.8	N/A
83	368	422	375	732	280	435.5	N/A
84	371	423	374	722	281	434.1	N/A
85	373	425	373	713	283	433.5	N/A
86	375	427	373	705	284	432.8	N/A
87	377	429	372	698	286	432.3	N/A
88	378	430	371	696	286	432.1	N/A
89	379	430	371	699	287	433.2	N/A
90	381	432	369	704	287	434.7	N/A
91	382	432	370	705	289	435.5	N/A
92	384	433	369	703	288	435.4	N/A
93	385	434	369	699	288	435.2	N/A
94	387	435	369	693	289	434.7	N/A
95	388	436	369	686	290	433.9	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: IHP

Job #: 25-416

Model: Montecito-C

Tracking #: 223

Run #: 1

Technician: AK

Date: 5/27/2025

Stove ΔT : 182

Elapsed Time (min)	Temperature Data (*F)						
	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
96	389	436	369	677	289	432.1	N/A
97	390	437	368	666	290	430.3	N/A
98	391	436	368	657	290	428.3	N/A
99	392	437	368	646	289	426.2	N/A
100	392	437	367	637	289	424.4	N/A
101	393	438	367	627	289	422.5	N/A
102	392	437	366	619	288	420.5	N/A
103	392	438	366	610	289	419.1	N/A
104	392	438	366	603	289	417.7	N/A
105	392	438	365	596	289	415.8	N/A
106	391	437	364	590	288	414.2	N/A
107	391	437	364	585	289	413.0	N/A
108	390	435	363	581	288	411.3	N/A
109	389	435	363	577	287	410.0	N/A
110	389	434	362	574	287	409.0	N/A
111	389	434	361	570	287	408.1	N/A
112	388	433	361	568	286	407.1	N/A
113	387	432	361	565	286	406.2	N/A
114	386	432	360	563	286	405.2	N/A
115	386	432	360	560	286	404.8	N/A
116	385	431	360	558	286	404.0	N/A
117	385	430	360	556	287	403.5	N/A
118	384	430	360	555	287	403.0	N/A
119	384	430	360	553	288	402.9	N/A
120	383	430	360	550	288	402.2	N/A
121	383	429	360	549	287	401.4	N/A
122	382	428	359	548	288	401.0	N/A
123	382	427	359	547	289	400.7	N/A
124	381	427	359	547	290	400.6	N/A
125	381	426	358	545	289	400.0	N/A
126	380	425	358	544	289	399.5	N/A
127	380	425	359	543	290	399.4	N/A
128	380	424	358	543	291	399.2	N/A
129	380	423	359	542	291	398.9	N/A
130	380	423	358	542	292	398.7	N/A
131	379	423	358	541	294	399.0	N/A
132	381	424	358	521	297	396.1	N/A
133	383	425	358	491	301	391.6	N/A
134	383	424	359	498	304	393.6	N/A
135	382	423	358	534	305	400.6	N/A
136	381	423	359	584	306	410.5	N/A
137	380	422	359	622	305	417.8	N/A
138	379	422	360	643	305	421.7	N/A
139	379	422	360	652	305	423.4	N/A
140	379	422	359	664	304	425.6	N/A
141	379	423	358	678	303	428.0	N/A
142	378	423	356	694	301	430.3	N/A
143	378	422	354	713	299	433.2	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: IHP

Job #: 25-416

Model: Montecito-C

Tracking #: 223

Run #: 1

Technician: AK

Date: 5/27/2025

Stove ΔT: 182

Elapsed Time (min)	Temperature Data (°F)						
	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
144	378	422	352	727	298	435.2	N/A
145	378	422	350	734	297	436.1	N/A
146	378	423	348	736	295	436.0	N/A
147	378	423	347	736	295	435.8	N/A
148	377	424	346	735	295	435.2	N/A
149	377	423	344	736	293	434.5	N/A
150	377	424	343	733	292	433.8	N/A
151	377	423	343	733	292	433.5	N/A
152	376	423	341	732	289	432.5	N/A
153	376	423	340	733	289	432.3	N/A
154	376	422	340	736	286	432.0	N/A
155	375	423	340	736	284	431.5	N/A
156	375	423	340	738	282	431.4	N/A
157	375	423	340	739	279	431.1	N/A
158	374	423	340	738	279	430.6	N/A
159	374	424	341	730	278	429.3	N/A
160	374	423	341	721	277	427.1	N/A
161	374	423	341	712	275	424.6	N/A
162	373	423	341	700	274	422.1	N/A
163	372	423	341	691	272	419.8	N/A
164	372	422	341	682	271	417.7	N/A
165	372	422	341	675	270	415.7	N/A
166	371	421	340	667	268	413.6	N/A
167	370	420	340	661	267	411.6	N/A
168	369	420	340	656	266	410.1	N/A
169	369	420	340	649	265	408.4	N/A
170	368	419	340	644	264	407.0	N/A
171	367	418	340	641	261	405.3	N/A
172	366	417	340	637	261	404.3	N/A
173	365	417	341	635	259	403.1	N/A
174	364	416	341	631	257	401.8	N/A
175	364	415	340	629	256	400.8	N/A
176	363	415	341	626	256	400.0	N/A
177	363	414	341	623	255	399.0	N/A
178	362	413	341	622	254	398.1	N/A
179	361	412	341	620	252	397.3	N/A
180	360	411	341	618	251	396.3	N/A
181	359	411	341	616	251	395.5	N/A
182	359	410	341	616	249	395.1	N/A
183	358	410	341	616	248	394.5	N/A
184	357	409	342	615	248	394.0	N/A
185	357	408	342	615	247	393.8	N/A
186	356	408	343	616	246	393.9	N/A
187	356	409	344	618	246	394.3	N/A
188	355	408	344	621	245	394.5	N/A
189	355	407	344	623	244	394.8	N/A
190	355	407	345	623	244	394.9	N/A
191	355	407	345	624	243	394.9	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: IHP

Job #: 25-416

Model: Montecito-C

Tracking #: 223

Run #: 1

Technician: AK

Date: 5/27/2025

Stove ΔT: 182

Elapsed Time (min)	Temperature Data (°F)						
	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
192	354	408	346	624	243	394.8	N/A
193	354	407	347	624	242	394.8	N/A
194	354	407	347	625	242	394.8	N/A
195	353	407	348	626	242	395.2	N/A
196	353	408	349	626	242	395.6	N/A
197	353	408	350	628	241	396.0	N/A
198	353	408	350	629	241	396.3	N/A
199	352	409	352	630	242	397.0	N/A
200	352	409	352	633	241	397.3	N/A
201	352	410	353	635	242	398.2	N/A
202	351	411	354	637	242	398.9	N/A
203	351	411	355	640	241	399.7	N/A
204	352	412	355	642	241	400.2	N/A
205	351	412	356	644	241	400.6	N/A
206	351	413	357	646	241	401.3	N/A
207	351	413	358	645	240	401.3	N/A
208	351	414	358	644	240	401.4	N/A
209	350	414	359	646	240	401.8	N/A
210	350	415	359	647	241	402.2	N/A
211	350	415	360	648	240	402.7	N/A
212	350	415	361	650	240	403.4	N/A
213	350	417	362	651	241	404.0	N/A
214	350	418	364	651	240	404.5	N/A
215	350	417	364	653	240	405.1	N/A
216	350	418	365	655	241	405.7	N/A
217	350	419	366	655	241	406.2	N/A
218	351	420	367	657	241	407.0	N/A
219	351	420	368	655	241	407.2	N/A
220	352	421	369	654	241	407.4	N/A
221	352	421	370	655	241	407.9	N/A
222	352	422	371	659	241	409.0	N/A
223	353	423	372	659	241	409.6	N/A
224	354	424	373	658	242	410.1	N/A
225	354	425	374	655	242	409.9	N/A
226	355	425	375	652	241	409.6	N/A
227	355	426	375	646	242	408.7	N/A
228	356	427	375	640	242	407.9	N/A
229	356	427	375	633	242	406.6	N/A
230	356	427	375	628	242	405.5	N/A
231	357	427	374	622	242	404.5	N/A
232	357	427	374	619	242	403.8	N/A
233	357	428	374	617	242	403.3	N/A
234	357	428	374	615	243	403.1	N/A
235	357	428	373	611	243	402.3	N/A
236	357	429	373	606	242	401.5	N/A
237	357	429	373	602	243	400.8	N/A
238	357	428	372	600	243	400.1	N/A
239	357	429	371	596	242	399.0	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: IHP

Job #: 25-416

Model: Montecito-C

Tracking #: 223

Run #: 1

Technician: AK

Date: 5/27/2025

Stove ΔT: 182

Elapsed Time (min)	Temperature Data (°F)						
	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
240	357	429	371	591	243	398.1	N/A
241	356	429	371	584	244	396.9	N/A
242	356	429	371	578	243	395.4	N/A
243	355	428	370	573	243	393.9	N/A
244	354	428	370	568	243	392.6	N/A
245	354	427	369	563	244	391.5	N/A
246	353	427	369	558	243	390.0	N/A
247	353	426	368	552	243	388.2	N/A
248	352	425	368	546	243	386.7	N/A
249	351	424	367	541	243	385.4	N/A
250	350	424	368	537	244	384.4	N/A
251	350	423	366	532	244	383.0	N/A
252	349	422	366	528	243	381.6	N/A
253	348	420	365	525	243	380.0	N/A
254	347	419	364	522	243	378.8	N/A
255	347	418	363	519	243	377.7	N/A
256	346	416	362	516	242	376.4	N/A
257	345	415	362	513	243	375.5	N/A
258	345	414	361	511	243	374.6	N/A
259	344	413	359	508	244	373.6	N/A
260	343	412	358	505	243	372.1	N/A
261	343	410	357	502	243	370.9	N/A
262	342	409	355	500	243	369.9	N/A
263	341	408	354	497	243	368.8	N/A
264	340	407	353	495	242	367.4	N/A
265	340	406	352	493	243	366.6	N/A
266	339	404	351	491	242	365.4	N/A
267	338	403	350	488	242	364.3	N/A
268	338	402	350	486	242	363.2	N/A
269	337	401	349	483	242	362.4	N/A
270	336	399	348	482	241	361.4	N/A
271	336	399	347	480	241	360.6	N/A
272	336	398	347	478	242	360.2	N/A
273	335	397	347	476	242	359.3	N/A
274	335	396	346	474	242	358.6	N/A
275	334	395	346	473	242	357.8	N/A
276	334	395	346	471	242	357.4	N/A
277	333	394	345	471	242	356.9	N/A
278	333	393	345	471	242	356.5	N/A
279	332	392	344	469	242	355.5	N/A
280	332	391	343	466	241	354.6	N/A
281	332	390	343	462	241	353.5	N/A
282	331	389	343	458	241	352.5	N/A
283	331	388	343	454	241	351.4	N/A
284	331	387	342	450	241	350.1	N/A
285	330	386	341	447	240	348.8	N/A
286	329	385	341	443	240	347.6	N/A
287	329	384	340	440	242	347.0	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: IHP

Job #: 25-416

Model: Montecito-C

Tracking #: 223

Run #: 1

Technician: AK

Date: 5/27/2025

Stove ΔT: 182

Elapsed Time (min)	Temperature Data (°F)						
	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
288	328	384	339	437	241	345.8	N/A
289	327	383	338	435	241	344.7	N/A
290	327	382	337	432	241	343.6	N/A
291	326	381	336	430	241	342.5	N/A
292	325	380	335	428	240	341.5	N/A
293	324	379	334	426	240	340.5	N/A
294	323	378	333	424	240	339.6	N/A
295	323	377	332	423	240	338.9	N/A
296	322	376	332	422	240	338.3	N/A
297	321	375	331	422	241	337.9	N/A
298	320	374	330	420	240	336.8	N/A
299	320	374	329	419	240	336.2	N/A
300	319	373	329	417	240	335.6	N/A
301	319	372	328	416	240	335.0	N/A
302	318	371	327	415	240	334.1	N/A
303	317	371	326	413	240	333.4	N/A
304	316	370	325	412	240	332.7	N/A
305	315	369	324	411	240	331.9	N/A
306	315	369	323	410	240	331.2	N/A
307	314	368	322	408	239	330.4	N/A
308	314	367	321	407	239	329.5	N/A
309	313	366	320	405	239	328.6	N/A
310	313	365	319	402	240	327.8	N/A
311	311	365	318	399	239	326.5	N/A
312	311	364	317	396	239	325.3	N/A
313	310	363	315	393	239	324.2	N/A
314	310	363	314	390	239	323.0	N/A
315	310	362	312	388	238	321.8	N/A
316	309	361	310	385	237	320.4	N/A
317	308	361	308	382	237	319.2	N/A
318	308	360	306	380	237	318.1	N/A
319	307	359	304	377	235	316.7	N/A
320	307	359	302	375	235	315.5	N/A
321	306	358	300	373	234	314.2	N/A
322	306	357	298	369	234	312.8	N/A
323	305	357	296	367	233	311.6	N/A
324	305	356	294	365	232	310.5	N/A
325	304	355	292	363	232	309.3	N/A
326	304	354	291	361	232	308.2	N/A
327	303	353	289	360	231	307.0	N/A
328	302	353	287	358	230	305.8	N/A
329	301	352	285	356	229	304.6	N/A
330	301	351	283	355	229	303.5	N/A
331	300	350	282	353	228	302.5	N/A
332	299	349	280	351	227	301.3	N/A
333	298	347	279	349	227	300.1	N/A
334	297	347	278	348	226	299.0	N/A
335	297	346	276	346	225	298.0	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: IHP

Job #: 25-416

Model: Montecito-C

Tracking #: 223

Run #: 1

Technician: AK

Date: 5/27/2025

Stove ΔT: 182

Elapsed Time (min)	Temperature Data (°F)						Catalyst Exit
	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	
336	296	345	275	345	225	297.1	N/A
337	295	344	274	344	225	296.2	N/A
338	294	342	273	342	224	295.1	N/A
339	293	341	271	340	224	294.0	N/A
340	292	340	271	339	224	293.2	N/A
341	292	339	270	337	223	292.1	N/A
342	291	338	269	336	223	291.2	N/A
343	290	337	267	335	222	290.1	N/A
344	289	336	266	334	222	289.3	N/A
345	288	335	266	333	222	288.6	N/A
346	287	334	265	332	222	287.8	N/A
347	287	333	264	331	221	287.0	N/A
348	286	332	263	329	222	286.3	N/A
349	285	331	263	328	222	285.7	N/A
350	284	329	262	328	222	284.8	N/A
351	284	328	261	327	221	284.2	N/A
352	283	327	260	326	221	283.5	N/A
353	282	326	260	325	222	282.9	N/A
354	281	325	259	324	222	282.2	N/A
355	281	324	258	323	221	281.5	N/A
356	280	323	258	323	221	280.8	N/A
357	279	322	257	322	221	280.1	N/A
358	278	321	256	320	221	279.3	N/A
359	278	320	256	319	221	278.7	N/A
360	277	319	255	318	221	277.9	N/A
361	276	318	254	317	221	277.3	N/A
362	276	317	254	316	220	276.5	N/A
363	275	316	253	315	220	275.9	N/A
364	274	315	253	314	220	275.1	N/A
365	273	314	252	312	220	274.4	N/A
366	273	313	252	312	219	273.6	N/A
367	272	312	251	311	219	272.9	N/A
368	271	312	251	310	219	272.2	N/A
369	270	311	250	308	218	271.4	N/A
370	269	310	249	308	218	270.9	N/A
371	268	309	249	306	218	270.1	N/A
372	268	308	248	305	218	269.4	N/A
373	267	307	248	305	218	268.7	N/A
374	266	306	247	304	217	268.1	N/A
375	265	306	247	302	217	267.3	N/A
376	264	305	246	301	217	266.6	N/A
377	263	304	246	301	216	266.0	N/A
378	263	303	245	300	216	265.3	N/A
379	262	302	245	299	215	264.7	N/A
380	261	301	245	298	215	264.0	N/A
381	260	301	245	297	214	263.3	N/A
382	260	300	244	296	214	262.7	N/A
383	259	299	244	295	214	262.2	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: IHP

Job #: 25-416

Model: Montecito-C

Tracking #: 223

Run #: 1

Technician: AK

Date: 5/27/2025

Stove ΔT : 182

Elapsed Time (min)	Temperature Data (°F)						
	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
384	258	298	244	294	213	261.6	N/A
385	257	297	244	294	213	261.1	N/A
386	256	297	244	293	212	260.4	N/A
387	256	296	244	292	212	259.9	N/A
388	255	295	244	292	212	259.3	N/A
389	254	294	243	291	211	258.8	N/A
390	254	294	243	290	211	258.4	N/A
391	253	293	243	289	211	257.8	N/A
392	252	292	243	288	210	257.2	N/A
393	252	291	243	288	210	256.7	N/A
394	251	290	243	287	209	256.2	N/A
395	250	290	243	287	209	255.6	N/A
396	250	289	243	286	208	255.1	N/A
397	249	288	243	285	207	254.4	N/A
398	248	287	243	284	207	253.8	N/A
399	248	287	243	283	206	253.3	N/A
400	247	286	243	283	206	252.7	N/A
401	246	285	243	282	205	252.2	N/A
402	246	284	243	282	204	251.8	N/A
403	245	284	243	281	203	251.1	N/A
404	244	283	243	280	203	250.5	N/A
405	244	282	242	280	201	249.9	N/A
406	243	281	242	279	201	249.4	N/A
407	243	281	242	278	200	248.9	N/A
408	242	280	242	278	200	248.4	N/A
Average	319.9	366.6	321.4	544.6	245.9	359.7	N/A

LAB SAMPLE DATA - ASTM E2515

Client: IHP
 Model: Montecito-C
 Run #: 1

Job #: 25-416
 Tracking #: 223
 Technician: AK
 Date: 5/27/2025

		Sample ID	Tare, mg	Final, mg	Catch, mg
Filters	A	G01281	236.9	238.6	1.7
	B	G01282	235.9	237.5	1.6
	Amb	G01283	236.9	237.0	0.1
Probes	A	14B	116627.8	116627.9	0.1
	B	14C	116537.0	116537.1	0.1
O-rings	A	14B	3362.7	3362.7	0.0
	B	14C	3439.0	3439.2	0.2

Placed in Dessicator on:

5/27/2025

Balance Audit (mg):

		200.0		200.0		200.0			
		Weight (mg)	Date/Time	Weight (mg)	Date/Time	Weight (mg)	Date/Time	Weight (mg)	Date/Time
Filters	A	238.9	5/27 18:00	238.6	6/2 15:00	238.6	6/4 11:15		
	B	237.6	5/27 18:00	237.5	6/2 15:00	237.5	6/4 11:15		
		237.1	5/27 18:00	237.0	6/2 15:00	237.0	6/4 11:15		
Probes	A	116629.0	5/27 18:00	116628.1	6/2 15:00	116627.9	6/4 11:15		
	B	116537.7	5/27 18:00	116537.1	6/2 15:00	116537.1	6/4 11:15		
O-Rings	A	3363.5	5/27 18:00	3362.8	6/2 15:00	3362.7	6/4 11:15		
	B	3440.0	5/27 18:00	3439.2	6/2 15:00	3439.2	6/4 11:15		

Train A Aggregate, mg: 1.8

Train B Aggregate, mg: 1.9

Ambient, mg: 0.1

IDC Wood Heater Run Sheets

Client: IHP Job Number: 25-416 Tracking #: 223
 Model: Montecito-C Run Number: 1 Test Date: 5/27/25

Pre-Test Set-up Check List

Perform the following checks after a minimum of 30 minutes of warmup time

Leak Checks	Requirement	Pump Off (lpm)	Pump On, Probe Blocked (lpm)	Net (lpm)	Result
PM-2.5	<0.05 lpm (net)	0.36	0.36	0	☒ Pass ☐ Fail
PM-Course	<0.05 lpm (net)	0.15	0.15	0	☒ Pass ☐ Fail
Ambient	<0.05 lpm (net)	-0.03	-0.03	0	☒ Pass ☐ Fail

Flow Checks	Requirement	TEOM Indicated Flow (lpm) ¹	Measured Flow		Difference (%)	Result
			(lpm) ²	(lpm) ³		
PM-2.5	±2%	1.00	1.02	1.016	1.6%	☒ Pass ☐ Fail
PM-Course	±2%	1.00	1.01	1.006	0.6%	☒ Pass ☐ Fail
Ambient	±2%	1.00	0.998	0.994	0.6%	☒ Pass ☐ Fail

¹Indicated flow is at 20°C, 1 atm

²Measured flow with PFS equipment ID 197, which indicates flow at 21.1°C, 1 atm

³Adjusted value (Measured Flow * 99.6%) to match the STP used by TEOM

Initial Filter Setup

Use **black** filter tool when changing filters

	1 min. requirement	5 min. requirement	Result
PM-2.5	Frequency > 200Hz	Mass > -1 ug, noise < 2ug	☒ Pass ☐ Fail
PM- Course	Frequency > 200Hz	Mass > -1 ug, noise < 2ug	☒ Pass ☐ Fail
Ambient	Frequency > 200Hz	Mass > -1 ug, noise < 2ug	☒ Pass ☐ Fail

Pre-Fire Verifications	Time probe in Tunnel	Result
Place probe in tunnel at least 10 min prior to test start	10:00	
Verify Data is recording [In RPCOMM] - Dichot		☒ Okay
Verify Data is recording [In RPCOMM] - Ambient		☒ Okay

Flue Gas Analyzer Calibration Check

Calibration Gas Values: Span Gas Cylinder#: CC505834 CO₂ (%): 17.35 CO (%): 4.350
 Mid Gas Cylinder#: CC341544 CO₂ (%): 10.00 CO (%): 2.500

Calibration Results:

	Pre Test			Post Test		
	Zero	Span	Mid	Zero	Span	Mid
Time	9:53	9:54	9:55	19:22	19:23	19:25
CO ₂	0.00	17.31	10.22	-0.06	17.22	10.11
CO	0.000	4.340	2.620	-0.013	4.316	2.497

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

Technician Signature: 

Date: 6/27/2025

IDC Wood Heater Run Sheets

Client: IHP Job Number: 25-416 Tracking #: 223
 Model: Montecito-C Run Number: 1 Test Date: 5/27/25

Pre-Test Conditions

		Requirements	Result
Room RH (%)	40.6		
Barometric Pressure	29.99		
Room Air Velocity (ft/min)	<50	Must be <50 ft/min within 2 ft of stove	☒ Pass ☐ Fail
Room Temperature (°F)	66.6	<87 °F	☒ Pass ☐ Fail
Average External Stove Temp (°F)	67.4	Within 2 °F of ambient (Run #1 only)	☒ Pass ☐ Fail ☐ N/A
Average Internal Stove Temp (°F)	68.0	Within 2 °F of ambient (Run #1 only)	☒ Pass ☐ Fail ☐ N/A
Time Coals Removed from Stove & Firebox Vacuumed	N/A	>1 hr before test (Runs #2 & 3 only)	☐ Pass ☐ Fail ☒ N/A
Earliest possible start time	N/A	24 hours from start of Run #1 (Runs #2 & 3 only)	☐ Pass ☐ Fail ☒ N/A



Technician Signature: 

Date: 6/27/2025

IDC Wood Heater Run Sheets

Client: IHP Job Number: 25-416 Tracking #: 223
Model: Montecito-C Run Number: 1 Test Date: 5/27/25

IDC FUELING NOTES

Fuel & Moisture Measurement

Fuel Type	Maple Cordwood
Moisture Meter Calibration 22%:	22.0
Moisture Meter Calibration 12%:	12.0
Moisture Reading Start Time:	08:30

L1 Test Notes

Scale Weight Prior to Loading (lbs):	0
Test Burn Start Time:	10:41
Air Control Setting (open/closed):	Open
Door Closed Time (5 min from start):	10:43
Bypass Closed Time:	N/A
Target End Weight (lbs):	1.72-1.90
Actual End Weight (lbs):	1.84
Phase End Time:	10:57

Additional Notes (Fuel adjustments, TEOM Filter Changes, etc.)

Time	Notes
	-None-

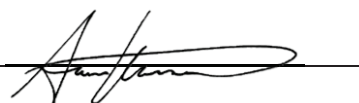
L2 Test Notes

Scale Weight Prior to Loading (lbs):	1.84
Load Time:	10:57
Air Control Setting (open/closed):	Open
Door Closed Time (immediately after loading):	10:58
Bypass Closed Time:	N/A
50% Target Weight (lbs):	6.65-7.35
Actual 50% Weight (lbs):	7.30
Air control closed time:	11:11
Target End Weight (lbs):	2.73-3.02
Actual End Weight (lbs):	2.80
Phase End Time:	12:52

Additional Notes (Fuel adjustments, TEOM Filter Changes, etc.)

Time	Notes
11:46	Changed TEOM Filters

Technician Signature: _____



Date: 6/27/2025

IDC Wood Heater Run Sheets

Client: IHP Job Number: 25-416 Tracking #: 223
 Model: Montecito-C Run Number: 1 Test Date: 5/27/25

L3 Test Notes

Scale Weight Prior to Loading (lbs):	2.80
Load Time:	11:52
Air Control Setting (5 min start-up allowed):	
Door Closed Time (immediately after loading):	11:53
Bypass Closed Time:	N/A
Target End Weight (lbs):	3.40-3.76
Actual End Weight (lbs):	3.42
Phase End Time:	12:52

Open @ 11:52 Closed @ 11:56

Additional Notes (Fuel adjustments, TEOM Filter Changes, etc.)

Time	Notes
12:45	Changed TEOM Filters

L4 Test Notes

Scale Weight Prior to Loading (lbs):	3.42
Load Time:	12:52
Air Control Setting (10 min start-up allowed):	
Door Closed Time (5 min after loading):	12:54
Bypass Closed Time:	N/A
Target End Weight (lbs):	3.25-3.59
Actual End Weight (lbs):	3.43
Phase End Time:	17:29

Open @ 12:52 Closed @ 12:57

Additional Notes (Fuel adjustments, TEOM Filter Changes, etc.)

Time	Notes

Post-Test Conditions

Room Air Velocity (ft/min)	<50
Room RH (%)	30.2
Barometric Pressure	29.74

Technician Signature: 

Date: 6/27/2025

IDC Wood Heater Run Sheets

Client: IHP Job Number: 25-416 Tracking #: 223
 Model: Montecito-C Run Number: 1 Test Date: 5/27/25

Post-Test Check List

Leak Checks	Requirement	Pump Off (lpm)	Pump On, Probe Blocked (lpm)	Net (lpm)	Result
PM-2.5	<0.05 lpm (net)	0.36	0.36	0	☒ Pass ☐ Fail
PM-Course	<0.05 lpm (net)	0.14	0.15	0.01	☒ Pass ☐ Fail
Ambient	<0.05 lpm (net)	-0.03	-0.03	0	☒ Pass ☐ Fail

Flow Checks	Requirement	TEOM Indicated Flow (lpm) ¹	Measured Flow		Difference (%)	Result
			(lpm) ²	(lpm) ³		
PM-2.5	±2%	1.00	1.01	1.006	0.6%	☒ Pass ☐ Fail
PM-Course	±2%	1.00	1.01	1.006	0.6%	☒ Pass ☐ Fail
Ambient	±2%	3.00	2.99	2.978	0.7%	☒ Pass ☐ Fail

¹Indicated flow is at 20°C, 1 atm

²Measured flow with PFS equipment ID 134, which indicates flow at 21.1°C, 1 atm

³Adjusted value (Measured Flow * 99.6%) to match the STP used by TEOM



Technician Signature: 

Date: 6/27/2025

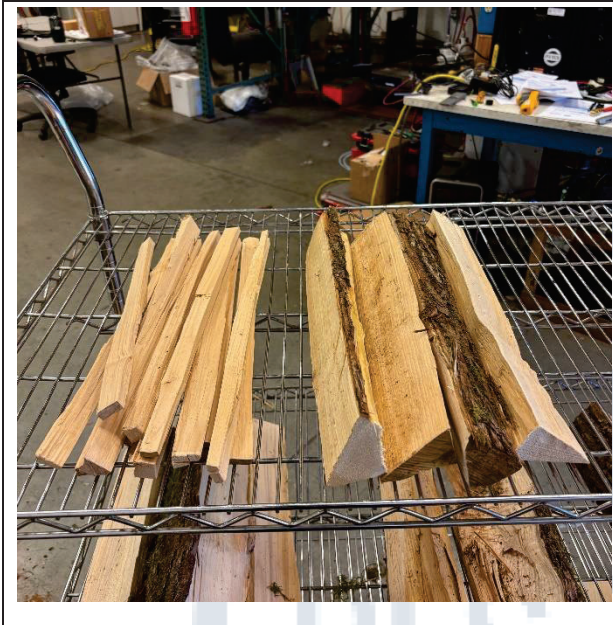
IDC Wood Heater Run Sheets

Client: IHP
Model: Montecito-C

Job Number: 25-416
Run Number: 1

Tracking #: 223
Test Date: 5/27/25

Test Fuel Photos



L1 Fuel Load



L1 Fuel Loaded



L1 Residual Fuel Load



L2 Fuel Load

Technician Signature: _____



Date: 6/27/2025

IDC Wood Heater Run Sheets

Client: IHP
Model: Montecito-C

Job Number: 25-416
Run Number: 1

Tracking #: 223
Test Date: 5/27/25



L2 Fuel Loaded



L2 Residual Fuel Loaded



L3 Fuel Load



L3 Fuel Loaded

Technician Signature: _____

A handwritten signature in black ink, appearing to be "A. J. [unclear]".

Date: 6/27/2025

IDC Wood Heater Run Sheets

Client: IHP
Model: Montecito-C

Job Number: 25-416
Run Number: 1

Tracking #: 223
Test Date: 5/27/25



L3 Residual Fuel Loaded



L4 Fuel Load



L4 Fuel Loaded

Technician Signature: _____

A handwritten signature in black ink, appearing to be "A. Johnson", written over a horizontal line.

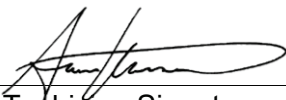
Date: 6/27/2025

WOOD STOVE TEST DATA PACKET
IDC / ASTM E2515



Run 2 Data Summary

Client:	IHP
Model:	Montecito-C
Job #:	25-416
Tracking #:	223
Test Date:	5/28/2025



Technician Signature

6/27/2025

Date

Run 1 Results Summary

Test Segments

	Clock	ET(min)
L1 Ignition	10:46 AM	0
L1 End	11:29 AM	15
L1 Duration		15
Fuel Consumed (lbs-wet)		4.12
Fuel Consumed (lbs-dry)		3.30

L2 Loaded	11:30 AM	16
L2 End	12:27 PM	64
L2 Duration		48
Fuel Consumed (lbs-wet)		10.11
Fuel Consumed (lbs-dry)		8.04

L3 Loaded	12:28 PM	65
L3 End	1:31 AM	128
L3 Duration		63
Fuel Consumed (lbs-wet)		6.65
Fuel Consumed (lbs-dry)		5.36

L4 Loaded	1:32 AM	129
L4 End	5:45 AM	475
L4 Duration		346
Fuel Consumed (lbs-wet)		18.57
Fuel Consumed (lbs-dry)		15.26

Total Fuel Burned (lbs-wet)	39.45	
Total Fuel Burned (lbs-dry)	31.95	14.49 (kg-dry)

Firebox Avg Temps (F)

L1TS _{avg(i)}	72
L1TS _{avg(f)}	312
L2TS _{avg(i)}	316
L2TS _{avg(f)}	437
L3TS _{avg(i)}	435
L3TS _{avg(f)}	393
L4TS _{avg(i)}	390
L14TS _{avg(f)}	221

Burn Time Rating (hrs)

BTR	6
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Burn Rate (lbs-wet/hr) (dry kg/hr)

BR _{L2}	16.48	5.99
BR _{L2}	12.64	4.56
BR _{L3}	6.33	2.31
BR _{L4}	3.22	1.46
OVERALL	4.98	1.83

1st hr Loaded	10:46 AM	0
1st hr End	11:46 AM	60
L4 Duration		60
Fuel Consumed (lbs-wet)		13.88
Fuel Consumed (lbs-dry)		11.28

PM Results

Burn Phase:	L1	L2	L3	L4	1st Hr	Total
E _T :	0.87	0.76	0.55	2.7	1.6	4.9
E _{g/hr} :	3.5	0.9	0.5	0.46	1.60	0.61
E _{g/kg} :	0.58	0.21	0.23	0.39	0.31	0.33
E _{g/MJ output} :	0.04	0.02	0.02	0.03		0.03
E _{lb/mmbtu output} :	0.10	0.04	0.04	0.07	-	0.06
CO (g):	24.1	38.8	33.2	284.0		380.1
CO (g/min):	1.60	0.81	0.53	0.82		0.80
Output (BTU/hr)	75,815	51,268	26,621	15,252		22,215
Efficiency (%)	64.2%	61.9%	64.7%	63.8%		63.5%

Rolling Average Max Values

	1-min Avg.	5-min Avg.	60-min Avg
PM (g/hr)	23.0	8.5	1.8

Quality Checks

Requirement

Observer Pass/Fail

Filter/Dewpt. Temp	Dewpoint must never exceed filter temp	Max Δ -33.2	PASS
Filter Temp	Must be between 80 and 90F at all times	81.7 / 87.3	PASS
Ambient Temp	Must be between 65 and 90F at all times	71.7 / 75.8	PASS
Minimum Tunnel Flow	>600 CFM	729.7	PASS
Weight Loss	Must be >0.1 lb per 20 min	Min -0.22 lb.	PASS

Test Input Data

Client: IHP
 Model: Montecito-C
 Run #: 2

Job #: 25-416
 Tracking #: 223
 Technician: AK
 Date: 5/28/2025

Traverse Data

pt	dP (in WC)
1	0.056
2	0.066
3	0.070
4	0.070
5	0.067
6	0.060
7	0.056
8	0.065
9	0.070
10	0.069
11	0.066
12	0.048
Center	0.070

Tunnel Data

Tunnel dia. (in):	12
Pitot Cp	0.99
Vs,cent (ft/s):	17.67
Vs, trav (ft/s):	16.81
Fp	0.952

	Pre-Test	Post Test
Barometric Pressure (in. Hg)	29.76	29.83
Lab Relative Humidity (%)	36.5	31.7

Traverse Temp:	73
Static Pressure:	-0.203

Fuel Data

Fuel Properties

Species	Maple
HHV (Btu/lb)	8587
%C	50.84%
%H	6.02%
%O	41.74%

	Wet Weight	MC (%db)	Dry Weight (lbs)
Kindling	1.50		
Starter	4.47	22.47	3.65
L2	11.07	23.02	9.00
L3	7.25	21.71	5.96
L4 _s	6.09	20.92	5.04
L4 _b	12.48	22.11	10.22
Avg. Moisture (%db)		22.05	

L1 Efficiency Results

Manufacturer: IHP
Model: Montecito-C
Date: 05/28/25
Run: 2
Control #: 223
Test Duration: 15
Output Category: L1

Test Results in Accordance with CSA B415.1-10

	HHV Basis	LHV Basis
Overall Efficiency	64.2%	68.6%
Combustion Efficiency	99.0%	99.0%
Heat Transfer Efficiency	64.8%	69.3%

Output Rate (kJ/h)	79,922	75,815	(Btu/h)
Burn Rate (kg/h)	6.24	13.74	(lb/h)
Input (kJ/h)	124,554	118,153	(Btu/h)

Test Load Weight (dry kg)	1.56	3.44	dry lb
MC wet (%)	19.91		
MC dry (%)	24.85		
Particulate (g)	N/A		
CO (g)	24		
Test Duration (h)	0.25		

Emissions	Particulate	CO
g/MJ Output	N/A	1.20
g/kg Dry Fuel	N/A	15.43
g/h	N/A	96.24
g/min	N/A	1.60
lb/MM Btu Output	N/A	2.80

Air/Fuel Ratio (A/F)	9.09
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VERSION:

2.4

4/15/2010

L2 Efficiency Results

Manufacturer: IHP
Model: Montecito-C
Date: 5/28/2025
Run: 2
Control #: 223
Test Duration: 48
Output Category: L2

Test Results in Accordance with CSA B415.1-10

	HHV Basis	LHV Basis
Overall Efficiency	61.9%	66.2%
Combustion Efficiency	99.4%	99.4%
Heat Transfer Efficiency	62.3%	66.7%

Output Rate (kJ/h)	54,046	51,268	(Btu/h)
Burn Rate (kg/h)	4.37	9.63	(lb/h)
Input (kJ/h)	87,277	82,792	(Btu/h)

Test Load Weight (dry kg)	3.50	7.70	dry lb
MC wet (%)	20.49		
MC dry (%)	25.77		
Particulate (g)	N/A		
CO (g)	39		
Test Duration (h)	0.80		

Emissions	Particulate	CO
g/MJ Output	N/A	0.90
g/kg Dry Fuel	N/A	11.11
g/h	N/A	48.53
g/min	N/A	0.81
lb/MM Btu Output	N/A	2.09

Air/Fuel Ratio (A/F)	9.78
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VERSION:

2.4

4/15/2010

L3 Efficiency Results

Manufacturer: IHP
Model: Montecito-C
Date: 05/28/25
Run: 2
Control #: 223
Test Duration: 63
Output Category: L3

Test Results in Accordance with CSA B415.1-10

	HHV Basis	LHV Basis
Overall Efficiency	64.7%	69.2%
Combustion Efficiency	99.3%	99.3%
Heat Transfer Efficiency	65.1%	69.7%

Output Rate (kJ/h)	28,063	26,621	(Btu/h)
Burn Rate (kg/h)	2.17	4.79	(lb/h)
Input (kJ/h)	43,383	41,153	(Btu/h)

Test Load Weight (dry kg)	2.28	5.03	dry lb
MC wet (%)	19.45		
MC dry (%)	24.14		
Particulate (g)	N/A		
CO (g)	33		
Test Duration (h)	1.05		

Emissions	Particulate	CO
g/MJ Output	N/A	1.13
g/kg Dry Fuel	N/A	14.56
g/h	N/A	31.62
g/min	N/A	0.53
lb/MM Btu Output	N/A	2.62

Air/Fuel Ratio (A/F)	13.20
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VERSION:

2.4

4/15/2010

L4 Efficiency Results

Manufacturer: IHP
Model: Montecito-C
Date: 05/28/25
Run: 2
Control #: 223
Test Duration: 346
Output Category: L4

Test Results in Accordance with CSA B415.1-10

	HHV Basis	LHV Basis
Overall Efficiency	63.8%	68.2%
Combustion Efficiency	97.6%	97.6%
Heat Transfer Efficiency	65.3%	69.8%

Output Rate (kJ/h)	16,078	15,252	(Btu/h)
Burn Rate (kg/h)	1.26	2.78	(lb/h)
Input (kJ/h)	25,215	23,919	(Btu/h)

Test Load Weight (dry kg)	7.28	16.05	dry lb
MC wet (%)	17.84		
MC dry (%)	21.72		
Particulate (g)	N/A		
CO (g)	284		
Test Duration (h)	5.77		

Emissions	Particulate	CO
g/MJ Output	N/A	3.06
g/kg Dry Fuel	N/A	39.01
g/h	N/A	49.24
g/min	N/A	0.82
lb/MM Btu Output	N/A	7.12

Air/Fuel Ratio (A/F)	19.82
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VERSION:

2.4

4/15/2010

Run 1 TEOM Data

ET (min)	Ci - 1-min avg PM (ug/m ³)	Tunnel dP (in WC)	sqrtdP	Tunnel Temp (F)	Tunnel Temp - 10 minute Avg. (F)	Tunnel RH - 10 minute avg. (%)	Tunnel Velocity - Vsi (ft/s)	Tunnel Flow - Q _{sdi} (m ³ /min)	E _i (mg)	E _{g/hr, i} (g/hr)	PM 5-min Rolling Avg (g/hr)	PM 30-min Rolling Avg (g/hr)	PM (cumulative g)
0	-29	0.072	0.2683	73.7	-	-	17.054	22.397	-0.648	-0.04	-	-	0.00
1	333	0.071	0.2665	76	-	-	16.972	22.193	7.391	0.44	-	-	0.01
2	17472	0.070	0.2646	80.8	-	-	16.927	21.938	383.290	23.00	-	-	0.39
3	5602	0.071	0.2665	80.7	-	-	17.046	22.096	123.776	7.43	-	-	0.51
4	2962	0.070	0.2646	83.5	-	-	16.969	21.883	64.822	3.89	6.94	-	0.58
5	3360	0.070	0.2646	86.7	-	-	17.019	21.819	73.308	4.40	7.83	-	0.65
6	2831	0.069	0.2627	89.3	-	-	16.937	21.611	61.181	3.67	8.48	-	0.71
7	869	0.070	0.2646	91.5	-	-	17.094	21.724	18.874	1.13	4.10	-	0.73
8	1142	0.069	0.2627	94.5	-	-	17.017	21.510	24.569	1.47	2.91	-	0.76
9	916	0.072	0.2683	96.9	85.36	141.6	17.421	21.925	20.077	1.20	2.38	-	0.78
10	1115	0.070	0.2646	98.6	87.85	159.37	17.203	21.585	24.069	1.44	1.79	-	0.80
11	948	0.069	0.2627	100.2	90.27	178.48	17.104	21.400	20.279	1.22	1.29	-	0.82
12	881	0.071	0.2665	101.6	92.35	198.23	17.372	21.681	19.098	1.15	1.30	-	0.84
13	699	0.068	0.2608	102.4	94.52	217.63	17.013	21.202	14.825	0.89	1.18	-	0.85
14	252	0.069	0.2627	102.5	96.42	235.57	17.139	21.356	5.380	0.32	1.00	-	0.86
15	591	0.069	0.2627	103.4	98.09	251.67	17.153	21.339	12.617	0.76	0.87	-	0.87
16	2568	0.067	0.2588	111.8	100.34	265.76	17.028	20.872	53.596	3.22	1.27	-	0.93
17	6719	0.069	0.2627	109.1	102.1	279.16	17.240	21.232	142.659	8.56	2.75	-	1.07
18	2650	0.069	0.2627	109.3	103.58	292.45	17.243	21.228	56.249	3.37	3.25	-	1.13
19	3729	0.068	0.2608	111.8	105.07	305.93	17.155	21.027	78.417	4.71	4.12	-	1.20
20	2096	0.067	0.2588	113.5	106.56	319.52	17.054	20.841	43.688	2.62	4.50	-	1.25
21	885	0.066	0.2569	114.7	108.01	333.18	16.943	20.663	18.292	1.10	4.07	-	1.27
22	819	0.067	0.2588	115.6	109.41	347	17.085	20.803	17.039	1.02	2.56	-	1.28
23	736	0.068	0.2608	117.3	110.9	360.96	17.237	20.927	15.411	0.92	2.07	-	1.30
24	631	0.068	0.2608	117.9	112.44	375.09	17.246	20.916	13.205	0.79	1.29	-	1.31
25	568	0.068	0.2608	118.1	113.91	389.48	17.249	20.912	11.869	0.71	0.91	-	1.32
26	785	0.069	0.2627	119.1	114.64	403.68	17.390	21.047	16.515	0.99	0.89	-	1.34
27	899	0.069	0.2627	117.2	115.45	416.26	17.362	21.082	18.947	1.14	0.91	-	1.36
28	865	0.068	0.2608	117.1	116.23	427.06	17.234	20.930	18.114	1.09	0.94	-	1.38
29	982	0.068	0.2608	117.5	116.8	435.94	17.240	20.923	20.555	1.23	1.03	-	1.40
30	933	0.068	0.2608	117.7	117.22	443.1	17.243	20.920	19.526	1.17	1.12	-	1.42
31	969	0.068	0.2608	117.8	117.53	448.81	17.245	20.918	20.262	1.22	1.17	-	1.44
32	433	0.068	0.2608	113	117.27	453.01	17.173	21.005	9.098	0.55	1.05	-	1.45
33	0	0.069	0.2627	109.2	116.46	455.43	17.241	21.230	-0.009	0.00	0.83	-	1.45
34	-76	0.069	0.2627	107	115.37	456.02	17.208	21.271	-1.616	-0.10	0.57	-	1.44
35	-36	0.070	0.2646	106.1	114.17	454.93	17.318	21.442	-0.779	-0.05	0.32	-	1.44
36	235	0.069	0.2627	104.8	112.74	453.16	17.174	21.312	5.008	0.30	0.14	-	1.45
37	169	0.069	0.2627	104.1	111.43	451.45	17.164	21.326	3.607	0.22	0.07	-	1.45
38	115	0.069	0.2627	103	110.02	449.49	17.147	21.346	2.463	0.15	0.10	-	1.46
39	78	0.069	0.2627	102.6	108.53	447.22	17.141	21.354	1.670	0.10	0.14	-	1.46
40	175	0.070	0.2646	102.2	106.98	444.63	17.259	21.516	3.775	0.23	0.20	-	1.46
41	291	0.071	0.2665	101	105.3	441.82	17.363	21.692	6.316	0.38	0.21	-	1.47
42	253	0.069	0.2627	100.5	104.05	438.98	17.109	21.394	5.412	0.32	0.24	-	1.47
43	291	0.070	0.2646	100.1	103.14	436.63	17.226	21.556	6.271	0.38	0.28	-	1.48
44	184	0.068	0.2608	99.6	102.4	434.91	16.971	21.256	3.907	0.23	0.31	-	1.48
45	251	0.069	0.2627	98.7	101.66	433.79	17.081	21.429	5.385	0.32	0.33	-	1.49
46	479	0.069	0.2627	98.5	101.03	433.2	17.078	21.432	10.256	0.62	0.37	-	1.50
47	353	0.070	0.2646	98.2	100.44	433.03	17.197	21.593	7.616	0.46	0.40	-	1.51
48	231	0.070	0.2646	97.7	99.91	433.26	17.189	21.603	4.996	0.30	0.39	-	1.51
49	434	0.069	0.2627	97.6	99.41	433.76	17.065	21.450	9.315	0.56	0.45	-	1.52
50	505	0.070	0.2646	96.9	98.88	434.54	17.177	21.618	10.916	0.65	0.52	-	1.53
51	520	0.071	0.2665	97	98.48	435.48	17.301	21.770	11.312	0.68	0.53	-	1.54
52	1032	0.069	0.2627	96.5	98.08	436.61	17.048	21.471	22.154	1.33	0.70	-	1.56
53	694	0.070	0.2646	96.3	97.7	437.82	17.168	21.630	15.009	0.90	0.82	-	1.58
54	598	0.070	0.2646	96.2	97.36	439.03	17.166	21.632	12.931	0.78	0.87	-	1.59
55	365	0.070	0.2646	96.1	97.1	440.13	17.165	21.634	7.898	0.47	0.83	-	1.60
56		0.071	0.2665	95.8	96.83	441.13					0.87	-	
57		0.071	0.2665	95.5	96.56	441.99					0.72	-	
58		0.071	0.2665	95.3	96.32	442.73					0.62	-	
59		0.070	0.2646	95.4	96.1	443.39					0.47	1.71	
60	204	0.069	0.2627	95	95.91	443.84	17.025	21.500	4.394	0.26	0.26	1.75	1.60
61	240	0.071	0.2665	94.5	95.66	443.95	17.262	21.819	5.229	0.31	0.29	1.77	1.61
62	273	0.070	0.2646	94.3	95.44	443.68	17.137	21.669	5.918	0.36	0.31	1.35	1.62
63	314	0.069	0.2627	94.4	95.25	443.09	17.016	21.512	6.751	0.41	0.33	1.22	1.62
64	465	0.070	0.2646	93.9	95.02	442.31	17.131	21.677	10.087	0.61	0.39	1.15	1.63
65	2394	0.071	0.2665	102.2	95.63	441.38	17.381	21.669	51.877	3.11	0.96	1.08	1.68
66	2762	0.069	0.2627	103.5	96.4	441.12	17.155	21.337	58.927	3.54	1.60	1.02	1.74
67	1086	0.071	0.2665	99.7	96.82	441.49	17.343	21.717	23.575	1.41	1.81	1.06	1.77
68	509	0.069	0.2627	97.8	97.07	442.03	17.068	21.446	10.922	0.66	1.86	1.10	1.78
69	396	0.068	0.2608	96.9	97.22	442.56	16.930	21.307	8.434	0.51	1.84	1.10	1.79
70	300	0.069	0.2627	96.5	97.37	443.1	17.048	21.471	6.451	0.39	1.30	1.09	1.79
71	415	0.070	0.2646	96	97.52	443.74	17.163	21.636	8.974	0.54	0.70	1.07	1.80
72	329	0.069	0.2627	95.5	97.64	444.52	17.032	21.490	7.070	0.42	0.50	1.06	1.81
73	294	0.070	0.2646	95.4	97.74	445.37	17.154	21.647	6.358	0.38	0.45	1.05	1.82
74	523	0.070	0.2646	95.3	97.88	446.2	17.152	21.649	11.329	0.68	0.48	1.05	1.83
75	408	0.071	0.2665	95.1	97.17	447.03	17.271	21.807	8.897	0.53	0.51	1.05	1.84
76	397	0.070	0.2646	94.9	96.31	446.96	17.146	21.657	8.601	0.52	0.51	1.00	1.84
77	306	0.068	0.2608	94.9	95.83	446.08	16.899	21.345	6.533	0.39	0.50	0.85	1.85
78	257	0.070	0.2646	94.7	95.52	444.77	17.143	21.661	5.560	0.33	0.49	0.80	1.86
79	167	0.069	0.2627	94.9	95.32	443.23	17.023	21.502	3.580	0.21	0.40	0.72	1.86
80	207	0.069	0.2627	94.7	95.14	441.56	17.020	21.506	4.452	0.27	0.34	0.68	1.86
81	168	0.071	0.2665	94.3	94.97	439.87	17.259	21.823	3.656	0.22	0.29	0.66	1.87
82	356	0.070	0.2646	94.4	94.86	438.15	17.138	21.667	7.710	0.46	0.30	0.65	1.88
83	311	0.070	0.2646	94.2	94.74	436.41	17.135	21.671	6.744	0.40	0.31	0.63	1.88
84	421	0.071	0.2665	93.8	94.59	434.65	17.251	21.833	9.188	0.55	0.38	0.63	1.89

Run 1 TEOM Data

85	276	0.070	0.2646	93.8	94.46	432.94	17.129	21.679	5.992	0.36	0.40	0.62	1.90
86	365	0.070	0.2646	94.1	94.38	431.29	17.134	21.673	7.919	0.48	0.45	0.61	1.91
87	332	0.070	0.2646	93.9	94.28	429.73	17.131	21.677	7.200	0.43	0.44	0.60	1.91
88	363	0.071	0.2665	93.5	94.16	428.25	17.246	21.839	7.925	0.48	0.46	0.59	1.92
89	325	0.070	0.2646	93.3	94	426.83	17.121	21.688	7.049	0.42	0.43	0.57	1.93
90	281	0.070	0.2646	93.5	93.88	425.45	17.125	21.684	6.097	0.37	0.43	0.56	1.93
91	360	0.071	0.2665	92.9	93.74	424	17.237	21.851	7.866	0.47	0.43	0.54	1.94
92	334	0.070	0.2646	92.9	93.59	422.47	17.115	21.696	7.241	0.43	0.43	0.54	1.95
93	318	0.070	0.2646	92.8	93.45	420.92	17.114	21.698	6.903	0.41	0.42	0.55	1.96
94	283	0.070	0.2646	92.6	93.33	419.41	17.111	21.702	6.144	0.37	0.41	0.56	1.96
95	322	0.069	0.2627	92.6	93.21	417.88	16.988	21.547	6.948	0.42	0.42	0.57	1.97
96	377	0.069	0.2627	92.4	93.04	416.44	16.985	21.550	8.114	0.49	0.42	0.57	1.98
97	385	0.069	0.2627	92.6	92.91	415.06	16.988	21.547	8.297	0.50	0.44	0.57	1.99
98	399	0.069	0.2627	92.3	92.79	413.74	16.983	21.552	8.595	0.52	0.46	0.58	1.99
99	132	0.071	0.2665	92.3	92.69	412.51	17.228	21.863	2.881	0.17	0.42	0.59	2.00
100	301	0.070	0.2646	92.2	92.56	411.35	17.104	21.710	6.538	0.39	0.41	0.59	2.00
101	373	0.072	0.2683	92	92.47	410.27	17.344	22.022	8.218	0.49	0.41	0.59	2.01
102	314	0.072	0.2683	92	92.38	409.27	17.344	22.022	6.912	0.41	0.40	0.59	2.02
103	339	0.071	0.2665	92.1	92.31	408.37	17.225	21.867	7.411	0.44	0.38	0.59	2.03
104	279	0.071	0.2665	91.8	92.23	407.53	17.220	21.872	6.104	0.37	0.42	0.60	2.03
105	366	0.069	0.2627	92.1	92.18	406.76	16.980	21.556	7.884	0.47	0.44	0.60	2.04
106	346	0.069	0.2627	92	92.14	406.03	16.979	21.558	7.456	0.45	0.43	0.59	2.05
107	177	0.069	0.2627	91.7	92.05	405.34	16.974	21.564	3.825	0.23	0.39	0.59	2.05
108	359	0.071	0.2665	91.7	91.99	404.67	17.218	21.874	7.856	0.47	0.40	0.60	2.06
109	238	0.071	0.2665	91.7	91.93	404.02	17.218	21.874	5.214	0.31	0.39	0.59	2.06
110	309	0.070	0.2646	91.5	91.86	403.39	17.094	21.724	6.719	0.40	0.37	0.59	2.07
111	356	0.070	0.2646	91.5	91.81	402.79	17.094	21.724	7.725	0.46	0.38	0.58	2.08
112	423	0.071	0.2665	91.4	91.75	402.22	17.214	21.880	9.252	0.56	0.44	0.56	2.09
113	232	0.071	0.2665	91.4	91.68	401.66	17.214	21.880	5.085	0.31	0.41	0.55	2.09
114	272	0.071	0.2665	91.7	91.67	401.14	17.218	21.874	5.958	0.36	0.42	0.55	2.10
115	528	0.070	0.2646	91.3	91.59	400.64	17.090	21.728	11.468	0.69	0.47	0.55	2.11
116	505	0.069	0.2627	91.3	91.52	400.14	16.968	21.572	10.892	0.65	0.51	0.54	2.12
117	462	0.070	0.2646	91.2	91.47	399.66	17.089	21.730	10.042	0.60	0.52	0.55	2.13
118	541	0.071	0.2665	91.2	91.42	399.24	17.211	21.884	11.830	0.71	0.60	0.55	2.14
119	390	0.070	0.2646	91.5	91.4	398.83	17.094	21.724	8.479	0.51	0.63	0.55	2.15
120	377	0.070	0.2646	91.1	91.36	398.44	17.087	21.732	8.200	0.49	0.59	0.56	2.16
121	203	0.071	0.2665	91.4	91.35	398.08	17.214	21.880	4.439	0.27	0.52	0.56	2.16
122	206	0.071	0.2665	91.2	91.33	397.73	17.211	21.884	4.505	0.27	0.45	0.56	2.17
123		0.071	0.2665	91	91.29	397.4					0.38	0.56	
124		0.072	0.2683	90.8	91.2	397.03					0.34	0.55	
125		0.072	0.2683	91	91.17	396.65					0.27	0.51	
126		0.069	0.2627	91	91.14	396.24					0.27	0.46	
127	295	0.070	0.2646	90.7	91.09	395.79	17.081	21.740	6.410	0.38	0.38	0.44	2.17
128	252	0.071	0.2665	90.8	91.05	395.33	17.204	21.892	5.508	0.33	0.36	0.43	2.18
129	3087	0.070	0.2646	102.4	92.14	394.61	17.262	21.512	66.414	3.98	1.57	0.43	2.25
130	16594	0.069	0.2627	101.4	93.17	394.34	17.123	21.377	354.738	21.28	6.50	0.43	2.60
131	3178	0.069	0.2627	101.7	94.2	395.84	17.127	21.371	67.920	4.08	6.01	0.49	2.67
132	2011	0.067	0.2588	103.4	95.42	399.04	16.903	21.027	42.295	2.54	6.44	0.88	2.71
133	2902	0.070	0.2646	100.5	96.37	403.3	17.232	21.548	62.533	3.75	7.13	0.95	2.77
134	1487	0.069	0.2627	99	97.19	408.29	17.086	21.423	31.864	1.91	6.71	0.98	2.81
135	938	0.069	0.2627	98.7	97.96	413.74	17.081	21.429	20.107	1.21	2.70	1.04	2.83
136	663	0.068	0.2608	98	98.66	419.6	16.947	21.286	14.120	0.85	2.05	1.07	2.84
137	488	0.069	0.2627	98.6	99.45	425.78	17.080	21.430	10.463	0.63	1.67	1.08	2.85
138	456	0.069	0.2627	98.4	100.21	432.18	17.077	21.434	9.772	0.59	1.04	1.09	2.86
139	701	0.069	0.2627	98.6	99.83	438.99	17.080	21.430	15.016	0.90	0.83	1.10	2.88
140	724	0.069	0.2627	98.7	99.56	445.43	17.081	21.429	15.515	0.93	0.78	1.11	2.89
141	277	0.071	0.2665	98.9	99.28	450.07	17.330	21.733	6.023	0.36	0.68	1.12	2.90
142	382	0.069	0.2627	98.6	98.8	452.95	17.080	21.430	8.183	0.49	0.65	1.13	2.91
143	213	0.070	0.2646	98.8	98.63	454.62	17.206	21.581	4.596	0.28	0.59	1.13	2.91
144	226	0.070	0.2646	98.9	98.62	455.42	17.208	21.579	4.880	0.29	0.47	1.13	2.91
145	253	0.070	0.2646	98.6	98.61	455.57	17.203	21.585	5.463	0.33	0.35	1.13	2.92
146	288	0.070	0.2646	98.9	98.7	455.13	17.208	21.579	6.222	0.37	0.35	1.12	2.93
147	274	0.071	0.2665	98.8	98.72	454.19	17.329	21.735	5.963	0.36	0.33	1.12	2.93
148	188	0.069	0.2627	99.1	98.79	452.81	17.088	21.421	4.036	0.24	0.32	1.12	2.94
149	327	0.069	0.2627	99.5	98.88	451.25	17.094	21.413	7.003	0.42	0.34	1.12	2.94
150	525	0.069	0.2627	99.8	98.99	449.72	17.098	21.407	11.240	0.67	0.41	1.11	2.95
151	481	0.069	0.2627	100	99.1	448.29	17.101	21.404	10.290	0.62	0.46	1.11	2.97
152	379	0.069	0.2627	100.2	99.26	446.91	17.104	21.400	8.100	0.49	0.49	1.12	2.97
153	362	0.069	0.2627	100	99.38	445.66	17.101	21.404	7.742	0.46	0.53	1.12	2.98
154	582	0.069	0.2627	100.2	99.51	444.62	17.104	21.400	12.459	0.75	0.60	1.12	2.99
155	906	0.069	0.2627	99.9	99.64	443.92	17.100	21.406	19.386	1.16	0.70	1.12	3.01
156	579	0.069	0.2627	99.6	99.71	443.43	17.095	21.411	12.391	0.74	0.72	1.13	3.03
157	380	0.070	0.2646	99.6	99.79	442.99	17.219	21.566	8.198	0.49	0.72	1.14	3.03
158	431	0.070	0.2646	99.1	99.79	442.53	17.211	21.575	9.296	0.56	0.74	1.15	3.04
159	480	0.069	0.2627	99.3	99.77	441.84	17.091	21.417	10.274	0.62	0.71	1.15	3.05
160	304	0.068	0.2608	98.7	99.66	440.81	16.957	21.273	6.477	0.39	0.56	1.16	3.06
161	416	0.068	0.2608	98.6	99.52	439.42	16.956	21.275	8.860	0.53	0.52	1.16	3.07
162	461	0.068	0.2608	98.7	99.37	437.77	16.957	21.273	9.815	0.59	0.54	1.16	3.08
163	362	0.068	0.2608	98.3	99.2	435.89	16.951	21.280	7.711	0.46	0.52	1.16	3.09
164	472	0.068	0.2608	98	98.98	433.72	16.947	21.286	10.051	0.60	0.51	1.16	3.10
165	413	0.068	0.2608	98.2	98.81	431.2	16.950	21.282	8.790	0.53	0.54	1.16	3.10
166	463	0.069	0.2627	97.7	98.62	428.48	17.066	21.448	9.936	0.60	0.56	1.17	3.11
167	390	0.069	0.2627	97.5	98.41	425.71	17.063	21.452	8.365	0.50	0.54	1.17	3.12
168	377	0.069	0.2627	97.3	98.23	422.94	17.060	21.455	8.097	0.49	0.54	1.17	3.13
169	384	0.070	0.2646	97.2	98.02	420.24	17.182	21.612	8.300	0.50	0.52	1.18	3.14
170	332	0.069	0.2627	96.7	97.82	417.6	17.051	21.467	7.137	0.43	0.50	1.18	3.15
171	390	0.069	0.2627	96.6	97.62	415.12	17.049	21.469	8.377	0.50	0.48	1.18	3.15
172	347	0.070	0.2646	96.6	97.41	412.83	17.172	21.624	7.497	0.45	0.47	1.18	3.16

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173	380	0.070	0.2646	96.7	97.25	410.69	17.174	21.622	8.217	0.49	0.47	1.18	3.17
174	388	0.069	0.2627	96.5	97.1	408.69	17.048	21.471	8.328	0.50	0.47	1.18	3.18
175	348	0.070	0.2646	96.2	96.9	406.82	17.166	21.632	7.524	0.45	0.48	1.18	3.19
176	513	0.069	0.2627	96.4	96.77	405.07	17.046	21.473	11.007	0.66	0.51	1.18	3.20
177	427	0.068	0.2608	95.9	96.61	403.45	16.915	21.326	9.104	0.55	0.53	1.17	3.21
178	1040	0.068	0.2608	96.1	96.49	401.97	16.918	21.322	22.180	1.33	0.70	1.17	3.23
179	1647	0.068	0.2608	95.8	96.35	400.6	16.913	21.328	35.137	2.11	1.02	1.17	3.26
180	1945	0.068	0.2608	95.5	96.23	399.32	16.909	21.334	41.487	2.49	1.43	1.19	3.31
181	1836	0.069	0.2627	95.4	96.11	398.04	17.031	21.492	39.468	2.37	1.77	1.22	3.34
182	2248	0.069	0.2627	95.1	95.96	396.64	17.026	21.498	48.326	2.90	2.24	1.26	3.39
183	2652	0.070	0.2646	95.1	95.8	395.1	17.149	21.653	57.419	3.45	2.66	1.28	3.45
184	2798	0.071	0.2665	94.5	95.6	393.42	17.262	21.819	61.054	3.66	2.97	1.31	3.51
185	3318	0.070	0.2646	94.2	95.4	391.65	17.135	21.671	71.898	4.31	3.34	1.35	3.58
186	3759	0.070	0.2646	94.2	95.18	389.73	17.135	21.671	81.462	4.89	3.84	1.39	3.67
187	3283	0.070	0.2646	93.8	94.97	387.66	17.129	21.679	71.167	4.27	4.12	1.46	3.74
188	3502	0.071	0.2665	93.5	94.71	385.47	17.246	21.839	76.489	4.59	4.34	1.54	3.81
189	3738	0.069	0.2627	93.3	94.46	383.17	16.999	21.533	80.493	4.83	4.58	1.54	3.89
190	4317	0.070	0.2646	93.2	94.23	380.75	17.120	21.690	93.648	5.62	4.84	1.25	3.99
191	3724	0.069	0.2627	93.3	94.02	378.28	16.999	21.533	80.182	4.81	4.82	1.27	4.07
192	3818	0.071	0.2665	93.1	93.82	375.85	17.240	21.847	83.418	5.01	4.97	1.32	4.15
193	3310	0.069	0.2627	92.6	93.57	373.51	16.988	21.547	71.319	4.28	4.91	1.34	4.22
194	2605	0.071	0.2665	92.5	93.37	371.28	17.231	21.859	56.943	3.42	4.63	1.39	4.28
195	2495	0.068	0.2608	92.6	93.21	369.11	16.864	21.390	53.359	3.20	4.14	1.44	4.33
196	2749	0.069	0.2627	92.6	93.05	367.07	16.988	21.547	59.239	3.55	3.89	1.49	4.39
197	1368	0.070	0.2646	92.4	92.91	365.2	17.107	21.706	29.698	1.78	3.25	1.53	4.42
198	1149	0.070	0.2646	92.3	92.79	363.52	17.106	21.708	24.943	1.50	2.69	1.58	4.45
199	1052	0.069	0.2627	92	92.66	361.99	16.979	21.558	22.675	1.36	2.28	1.60	4.47
200	636	0.070	0.2646	91.9	92.53	360.63	17.100	21.716	13.803	0.83	1.80	1.61	4.48
201	580	0.071	0.2665	91.9	92.39	359.42	17.221	21.871	12.692	0.76	1.25	1.63	4.50
202	385	0.070	0.2646	91.9	92.27	358.39	17.100	21.716	8.362	0.50	0.99	1.63	4.50
203	396	0.069	0.2627	91.7	92.18	357.51	16.974	21.564	8.534	0.51	0.79	1.64	4.51
204	581	0.070	0.2646	91.9	92.12	356.76	17.100	21.716	12.622	0.76	0.67	1.64	4.52
205	573	0.070	0.2646	91.6	92.02	356.1	17.095	21.722	12.447	0.75	0.66	1.65	4.54
206	400	0.069	0.2627	91.4	91.9	355.53	16.969	21.570	8.632	0.52	0.61	1.65	4.55
207	316	0.068	0.2608	91.8	91.84	355.02	16.852	21.405	6.764	0.41	0.59	1.66	4.55
208	347	0.070	0.2646	91.9	91.8	354.57	17.100	21.716	7.546	0.45	0.58	1.66	4.56
209	164	0.070	0.2646	91.8	91.78	354.2	17.098	21.718	3.566	0.21	0.47	1.66	4.56
210	330	0.071	0.2665	91.8	91.77	353.92	17.220	21.872	7.226	0.43	0.40	1.66	4.57
211	116	0.070	0.2646	91.8	91.76	353.75	17.098	21.718	2.529	0.15	0.33	1.65	4.57
212	134	0.070	0.2646	91.8	91.75	353.64	17.098	21.718	2.919	0.18	0.29	1.65	4.58
213	169	0.070	0.2646	91.6	91.74	353.6	17.095	21.722	3.669	0.22	0.24	1.65	4.58
214	231	0.069	0.2627	91.6	91.71	353.65	16.973	21.566	4.975	0.30	0.26	1.64	4.58
215	278	0.071	0.2665	92.1	91.76	353.85	17.225	21.867	6.086	0.37	0.24	1.62	4.59
216	242	0.070	0.2646	91.9	91.81	354.17	17.100	21.716	5.245	0.31	0.27	1.61	4.60
217	273	0.070	0.2646	92	91.83	354.59	17.101	21.714	5.920	0.36	0.31	1.61	4.60
218	193	0.070	0.2646	92.1	91.85	355.1	17.103	21.712	4.192	0.25	0.32	1.61	4.61
219	193	0.071	0.2665	92.2	91.89	355.74	17.226	21.865	4.224	0.25	0.31	1.60	4.61
220	248	0.071	0.2665	92.3	91.94	356.45	17.228	21.863	5.420	0.33	0.30	1.60	4.62
221	146	0.069	0.2627	92.2	91.98	357.22	16.982	21.554	3.143	0.19	0.27	1.60	4.62
222	299	0.069	0.2627	92.5	92.05	358.04	16.986	21.549	6.452	0.39	0.28	1.59	4.63
223	279	0.070	0.2646	92.2	92.11	358.91	17.104	21.710	6.056	0.36	0.30	1.59	4.63
224	150	0.070	0.2646	92.7	92.22	359.82	17.112	21.700	3.247	0.19	0.29	1.58	4.63
225	221	0.069	0.2627	92.5	92.26	360.74	16.986	21.549	4.755	0.29	0.28	1.58	4.64
226	311	0.071	0.2665	92.4	92.31	361.64	17.229	21.861	6.794	0.41	0.33	1.57	4.65
227	329	0.070	0.2646	92.6	92.37	362.56	17.111	21.702	7.130	0.43	0.34	1.57	4.65
228	184	0.070	0.2646	92.5	92.41	363.48	17.109	21.704	3.996	0.24	0.31	1.57	4.66
229	508	0.071	0.2665	92.5	92.44	364.42	17.231	21.859	11.095	0.67	0.41	1.57	4.67
230	603	0.069	0.2627	92.8	92.49	365.36	16.991	21.543	12.985	0.78	0.50	1.56	4.68
231	380	0.071	0.2665	92.5	92.52	366.25	17.231	21.859	8.299	0.50	0.52	1.57	4.69
232	487	0.070	0.2646	92.7	92.54	367.07	17.112	21.700	10.572	0.63	0.56	1.57	4.70
233	276	0.070	0.2646	92.5	92.57	367.79	17.109	21.704	5.995	0.36	0.59	1.57	4.71
234	98	0.069	0.2627	92.5	92.55	368.35	16.986	21.549	2.104	0.13	0.48	1.57	4.71
235	67	0.070	0.2646	92.7	92.57	368.78	17.112	21.700	1.445	0.09	0.34	1.57	4.71
236	76	0.071	0.2665	92.3	92.56	369.09	17.228	21.863	1.669	0.10	0.26	1.56	4.71
237	63	0.070	0.2646	92.4	92.54	369.29	17.107	21.706	1.363	0.08	0.15	1.56	4.71
238	71	0.071	0.2665	92.2	92.51	369.34	17.226	21.865	1.558	0.09	0.10	1.53	4.71
239	109	0.071	0.2665	92.2	92.48	369.2	17.226	21.865	2.386	0.14	0.10	1.50	4.72
240	51	0.070	0.2646	92.2	92.42	368.88	17.104	21.710	1.105	0.07	0.10	1.46	4.72
241	-3	0.069	0.2627	92	92.37	368.46	16.979	21.558	-0.067	0.00	0.08	1.42	4.72
242	96	0.071	0.2665	92	92.3	367.94	17.223	21.869	2.096	0.13	0.08	1.37	4.72
243	81	0.071	0.2665	92.2	92.27	367.36	17.226	21.865	1.769	0.11	0.09	1.31	4.72
244	106	0.071	0.2665	91.8	92.2	366.75	17.220	21.872	2.328	0.14	0.09	1.25	4.72
245	135	0.070	0.2646	91.7	92.1	366.1	17.097	21.720	2.934	0.18	0.11	1.18	4.73
246	31	0.071	0.2665	91.7	92.04	365.42	17.218	21.874	0.683	0.04	0.12	1.10	4.73
247	184	0.070	0.2646	91.7	91.97	364.65	17.097	21.720	3.994	0.24	0.14	1.03	4.73
248	45	0.071	0.2665	91.7	91.92	363.85	17.218	21.874	0.981	0.06	0.13	0.95	4.73
249	110	0.071	0.2665	91.4	91.84	363.03	17.214	21.880	2.414	0.14	0.13	0.87	4.74
250	39	0.070	0.2646	91.4	91.76	362.22	17.092	21.726	0.843	0.05	0.11	0.77	4.74
251	145	0.070	0.2646	91.3	91.69	361.36	17.090	21.728	3.160	0.19	0.14	0.69	4.74
252	39	0.070	0.2646	91.1	91.6	360.51	17.087	21.732	0.848	0.05	0.10	0.61	4.74
253	123	0.069	0.2627	91.1	91.49	359.63	16.965	21.576	2.660	0.16	0.12	0.54	4.74
254	-37	0.071	0.2665	91.2	91.43	358.74	17.211	21.884	-0.805	-0.05	0.08	0.48	4.74
255	168	0.071	0.2665	90.8	91.34	357.8	17.204	21.892	3.671	0.22	0.11	0.42	4.75
256	64	0.070	0.2646	90.7	91.24	356.83	17.081	21.740	1.402	0.08	0.09	0.36	4.75
257	116	0.071	0.2665	90.6	91.13	355.9	17.201	21.896	2.534	0.15	0.11	0.34	4.75
258	61	0.071	0.2665	90.6	91.02	354.97	17.201	21.896	1.332	0.08	0.10	0.31	4.75
259	-18	0.071	0.2665	90.5	90.93	354.04	17.200	21.898	-0.386	-0.02	0.04	0.29	4.75
260	116	0.071	0.2665	90.2	90.81	353.07	17.195	21.904	2.531	0.15	0.09	0.28	

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261	82	0.071	0.2665	90.1	90.69	352.1	17.193	21.906	1.801	0.11	0.09	0.26	4.75
262	116	0.070	0.2646	90.3	90.61	351.13	17.075	21.748	2.533	0.15	0.09	0.26	4.76
263	3	0.069	0.2627	90.1	90.51	350.18	16.949	21.596	0.074	0.00	0.08	0.25	4.76
264	25	0.071	0.2665	90	90.39	349.24	17.192	21.908	0.545	0.03	0.09	0.24	4.76
265	114	0.071	0.2665	89.8	90.29	348.31	17.189	21.912	2.500	0.15	0.09	0.23	4.76
266	56	0.071	0.2665	89.9	90.21	347.42	17.190	21.910	1.231	0.07	0.08	0.22	4.76
267	67	0.072	0.2683	89.7	90.12	346.52	17.308	22.068	1.481	0.09	0.07	0.22	4.76
268	-27	0.070	0.2646	89.7	90.03	345.62	17.066	21.759	-0.596	-0.04	0.06	0.21	4.76
269	98	0.070	0.2646	89.7	89.95	344.7	17.066	21.759	2.125	0.13	0.08	0.21	4.76
270	198	0.070	0.2646	89.4	89.87	343.83	17.061	21.765	4.308	0.26	0.10	0.20	4.77
271	240	0.071	0.2665	89.4	89.8	342.96	17.182	21.920	5.264	0.32	0.15	0.20	4.77
272	248	0.070	0.2646	89.5	89.72	342.09	17.063	21.763	5.389	0.32	0.20	0.20	4.78
273	302	0.071	0.2665	89.1	89.62	341.2	17.178	21.926	6.617	0.40	0.28	0.20	4.79
274	343	0.070	0.2646	89.1	89.53	340.33	17.056	21.771	7.465	0.45	0.35	0.20	4.79
275	289	0.071	0.2665	89.1	89.46	339.5	17.178	21.926	6.341	0.38	0.37	0.20	4.80
276	149	0.070	0.2646	89.3	89.4	338.69	17.059	21.767	3.251	0.20	0.35	0.20	4.80
277	76	0.070	0.2646	89	89.33	337.93	17.055	21.773	1.653	0.10	0.30	0.20	4.81
278	171	0.071	0.2665	89.2	89.28	337.22	17.179	21.924	3.756	0.23	0.27	0.20	4.81
279	140	0.069	0.2627	88.9	89.2	336.56	16.931	21.619	3.016	0.18	0.22	0.20	4.81
280	67	0.069	0.2627	88.9	89.15	335.91	16.931	21.619	1.453	0.09	0.16	0.20	4.81
281	80	0.070	0.2646	89.1	89.12	335.31	17.056	21.771	1.743	0.10	0.14	0.20	4.81
282	157	0.071	0.2665	89.1	89.08	334.74	17.178	21.926	3.441	0.21	0.16	0.19	4.82
283	37	0.071	0.2665	89	89.07	334.19	17.176	21.928	0.810	0.05	0.13	0.19	4.82
284	27	0.070	0.2646	88.7	89.03	333.66	17.050	21.779	0.580	0.03	0.10	0.19	4.82
285	40	0.070	0.2646	88.5	88.97	333.13	17.047	21.783	0.865	0.05	0.09	0.19	4.82
286	138	0.070	0.2646	88.8	88.92	332.58	17.052	21.777	3.010	0.18	0.10	0.18	4.82
287	31	0.071	0.2665	88.5	88.87	332.01	17.168	21.938	0.670	0.04	0.07	0.17	4.82
288	177	0.071	0.2665	88.5	88.8	331.41	17.168	21.938	3.876	0.23	0.11	0.17	4.83
289	35	0.071	0.2665	88.3	88.74	330.8	17.165	21.942	0.767	0.05	0.11	0.16	4.83
290	114	0.070	0.2646	88.4	88.69	330.2	17.045	21.785	2.488	0.15	0.13	0.15	4.83
291	96	0.070	0.2646	88.6	88.64	329.55	17.049	21.781	2.083	0.12	0.12	0.14	4.83
292	-7	0.071	0.2665	88.2	88.55	328.88	17.164	21.944	-0.148	-0.01	0.11	0.14	4.83
293	41	0.069	0.2627	88.3	88.48	328.22	16.922	21.631	0.887	0.05	0.07	0.13	4.83
294	-8	0.070	0.2646	88.4	88.45	327.51	17.045	21.785	-0.170	-0.01	0.06	0.13	4.83
295	-62	0.072	0.2683	87.9	88.39	326.73	17.279	22.104	-1.374	-0.08	0.02	0.13	4.83
296	75	0.071	0.2665	87.8	88.29	325.89	17.157	21.952	1.652	0.10	0.01	0.13	4.83
297	82	0.069	0.2627	87.8	88.22	324.95	16.914	21.641	1.766	0.11	0.03	0.12	4.84
298	-147	0.070	0.2646	87.7	88.14	323.92	17.035	21.799	-3.210	-0.19	-0.02	0.12	4.83
299	-2	0.069	0.2627	87.6	88.07	322.79	16.911	21.645	-0.035	0.00	-0.01	0.12	4.83
300	52	0.069	0.2627	87.4	87.97	321.56	16.908	21.649	1.119	0.07	0.02	0.12	4.83
301	75	0.071	0.2665	87.5	87.86	320.28	17.153	21.958	1.651	0.10	0.02	0.12	4.84
302	57	0.071	0.2665	87.4	87.78	318.89	17.151	21.960	1.250	0.08	0.01	0.12	4.84
303	38	0.071	0.2665	87.4	87.69	317.42	17.151	21.960	0.824	0.05	0.06	0.12	4.84
304	109	0.070	0.2646	87.2	87.57	315.92	17.027	21.809	2.375	0.14	0.09	0.12	4.84
305	-160	0.070	0.2646	86.9	87.47	314.41	17.022	21.815	-3.489	-0.21	0.03	0.11	4.84
306	-59	0.071	0.2665	87	87.39	312.9	17.145	21.968	-1.292	-0.08	0.00	0.12	4.84
307	28	0.070	0.2646	86.8	87.29	311.38	17.021	21.817	0.609	0.04	-0.01	0.11	4.84
308	-7	0.070	0.2646	86.8	87.2	309.9	17.021	21.817	-0.152	-0.01	-0.02	0.11	4.84
309	-19	0.072	0.2683	86.4	87.08	308.44	17.256	22.135	-0.419	-0.03	-0.06	0.10	4.84
310	57	0.069	0.2627	86.4	86.98	307	16.892	21.669	1.228	0.07	0.00	0.10	4.84
311	45	0.071	0.2665	86.7	86.9	305.59	17.140	21.974	0.998	0.06	0.03	0.10	4.84
312	-16	0.071	0.2665	86.5	86.81	304.22	17.137	21.978	-0.352	-0.02	0.02	0.10	4.84
313	73	0.071	0.2665	86.4	86.71	302.89	17.135	21.980	1.611	0.10	0.04	0.10	4.84
314	-137	0.070	0.2646	86.2	86.61	301.59	17.011	21.829	-2.997	-0.18	0.01	0.10	4.84
315	-1	0.070	0.2646	86.5	86.57	300.33	17.016	21.823	-0.022	0.00	-0.01	0.10	4.84
316	99	0.071	0.2665	86.1	86.48	299.11	17.131	21.986	2.179	0.13	0.01	0.09	4.84
317	81	0.071	0.2665	86.1	86.41	297.95	17.131	21.986	1.781	0.11	0.03	0.09	4.84
318	6	0.071	0.2665	86	86.33	296.81	17.129	21.988	0.130	0.01	0.01	0.09	4.84
319	75	0.072	0.2683	86.1	86.3	295.68	17.251	22.141	1.656	0.10	0.07	0.09	4.84
320	120	0.072	0.2683	85.7	86.23	294.6	17.245	22.149	2.658	0.16	0.10	0.09	4.84
321	52	0.073	0.2702	85.8	86.14	293.54	17.366	22.300	1.158	0.07	0.09	0.09	4.85
322	-10	0.071	0.2665	85.7	86.06	292.52	17.124	21.995	-0.209	-0.01	0.06	0.09	4.85
323	20	0.071	0.2665	85.8	86	291.51	17.126	21.993	0.440	0.03	0.07	0.09	4.85
324	-44	0.072	0.2683	85.6	85.94	290.55	17.243	22.151	-0.968	-0.06	0.04	0.09	4.84
325	54	0.070	0.2646	85.4	85.83	289.63	16.999	21.845	1.179	0.07	0.02	0.09	4.85
326	12	0.073	0.2702	85.7	85.79	288.73	17.364	22.302	0.264	0.02	0.01	0.09	4.85
327	113	0.070	0.2646	85.5	85.73	287.87	17.000	21.843	2.460	0.15	0.04	0.09	4.85
328	77	0.071	0.2665	85.5	85.68	287.05	17.121	21.999	1.692	0.10	0.06	0.09	4.85
329	53	0.069	0.2627	85.5	85.62	286.29	16.878	21.687	1.144	0.07	0.08	0.09	4.85
330	-22	0.072	0.2683	85.5	85.6	285.56	17.241	22.153	-0.483	-0.03	0.06	0.08	4.85
331	72	0.071	0.2665	85.6	85.58	284.86	17.123	21.997	1.578	0.09	0.08	0.08	4.85
332	34	0.072	0.2683	85.6	85.57	284.2	17.243	22.151	0.751	0.05	0.06	0.07	4.85
333	86	0.071	0.2665	85.4	85.53	283.59	17.120	22.001	1.887	0.11	0.06	0.07	4.86
334	141	0.072	0.2683	85.3	85.5	283	17.238	22.157	3.114	0.19	0.08	0.06	4.86
335	75	0.071	0.2665	85.5	85.51	282.42	17.121	21.999	1.656	0.10	0.11	0.06	4.86
336	8	0.071	0.2665	85	85.44	281.86	17.113	22.009	0.177	0.01	0.09	0.06	4.86
337	83	0.069	0.2627	85.3	85.42	281.33	16.875	21.691	1.800	0.11	0.10	0.06	4.86
338	43	0.071	0.2665	84.9	85.36	280.81	17.112	22.011	0.950	0.06	0.09	0.05	4.86
339	-339	0.071	0.2665	85.2	85.33	280.31	17.117	22.005	-7.452	-0.45	-0.03	0.05	4.86
340	241	0.070	0.2646	85.6	85.34	279.79	17.002	21.841	5.256	0.32	0.01	0.05	4.86
341	61	0.070	0.2646	85.3	85.31	279.29	16.997	21.847	1.329	0.08	0.02	0.04	4.86
342	0	0.070	0.2646	85.2	85.27	278.81	16.996	21.849	-0.005	0.00	0.00	0.04	4.86
343	167	0.071	0.2665	85.3	85.26	278.34	17.118	22.003	3.666	0.22	0.03	0.04	4.87
344	-193	0.071	0.2665	85.1	85.24	277.85	17.115	22.007	-4.252	-0.26	0.07	0.04	4.86
345	9	0.071	0.2665	85.1	85.2	277.41	17.115	22.007	0.203	0.01	0.01	0.05	4.86
346	59	0.073	0.2702	84.9	85.19	276.97	17.351	22.319	1.321	0.08	0.01	0.04	4.86
347	-105	0.071	0.2665	85.1	85.17	276.52	17.115	22.007	-2.314	-0.14	-0.02	0.04	4.86
348	22	0.070	0.2646	85	85.18	276.07	16.993	21.853	0.480	0.03	-0.05	0.04	4.86

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349	8	0.070	0.2646	84.8	85.14	275.62	16.989	21.857	0.176	0.01	0.00	0.03	4.86
350	106	0.073	0.2702	84.8	85.06	275.2	17.350	22.321	2.370	0.14	0.02	0.03	4.86
351	71	0.072	0.2683	84.8	85.01	274.78	17.230	22.167	1.581	0.09	0.03	0.03	4.87
352	16	0.070	0.2646	84.7	84.96	274.35	16.988	21.859	0.351	0.02	0.06	0.03	4.87
353	-62	0.071	0.2665	85	84.93	273.92	17.113	22.009	-1.356	-0.08	0.04	0.03	4.86
354	19	0.071	0.2665	84.9	84.91	273.5	17.112	22.011	0.414	0.02	0.04	0.03	4.86
355	13	0.071	0.2665	84.8	84.88	273.05	17.110	22.013	0.281	0.02	0.02	0.03	4.86
356	-40	0.071	0.2665	84.8	84.87	272.62	17.110	22.013	-0.886	-0.05	-0.01	0.03	4.86
357	21	0.071	0.2665	84.6	84.82	272.17	17.107	22.017	0.457	0.03	-0.01	0.03	4.86
358	-138	0.071	0.2665	84.9	84.81	271.75	17.112	22.011	-3.028	-0.18	-0.03	0.03	4.86
359	292	0.069	0.2627	84.4	84.77	271.31	16.861	21.708	6.337	0.38	0.04	0.03	4.87
360	-29	0.071	0.2665	84.6	84.75	270.86	17.107	22.017	-0.646	-0.04	0.03	0.03	4.87
361	136	0.070	0.2646	84.3	84.7	270.41	16.982	21.867	2.975	0.18	0.07	0.03	4.87
362	67	0.071	0.2665	84.4	84.67	269.94	17.104	22.021	1.479	0.09	0.09	0.03	4.87
363	-32	0.073	0.2702	84.4	84.61	269.47	17.343	22.329	-0.717	-0.04	0.11	0.03	4.87
364	-13	0.071	0.2665	84.5	84.57	269.01	17.106	22.019	-0.296	-0.02	0.03	0.03	4.87
365	108	0.071	0.2665	84.4	84.53	268.53	17.104	22.021	2.384	0.14	0.07	0.04	4.87
366	-63	0.071	0.2665	84	84.45	268.06	17.098	22.029	-1.399	-0.08	0.02	0.04	4.87
367	-6	0.071	0.2665	84.1	84.4	267.6	17.099	22.027	-0.135	-0.01	0.00	0.04	4.87
368	-25	0.070	0.2646	84.3	84.34	267.11	16.982	21.867	-0.551	-0.03	0.00	0.04	4.87
369	-62	0.071	0.2665	84.3	84.33	266.63	17.102	22.023	-1.375	-0.08	-0.01	0.04	4.87
370	77	0.071	0.2665	84.4	84.31	266.16	17.104	22.021	1.695	0.10	-0.02	0.04	4.87
371	-70	0.071	0.2665	84.1	84.29	265.69	17.099	22.027	-1.538	-0.09	-0.02	0.03	4.87
372	46	0.070	0.2646	84	84.25	265.23	16.977	21.873	1.013	0.06	-0.01	0.04	4.87
373	135	0.070	0.2646	84.1	84.22	264.76	16.978	21.871	2.956	0.18	0.03	0.03	4.87
374	-180	0.073	0.2702	83.9	84.16	264.29	17.335	22.339	-4.015	-0.24	0.00	0.04	4.87
375	25	0.071	0.2665	84	84.12	263.83	17.098	22.029	0.550	0.03	-0.01	0.04	4.87
376	91	0.070	0.2646	83.9	84.11	263.35	16.975	21.875	1.984	0.12	0.03	0.03	4.87
377	71	0.070	0.2646	84	84.1	262.86	16.977	21.873	1.552	0.09	0.04	0.03	4.87
378	-22	0.073	0.2702	83.9	84.06	262.36	17.335	22.339	-0.489	-0.03	-0.01	0.03	4.87
379	-1	0.072	0.2683	83.9	84.02	261.85	17.216	22.186	-0.024	0.00	0.04	0.03	4.87
380	-41	0.070	0.2646	83.7	83.95	261.32	16.972	21.879	-0.893	-0.05	0.03	0.03	4.87
381	-123	0.071	0.2665	83.6	83.9	260.78	17.091	22.037	-2.716	-0.16	-0.03	0.03	4.87
382	219	0.071	0.2665	83.8	83.88	260.24	17.095	22.033	4.834	0.29	0.01	0.03	4.87
383	-76	0.070	0.2646	83.6	83.83	259.69	16.971	21.881	-1.661	-0.10	-0.01	0.02	4.87
384	-18	0.071	0.2665	83.5	83.79	259.12	17.090	22.039	-0.406	-0.02	-0.01	0.03	4.87
385	-116	0.071	0.2665	83.6	83.75	258.53	17.091	22.037	-2.557	-0.15	-0.03	0.03	4.87
386	33	0.073	0.2702	83.5	83.71	257.94	17.329	22.347	0.745	0.04	0.01	0.03	4.87
387	-151	0.071	0.2665	83.6	83.67	257.34	17.091	22.037	-3.325	-0.20	-0.09	0.02	4.87
388	-38	0.071	0.2665	83.5	83.63	256.76	17.090	22.039	-0.832	-0.05	-0.08	0.02	4.87
389	-25	0.071	0.2665	83.4	83.58	256.17	17.088	22.041	-0.560	-0.03	-0.08	0.02	4.87
390	-4	0.071	0.2665	83.4	83.55	255.59	17.088	22.041	-0.078	0.00	-0.05	0.02	4.87
391	-27	0.070	0.2646	83.3	83.52	255.02	16.966	21.887	-0.593	-0.04	-0.06	0.01	4.87
392	-77	0.068	0.2608	83.5	83.49	254.43	16.725	21.568	-1.663	-0.10	-0.04	0.01	4.86
393	73	0.071	0.2665	83.3	83.46	253.86	17.087	22.043	1.609	0.10	-0.02	0.01	4.87
394	-80	0.071	0.2665	83.3	83.44	253.29	17.087	22.043	-1.760	-0.11	-0.03	0.01	4.86
395	60	0.071	0.2665	83.2	83.4	252.74	17.085	22.045	1.326	0.08	-0.01	0.01	4.86
396	79	0.071	0.2665	83.1	83.36	252.19	17.084	22.047	1.745	0.10	0.02	0.00	4.87
397	5	0.072	0.2683	83.1	83.31	251.65	17.203	22.202	0.117	0.01	0.04	0.00	4.87
398	-15	0.071	0.2665	83.1	83.27	251.08	17.084	22.047	-0.323	-0.02	0.01	0.00	4.87
399	29	0.071	0.2665	83	83.23	250.53	17.082	22.049	0.650	0.04	0.04	0.01	4.87
400	-210	0.068	0.2608	83	83.19	249.97	16.717	21.578	-4.531	-0.27	-0.03	0.01	4.86
401	136	0.070	0.2646	83	83.16	249.42	16.961	21.893	2.981	0.18	-0.01	0.01	4.87
402	9	0.072	0.2683	83.1	83.12	248.88	17.203	22.202	0.195	0.01	-0.01	0.00	4.87
403	0	0.071	0.2665	82.9	83.08	248.33	17.080	22.051	-0.002	0.00	-0.01	0.00	4.87
404	33	0.071	0.2665	83	83.05	247.79	17.082	22.049	0.728	0.04	-0.01	0.00	4.87
405	-42	0.069	0.2627	82.8	83.01	247.24	16.837	21.740	-0.923	-0.06	0.04	0.00	4.87
406	-28	0.071	0.2665	82.9	82.99	246.69	17.080	22.051	-0.608	-0.04	-0.01	0.00	4.86
407	-51	0.072	0.2683	82.9	82.97	246.15	17.200	22.206	-1.132	-0.07	-0.02	0.00	4.86
408	-22	0.071	0.2665	82.8	82.94	245.63	17.079	22.053	-0.485	-0.03	-0.03	0.00	4.86
409	31	0.070	0.2646	82.8	82.92	245.13	16.958	21.897	0.683	0.04	-0.03	0.00	4.86
410	-39	0.071	0.2665	82.9	82.91	244.63	17.080	22.051	-0.850	-0.05	-0.03	0.00	4.86
411	-64	0.071	0.2665	82.8	82.89	244.13	17.079	22.053	-1.405	-0.08	-0.04	0.00	4.86
412	-25	0.070	0.2646	82.9	82.87	243.65	16.960	21.895	-0.558	-0.03	-0.03	0.00	4.86
413	-74	0.072	0.2683	82.7	82.85	243.18	17.197	22.210	-1.645	-0.10	-0.05	0.00	4.86
414	24	0.072	0.2683	82.8	82.83	242.71	17.199	22.208	0.531	0.03	-0.05	0.00	4.86
415	77	0.071	0.2665	82.7	82.82	242.27	17.077	22.055	1.708	0.10	-0.02	-0.01	4.86
416	-5	0.072	0.2683	82.8	82.81	241.86	17.199	22.208	-0.122	-0.01	0.00	0.00	4.86
417	64	0.070	0.2646	82.5	82.77	241.46	16.953	21.903	1.411	0.08	0.02	0.00	4.86
418	-99	0.070	0.2646	82.7	82.76	241.09	16.957	21.899	-2.175	-0.13	0.02	0.00	4.86
419	-113	0.071	0.2665	82.5	82.73	240.71	17.074	22.059	-2.493	-0.15	-0.02	-0.01	4.86
420	12	0.071	0.2665	82.5	82.69	240.36	17.074	22.059	0.261	0.02	-0.04	-0.01	4.86
421	-84	0.072	0.2683	82.6	82.67	240.02	17.196	22.212	-1.876	-0.11	-0.06	-0.01	4.86
422	-15	0.071	0.2665	82.6	82.64	239.7	17.076	22.057	-0.328	-0.02	-0.08	-0.01	4.86
423	-39	0.070	0.2646	82.6	82.63	239.38	16.955	21.901	-0.853	-0.05	-0.06	-0.01	4.86
424	0	0.072	0.2683	82.5	82.6	239.08	17.194	22.214	0.011	0.00	-0.03	-0.01	4.86
425	7	0.071	0.2665	82.5	82.58	238.78	17.074	22.059	0.155	0.01	-0.03	-0.02	4.86
426	58	0.071	0.2665	82.5	82.55	238.47	17.074	22.059	1.278	0.08	0.00	-0.02	4.86
427	-33	0.071	0.2665	82.3	82.53	238.17	17.071	22.063	-0.726	-0.04	0.00	-0.02	4.86
428	81	0.071	0.2665	82.4	82.5	237.86	17.073	22.061	1.793	0.11	0.03	-0.01	4.86
429	39	0.072	0.2683	82.5	82.5	237.57	17.194	22.214	0.864	0.05	0.04	-0.01	4.86
430	41	0.071	0.2665	82.6	82.51	237.28	17.076	22.057	0.915	0.05	0.05	-0.01	4.86
431	-40	0.072	0.2683	82.4	82.49	236.99	17.192	22.216	-0.894	-0.05	0.02	-0.01	4.86
432	96	0.071	0.2665	82.4	82.47	236.7	17.073	22.061	2.119	0.13	0.06	-0.01	4.86
433	-39	0.072	0.2683	82.3	82.44	236.41	17.191	22.218	-0.868	-0.05	0.03	-0.02	4.86
434	-14	0.072	0.2683	82.2	82.41	236.12	17.189	22.220	-0.305	-0.02	0.01	-0.01	4.86
435	-34	0.071	0.2665	82.4	82.4	235.84	17.073	22.061	-0.756	-0.05	-0.01	-0.01	4.86
436	-25	0.071	0.2665	82.3	82.38	235.56	17.071	22.063	-0.545	-0.03	0.00	-0.01	4.86

Run 1 TEOM Data

437	12	0.072	0.2683	82.2	82.37	235.28	17.189	22.220	0.262	0.02	-0.03	-0.02	4.86
438	-69	0.070	0.2646	82.3	82.36	235	16.950	21.908	-1.517	-0.09	-0.03	-0.02	4.86
439	121	0.071	0.2665	82.1	82.32	234.7	17.068	22.068	2.673	0.16	0.00	-0.02	4.86
440	-33	0.072	0.2683	82.3	82.29	234.42	17.191	22.218	-0.723	-0.04	0.00	-0.02	4.86
441	37	0.071	0.2665	82.2	82.27	234.11	17.069	22.066	0.825	0.05	0.02	-0.01	4.86
442	-17	0.071	0.2665	82.2	82.25	233.8	17.069	22.066	-0.383	-0.02	0.01	-0.02	4.86
443	18	0.071	0.2665	82.3	82.25	233.49	17.071	22.063	0.393	0.02	0.03	-0.01	4.86
444	26	0.072	0.2683	82.3	82.26	233.17	17.191	22.218	0.581	0.03	0.01	-0.01	4.86
445	-23	0.072	0.2683	82.2	82.24	232.84	17.189	22.220	-0.503	-0.03	0.01	-0.01	4.86
446	9	0.071	0.2665	82.2	82.23	232.51	17.069	22.066	0.208	0.01	0.00	-0.01	4.86
447	15	0.072	0.2683	82.2	82.23	232.17	17.189	22.220	0.327	0.02	0.01	-0.01	4.86
448	-14	0.070	0.2646	82.2	82.22	231.82	16.949	21.910	-0.311	-0.02	0.00	-0.01	4.86
449	-68	0.070	0.2646	82.1	82.22	231.46	16.947	21.912	-1.499	-0.09	-0.02	-0.01	4.86
450	-69	0.072	0.2683	82.1	82.2	231.07	17.188	22.222	-1.534	-0.09	-0.03	-0.01	4.86
451	46	0.072	0.2683	82.1	82.19	230.68	17.188	22.222	1.015	0.06	-0.02	-0.01	4.86
452	60	0.072	0.2683	82	82.17	230.27	17.186	22.224	1.343	0.08	-0.01	-0.01	4.86
453	-37	0.071	0.2665	82	82.14	229.86	17.066	22.070	-0.825	-0.05	-0.02	-0.01	4.86
454	-54	0.070	0.2646	82.2	82.13	229.45	16.949	21.910	-1.182	-0.07	-0.01	0.00	4.86
455	-23	0.071	0.2665	82.1	82.12	229.03	17.068	22.068	-0.502	-0.03	0.00	-0.01	4.86
456	-65	0.071	0.2665	82.2	82.12	228.59	17.069	22.066	-1.423	-0.09	-0.03	-0.01	4.86
457	54	0.071	0.2665	82.2	82.12	228.16	17.069	22.066	1.192	0.07	-0.03	-0.01	4.86
458	52	0.071	0.2665	82.1	82.11	227.73	17.068	22.068	1.158	0.07	-0.01	-0.01	4.86
459	-5	0.071	0.2665	82.2	82.12	227.32	17.069	22.066	-0.119	-0.01	0.00	-0.01	4.86
460	-25	0.071	0.2665	82	82.11	226.93	17.066	22.070	-0.553	-0.03	0.00	0.00	4.86
461	-41	0.071	0.2665	82.1	82.11	226.57	17.068	22.068	-0.906	-0.05	0.01	-0.01	4.86
462	-12	0.072	0.2683	82.1	82.12	226.23	17.188	22.222	-0.260	-0.02	-0.01	-0.01	4.86
463	68	0.070	0.2646	82.2	82.14	225.88	16.949	21.910	1.483	0.09	0.00	-0.01	4.86
464	24	0.072	0.2683	82.1	82.13	225.54	17.188	22.222	0.529	0.03	0.00	-0.01	4.86
465	-18	0.072	0.2683	82.1	82.13	225.22	17.188	22.222	-0.394	-0.02	0.01	-0.01	4.86
466	-48	0.070	0.2646	82.2	82.13	224.93	16.949	21.910	-1.046	-0.06	0.00	-0.01	4.86
467	7	0.070	0.2646	82	82.11	224.65	16.946	21.914	0.156	0.01	0.01	-0.01	4.86
468	-60	0.072	0.2683	82.1	82.11	224.39	17.188	22.222	-1.328	-0.08	-0.02	-0.01	4.86
469	32	0.072	0.2683	82.1	82.1	224.14	17.188	22.222	0.706	0.04	-0.02	-0.01	4.86
470	-88	0.071	0.2665	82.1	82.11	223.87	17.068	22.068	-1.932	-0.12	-0.04	-0.01	4.85
471	-40	0.072	0.2683	82.1	82.11	223.61	17.188	22.222	-0.886	-0.05	-0.04	-0.01	4.85
472	-135	0.071	0.2665	82.1	82.11	223.34	17.068	22.068	-2.976	-0.18	-0.08	-0.01	4.85
473	19	0.070	0.2646	82.2	82.11	223.1	16.949	21.910	0.422	0.03	-0.06	-0.01	4.85
474	15	0.072	0.2683	82	82.1	222.86	17.186	22.224	0.336	0.02	-0.06	-0.01	4.85
475	55	0.071	0.2665	82.4	82.13	222.6	17.073	22.061	1.210	0.07	-0.02	-0.01	4.85

TEST RESULTS - ASTM E2780 / ASTM E2515

Client: IHP

Model: Montecito-C

Run #: 2

Job #: 25-416

Tracking #: 223

Technician: AK

Date: 5/28/2025

Total Fuel Burned (kg-dry) 14.49

	Ambient Sample	Sample Train A	Sample Train B	1st Hour Filter
Total Sample Volume (ft ³)	101.415	74.447	75.370	-
Average Gas Velocity in Dilution Tunnel (ft/sec)	17.1			
Average Gas Flow Rate in Dilution Tunnel (dscf/hr)	45228.4			
Average Gas Meter Temperature (°F)	74.7	88.3	88.7	-
Total Sample Volume (dscf)	100.876	71.901	73.194	-
Average Tunnel Temperature (°F)	90.9			
Total Time of Test (min)	475			
Total Particulate Catch (mg)	0.1	1.9	2.0	-
Particulate Concentration, dry-standard (g/dscf)	0.0000010	0.0000264	0.0000273	-
Total PM Emissions (g)	0.35	9.11	9.43	-
Particulate Emission Rate (g/hr)	0.04	1.15	1.19	-
Emissions Factor (g/kg)	-	0.63	0.65	-
Difference from Average Total Particulate Emissions (g)	-	0.16	0.16	-
Difference from Average Total Particulate Emissions (%)	-	1.7%	1.7%	-
Difference from Average Emissions Factor (g/kg)	-	0.01	0.01	-

Final Average Results	
Total Particulate Emissions (g)	9.27
Particulate Emission Rate (g/hr)	1.17
Emissions Factor (g/kg)	0.64

Quality Checks	Requirement	Observed	Result
Dual Train Precision	Each train within 7.5% of average emissions (in grams), or emission factors within 0.5 g/kg	See Above	OK
Filter Temps	<90 °F	87.3	OK
Face Velocity	< 30 ft/min	8.7	OK
Leakage Rate	Less than 4% of average sample rate	0 cfm	OK
Ambient Temp	55-90 °F	Min:71.7/Max:75.8	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

DILUTION TUNNEL & MISC. DATA - ASTM E2780 / E2515

Client: IHP
 Model: Montecito-C
 Run #: 2
 Test Start Time: 10:46

Job #: 25-416
 Tracking #: 223
 Technician: AK
 Date: 5/28/2025

Total Sampling Time (min): 475
 Recording Interval (min): 1

Meter Box γ Factor: 1.005 (A)
 Meter Box γ Factor: 1.011 (B)
 Meter Box γ Factor: - (C)
 Meter Box γ Factor: 1.012 (Ambient)

Induced Draft Check (in. H₂O): 0
 Smoke Capture Check (%): 100%
 Date Flue Pipe Last Cleaned: 5/26/2025
 Test Fuel Scale Audit (lbs): 10.00
 Platform Scale Audit (lbs): 10.0

	Pre-Test	Post Test	Avg.
Barometric Pressure (in. Hg)	29.76	29.83	29.80
Relative Humidity (%)	36.5	31.7	
Room Air Velocity (ft/min)	<50	<50	
Pitot Tube Leak Check	0	0	
Ambient Sample Volume:		101.415	ft ³

Sample Train Leak Checks

	Pre-test	Post-test		
(A)	0.001	0.000	cfm @	-7 in. Hg
(B)	0.001	0.000	cfm @	-7 in. Hg
(C)	-	-	cfm @	- in. Hg
(Ambient)	0.000	0.000	cfm @	-12 in. Hg

DILUTION TUNNEL FLOW

Traverse Data

Point	dP (in H ₂ O)	Temp (°F)
1	0.056	73
2	0.066	73
3	0.070	73
4	0.070	73
5	0.067	73
6	0.060	73
7	0.056	73
8	0.065	73
9	0.070	73
10	0.069	73
11	0.066	73
12	0.048	73
Center	0.070	73

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}: 16.81 ft/sec

V_{scent}: 17.67 ft/sec

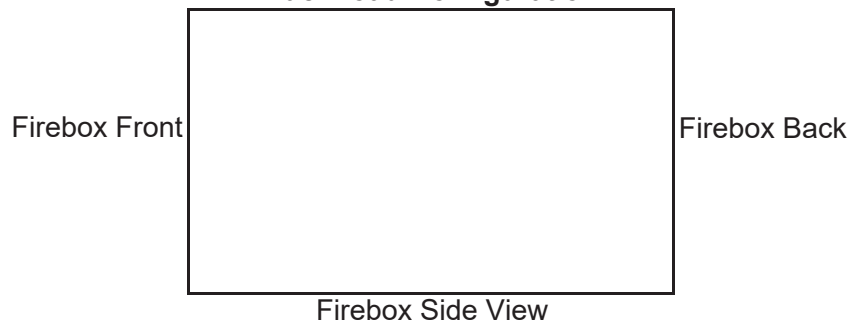
F_p: 0.952 [ratio]

Initial Tunnel Flow: 765.2 scf/min

Static Pressure: -0.203 in. H₂O

TEST FUEL PROPERTIES

Fuel Load Configuration



Actual Fuel Used Properties

Fuel Type: D. Fir
 HHV (kJ/kg): 19,810
 %C: 48.73
 %H: 6.87
 %O: 43.9
 %Ash: 0.5
 MC (%DB): #DIV/0!

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: IHP

Job #: 25-416

Model: Montecito-C

Tracking #: 223

Run #: 2

Technician: AK

Date: 5/28/2025

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	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	-0.005		0.072	0.01	73	-0.3		6.14		74	72	84	72
1	0.129	0.134	0.071	1.11	74	-1.1	-	5.95	-0.19	76	149	83	72
2	0.290	0.161	0.070	1.10	75	-1.1	-	5.68	-0.27	81	310	84	72
3	0.447	0.157	0.071	1.09	75	-1.1	-	5.46	-0.22	81	414	84	72
4	0.607	0.160	0.070	1.10	75	-1.0	-	5.19	-0.27	84	568	83	72
5	0.763	0.156	0.070	1.09	75	-0.9	-	4.88	-0.31	87	666	83	72
6	0.921	0.158	0.069	1.09	76	-1.0	-	4.55	-0.33	89	715	83	72
7	1.079	0.158	0.070	1.09	76	-1.0	-	4.21	-0.34	92	759	82	72
8	1.235	0.156	0.069	1.07	76	-1.0	-	3.83	-0.38	95	815	83	72
9	1.393	0.158	0.072	1.07	76	-1.0	-	3.44	-0.39	97	856	84	72
10	1.549	0.156	0.070	1.06	77	-1.1	100	3.09	-0.35	99	882	84	72
11	1.708	0.159	0.069	1.07	77	-1.0	-	2.76	-0.33	100	897	84	72
12	1.865	0.157	0.071	1.06	78	-1.0	-	2.45	-0.31	102	899	84	72
13	2.020	0.155	0.068	1.06	78	-1.1	-	2.18	-0.27	102	894	84	72
14	2.177	0.157	0.069	1.07	78	-1.1	-	1.97	-0.21	103	876	83	72
15	2.331	0.154	0.069	1.06	78	-1.1	-	1.85	-0.12	103	865	83	72
16	2.486	0.155	0.067	1.06	79	-1.1	-	12.50	10.65	112	720	84	73
17	2.642	0.156	0.069	1.05	79	-1.1	-	12.16	-0.34	109	861	84	73
18	2.798	0.156	0.069	1.05	79	-1.1	-	11.76	-0.40	109	957	83	73
19	2.953	0.155	0.068	1.05	80	-1.1	-	11.33	-0.43	112	1,036	84	73
20	3.108	0.155	0.067	1.05	80	-1.2	104	10.92	-0.41	114	1,059	84	73
21	3.264	0.156	0.066	1.06	80	-1.2	-	10.53	-0.39	115	1,069	85	73
22	3.419	0.155	0.067	1.06	81	-1.2	-	10.16	-0.37	116	1,077	85	73
23	3.573	0.154	0.068	1.05	81	-1.2	-	9.80	-0.36	117	1,079	85	73
24	3.729	0.156	0.068	1.04	81	-1.1	-	9.45	-0.35	118	1,084	85	73
25	3.887	0.158	0.068	1.05	81	-1.1	-	9.11	-0.34	118	1,086	85	73
26	4.041	0.154	0.069	1.04	82	-1.1	-	8.76	-0.35	119	1,095	85	74
27	4.197	0.156	0.069	1.04	82	-1.1	-	8.41	-0.35	117	1,112	85	74
28	4.352	0.155	0.068	1.04	82	-1.1	-	8.08	-0.33	117	1,112	85	74
29	4.506	0.154	0.068	1.05	83	-1.1	-	7.75	-0.33	118	1,112	85	74
30	4.658	0.152	0.068	1.05	83	-1.1	104	7.43	-0.32	118	1,107	85	74
31	4.814	0.156	0.068	1.03	83	-1.1	-	7.13	-0.30	118	1,102	85	74

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: IHP

Job #: 25-416

Model: Montecito-C

Tracking #: 223

Run #: 2

Technician: AK

Date: 5/28/2025

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	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
32	4.969	0.155	0.068	1.06	83	-1.2	-	7.00	-0.13	113	1,045	85	74
33	5.123	0.154	0.069	1.05	84	-1.2	-	6.82	-0.18	109	989	85	74
34	5.279	0.156	0.069	1.05	84	-1.2	-	6.66	-0.16	107	947	85	74
35	5.435	0.156	0.070	1.05	84	-1.2	-	6.53	-0.13	106	911	84	74
36	5.589	0.154	0.069	1.05	84	-1.1	-	6.37	-0.16	105	878	84	74
37	5.744	0.155	0.069	1.05	84	-1.1	-	6.22	-0.15	104	850	83	74
38	5.901	0.157	0.069	1.05	85	-1.3	-	6.08	-0.14	103	827	83	74
39	6.055	0.154	0.069	1.06	85	-1.3	-	5.93	-0.15	103	808	84	74
40	6.214	0.159	0.070	1.04	85	-1.3	103	5.79	-0.14	102	793	83	74
41	6.370	0.156	0.071	1.05	85	-1.3	-	5.63	-0.16	101	781	84	74
42	6.524	0.154	0.069	1.05	85	-1.3	-	5.49	-0.14	101	772	83	75
43	6.680	0.156	0.070	1.05	85	-1.2	-	5.34	-0.15	100	765	84	75
44	6.836	0.156	0.068	1.05	85	-1.3	-	5.18	-0.16	100	760	85	75
45	6.987	0.151	0.069	1.05	86	-1.3	-	5.04	-0.14	99	754	84	75
46	7.143	0.156	0.069	1.04	86	-1.4	-	4.90	-0.14	99	748	84	75
47	7.300	0.157	0.070	1.05	86	-1.3	-	4.75	-0.15	98	743	84	75
48	7.454	0.154	0.070	1.05	86	-1.3	-	4.60	-0.15	98	740	83	75
49	7.610	0.156	0.069	1.05	86	-1.4	-	4.46	-0.14	98	737	83	75
50	7.767	0.157	0.070	1.06	86	-1.4	101	4.32	-0.14	97	736	83	75
51	7.921	0.154	0.071	1.05	86	-1.4	-	4.16	-0.16	97	736	84	75
52	8.077	0.156	0.069	1.04	86	-1.4	-	4.02	-0.14	97	736	84	75
53	8.234	0.157	0.070	1.05	86	-1.4	-	3.88	-0.14	96	734	83	75
54	8.389	0.155	0.070	1.05	87	-1.4	-	3.76	-0.12	96	730	83	75
55	8.547	0.158	0.070	1.05	87	-1.4	-	3.63	-0.13	96	722	83	75
56	8.704	0.157	0.071	1.04	87	-1.4	-	3.51	-0.12	96	718	83	75
57	8.858	0.154	0.071	1.04	87	-1.4	-	3.39	-0.12	96	714	82	75
58	9.015	0.157	0.071	1.04	87	-1.5	-	3.27	-0.12	95	710	84	75
59	9.171	0.156	0.070	1.04	88	-1.5	-	3.16	-0.11	95	704	84	75
60	9.324	0.153	0.069	1.06	87	-1.5	101	3.08	-0.08	95	694	84	75
61	9.480	0.156	0.071	1.05	87	-1.5	-	2.98	-0.10	95	684	84	75
62	9.637	0.157	0.070	1.05	87	-1.6	-	2.90	-0.08	94	676	83	75
63	9.792	0.155	0.069	1.05	87	-1.5	-	2.84	-0.06	94	670	84	75

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: IHP

Job #: 25-416

Model: Montecito-C

Tracking #: 223

Run #: 2

Technician: AK

Date: 5/28/2025

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	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
64	9.948	0.156	0.070	1.05	87	-1.6	-	2.81	-0.03	94	665	83	75
65	10.105	0.157	0.071	1.05	88	-1.6	-	9.65	6.84	102	688	83	75
66	10.259	0.154	0.069	1.05	88	-1.5	-	9.38	-0.27	104	820	84	75
67	10.416	0.157	0.071	1.05	87	-1.5	-	9.25	-0.13	100	752	82	75
68	10.573	0.157	0.069	1.05	87	-1.6	-	9.07	-0.18	98	735	82	75
69	10.730	0.157	0.068	1.05	88	-1.6	-	8.92	-0.15	97	726	84	75
70	10.887	0.157	0.069	1.05	88	-1.6	101	8.77	-0.15	97	718	84	75
71	11.043	0.156	0.070	1.05	88	-1.7	-	8.62	-0.15	96	714	83	75
72	11.198	0.155	0.069	1.06	88	-1.6	-	8.47	-0.15	96	709	84	75
73	11.355	0.157	0.070	1.05	88	-1.6	-	8.33	-0.14	95	705	84	75
74	11.512	0.157	0.070	1.05	88	-1.7	-	8.19	-0.14	95	700	84	75
75	11.664	0.152	0.071	1.05	88	-1.6	-	8.07	-0.12	95	695	84	75
76	11.821	0.157	0.070	1.06	87	-1.6	-	7.94	-0.13	95	689	83	75
77	11.978	0.157	0.068	1.05	88	-1.6	-	7.81	-0.13	95	684	82	75
78	12.133	0.155	0.070	1.06	89	-1.6	-	7.69	-0.12	95	678	82	75
79	12.290	0.157	0.069	1.05	89	-1.7	-	7.58	-0.11	95	673	84	75
80	12.446	0.156	0.069	1.04	89	-1.7	101	7.45	-0.13	95	671	84	75
81	12.602	0.156	0.071	1.05	89	-1.6	-	7.33	-0.12	94	669	84	75
82	12.759	0.157	0.070	1.05	89	-1.6	-	7.21	-0.12	94	667	84	75
83	12.915	0.156	0.070	1.06	89	-1.6	-	7.10	-0.11	94	663	84	75
84	13.071	0.156	0.071	1.05	89	-1.7	-	6.98	-0.12	94	659	84	75
85	13.231	0.160	0.070	1.06	89	-1.7	-	6.87	-0.11	94	656	83	75
86	13.386	0.155	0.070	1.05	88	-1.6	-	6.77	-0.10	94	652	83	75
87	13.543	0.157	0.070	1.05	89	-1.6	-	6.67	-0.10	94	648	83	75
88	13.700	0.157	0.071	1.05	89	-1.6	-	6.57	-0.10	94	643	83	75
89	13.855	0.155	0.070	1.06	89	-1.7	-	6.47	-0.10	93	639	83	75
90	14.009	0.154	0.070	1.05	89	-1.7	100	6.38	-0.09	94	634	84	75
91	14.167	0.158	0.071	1.05	88	-1.6	-	6.29	-0.09	93	629	84	75
92	14.322	0.155	0.070	1.05	88	-1.7	-	6.20	-0.09	93	625	84	75
93	14.479	0.157	0.070	1.05	89	-1.6	-	6.11	-0.09	93	621	84	75
94	14.636	0.157	0.070	1.06	89	-1.6	-	6.02	-0.09	93	618	83	75
95	14.792	0.156	0.069	1.05	89	-1.7	-	5.93	-0.09	93	617	82	75

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: IHP

Job #: 25-416

Model: Montecito-C

Tracking #: 223

Run #: 2

Technician: AK

Date: 5/28/2025

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	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
96	14.949	0.157	0.069	1.05	89	-1.7	-	5.84	-0.09	92	615	82	75
97	15.105	0.156	0.069	1.05	88	-1.7	-	5.76	-0.08	93	612	83	75
98	15.261	0.156	0.069	1.06	89	-1.7	-	5.67	-0.09	92	611	83	75
99	15.422	0.161	0.071	1.06	89	-1.7	-	5.58	-0.09	92	610	84	75
100	15.577	0.155	0.070	1.05	89	-1.7	100	5.50	-0.08	92	608	84	75
101	15.734	0.157	0.072	1.05	89	-1.7	-	5.41	-0.09	92	606	84	75
102	15.890	0.156	0.072	1.05	89	-1.8	-	5.33	-0.08	92	605	83	75
103	16.046	0.156	0.071	1.06	89	-1.7	-	5.24	-0.09	92	604	83	75
104	16.204	0.158	0.071	1.06	89	-1.8	-	5.16	-0.08	92	603	83	75
105	16.358	0.154	0.069	1.05	89	-1.7	-	5.09	-0.07	92	602	83	75
106	16.513	0.155	0.069	1.06	89	-1.7	-	5.01	-0.08	92	601	84	75
107	16.671	0.158	0.069	1.05	89	-1.8	-	4.92	-0.09	92	600	84	75
108	16.827	0.156	0.071	1.04	89	-1.7	-	4.84	-0.08	92	599	84	75
109	16.984	0.157	0.071	1.04	89	-1.7	-	4.76	-0.08	92	598	84	75
110	17.141	0.157	0.070	1.04	89	-1.8	100	4.69	-0.07	92	597	84	75
111	17.299	0.158	0.070	1.04	89	-1.8	-	4.60	-0.09	92	596	83	75
112	17.457	0.158	0.071	1.05	88	-1.8	-	4.53	-0.07	91	595	83	75
113	17.613	0.156	0.071	1.05	90	-1.8	-	4.45	-0.08	91	595	83	75
114	17.769	0.156	0.071	1.06	89	-1.8	-	4.37	-0.08	92	595	84	75
115	17.927	0.158	0.070	1.06	89	-1.8	-	4.30	-0.07	91	594	83	75
116	18.082	0.155	0.069	1.05	90	-1.8	-	4.23	-0.07	91	593	83	75
117	18.236	0.154	0.070	1.05	89	-1.8	-	4.15	-0.08	91	592	83	75
118	18.394	0.158	0.071	1.06	89	-1.8	-	4.08	-0.07	91	591	82	75
119	18.549	0.155	0.070	1.05	89	-1.8	-	4.00	-0.08	92	590	83	75
120	18.707	0.158	0.070	1.05	90	-1.9	100	3.94	-0.06	91	588	83	75
121	18.864	0.157	0.071	1.05	90	-1.8	-	3.87	-0.07	91	586	84	75
122	19.020	0.156	0.071	1.04	90	-1.8	-	3.80	-0.07	91	585	84	75
123	19.177	0.157	0.071	1.05	89	-1.8	-	3.73	-0.07	91	583	84	75
124	19.334	0.157	0.072	1.06	89	-1.9	-	3.67	-0.06	91	582	84	75
125	19.492	0.158	0.072	1.05	88	-1.8	-	3.60	-0.07	91	580	83	75
126	19.650	0.158	0.069	1.04	90	-1.9	-	3.54	-0.06	91	579	83	75
127	19.805	0.155	0.070	1.05	90	-1.8	-	3.48	-0.06	91	577	83	75

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: IHP

Job #: 25-416

Model: Montecito-C

Tracking #: 223

Run #: 2

Technician: AK

Date: 5/28/2025

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	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
128	19.963	0.158	0.071	1.06	90	-1.8	-	3.41	-0.07	91	577	84	75
129	20.120	0.157	0.070	1.06	90	-1.9	-	22.94	19.53	102	451	84	75
130	20.275	0.155	0.069	1.05	89	-1.9	101	21.57	-1.37	101	616	85	75
131	20.430	0.155	0.069	1.05	89	-1.8	-	21.29	-0.28	102	771	85	75
132	20.587	0.157	0.067	1.05	89	-1.9	-	20.97	-0.32	103	852	84	75
133	20.742	0.155	0.070	1.06	90	-1.9	-	20.68	-0.29	101	806	84	75
134	20.900	0.158	0.069	1.07	89	-1.9	-	20.44	-0.24	99	800	83	75
135	21.056	0.156	0.069	1.05	89	-1.9	-	20.20	-0.24	99	804	83	75
136	21.212	0.156	0.068	1.05	90	-1.8	-	19.97	-0.23	98	812	83	75
137	21.370	0.158	0.069	1.05	90	-1.8	-	19.75	-0.22	99	815	84	75
138	21.526	0.156	0.069	1.06	90	-1.8	-	19.54	-0.21	98	818	84	75
139	21.686	0.160	0.069	1.07	90	-1.8	-	19.33	-0.21	99	817	84	75
140	21.843	0.157	0.069	1.05	90	-1.8	101	19.12	-0.21	99	816	85	75
141	21.999	0.156	0.071	1.06	91	-1.8	-	18.92	-0.20	99	813	84	75
142	22.156	0.157	0.069	1.05	91	-1.8	-	18.73	-0.19	99	812	83	75
143	22.312	0.156	0.070	1.05	89	-1.8	-	18.55	-0.18	99	807	83	75
144	22.469	0.157	0.070	1.06	90	-1.7	-	18.35	-0.20	99	804	83	75
145	22.627	0.158	0.070	1.06	89	-1.7	-	18.17	-0.18	99	799	83	75
146	22.780	0.153	0.070	1.04	90	-1.6	-	18.00	-0.17	99	794	83	76
147	22.937	0.157	0.071	1.05	90	-1.6	-	17.81	-0.19	99	788	84	76
148	23.094	0.157	0.069	1.06	91	-1.6	-	17.64	-0.17	99	785	84	76
149	23.250	0.156	0.069	1.05	90	-1.6	-	17.45	-0.19	100	791	84	76
150	23.407	0.157	0.069	1.05	90	-1.5	101	17.25	-0.20	100	797	84	76
151	23.564	0.157	0.069	1.06	90	-1.5	-	17.06	-0.19	100	798	85	76
152	23.720	0.156	0.069	1.06	91	-1.6	-	16.88	-0.18	100	796	84	76
153	23.880	0.160	0.069	1.05	90	-1.6	-	16.69	-0.19	100	793	85	76
154	24.036	0.156	0.069	1.06	90	-1.6	-	16.51	-0.18	100	796	85	76
155	24.193	0.157	0.069	1.05	90	-1.5	-	16.32	-0.19	100	792	84	76
156	24.350	0.157	0.069	1.06	90	-1.5	-	16.17	-0.15	100	782	84	76
157	24.506	0.156	0.070	1.06	91	-1.5	-	16.01	-0.16	100	771	84	76
158	24.663	0.157	0.070	1.06	91	-1.5	-	15.87	-0.14	99	760	83	76
159	24.820	0.157	0.069	1.05	90	-1.5	-	15.74	-0.13	99	749	84	76

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: IHP
 Model: Montecito-C
 Run #: 2

Job #: 25-416
 Tracking #: 223
 Technician: AK
 Date: 5/28/2025

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	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
160	24.973	0.153	0.068	1.06	90	-1.6	102	15.61	-0.13	99	739	83	76
161	25.131	0.158	0.068	1.06	90	-1.5	-	15.47	-0.14	99	730	83	76
162	25.287	0.156	0.068	1.05	90	-1.5	-	15.34	-0.13	99	721	84	76
163	25.444	0.157	0.068	1.04	90	-1.5	-	15.22	-0.12	98	714	83	76
164	25.601	0.157	0.068	1.06	89	-1.6	-	15.09	-0.13	98	707	83	76
165	25.757	0.156	0.068	1.05	90	-1.5	-	14.97	-0.12	98	702	84	76
166	25.914	0.157	0.069	1.05	90	-1.5	-	14.85	-0.12	98	697	84	76
167	26.074	0.160	0.069	1.05	89	-1.5	-	14.73	-0.12	98	691	83	76
168	26.230	0.156	0.069	1.06	90	-1.5	-	14.60	-0.13	97	687	83	76
169	26.388	0.158	0.070	1.06	90	-1.6	-	14.48	-0.12	97	684	83	76
170	26.544	0.156	0.069	1.05	90	-1.5	102	14.36	-0.12	97	681	84	76
171	26.701	0.157	0.069	1.06	89	-1.5	-	14.24	-0.12	97	679	84	76
172	26.858	0.157	0.070	1.06	90	-1.6	-	14.12	-0.12	97	677	83	76
173	27.014	0.156	0.070	1.05	91	-1.6	-	13.99	-0.13	97	674	84	76
174	27.169	0.155	0.069	1.05	91	-1.6	-	13.88	-0.11	97	671	84	76
175	27.326	0.157	0.070	1.05	88	-1.6	-	13.76	-0.12	96	668	84	76
176	27.482	0.156	0.069	1.06	91	-1.6	-	13.63	-0.13	96	665	83	76
177	27.639	0.157	0.068	1.06	90	-1.6	-	13.53	-0.10	96	661	83	76
178	27.796	0.157	0.068	1.06	91	-1.6	-	13.42	-0.11	96	654	83	76
179	27.952	0.156	0.068	1.04	90	-1.7	-	13.31	-0.11	96	649	83	76
180	28.110	0.158	0.068	1.05	90	-1.6	101	13.19	-0.12	96	646	84	76
181	28.265	0.155	0.069	1.05	90	-1.6	-	13.10	-0.09	95	641	84	76
182	28.425	0.160	0.069	1.05	89	-1.6	-	13.00	-0.10	95	628	85	76
183	28.583	0.158	0.070	1.05	90	-1.7	-	12.91	-0.09	95	619	84	76
184	28.738	0.155	0.071	1.05	90	-1.7	-	12.82	-0.09	95	611	84	76
185	28.896	0.158	0.070	1.05	90	-1.7	-	12.73	-0.09	94	603	84	76
186	29.052	0.156	0.070	1.05	89	-1.7	-	12.64	-0.09	94	595	83	75
187	29.209	0.157	0.070	1.06	89	-1.6	-	12.55	-0.09	94	589	82	75
188	29.367	0.158	0.071	1.06	90	-1.7	-	12.47	-0.08	94	583	83	76
189	29.520	0.153	0.069	1.05	90	-1.6	-	12.38	-0.09	93	577	83	76
190	29.677	0.157	0.070	1.05	90	-1.7	101	12.30	-0.08	93	571	84	76
191	29.835	0.158	0.069	1.05	91	-1.7	-	12.20	-0.10	93	567	84	76

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: IHP

Job #: 25-416

Model: Montecito-C

Tracking #: 223

Run #: 2

Technician: AK

Date: 5/28/2025

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	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
192	29.991	0.156	0.071	1.04	90	-1.7	-	12.11	-0.09	93	563	84	76
193	30.148	0.157	0.069	1.06	90	-1.8	-	12.03	-0.08	93	560	84	76
194	30.305	0.157	0.071	1.05	90	-1.8	-	11.94	-0.09	93	558	83	76
195	30.462	0.157	0.068	1.05	91	-1.7	-	11.84	-0.10	93	556	83	76
196	30.623	0.161	0.069	1.06	90	-1.8	-	11.75	-0.09	93	557	83	76
197	30.778	0.155	0.070	1.07	89	-1.8	-	11.66	-0.09	92	560	84	76
198	30.936	0.158	0.070	1.06	91	-1.8	-	11.58	-0.08	92	558	83	75
199	31.093	0.157	0.069	1.06	89	-1.7	-	11.49	-0.09	92	557	84	75
200	31.250	0.157	0.070	1.06	90	-1.8	100	11.41	-0.08	92	557	84	75
201	31.408	0.158	0.071	1.05	89	-1.8	-	11.32	-0.09	92	557	84	75
202	31.563	0.155	0.070	1.05	89	-1.8	-	11.24	-0.08	92	558	84	75
203	31.718	0.155	0.069	1.06	90	-1.9	-	11.15	-0.09	92	559	84	75
204	31.876	0.158	0.070	1.07	90	-1.9	-	11.07	-0.08	92	556	84	75
205	32.032	0.156	0.070	1.05	89	-1.9	-	10.98	-0.09	92	557	84	75
206	32.190	0.158	0.069	1.06	89	-1.9	-	10.89	-0.09	91	558	83	75
207	32.347	0.157	0.068	1.06	90	-1.8	-	10.81	-0.08	92	560	83	75
208	32.503	0.156	0.070	1.06	90	-1.8	-	10.73	-0.08	92	563	83	75
209	32.661	0.158	0.070	1.06	90	-1.9	-	10.65	-0.08	92	566	84	75
210	32.820	0.159	0.071	1.05	90	-1.9	100	10.56	-0.09	92	569	84	75
211	32.978	0.158	0.070	1.06	90	-1.9	-	10.47	-0.09	92	571	84	75
212	33.135	0.157	0.070	1.06	91	-1.9	-	10.39	-0.08	92	573	84	76
213	33.291	0.156	0.070	1.06	90	-1.9	-	10.30	-0.09	92	575	84	75
214	33.449	0.158	0.069	1.06	90	-1.9	-	10.21	-0.09	92	577	83	75
215	33.605	0.156	0.071	1.06	90	-1.8	-	10.11	-0.10	92	581	83	76
216	33.763	0.158	0.070	1.05	89	-1.9	-	10.03	-0.08	92	584	83	75
217	33.918	0.155	0.070	1.05	90	-1.9	-	9.93	-0.10	92	587	84	75
218	34.074	0.156	0.070	1.06	90	-1.9	-	9.84	-0.09	92	590	84	75
219	34.232	0.158	0.071	1.06	90	-1.9	-	9.74	-0.10	92	592	84	75
220	34.389	0.157	0.071	1.06	90	-1.9	99	9.65	-0.09	92	594	84	75
221	34.545	0.156	0.069	1.05	91	-1.9	-	9.56	-0.09	92	596	83	75
222	34.703	0.158	0.069	1.06	90	-1.9	-	9.47	-0.09	93	597	83	75
223	34.862	0.159	0.070	1.06	90	-1.9	-	9.38	-0.09	92	599	82	75

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: IHP

Job #: 25-416

Model: Montecito-C

Tracking #: 223

Run #: 2

Technician: AK

Date: 5/28/2025

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	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
224	35.020	0.158	0.070	1.06	90	-1.9	-	9.29	-0.09	93	600	83	75
225	35.176	0.156	0.069	1.05	90	-1.9	-	9.20	-0.09	93	601	84	75
226	35.333	0.157	0.071	1.05	90	-1.9	-	9.11	-0.09	92	603	83	75
227	35.491	0.158	0.070	1.06	90	-1.9	-	9.02	-0.09	93	604	85	75
228	35.647	0.156	0.070	1.05	90	-1.9	-	8.93	-0.09	93	606	84	75
229	35.804	0.157	0.071	1.06	90	-1.8	-	8.84	-0.09	93	609	84	75
230	35.959	0.155	0.069	1.05	90	-1.9	100	8.75	-0.09	93	608	84	75
231	36.115	0.156	0.071	1.05	88	-1.9	-	8.67	-0.08	93	608	84	75
232	36.273	0.158	0.070	1.05	89	-2.0	-	8.58	-0.09	93	606	83	75
233	36.428	0.155	0.070	1.05	89	-1.9	-	8.51	-0.07	93	603	83	75
234	36.584	0.156	0.069	1.05	89	-1.9	-	8.44	-0.07	93	600	82	75
235	36.742	0.158	0.070	1.06	90	-1.9	-	8.37	-0.07	93	597	83	75
236	36.898	0.156	0.071	1.06	89	-2.0	-	8.30	-0.07	92	595	84	75
237	37.055	0.157	0.070	1.05	90	-1.8	-	8.24	-0.06	92	591	84	75
238	37.213	0.158	0.071	1.06	90	-1.9	-	8.17	-0.07	92	588	85	75
239	37.368	0.155	0.071	1.06	90	-2.0	-	8.11	-0.06	92	585	83	75
240	37.526	0.158	0.070	1.05	90	-1.8	100	8.04	-0.07	92	582	83	75
241	37.684	0.158	0.069	1.06	91	-1.9	-	7.98	-0.06	92	579	84	75
242	37.840	0.156	0.071	1.06	90	-1.9	-	7.92	-0.06	92	575	82	75
243	37.998	0.158	0.071	1.05	90	-1.9	-	7.87	-0.05	92	571	83	75
244	38.154	0.156	0.071	1.05	90	-1.9	-	7.81	-0.06	92	568	83	75
245	38.311	0.157	0.070	1.05	89	-1.9	-	7.75	-0.06	92	566	83	75
246	38.469	0.158	0.071	1.05	90	-2.0	-	7.70	-0.05	92	563	84	75
247	38.625	0.156	0.070	1.05	90	-1.9	-	7.64	-0.06	92	559	83	75
248	38.783	0.158	0.071	1.07	89	-1.9	-	7.59	-0.05	92	557	84	75
249	38.940	0.157	0.071	1.06	89	-1.9	-	7.54	-0.05	91	555	84	75
250	39.096	0.156	0.070	1.05	88	-1.9	100	7.48	-0.06	91	552	83	75
251	39.254	0.158	0.070	1.05	90	-2.0	-	7.43	-0.05	91	550	83	75
252	39.410	0.156	0.070	1.04	89	-1.9	-	7.39	-0.04	91	546	82	75
253	39.567	0.157	0.069	1.04	90	-2.0	-	7.34	-0.05	91	541	84	75
254	39.725	0.158	0.071	1.06	90	-2.0	-	7.29	-0.05	91	538	84	75
255	39.881	0.156	0.071	1.05	90	-2.0	-	7.25	-0.04	91	533	84	75

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: IHPJob #: 25-416Model: Montecito-CTracking #: 223Run #: 2Technician: AKDate: 5/28/2025

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	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
256	40.039	0.158	0.070	1.06	90	-1.9	-	7.20	-0.05	91	530	84	75
257	40.195	0.156	0.071	1.05	89	-1.9	-	7.15	-0.05	91	526	84	75
258	40.352	0.157	0.071	1.06	89	-2.0	-	7.12	-0.03	91	522	83	75
259	40.510	0.158	0.071	1.05	89	-2.0	-	7.07	-0.05	91	519	83	75
260	40.666	0.156	0.071	1.05	89	-2.0	100	7.03	-0.04	90	515	83	75
261	40.824	0.158	0.071	1.05	90	-2.0	-	6.99	-0.04	90	512	84	75
262	40.981	0.157	0.070	1.06	91	-2.0	-	6.95	-0.04	90	509	84	75
263	41.137	0.156	0.069	1.05	90	-2.0	-	6.91	-0.04	90	506	85	75
264	41.295	0.158	0.071	1.05	90	-2.0	-	6.87	-0.04	90	503	84	75
265	41.450	0.155	0.071	1.05	90	-2.1	-	6.83	-0.04	90	500	83	75
266	41.608	0.158	0.071	1.05	90	-2.0	-	6.79	-0.04	90	497	83	75
267	41.766	0.158	0.072	1.06	90	-2.0	-	6.75	-0.04	90	495	83	75
268	41.922	0.156	0.070	1.06	91	-2.0	-	6.72	-0.03	90	492	83	75
269	42.080	0.158	0.070	1.06	90	-2.0	-	6.68	-0.04	90	489	83	75
270	42.236	0.156	0.070	1.06	90	-2.0	100	6.64	-0.04	89	487	83	75
271	42.393	0.157	0.071	1.05	89	-2.0	-	6.60	-0.04	89	485	84	75
272	42.551	0.158	0.070	1.05	89	-2.1	-	6.57	-0.03	90	484	84	75
273	42.707	0.156	0.071	1.05	89	-2.1	-	6.53	-0.04	89	481	83	75
274	42.865	0.158	0.070	1.05	90	-2.1	-	6.49	-0.04	89	481	84	75
275	43.022	0.157	0.071	1.06	89	-2.1	-	6.45	-0.04	89	480	83	75
276	43.178	0.156	0.070	1.05	89	-2.1	-	6.41	-0.04	89	480	83	75
277	43.336	0.158	0.070	1.05	88	-2.1	-	6.37	-0.04	89	480	83	75
278	43.492	0.156	0.071	1.06	90	-2.2	-	6.33	-0.04	89	480	84	75
279	43.650	0.158	0.069	1.06	89	-2.1	-	6.30	-0.03	89	480	84	75
280	43.808	0.158	0.069	1.06	89	-2.1	100	6.27	-0.03	89	478	84	75
281	43.963	0.155	0.070	1.05	89	-2.1	-	6.23	-0.04	89	477	84	75
282	44.121	0.158	0.071	1.05	90	-2.1	-	6.19	-0.04	89	475	84	75
283	44.278	0.157	0.071	1.05	90	-2.1	-	6.16	-0.03	89	474	84	75
284	44.434	0.156	0.070	1.05	90	-2.2	-	6.13	-0.03	89	473	83	75
285	44.593	0.159	0.070	1.06	90	-2.2	-	6.11	-0.02	89	471	83	75
286	44.748	0.155	0.070	1.07	90	-2.1	-	6.07	-0.04	89	470	83	75
287	44.906	0.158	0.071	1.05	89	-2.1	-	6.05	-0.02	89	468	84	75

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: IHP

Job #: 25-416

Model: Montecito-C

Tracking #: 223

Run #: 2

Technician: AK

Date: 5/28/2025

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	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
288	45.064	0.158	0.071	1.05	90	-2.1	-	6.01	-0.04	89	467	84	75
289	45.219	0.155	0.071	1.05	88	-2.2	-	5.99	-0.02	88	465	83	75
290	45.377	0.158	0.070	1.06	89	-2.2	100	5.96	-0.03	88	463	84	75
291	45.533	0.156	0.070	1.06	89	-2.2	-	5.93	-0.03	89	462	84	75
292	45.691	0.158	0.071	1.05	90	-2.2	-	5.89	-0.04	88	459	83	75
293	45.849	0.158	0.069	1.05	90	-2.2	-	5.88	-0.01	88	456	83	75
294	46.004	0.155	0.070	1.06	89	-2.3	-	5.86	-0.02	88	451	83	75
295	46.162	0.158	0.072	1.05	90	-2.3	-	5.84	-0.02	88	443	83	75
296	46.319	0.157	0.071	1.05	90	-2.2	-	5.82	-0.02	88	438	83	75
297	46.476	0.157	0.069	1.05	89	-2.2	-	5.80	-0.02	88	434	83	75
298	46.634	0.158	0.070	1.05	89	-2.3	-	5.78	-0.02	88	429	84	75
299	46.789	0.155	0.069	1.06	90	-2.3	-	5.77	-0.01	88	425	82	75
300	46.947	0.158	0.069	1.05	89	-2.3	100	5.74	-0.03	87	421	82	75
301	47.105	0.158	0.071	1.06	89	-2.3	-	5.73	-0.01	88	418	83	75
302	47.261	0.156	0.071	1.05	89	-2.3	-	5.71	-0.02	87	414	83	75
303	47.419	0.158	0.071	1.06	89	-2.2	-	5.69	-0.02	87	411	84	75
304	47.575	0.156	0.070	1.05	90	-2.2	-	5.67	-0.02	87	408	84	75
305	47.733	0.158	0.070	1.06	90	-2.3	-	5.66	-0.01	87	405	84	75
306	47.890	0.157	0.071	1.05	89	-2.3	-	5.64	-0.02	87	402	83	75
307	48.046	0.156	0.070	1.05	89	-2.3	-	5.63	-0.01	87	399	83	75
308	48.204	0.158	0.070	1.05	89	-2.3	-	5.61	-0.02	87	397	83	75
309	48.361	0.157	0.072	1.06	89	-2.2	-	5.59	-0.02	86	395	82	75
310	48.518	0.157	0.069	1.06	90	-2.4	101	5.57	-0.02	86	393	83	75
311	48.676	0.158	0.071	1.05	89	-2.3	-	5.56	-0.01	87	390	83	75
312	48.831	0.155	0.071	1.05	89	-2.3	-	5.54	-0.02	87	389	84	75
313	48.989	0.158	0.071	1.06	89	-2.4	-	5.52	-0.02	86	386	83	75
314	49.147	0.158	0.070	1.05	89	-2.4	-	5.51	-0.01	86	385	82	75
315	49.303	0.156	0.070	1.05	89	-2.3	-	5.49	-0.02	87	383	83	75
316	49.461	0.158	0.071	1.06	89	-2.4	-	5.47	-0.02	86	382	83	75
317	49.617	0.156	0.071	1.05	89	-2.4	-	5.45	-0.02	86	381	84	75
318	49.774	0.157	0.071	1.06	89	-2.4	-	5.44	-0.01	86	380	84	75
319	49.932	0.158	0.072	1.05	89	-2.3	-	5.42	-0.02	86	379	84	75

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: IHP

Job #: 25-416

Model: Montecito-C

Tracking #: 223

Run #: 2

Technician: AK

Date: 5/28/2025

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	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
320	50.088	0.156	0.072	1.05	88	-2.4	99	5.40	-0.02	86	377	83	75
321	50.246	0.158	0.073	1.05	89	-2.4	-	5.38	-0.02	86	375	83	75
322	50.403	0.157	0.071	1.06	89	-2.4	-	5.37	-0.01	86	374	82	75
323	50.560	0.157	0.071	1.06	89	-2.4	-	5.35	-0.02	86	373	83	75
324	50.718	0.158	0.072	1.06	90	-2.3	-	5.33	-0.02	86	374	84	75
325	50.874	0.156	0.070	1.06	90	-2.4	-	5.32	-0.01	85	373	84	75
326	51.031	0.157	0.073	1.06	89	-2.4	-	5.30	-0.02	86	372	84	75
327	51.189	0.158	0.070	1.06	90	-2.3	-	5.29	-0.01	86	371	84	75
328	51.345	0.156	0.071	1.06	89	-2.4	-	5.27	-0.02	86	371	83	75
329	51.503	0.158	0.069	1.06	89	-2.4	-	5.26	-0.01	86	370	83	75
330	51.659	0.156	0.072	1.05	90	-2.4	98	5.23	-0.03	86	369	82	75
331	51.817	0.158	0.071	1.05	90	-2.4	-	5.22	-0.01	86	368	84	75
332	51.975	0.158	0.072	1.06	89	-2.4	-	5.20	-0.02	86	367	84	75
333	52.130	0.155	0.071	1.06	89	-2.4	-	5.18	-0.02	85	367	84	75
334	52.289	0.159	0.072	1.05	89	-2.4	-	5.17	-0.01	85	367	82	75
335	52.445	0.156	0.071	1.06	89	-2.5	-	5.16	-0.01	86	367	82	75
336	52.602	0.157	0.071	1.06	90	-2.5	-	5.14	-0.02	85	366	83	75
337	52.760	0.158	0.069	1.05	89	-2.5	-	5.12	-0.02	85	365	83	75
338	52.916	0.156	0.071	1.04	90	-2.4	-	5.10	-0.02	85	364	83	75
339	53.074	0.158	0.071	1.07	89	-2.4	-	5.08	-0.02	85	364	83	75
340	53.231	0.157	0.070	1.06	89	-2.4	99	5.07	-0.01	86	363	84	75
341	53.387	0.156	0.070	1.04	90	-2.5	-	5.05	-0.02	85	363	83	75
342	53.545	0.158	0.070	1.06	88	-2.4	-	5.04	-0.01	85	362	83	75
343	53.701	0.156	0.071	1.05	89	-2.5	-	5.02	-0.02	85	361	83	75
344	53.859	0.158	0.071	1.05	89	-2.5	-	5.00	-0.02	85	361	83	75
345	54.017	0.158	0.071	1.06	89	-2.5	-	4.99	-0.01	85	360	83	75
346	54.172	0.155	0.073	1.05	89	-2.4	-	4.97	-0.02	85	360	84	75
347	54.331	0.159	0.071	1.05	89	-2.4	-	4.96	-0.01	85	359	84	75
348	54.487	0.156	0.070	1.06	90	-2.5	-	4.94	-0.02	85	358	84	75
349	54.644	0.157	0.070	1.05	90	-2.4	-	4.93	-0.01	85	358	83	75
350	54.802	0.158	0.073	1.05	91	-2.5	99	4.92	-0.01	85	357	82	75
351	54.958	0.156	0.072	1.06	90	-2.4	-	4.90	-0.02	85	357	83	75

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: IHP

Job #: 25-416

Model: Montecito-C

Tracking #: 223

Run #: 2

Technician: AK

Date: 5/28/2025

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	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
352	55.116	0.158	0.070	1.05	89	-2.5	-	4.88	-0.02	85	357	82	75
353	55.273	0.157	0.071	1.06	89	-2.4	-	4.87	-0.01	85	356	84	75
354	55.429	0.156	0.071	1.06	89	-2.5	-	4.85	-0.02	85	355	84	75
355	55.588	0.159	0.071	1.06	89	-2.4	-	4.84	-0.01	85	355	84	75
356	55.743	0.155	0.071	1.05	88	-2.5	-	4.82	-0.02	85	354	84	75
357	55.901	0.158	0.071	1.05	89	-2.5	-	4.81	-0.01	85	354	84	75
358	56.059	0.158	0.071	1.06	88	-2.5	-	4.79	-0.02	85	353	83	75
359	56.215	0.156	0.069	1.05	89	-2.5	-	4.78	-0.01	84	352	83	74
360	56.373	0.158	0.071	1.06	89	-2.5	98	4.77	-0.01	85	352	83	74
361	56.529	0.156	0.070	1.06	89	-2.5	-	4.75	-0.02	84	351	84	74
362	56.687	0.158	0.071	1.06	89	-2.5	-	4.74	-0.01	84	350	83	74
363	56.844	0.157	0.073	1.06	90	-2.5	-	4.72	-0.02	84	349	84	74
364	57.000	0.156	0.071	1.06	89	-2.6	-	4.71	-0.01	85	349	83	74
365	57.158	0.158	0.071	1.07	90	-2.5	-	4.69	-0.02	84	349	83	74
366	57.315	0.157	0.071	1.05	89	-2.5	-	4.67	-0.02	84	348	82	74
367	57.472	0.157	0.071	1.06	89	-2.6	-	4.66	-0.01	84	348	83	74
368	57.630	0.158	0.070	1.06	89	-2.5	-	4.65	-0.01	84	347	83	74
369	57.786	0.156	0.071	1.06	89	-2.4	-	4.63	-0.02	84	346	83	74
370	57.943	0.157	0.071	1.06	89	-2.5	99	4.62	-0.01	84	345	84	74
371	58.101	0.158	0.071	1.05	89	-2.5	-	4.61	-0.01	84	344	84	74
372	58.257	0.156	0.070	1.04	89	-2.5	-	4.59	-0.02	84	344	84	74
373	58.415	0.158	0.070	1.06	90	-2.5	-	4.58	-0.01	84	343	83	74
374	58.571	0.156	0.073	1.06	89	-2.5	-	4.57	-0.01	84	342	82	74
375	58.729	0.158	0.071	1.06	90	-2.6	-	4.55	-0.02	84	341	83	74
376	58.887	0.158	0.070	1.06	89	-2.6	-	4.54	-0.01	84	340	83	75
377	59.043	0.156	0.070	1.04	89	-2.5	-	4.52	-0.02	84	338	83	74
378	59.201	0.158	0.073	1.06	88	-2.6	-	4.51	-0.01	84	337	84	74
379	59.357	0.156	0.072	1.06	88	-2.5	-	4.50	-0.01	84	335	84	74
380	59.515	0.158	0.070	1.06	88	-2.4	99	4.49	-0.01	84	334	83	74
381	59.673	0.158	0.071	1.04	89	-2.5	-	4.47	-0.02	84	333	82	74
382	59.829	0.156	0.071	1.06	89	-2.4	-	4.46	-0.01	84	332	83	74
383	59.987	0.158	0.070	1.06	89	-2.4	-	4.45	-0.01	84	331	83	74

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: IHP

Job #: 25-416

Model: Montecito-C

Tracking #: 223

Run #: 2

Technician: AK

Date: 5/28/2025

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	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
384	60.144	0.157	0.071	1.05	89	-2.5	-	4.44	-0.01	84	330	83	74
385	60.300	0.156	0.071	1.06	88	-2.6	-	4.43	-0.01	84	329	84	74
386	60.459	0.159	0.073	1.05	89	-2.5	-	4.42	-0.01	84	328	84	74
387	60.614	0.155	0.071	1.05	89	-2.5	-	4.41	-0.01	84	327	84	74
388	60.772	0.158	0.071	1.06	90	-2.5	-	4.39	-0.02	84	326	83	74
389	60.930	0.158	0.071	1.05	89	-2.5	-	4.38	-0.01	83	325	83	74
390	61.086	0.156	0.071	1.05	89	-2.5	99	4.37	-0.01	83	324	82	74
391	61.244	0.158	0.070	1.06	89	-2.4	-	4.36	-0.01	83	322	82	74
392	61.400	0.156	0.068	1.06	89	-2.4	-	4.34	-0.02	84	322	83	74
393	61.558	0.158	0.071	1.06	88	-2.4	-	4.33	-0.01	83	321	84	74
394	61.716	0.158	0.071	1.06	90	-2.5	-	4.32	-0.01	83	320	83	74
395	61.872	0.156	0.071	1.06	90	-2.5	-	4.31	-0.01	83	320	83	74
396	62.030	0.158	0.071	1.05	90	-2.5	-	4.30	-0.01	83	319	83	74
397	62.186	0.156	0.072	1.06	89	-2.5	-	4.28	-0.02	83	318	82	74
398	62.343	0.157	0.071	1.06	89	-2.4	-	4.27	-0.01	83	318	83	74
399	62.501	0.158	0.071	1.05	89	-2.5	-	4.26	-0.01	83	317	83	74
400	62.657	0.156	0.068	1.06	89	-2.5	100	4.25	-0.01	83	316	84	74
401	62.815	0.158	0.070	1.05	89	-2.5	-	4.24	-0.01	83	316	84	74
402	62.972	0.157	0.072	1.06	90	-2.5	-	4.22	-0.02	83	315	84	74
403	63.129	0.157	0.071	1.06	90	-2.4	-	4.21	-0.01	83	314	84	74
404	63.287	0.158	0.071	1.06	90	-2.5	-	4.20	-0.01	83	313	83	74
405	63.443	0.156	0.069	1.05	89	-2.4	-	4.19	-0.01	83	312	83	74
406	63.600	0.157	0.071	1.04	89	-2.4	-	4.18	-0.01	83	311	83	74
407	63.758	0.158	0.072	1.06	90	-2.4	-	4.17	-0.01	83	311	83	74
408	63.914	0.156	0.071	1.05	89	-2.5	-	4.15	-0.02	83	310	83	74
409	64.072	0.158	0.070	1.04	89	-2.5	-	4.14	-0.01	83	309	84	74
410	64.229	0.157	0.071	1.05	88	-2.5	100	4.13	-0.01	83	308	84	74
411	64.386	0.157	0.071	1.05	88	-2.5	-	4.12	-0.01	83	307	84	74
412	64.544	0.158	0.070	1.06	89	-2.5	-	4.11	-0.01	83	307	84	74
413	64.700	0.156	0.072	1.06	89	-2.4	-	4.10	-0.01	83	307	84	74
414	64.858	0.158	0.072	1.06	89	-2.4	-	4.08	-0.02	83	307	83	74
415	65.015	0.157	0.071	1.06	89	-2.5	-	4.07	-0.01	83	308	83	74

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: IHP
 Model: Montecito-C
 Run #: 2

Job #: 25-416
 Tracking #: 223
 Technician: AK
 Date: 5/28/2025

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	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
416	65.172	0.157	0.072	1.05	89	-2.4	-	4.06	-0.01	83	308	83	74
417	65.330	0.158	0.070	1.05	89	-2.5	-	4.05	-0.01	83	307	83	74
418	65.486	0.156	0.070	1.06	89	-2.4	-	4.04	-0.01	83	307	84	74
419	65.643	0.157	0.071	1.06	89	-2.5	-	4.02	-0.02	83	306	84	74
420	65.801	0.158	0.071	1.05	89	-2.5	99	4.01	-0.01	83	306	85	74
421	65.957	0.156	0.072	1.05	88	-2.5	-	4.00	-0.01	83	306	84	74
422	66.115	0.158	0.071	1.04	89	-2.4	-	3.99	-0.01	83	305	84	74
423	66.271	0.156	0.070	1.05	89	-2.5	-	3.97	-0.02	83	305	83	74
424	66.429	0.158	0.072	1.06	89	-2.5	-	3.97	0.00	83	305	83	74
425	66.587	0.158	0.071	1.07	89	-2.5	-	3.95	-0.02	83	304	83	74
426	66.743	0.156	0.071	1.06	90	-2.4	-	3.94	-0.01	83	303	84	74
427	66.901	0.158	0.071	1.06	89	-2.5	-	3.93	-0.01	82	303	83	74
428	67.057	0.156	0.071	1.06	89	-2.4	-	3.92	-0.01	82	302	84	74
429	67.214	0.157	0.072	1.06	89	-2.4	-	3.91	-0.01	83	302	83	74
430	67.372	0.158	0.071	1.05	90	-2.5	99	3.90	-0.01	83	301	83	74
431	67.528	0.156	0.072	1.07	89	-2.4	-	3.88	-0.02	82	301	82	74
432	67.687	0.159	0.071	1.06	89	-2.5	-	3.87	-0.01	82	301	83	74
433	67.843	0.156	0.072	1.06	89	-2.4	-	3.86	-0.01	82	300	83	74
434	68.000	0.157	0.072	1.06	89	-2.5	-	3.85	-0.01	82	300	83	74
435	68.158	0.158	0.071	1.06	89	-2.5	-	3.84	-0.01	82	299	84	74
436	68.314	0.156	0.071	1.06	90	-2.4	-	3.83	-0.01	82	299	83	74
437	68.472	0.158	0.072	1.06	89	-2.3	-	3.81	-0.02	82	299	83	74
438	68.629	0.157	0.070	1.05	89	-2.4	-	3.80	-0.01	82	298	83	74
439	68.786	0.157	0.071	1.05	90	-2.4	-	3.80	0.00	82	297	83	74
440	68.944	0.158	0.072	1.06	90	-2.4	98	3.78	-0.02	82	296	84	74
441	69.099	0.155	0.071	1.05	90	-2.4	-	3.77	-0.01	82	296	84	74
442	69.257	0.158	0.071	1.06	90	-2.4	-	3.76	-0.01	82	295	83	74
443	69.415	0.158	0.071	1.05	89	-2.4	-	3.75	-0.01	82	294	84	74
444	69.571	0.156	0.072	1.05	90	-2.4	-	3.74	-0.01	82	294	83	74
445	69.729	0.158	0.072	1.06	90	-2.5	-	3.72	-0.02	82	293	83	74
446	69.886	0.157	0.071	1.05	90	-2.3	-	3.72	0.00	82	293	83	74
447	70.043	0.157	0.072	1.06	90	-2.4	-	3.71	-0.01	82	292	83	74

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: IHP

Job #: 25-416

Model: Montecito-C

Tracking #: 223

Run #: 2

Technician: AK

Date: 5/28/2025

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	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
448	70.201	0.158	0.070	1.05	89	-2.4	-	3.70	-0.01	82	291	84	74
449	70.357	0.156	0.070	1.05	89	-2.3	-	3.69	-0.01	82	290	84	74
450	70.515	0.158	0.072	1.06	89	-2.3	98	3.68	-0.01	82	290	84	74
451	70.672	0.157	0.072	1.05	89	-2.4	-	3.67	-0.01	82	289	83	74
452	70.828	0.156	0.072	1.06	89	-2.3	-	3.66	-0.01	82	289	83	74
453	70.986	0.158	0.071	1.06	89	-2.5	-	3.65	-0.01	82	289	82	74
454	71.142	0.156	0.070	1.06	89	-2.4	-	3.63	-0.02	82	288	83	74
455	71.300	0.158	0.071	1.06	89	-2.4	-	3.62	-0.01	82	288	83	74
456	71.458	0.158	0.071	1.05	90	-2.3	-	3.62	0.00	82	288	84	74
457	71.614	0.156	0.071	1.05	89	-2.4	-	3.60	-0.02	82	288	84	74
458	71.772	0.158	0.071	1.06	90	-2.4	-	3.59	-0.01	82	288	84	74
459	71.928	0.156	0.071	1.06	90	-2.4	-	3.58	-0.01	82	288	83	74
460	72.086	0.158	0.071	1.07	90	-2.4	98	3.57	-0.01	82	288	82	75
461	72.244	0.158	0.071	1.06	90	-2.4	-	3.56	-0.01	82	288	83	74
462	72.399	0.155	0.072	1.06	89	-2.3	-	3.55	-0.01	82	287	82	75
463	72.558	0.159	0.070	1.06	90	-2.4	-	3.53	-0.02	82	287	83	74
464	72.714	0.156	0.072	1.06	89	-2.4	-	3.52	-0.01	82	287	84	75
465	72.871	0.157	0.072	1.06	90	-2.3	-	3.51	-0.01	82	286	84	74
466	73.029	0.158	0.070	1.06	89	-2.3	-	3.50	-0.01	82	286	84	74
467	73.185	0.156	0.070	1.05	89	-2.3	-	3.49	-0.01	82	286	84	74
468	73.343	0.158	0.072	1.05	89	-2.3	-	3.48	-0.01	82	285	83	74
469	73.500	0.157	0.072	1.06	89	-2.4	-	3.47	-0.01	82	285	82	75
470	73.657	0.157	0.071	1.05	89	-2.3	99	3.46	-0.01	82	284	83	74
471	73.815	0.158	0.072	1.06	90	-2.3	-	3.46	0.00	82	284	82	75
472	73.971	0.156	0.071	1.06	89	-2.4	-	3.44	-0.02	82	283	83	75
473	74.128	0.157	0.070	1.05	89	-2.4	-	3.43	-0.01	82	283	84	75
474	74.286	0.158	0.072	1.06	89	-2.4	-	3.42	-0.01	82	282	83	75
475	74.442	0.156	0.071	1.06	89	-2.3	98	3.41	-0.01	82	281	84	75
Avg/Tot	74.447	0.157	0.070	1.05	88.3	-2.0	100			90.9	535.6	83.4	74.7

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: IHP
 Model: Montecito-C
 Run #: 2

Job #: 25-416
 Tracking #: 223
 Technician: AK
 Date: 5/28/2025

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	-0.006		0.02	72	-0.6		86	0.002	0.09	0.004
1	0.134	0.140	1.23	73	-1.4	-	87	0.009	0.09	0.005
2	0.295	0.161	1.18	72	-1.5	-	87	0.004	0.09	0.005
3	0.458	0.163	1.20	72	-1.3	-	87	0.004	4.73	0.100
4	0.617	0.159	1.19	73	-1.4	-	87	0.007	11.41	0.127
5	0.779	0.162	1.18	73	-1.3	-	87	0.008	13.31	0.244
6	0.938	0.159	1.17	73	-1.4	-	87	0.008	13.46	0.292
7	1.099	0.161	1.15	73	-1.5	-	86	0.002	13.97	0.064
8	1.257	0.158	1.17	73	-1.5	-	86	0.005	15.83	0.117
9	1.417	0.160	1.17	73	-1.3	-	87	0.005	16.31	0.153
10	1.575	0.158	1.16	73	-1.4	101	87	0.001	16.25	0.181
11	1.737	0.162	1.17	73	-1.5	-	87	0.005	15.69	0.160
12	1.895	0.158	1.15	74	-1.3	-	87	0.001	15.08	0.087
13	2.054	0.159	1.14	74	-1.3	-	87	0.005	14.12	0.041
14	2.211	0.157	1.14	74	-1.3	-	87	0.002	11.99	0.019
15	2.368	0.157	1.16	74	-1.3	-	87	0.006	11.44	0.033
16	2.525	0.157	1.13	74	-1.4	-	87	0.004	4.01	0.177
17	2.683	0.158	1.12	75	-1.4	-	87	0.003	13.00	0.716
18	2.842	0.159	1.13	75	-1.4	-	87	0.002	16.13	0.274
19	2.997	0.155	1.14	75	-1.5	-	87	0.006	17.62	0.623
20	3.156	0.159	1.15	75	-1.3	105	87	0.005	17.48	0.274
21	3.311	0.155	1.14	76	-1.3	-	87	0.009	17.05	0.086
22	3.469	0.158	1.14	75	-1.4	-	87	-0.002	16.72	0.065
23	3.627	0.158	1.14	76	-1.3	-	87	0.003	16.32	0.055
24	3.782	0.155	1.14	76	-1.3	-	87	0.004	16.26	0.037
25	3.943	0.161	1.13	76	-1.4	-	87	0.009	15.71	0.029
26	4.098	0.155	1.12	77	-1.3	-	87	0.009	15.99	0.031
27	4.256	0.158	1.14	77	-1.5	-	87	0.010	16.83	0.053
28	4.413	0.157	1.13	77	-1.5	-	87	0.006	16.39	0.054
29	4.568	0.155	1.12	77	-1.5	-	87	0.000	16.16	0.049
30	4.723	0.155	1.12	78	-1.5	105	87	0.006	15.86	0.042
31	4.880	0.157	1.14	78	-1.3	-	87	0.007	15.48	0.041

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: IHP
 Model: Montecito-C
 Run #: 2

Job #: 25-416
 Tracking #: 223
 Technician: AK
 Date: 5/28/2025

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 (%)
32	5.035	0.155	1.12	78	-1.4	-	87	0.003	16.36	0.804
33	5.194	0.159	1.14	78	-1.3	-	87	0.001	13.08	0.119
34	5.349	0.155	1.14	78	-1.4	-	87	0.003	11.70	0.101
35	5.507	0.158	1.13	79	-1.4	-	87	0.004	11.05	0.109
36	5.665	0.158	1.13	79	-1.3	-	87	0.006	10.63	0.124
37	5.820	0.155	1.14	79	-1.4	-	87	0.002	10.55	0.124
38	5.979	0.159	1.15	79	-1.3	-	87	0.010	10.61	0.129
39	6.135	0.156	1.13	80	-1.5	-	87	0.008	10.64	0.115
40	6.295	0.160	1.12	80	-1.5	104	87	0.007	10.86	0.107
41	6.452	0.157	1.14	80	-1.5	-	87	0.009	11.12	0.109
42	6.608	0.156	1.15	80	-1.3	-	87	0.009	11.25	0.114
43	6.767	0.159	1.13	81	-1.4	-	87	0.009	11.46	0.115
44	6.923	0.156	1.13	81	-1.5	-	87	0.005	11.60	0.105
45	7.078	0.155	1.15	81	-1.5	-	87	0.011	11.69	0.108
46	7.236	0.158	1.13	81	-1.3	-	87	0.005	11.64	0.125
47	7.392	0.156	1.14	82	-1.5	-	87	0.004	11.71	0.099
48	7.551	0.159	1.13	82	-1.4	-	87	0.009	11.70	0.112
49	7.707	0.156	1.14	82	-1.4	-	87	0.008	11.86	0.113
50	7.865	0.158	1.13	82	-1.4	101	87	0.008	11.95	0.119
51	8.023	0.158	1.13	83	-1.4	-	87	0.005	12.08	0.150
52	8.179	0.156	1.14	82	-1.3	-	87	0.007	12.42	0.166
53	8.338	0.159	1.15	83	-1.4	-	87	0.009	12.08	0.087
54	8.494	0.156	1.15	83	-1.4	-	87	0.006	11.82	0.088
55	8.655	0.161	1.14	83	-1.4	-	87	0.009	11.22	0.060
56	8.812	0.157	1.14	83	-1.4	-	87	0.001	11.18	0.069
57	8.970	0.158	1.13	83	-1.4	-	87	0.005	11.24	0.064
58	9.128	0.158	1.15	84	-1.3	-	87	0.006	11.30	0.075
59	9.285	0.157	1.15	84	-1.4	-	87	0.009	10.91	0.068
60	9.441	0.156	1.14	84	-1.4	101	87	0.011	10.01	0.057
61	9.598	0.157	1.14	84	-1.4	-	87	0.002	9.67	0.078
62	9.756	0.158	1.17	84	-1.4	-	87	0.009	9.44	0.102
63	9.915	0.159	1.16	85	-1.4	-	87	0.010	9.50	0.100

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: IHP
 Model: Montecito-C
 Run #: 2

Job #: 25-416
 Tracking #: 223
 Technician: AK
 Date: 5/28/2025

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 (%)
64	10.072	0.157	1.15	84	-1.3	-	87	0.005	9.75	0.085
65	10.231	0.159	1.14	85	-1.5	-	87	0.000	5.58	0.187
66	10.387	0.156	1.13	85	-1.3	-	87	0.007	12.90	0.260
67	10.546	0.159	1.13	85	-1.5	-	87	0.009	12.36	0.123
68	10.702	0.156	1.14	85	-1.4	-	87	0.005	11.85	0.087
69	10.864	0.162	1.16	85	-1.3	-	87	0.004	11.16	0.082
70	11.021	0.157	1.14	86	-1.3	102	87	0.010	10.99	0.082
71	11.179	0.158	1.14	86	-1.4	-	87	0.008	10.98	0.068
72	11.338	0.159	1.14	86	-1.3	-	87	0.007	11.00	0.056
73	11.495	0.157	1.12	86	-1.3	-	87	0.007	10.78	0.053
74	11.654	0.159	1.15	86	-1.3	-	87	0.008	10.63	0.052
75	11.808	0.154	1.14	86	-1.3	-	87	0.009	10.38	0.073
76	11.966	0.158	1.15	86	-1.4	-	87	0.011	10.09	0.088
77	12.125	0.159	1.13	87	-1.4	-	87	0.010	9.93	0.092
78	12.282	0.157	1.14	87	-1.4	-	87	0.010	9.64	0.093
79	12.441	0.159	1.15	87	-1.4	-	87	0.005	9.49	0.102
80	12.598	0.157	1.14	87	-1.4	101	87	0.004	10.00	0.080
81	12.757	0.159	1.14	87	-1.4	-	87	0.009	10.01	0.083
82	12.914	0.157	1.13	87	-1.5	-	87	0.006	9.98	0.077
83	13.073	0.159	1.12	87	-1.3	-	87	0.007	9.80	0.068
84	13.231	0.158	1.15	87	-1.3	-	87	0.009	9.61	0.076
85	13.392	0.161	1.13	87	-1.5	-	87	0.004	9.32	0.082
86	13.550	0.158	1.13	88	-1.4	-	87	0.005	9.14	0.092
87	13.708	0.158	1.14	88	-1.4	-	87	0.008	8.92	0.110
88	13.867	0.159	1.15	87	-1.4	-	87	0.008	8.70	0.118
89	14.024	0.157	1.14	87	-1.4	-	87	0.009	8.48	0.134
90	14.181	0.157	1.15	88	-1.3	101	87	0.008	8.35	0.136
91	14.338	0.157	1.16	88	-1.3	-	87	0.002	8.27	0.145
92	14.497	0.159	1.13	88	-1.4	-	87	0.008	8.24	0.143
93	14.655	0.158	1.15	88	-1.4	-	87	0.008	8.16	0.140
94	14.814	0.159	1.14	88	-1.5	-	87	0.007	8.20	0.138
95	14.972	0.158	1.16	88	-1.4	-	87	0.005	8.33	0.135

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: IHP
 Model: Montecito-C
 Run #: 2

Job #: 25-416
 Tracking #: 223
 Technician: AK
 Date: 5/28/2025

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 (%)
96	15.130	0.158	1.12	88	-1.4	-	87	0.009	8.45	0.161
97	15.289	0.159	1.14	89	-1.4	-	87	0.009	8.42	0.156
98	15.446	0.157	1.15	88	-1.4	-	87	0.009	8.42	0.141
99	15.608	0.162	1.15	88	-1.4	-	87	0.008	8.43	0.141
100	15.765	0.157	1.16	88	-1.4	100	87	0.004	8.38	0.138
101	15.925	0.160	1.14	88	-1.4	-	87	0.007	8.41	0.140
102	16.082	0.157	1.13	88	-1.4	-	87	0.008	8.42	0.145
103	16.242	0.160	1.13	89	-1.4	-	87	0.006	8.42	0.135
104	16.399	0.157	1.13	89	-1.4	-	87	0.009	8.48	0.133
105	16.555	0.156	1.15	89	-1.4	-	87	0.003	8.52	0.135
106	16.714	0.159	1.14	89	-1.4	-	87	0.002	8.55	0.138
107	16.871	0.157	1.15	89	-1.4	-	87	0.008	8.60	0.120
108	17.031	0.160	1.15	89	-1.4	-	87	0.010	8.55	0.124
109	17.188	0.157	1.13	89	-1.4	-	87	0.009	8.54	0.098
110	17.348	0.160	1.15	89	-1.4	100	87	0.008	8.65	0.097
111	17.507	0.159	1.14	89	-1.4	-	87	0.009	8.60	0.101
112	17.667	0.160	1.14	89	-1.4	-	87	0.010	8.65	0.099
113	17.824	0.157	1.14	89	-1.4	-	87	0.005	8.71	0.090
114	17.984	0.160	1.15	90	-1.4	-	87	0.007	8.72	0.087
115	18.142	0.158	1.12	89	-1.4	-	87	0.011	8.74	0.076
116	18.300	0.158	1.15	89	-1.4	-	87	0.007	8.74	0.080
117	18.457	0.157	1.14	89	-1.4	-	87	0.008	8.80	0.094
118	18.613	0.156	1.14	89	-1.4	-	87	0.009	8.76	0.078
119	18.773	0.160	1.16	90	-1.5	-	87	0.009	8.65	0.075
120	18.930	0.157	1.13	89	-1.3	100	87	0.004	8.57	0.073
121	19.090	0.160	1.14	90	-1.4	-	87	0.009	8.51	0.068
122	19.247	0.157	1.15	90	-1.4	-	87	0.007	8.48	0.076
123	19.407	0.160	1.13	89	-1.5	-	87	0.002	8.46	0.077
124	19.565	0.158	1.15	89	-1.4	-	87	0.003	8.37	0.074
125	19.726	0.161	1.15	90	-1.3	-	87	0.007	8.33	0.084
126	19.885	0.159	1.15	90	-1.4	-	87	0.004	8.34	0.083
127	20.043	0.158	1.14	90	-1.4	-	87	0.007	8.45	0.065

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: IHPJob #: 25-416Model: Montecito-CTracking #: 223Run #: 2Technician: AKDate: 5/28/2025

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 (%)
128	20.202	0.159	1.14	90	-1.5	-	87	0.006	8.67	0.062
129	20.359	0.157	1.13	90	-1.4	-	87	0.008	2.98	0.129
130	20.519	0.160	1.15	90	-1.4	101	87	0.006	8.31	0.501
131	20.673	0.154	1.17	89	-1.5	-	87	0.002	13.15	0.250
132	20.833	0.160	1.17	89	-1.4	-	87	0.015	14.81	0.133
133	20.991	0.158	1.13	90	-1.4	-	87	0.003	16.29	0.836
134	21.150	0.159	1.15	90	-1.5	-	87	0.008	15.26	0.344
135	21.308	0.158	1.15	90	-1.3	-	87	0.006	15.00	0.311
136	21.467	0.159	1.14	90	-1.4	-	87	0.007	14.96	0.211
137	21.626	0.159	1.14	90	-1.4	-	87	0.004	14.76	0.149
138	21.783	0.157	1.14	90	-1.4	-	87	0.008	14.38	0.146
139	21.946	0.163	1.13	90	-1.3	-	87	0.007	14.09	0.117
140	22.103	0.157	1.15	90	-1.4	101	87	0.009	13.84	0.103
141	22.263	0.160	1.15	90	-1.4	-	87	0.008	13.65	0.104
142	22.420	0.157	1.15	90	-1.3	-	87	0.012	13.44	0.093
143	22.580	0.160	1.13	90	-1.4	-	87	0.008	13.13	0.084
144	22.737	0.157	1.14	90	-1.3	-	87	0.008	12.89	0.079
145	22.897	0.160	1.14	90	-1.3	-	87	0.008	12.58	0.077
146	23.052	0.155	1.15	90	-1.4	-	87	0.006	12.30	0.072
147	23.211	0.159	1.13	90	-1.4	-	87	0.010	12.08	0.069
148	23.370	0.159	1.13	90	-1.3	-	87	0.008	12.16	0.075
149	23.528	0.158	1.13	90	-1.3	-	87	0.007	13.03	0.106
150	23.687	0.159	1.14	91	-1.3	101	87	0.006	13.67	0.117
151	23.844	0.157	1.13	90	-1.4	-	87	0.005	13.37	0.091
152	24.004	0.160	1.13	91	-1.3	-	87	0.009	13.03	0.074
153	24.164	0.160	1.13	90	-1.5	-	87	0.003	12.85	0.076
154	24.324	0.160	1.14	91	-1.4	-	87	0.006	12.66	0.146
155	24.481	0.157	1.14	90	-1.5	-	87	0.012	13.00	0.143
156	24.641	0.160	1.16	90	-1.5	-	87	0.010	11.99	0.063
157	24.798	0.157	1.13	91	-1.5	-	87	0.004	11.09	0.071
158	24.957	0.159	1.15	90	-1.4	-	87	0.003	10.60	0.091
159	25.115	0.158	1.13	90	-1.3	-	87	0.007	10.11	0.108

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: IHP
 Model: Montecito-C
 Run #: 2

Job #: 25-416
 Tracking #: 223
 Technician: AK
 Date: 5/28/2025

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 (%)
160	25.271	0.156	1.12	90	-1.3	102	87	0.009	9.81	0.143
161	25.431	0.160	1.13	90	-1.3	-	87	0.001	9.55	0.167
162	25.588	0.157	1.14	91	-1.5	-	87	0.010	9.46	0.194
163	25.748	0.160	1.13	90	-1.3	-	87	0.007	9.44	0.176
164	25.905	0.157	1.14	91	-1.4	-	87	0.008	9.42	0.171
165	26.065	0.160	1.13	91	-1.5	-	87	0.007	9.44	0.160
166	26.222	0.157	1.14	90	-1.4	-	87	0.007	9.37	0.172
167	26.385	0.163	1.15	90	-1.4	-	87	0.009	9.28	0.183
168	26.542	0.157	1.14	91	-1.4	-	87	0.005	9.30	0.172
169	26.702	0.160	1.13	91	-1.4	-	87	0.007	9.39	0.144
170	26.859	0.157	1.14	90	-1.5	102	87	0.006	9.41	0.135
171	27.018	0.159	1.13	90	-1.3	-	87	0.007	9.56	0.122
172	27.177	0.159	1.14	91	-1.5	-	87	0.006	9.63	0.121
173	27.336	0.159	1.16	91	-1.3	-	87	0.011	9.57	0.127
174	27.492	0.156	1.16	90	-1.4	-	87	0.006	9.45	0.138
175	27.649	0.157	1.12	90	-1.4	-	87	0.009	9.24	0.170
176	27.809	0.160	1.13	91	-1.4	-	87	0.009	9.07	0.198
177	27.966	0.157	1.14	90	-1.4	-	87	0.009	9.03	0.229
178	28.126	0.160	1.13	91	-1.3	-	87	0.003	8.53	0.480
179	28.283	0.157	1.14	91	-1.3	-	87	0.008	8.61	0.401
180	28.443	0.160	1.15	91	-1.4	101	87	0.013	8.40	0.406
181	28.601	0.158	1.13	91	-1.3	-	87	0.006	8.25	0.348
182	28.762	0.161	1.14	91	-1.4	-	87	0.009	7.48	0.463
183	28.921	0.159	1.15	91	-1.4	-	87	0.002	7.35	0.459
184	29.079	0.158	1.14	91	-1.3	-	87	0.005	7.15	0.464
185	29.239	0.160	1.16	91	-1.3	-	87	0.009	7.07	0.466
186	29.396	0.157	1.13	91	-1.3	-	87	0.013	6.96	0.452
187	29.556	0.160	1.16	91	-1.4	-	87	0.010	7.02	0.469
188	29.713	0.157	1.13	91	-1.5	-	87	0.011	6.95	0.490
189	29.871	0.158	1.15	91	-1.3	-	87	0.008	7.02	0.498
190	30.028	0.157	1.15	91	-1.5	101	87	0.010	6.97	0.489
191	30.188	0.160	1.15	91	-1.4	-	87	0.006	7.07	0.479

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: IHP
 Model: Montecito-C
 Run #: 2

Job #: 25-416
 Tracking #: 223
 Technician: AK
 Date: 5/28/2025

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 (%)
192	30.346	0.158	1.14	91	-1.3	-	87	0.005	7.03	0.490
193	30.506	0.160	1.15	91	-1.5	-	87	0.007	7.14	0.469
194	30.665	0.159	1.15	91	-1.4	-	87	0.005	7.34	0.439
195	30.824	0.159	1.15	91	-1.4	-	87	0.010	7.41	0.413
196	30.985	0.161	1.14	91	-1.3	-	87	0.006	7.51	0.415
197	31.144	0.159	1.16	91	-1.4	-	87	0.010	7.82	0.321
198	31.303	0.159	1.15	91	-1.3	-	87	0.007	7.59	0.320
199	31.462	0.159	1.14	91	-1.4	-	87	0.008	7.35	0.334
200	31.622	0.160	1.18	91	-1.3	100	87	0.009	7.30	0.319
201	31.780	0.158	1.15	91	-1.3	-	87	0.006	7.44	0.302
202	31.940	0.160	1.14	91	-1.5	-	87	0.004	7.71	0.245
203	32.094	0.154	1.14	91	-1.5	-	87	0.005	7.72	0.262
204	32.255	0.161	1.13	91	-1.5	-	87	0.007	7.44	0.287
205	32.413	0.158	1.16	91	-1.5	-	87	0.008	7.42	0.291
206	32.573	0.160	1.16	91	-1.4	-	87	0.008	7.53	0.277
207	32.731	0.158	1.16	91	-1.4	-	87	0.008	7.70	0.237
208	32.891	0.160	1.14	91	-1.4	-	87	0.004	7.84	0.206
209	33.049	0.158	1.14	91	-1.3	-	87	0.003	7.94	0.181
210	33.212	0.163	1.15	91	-1.4	100	87	0.006	8.03	0.154
211	33.370	0.158	1.15	91	-1.3	-	87	0.004	8.05	0.151
212	33.530	0.160	1.15	91	-1.3	-	87	0.005	8.09	0.149
213	33.688	0.158	1.14	91	-1.5	-	87	0.009	8.20	0.124
214	33.848	0.160	1.14	91	-1.4	-	87	0.006	8.31	0.122
215	34.006	0.158	1.14	91	-1.5	-	87	0.006	8.44	0.107
216	34.166	0.160	1.15	91	-1.4	-	87	0.008	8.54	0.109
217	34.322	0.156	1.16	91	-1.3	-	87	0.007	8.60	0.097
218	34.481	0.159	1.16	91	-1.3	-	87	0.010	8.66	0.094
219	34.641	0.160	1.14	91	-1.5	-	87	0.010	8.70	0.089
220	34.798	0.157	1.15	91	-1.4	99	87	0.005	8.73	0.086
221	34.959	0.161	1.15	91	-1.4	-	87	0.003	8.72	0.080
222	35.116	0.157	1.15	91	-1.5	-	87	0.011	8.70	0.081
223	35.279	0.163	1.14	91	-1.4	-	87	0.009	8.71	0.077

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: IHP
 Model: Montecito-C
 Run #: 2

Job #: 25-416
 Tracking #: 223
 Technician: AK
 Date: 5/28/2025

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 (%)
224	35.437	0.158	1.14	91	-1.3	-	87	0.002	8.72	0.078
225	35.597	0.160	1.14	91	-1.5	-	87	0.006	8.73	0.073
226	35.755	0.158	1.13	91	-1.3	-	87	0.009	8.69	0.069
227	35.915	0.160	1.13	91	-1.4	-	87	0.007	8.80	0.068
228	36.073	0.158	1.14	91	-1.5	-	87	0.012	8.90	0.059
229	36.233	0.160	1.14	91	-1.5	-	87	0.002	9.12	0.057
230	36.388	0.155	1.13	91	-1.4	100	87	0.008	8.73	0.062
231	36.548	0.160	1.13	91	-1.4	-	87	0.009	8.58	0.067
232	36.706	0.158	1.13	91	-1.4	-	87	0.008	8.41	0.067
233	36.863	0.157	1.17	91	-1.4	-	87	0.007	7.93	0.081
234	37.023	0.160	1.14	91	-1.4	-	87	0.007	7.75	0.089
235	37.181	0.158	1.15	91	-1.5	-	87	0.010	7.66	0.083
236	37.341	0.160	1.15	91	-1.5	-	87	0.011	7.58	0.081
237	37.498	0.157	1.17	91	-1.5	-	87	0.009	7.49	0.085
238	37.659	0.161	1.14	91	-1.4	-	87	0.008	7.37	0.083
239	37.816	0.157	1.16	91	-1.4	-	87	0.001	7.32	0.082
240	37.977	0.161	1.15	91	-1.5	100	87	0.008	7.19	0.085
241	38.134	0.157	1.14	91	-1.4	-	87	0.009	7.14	0.086
242	38.294	0.160	1.14	91	-1.4	-	87	0.009	7.07	0.095
243	38.452	0.158	1.13	91	-1.4	-	87	0.009	6.99	0.093
244	38.612	0.160	1.11	91	-1.4	-	87	0.009	6.92	0.095
245	38.770	0.158	1.17	91	-1.4	-	87	0.006	6.86	0.097
246	38.930	0.160	1.14	91	-1.4	-	87	0.005	6.84	0.104
247	39.088	0.158	1.14	91	-1.3	-	87	0.008	6.82	0.106
248	39.248	0.160	1.13	91	-1.3	-	87	0.008	6.78	0.108
249	39.406	0.158	1.15	91	-1.3	-	87	0.005	6.70	0.113
250	39.565	0.159	1.15	91	-1.3	100	87	0.007	6.67	0.121
251	39.725	0.160	1.15	91	-1.5	-	87	0.008	6.68	0.114
252	39.883	0.158	1.13	91	-1.4	-	87	0.006	6.56	0.127
253	40.043	0.160	1.15	91	-1.3	-	87	0.007	6.36	0.147
254	40.201	0.158	1.13	91	-1.4	-	87	0.007	6.28	0.150
255	40.361	0.160	1.13	91	-1.3	-	87	0.003	6.24	0.149

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: IHP
 Model: Montecito-C
 Run #: 2

Job #: 25-416
 Tracking #: 223
 Technician: AK
 Date: 5/28/2025

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 (%)
256	40.519	0.158	1.15	91	-1.4	-	87	0.006	6.23	0.151
257	40.679	0.160	1.15	91	-1.4	-	87	0.004	6.33	0.175
258	40.836	0.157	1.14	91	-1.4	-	87	0.006	6.29	0.182
259	40.997	0.161	1.14	91	-1.4	-	87	0.008	6.24	0.179
260	41.154	0.157	1.14	91	-1.4	100	87	0.005	6.19	0.188
261	41.314	0.160	1.13	91	-1.3	-	87	0.007	6.11	0.187
262	41.472	0.158	1.15	91	-1.3	-	87	0.006	6.02	0.205
263	41.632	0.160	1.14	91	-1.5	-	87	0.008	5.97	0.212
264	41.789	0.157	1.14	91	-1.4	-	87	0.008	5.96	0.195
265	41.949	0.160	1.15	91	-1.4	-	87	0.008	5.90	0.199
266	42.108	0.159	1.16	91	-1.5	-	87	0.001	5.87	0.195
267	42.267	0.159	1.14	91	-1.5	-	87	0.003	5.87	0.196
268	42.426	0.159	1.15	91	-1.3	-	87	0.009	5.83	0.212
269	42.585	0.159	1.14	91	-1.4	-	87	0.005	5.82	0.212
270	42.744	0.159	1.13	91	-1.5	100	87	0.007	5.79	0.231
271	42.903	0.159	1.13	91	-1.5	-	87	0.003	5.88	0.258
272	43.063	0.160	1.14	91	-1.4	-	87	0.008	5.94	0.258
273	43.220	0.157	1.14	91	-1.3	-	87	0.004	5.91	0.266
274	43.381	0.161	1.17	91	-1.5	-	87	0.007	5.93	0.256
275	43.538	0.157	1.15	91	-1.4	-	87	0.002	5.99	0.231
276	43.699	0.161	1.14	91	-1.4	-	87	0.006	6.11	0.217
277	43.856	0.157	1.14	91	-1.4	-	87	0.009	6.11	0.207
278	44.016	0.160	1.15	91	-1.4	-	87	0.009	6.09	0.185
279	44.174	0.158	1.17	91	-1.4	-	87	0.008	6.05	0.179
280	44.334	0.160	1.15	91	-1.3	100	87	0.009	6.02	0.164
281	44.492	0.158	1.14	91	-1.3	-	87	0.004	5.98	0.182
282	44.652	0.160	1.15	91	-1.4	-	87	0.009	5.97	0.179
283	44.810	0.158	1.14	91	-1.4	-	87	0.007	5.88	0.191
284	44.970	0.160	1.14	91	-1.5	-	87	0.006	5.83	0.203
285	45.128	0.158	1.13	91	-1.4	-	87	0.006	5.77	0.212
286	45.287	0.159	1.13	91	-1.4	-	87	0.006	5.75	0.225
287	45.446	0.159	1.15	91	-1.5	-	87	0.009	5.73	0.248

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: IHP
 Model: Montecito-C
 Run #: 2

Job #: 25-416
 Tracking #: 223
 Technician: AK
 Date: 5/28/2025

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 (%)
288	45.605	0.159	1.15	91	-1.4	-	87	0.009	5.71	0.243
289	45.765	0.160	1.15	91	-1.4	-	87	0.005	5.66	0.248
290	45.923	0.158	1.14	91	-1.4	100	87	0.008	5.70	0.236
291	46.083	0.160	1.14	91	-1.3	-	87	0.007	5.74	0.232
292	46.240	0.157	1.15	91	-1.4	-	87	0.010	5.60	0.240
293	46.401	0.161	1.15	91	-1.3	-	87	0.006	5.08	0.337
294	46.558	0.157	1.13	91	-1.3	-	87	0.005	4.62	0.502
295	46.718	0.160	1.15	91	-1.5	-	87	0.006	4.47	0.637
296	46.876	0.158	1.15	91	-1.4	-	87	0.008	4.45	0.621
297	47.036	0.160	1.14	91	-1.3	-	87	0.000	4.44	0.602
298	47.194	0.158	1.14	91	-1.3	-	87	0.012	4.42	0.591
299	47.354	0.160	1.16	91	-1.4	-	87	0.015	4.41	0.589
300	47.512	0.158	1.16	91	-1.4	100	87	0.005	4.43	0.581
301	47.672	0.160	1.16	91	-1.4	-	87	0.008	4.44	0.574
302	47.830	0.158	1.14	91	-1.5	-	87	0.003	4.43	0.566
303	47.990	0.160	1.13	91	-1.4	-	87	0.007	4.43	0.559
304	48.148	0.158	1.16	91	-1.5	-	87	0.008	4.39	0.552
305	48.308	0.160	1.14	91	-1.4	-	87	0.008	4.41	0.550
306	48.467	0.159	1.16	91	-1.3	-	87	0.007	4.39	0.550
307	48.626	0.159	1.14	91	-1.3	-	87	0.005	4.39	0.548
308	48.785	0.159	1.14	91	-1.3	-	87	0.006	4.37	0.549
309	48.944	0.159	1.13	91	-1.4	-	87	0.005	4.40	0.544
310	49.104	0.160	1.14	91	-1.3	100	87	0.005	4.38	0.544
311	49.262	0.158	1.15	91	-1.4	-	87	0.003	4.38	0.538
312	49.422	0.160	1.14	91	-1.5	-	87	0.006	4.39	0.541
313	49.580	0.158	1.15	91	-1.4	-	87	0.011	4.40	0.544
314	49.740	0.160	1.14	91	-1.5	-	87	0.010	4.40	0.548
315	49.897	0.157	1.13	91	-1.4	-	87	0.007	4.34	0.541
316	50.058	0.161	1.15	91	-1.5	-	87	0.008	4.37	0.539
317	50.216	0.158	1.15	91	-1.3	-	87	0.010	4.36	0.542
318	50.376	0.160	1.15	91	-1.5	-	87	0.006	4.35	0.537
319	50.534	0.158	1.15	91	-1.5	-	87	0.001	4.31	0.530

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: IHP
 Model: Montecito-C
 Run #: 2

Job #: 25-416
 Tracking #: 223
 Technician: AK
 Date: 5/28/2025

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 (%)
320	50.694	0.160	1.15	91	-1.3	99	87	0.003	4.34	0.529
321	50.852	0.158	1.14	91	-1.5	-	87	0.006	4.31	0.522
322	51.012	0.160	1.15	91	-1.4	-	87	0.013	4.34	0.525
323	51.170	0.158	1.14	91	-1.4	-	87	0.005	4.32	0.522
324	51.330	0.160	1.14	91	-1.5	-	87	0.006	4.43	0.535
325	51.488	0.158	1.17	91	-1.5	-	87	0.009	4.43	0.523
326	51.648	0.160	1.14	91	-1.5	-	87	0.006	4.39	0.508
327	51.807	0.159	1.15	91	-1.5	-	87	0.010	4.46	0.504
328	51.966	0.159	1.13	91	-1.3	-	86	0.009	4.42	0.501
329	52.125	0.159	1.14	91	-1.4	-	87	0.009	4.44	0.503
330	52.285	0.160	1.16	91	-1.5	98	87	0.005	4.45	0.502
331	52.444	0.159	1.15	91	-1.4	-	87	0.004	4.41	0.504
332	52.603	0.159	1.14	91	-1.3	-	87	0.007	4.41	0.487
333	52.763	0.160	1.15	91	-1.4	-	87	0.007	4.43	0.487
334	52.921	0.158	1.15	91	-1.4	-	87	0.007	4.40	0.486
335	53.081	0.160	1.14	91	-1.5	-	87	0.008	4.38	0.493
336	53.239	0.158	1.15	91	-1.3	-	87	0.007	4.41	0.495
337	53.399	0.160	1.13	91	-1.5	-	87	0.005	4.38	0.494
338	53.557	0.158	1.15	91	-1.5	-	87	0.007	4.36	0.485
339	53.717	0.160	1.14	91	-1.3	-	87	0.006	4.37	0.483
340	53.875	0.158	1.13	91	-1.5	99	87	0.003	4.33	0.485
341	54.035	0.160	1.13	91	-1.5	-	87	0.010	4.36	0.480
342	54.193	0.158	1.14	91	-1.3	-	87	0.007	4.32	0.469
343	54.353	0.160	1.15	91	-1.5	-	87	0.009	4.24	0.451
344	54.511	0.158	1.14	91	-1.3	-	87	0.003	4.26	0.443
345	54.671	0.160	1.15	91	-1.5	-	87	0.007	4.27	0.442
346	54.829	0.158	1.16	91	-1.5	-	87	0.007	4.22	0.442
347	54.989	0.160	1.14	91	-1.3	-	87	0.005	4.23	0.435
348	55.147	0.158	1.15	91	-1.4	-	87	0.011	4.21	0.433
349	55.307	0.160	1.14	91	-1.4	-	87	0.011	4.19	0.434
350	55.466	0.159	1.14	91	-1.4	98	87	0.010	4.21	0.434
351	55.625	0.159	1.15	91	-1.4	-	87	0.013	4.20	0.425

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: IHP
 Model: Montecito-C
 Run #: 2

Job #: 25-416
 Tracking #: 223
 Technician: AK
 Date: 5/28/2025

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 (%)
352	55.784	0.159	1.14	91	-1.4	-	87	0.006	4.18	0.423
353	55.944	0.160	1.13	91	-1.4	-	87	0.006	4.16	0.415
354	56.103	0.159	1.14	91	-1.4	-	87	0.007	4.14	0.419
355	56.262	0.159	1.15	91	-1.3	-	87	0.010	4.12	0.421
356	56.422	0.160	1.15	91	-1.3	-	87	0.011	4.13	0.420
357	56.580	0.158	1.15	91	-1.4	-	87	0.008	4.11	0.414
358	56.740	0.160	1.16	91	-1.5	-	86	0.010	4.09	0.417
359	56.898	0.158	1.14	91	-1.5	-	87	0.009	4.10	0.414
360	57.058	0.160	1.15	91	-1.3	98	87	0.008	4.05	0.410
361	57.216	0.158	1.14	91	-1.3	-	87	0.007	4.08	0.411
362	57.376	0.160	1.14	91	-1.3	-	87	0.010	4.05	0.410
363	57.534	0.158	1.14	91	-1.3	-	86	0.008	4.08	0.408
364	57.695	0.161	1.14	91	-1.4	-	87	0.005	4.06	0.411
365	57.852	0.157	1.12	91	-1.5	-	87	0.007	4.03	0.409
366	58.013	0.161	1.18	91	-1.5	-	87	0.010	4.00	0.409
367	58.170	0.157	1.14	91	-1.3	-	87	0.009	4.01	0.407
368	58.331	0.161	1.16	91	-1.3	-	87	0.010	3.98	0.410
369	58.489	0.158	1.15	91	-1.3	-	87	0.003	3.94	0.409
370	58.649	0.160	1.15	91	-1.3	99	87	0.005	3.90	0.407
371	58.806	0.157	1.14	91	-1.4	-	86	0.006	3.89	0.408
372	58.967	0.161	1.15	91	-1.4	-	87	0.009	3.89	0.403
373	59.125	0.158	1.13	91	-1.4	-	87	0.003	3.87	0.407
374	59.285	0.160	1.14	91	-1.3	-	87	0.005	3.86	0.405
375	59.444	0.159	1.15	91	-1.3	-	87	0.005	3.87	0.405
376	59.603	0.159	1.14	91	-1.5	-	87	0.006	3.83	0.402
377	59.762	0.159	1.16	91	-1.5	-	87	0.008	3.69	0.388
378	59.922	0.160	1.13	91	-1.4	-	87	0.009	3.65	0.380
379	60.081	0.159	1.16	91	-1.3	-	87	0.004	3.62	0.373
380	60.240	0.159	1.12	91	-1.5	99	87	0.005	3.63	0.371
381	60.400	0.160	1.15	91	-1.3	-	87	0.008	3.61	0.362
382	60.558	0.158	1.15	91	-1.4	-	87	0.009	3.60	0.365
383	60.718	0.160	1.16	91	-1.5	-	87	0.007	3.59	0.363

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: IHP
 Model: Montecito-C
 Run #: 2

Job #: 25-416
 Tracking #: 223
 Technician: AK
 Date: 5/28/2025

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 (%)
384	60.877	0.159	1.17	91	-1.3	-	87	0.006	3.62	0.362
385	61.037	0.160	1.15	91	-1.5	-	87	0.007	3.59	0.367
386	61.195	0.158	1.15	91	-1.3	-	87	0.009	3.58	0.363
387	61.355	0.160	1.14	91	-1.4	-	87	0.008	3.55	0.353
388	61.513	0.158	1.13	91	-1.4	-	87	0.008	3.52	0.355
389	61.674	0.161	1.15	91	-1.4	-	87	0.008	3.52	0.355
390	61.831	0.157	1.14	91	-1.5	99	87	0.009	3.55	0.361
391	61.992	0.161	1.15	91	-1.3	-	87	0.008	3.55	0.365
392	62.150	0.158	1.15	91	-1.3	-	87	0.012	3.53	0.363
393	62.310	0.160	1.16	91	-1.5	-	87	0.005	3.55	0.367
394	62.468	0.158	1.15	91	-1.4	-	87	0.010	3.48	0.359
395	62.629	0.161	1.15	91	-1.5	-	87	0.006	3.47	0.357
396	62.786	0.157	1.16	91	-1.4	-	87	0.007	3.48	0.356
397	62.947	0.161	1.16	91	-1.5	-	87	0.011	3.44	0.353
398	63.105	0.158	1.13	91	-1.4	-	87	0.000	3.42	0.351
399	63.265	0.160	1.16	91	-1.3	-	87	0.006	3.42	0.351
400	63.423	0.158	1.14	91	-1.5	100	87	0.002	3.42	0.349
401	63.583	0.160	1.15	91	-1.4	-	87	0.010	3.40	0.350
402	63.741	0.158	1.13	91	-1.3	-	87	0.009	3.37	0.343
403	63.902	0.161	1.14	91	-1.3	-	87	0.010	3.40	0.347
404	64.060	0.158	1.15	91	-1.3	-	87	0.007	3.39	0.347
405	64.220	0.160	1.16	91	-1.4	-	87	0.010	3.38	0.347
406	64.379	0.159	1.13	91	-1.4	-	87	0.005	3.40	0.348
407	64.538	0.159	1.13	91	-1.5	-	87	0.008	3.38	0.352
408	64.698	0.160	1.13	91	-1.5	-	87	0.004	3.38	0.352
409	64.857	0.159	1.16	91	-1.5	-	87	0.007	3.37	0.347
410	65.016	0.159	1.15	91	-1.4	100	87	0.006	3.37	0.340
411	65.175	0.159	1.15	91	-1.3	-	87	0.004	3.36	0.345
412	65.335	0.160	1.16	91	-1.3	-	87	0.005	3.35	0.344
413	65.493	0.158	1.12	91	-1.3	-	87	0.005	3.36	0.342
414	65.653	0.160	1.17	91	-1.4	-	87	0.007	3.63	0.364
415	65.811	0.158	1.15	91	-1.3	-	87	0.012	3.60	0.358

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: IHP
 Model: Montecito-C
 Run #: 2

Job #: 25-416
 Tracking #: 223
 Technician: AK
 Date: 5/28/2025

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 (%)
416	65.972	0.161	1.14	91	-1.3	-	86	0.007	3.61	0.357
417	66.130	0.158	1.14	91	-1.4	-	86	0.008	3.54	0.358
418	66.290	0.160	1.13	91	-1.3	-	87	0.008	3.54	0.361
419	66.448	0.158	1.11	91	-1.4	-	86	0.011	3.52	0.362
420	66.608	0.160	1.13	91	-1.3	99	86	0.011	3.49	0.360
421	66.766	0.158	1.16	91	-1.3	-	86	0.009	3.46	0.359
422	66.927	0.161	1.15	91	-1.5	-	86	0.007	3.45	0.356
423	67.085	0.158	1.15	91	-1.3	-	86	0.007	3.46	0.354
424	67.245	0.160	1.13	91	-1.4	-	87	0.011	3.40	0.355
425	67.403	0.158	1.14	91	-1.3	-	87	0.009	3.42	0.354
426	67.564	0.161	1.15	91	-1.3	-	87	0.005	3.41	0.354
427	67.722	0.158	1.14	91	-1.5	-	87	0.012	3.39	0.355
428	67.882	0.160	1.13	91	-1.4	-	87	0.005	3.38	0.355
429	68.040	0.158	1.15	91	-1.3	-	87	0.009	3.36	0.352
430	68.201	0.161	1.15	91	-1.5	99	87	0.009	3.33	0.350
431	68.358	0.157	1.13	91	-1.4	-	87	0.008	3.34	0.355
432	68.519	0.161	1.15	91	-1.3	-	87	0.011	3.38	0.361
433	68.677	0.158	1.15	91	-1.4	-	87	0.007	3.38	0.370
434	68.837	0.160	1.14	91	-1.5	-	87	0.004	3.33	0.370
435	68.996	0.159	1.14	91	-1.5	-	87	0.010	3.33	0.375
436	69.155	0.159	1.14	91	-1.4	-	87	0.004	3.30	0.385
437	69.314	0.159	1.15	91	-1.3	-	87	0.009	3.29	0.380
438	69.474	0.160	1.14	91	-1.4	-	87	0.007	3.29	0.377
439	69.633	0.159	1.15	91	-1.3	-	87	0.003	3.26	0.375
440	69.792	0.159	1.11	91	-1.4	98	87	0.004	3.24	0.374
441	69.952	0.160	1.15	91	-1.3	-	87	0.009	3.23	0.369
442	70.110	0.158	1.14	91	-1.5	-	87	0.004	3.20	0.363
443	70.270	0.160	1.16	91	-1.3	-	87	0.008	3.18	0.355
444	70.428	0.158	1.14	91	-1.5	-	87	0.005	3.19	0.372
445	70.589	0.161	1.16	91	-1.3	-	87	0.010	3.13	0.375
446	70.746	0.157	1.16	91	-1.3	-	87	0.008	3.12	0.369
447	70.907	0.161	1.14	91	-1.5	-	87	0.005	3.10	0.355

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: IHP
 Model: Montecito-C
 Run #: 2

Job #: 25-416
 Tracking #: 223
 Technician: AK
 Date: 5/28/2025

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 (%)
448	71.065	0.158	1.16	91	-1.4	-	87	0.007	3.08	0.344
449	71.226	0.161	1.15	91	-1.3	-	87	0.011	3.06	0.331
450	71.383	0.157	1.16	91	-1.5	98	87	0.012	3.02	0.321
451	71.544	0.161	1.15	91	-1.5	-	87	0.007	3.02	0.310
452	71.702	0.158	1.14	91	-1.3	-	87	0.007	3.18	0.342
453	71.862	0.160	1.15	91	-1.4	-	86	0.009	3.21	0.340
454	72.020	0.158	1.14	91	-1.5	-	87	0.006	3.18	0.334
455	72.181	0.161	1.12	91	-1.4	-	87	0.006	3.21	0.331
456	72.339	0.158	1.14	91	-1.5	-	87	0.006	3.23	0.350
457	72.499	0.160	1.13	91	-1.5	-	87	0.005	3.26	0.342
458	72.657	0.158	1.15	91	-1.5	-	86	0.004	3.27	0.335
459	72.818	0.161	1.16	91	-1.3	-	87	0.007	3.24	0.330
460	72.975	0.157	1.15	91	-1.3	98	86	0.010	3.22	0.332
461	73.136	0.161	1.14	91	-1.5	-	86	0.004	3.19	0.331
462	73.294	0.158	1.16	91	-1.3	-	86	0.003	3.21	0.329
463	73.454	0.160	1.14	91	-1.4	-	86	0.009	3.17	0.326
464	73.612	0.158	1.15	91	-1.3	-	87	0.008	3.14	0.343
465	73.772	0.160	1.15	91	-1.4	-	87	0.004	3.11	0.331
466	73.931	0.159	1.15	91	-1.4	-	87	0.003	3.08	0.326
467	74.091	0.160	1.13	91	-1.5	-	87	0.010	3.07	0.328
468	74.250	0.159	1.17	91	-1.4	-	87	0.002	3.06	0.329
469	74.409	0.159	1.16	91	-1.3	-	87	0.004	3.05	0.322
470	74.568	0.159	1.14	91	-1.5	99	87	0.003	3.02	0.321
471	74.727	0.159	1.16	91	-1.4	-	87	0.002	2.97	0.315
472	74.887	0.160	1.14	91	-1.4	-	87	0.006	2.96	0.310
473	75.046	0.159	1.13	91	-1.3	-	87	0.004	2.92	0.312
474	75.206	0.160	1.14	91	-1.5	-	87	0.006	2.95	0.308
475	75.364	0.158	1.15	91	-1.5	98	86	0.006	2.93	0.313
Avg/Tot	75.370	0.159	1.14	88.7	-1.4	100	86.8	0.007	7.25	0.258

WOODSTOVE SURFACE TEMPERATURE DATA

Client: IHP

Job #: 25-416

Model: Montecito-C

Tracking #: 223

Run #: 2

Technician: AK

Date: 5/28/2025

Stove ΔT : 149

Elapsed Time (min)	Temperature Data (°F)						
	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
0	72	72	73	72	72	72.2	N/A
1	73	72	73	84	72	74.6	N/A
2	74	73	74	117	72	82.1	N/A
3	78	73	76	188	73	97.6	N/A
4	81	74	79	306	75	123.2	N/A
5	86	76	85	429	79	150.8	N/A
6	93	78	93	530	84	175.4	N/A
7	102	81	102	598	90	194.6	N/A
8	112	86	114	655	99	213.4	N/A
9	122	93	130	705	111	232.0	N/A
10	129	102	145	748	125	249.9	N/A
11	135	113	160	781	141	265.8	N/A
12	140	124	173	804	157	279.6	N/A
13	146	134	184	822	173	291.6	N/A
14	153	142	201	826	192	302.6	N/A
15	161	148	218	822	210	311.8	N/A
16	169	155	235	792	230	316.3	N/A
17	177	165	251	800	251	328.7	N/A
18	186	171	266	838	271	346.3	N/A
19	194	180	282	886	292	366.8	N/A
20	203	189	298	926	313	385.8	N/A
21	213	199	316	953	332	402.4	N/A
22	223	208	332	975	351	417.8	N/A
23	233	218	349	990	367	431.2	N/A
24	244	227	365	1002	382	443.9	N/A
25	254	237	380	1012	396	455.7	N/A
26	264	248	385	1016	379	458.4	N/A
27	274	260	379	1014	345	454.4	N/A
28	284	272	376	1011	329	454.3	N/A
29	293	283	374	1007	320	455.6	N/A
30	302	293	375	1002	315	457.4	N/A
31	311	303	376	995	313	459.5	N/A
32	319	312	378	978	311	459.7	N/A
33	326	321	379	940	311	455.4	N/A
34	333	329	380	895	312	449.8	N/A
35	338	336	381	856	313	444.8	N/A
36	343	342	381	823	315	440.6	N/A
37	348	347	380	795	316	437.3	N/A
38	352	352	380	774	317	434.7	N/A
39	356	356	379	756	318	432.9	N/A
40	359	360	377	743	319	431.5	N/A
41	362	363	377	735	321	431.4	N/A
42	364	366	376	729	321	431.4	N/A
43	367	368	376	727	322	431.9	N/A
44	369	371	376	725	322	432.6	N/A
45	371	373	376	725	323	433.6	N/A
46	374	375	377	725	324	434.7	N/A
47	376	377	377	725	324	435.6	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: IHP

Job #: 25-416

Model: Montecito-C

Tracking #: 223

Run #: 2

Technician: AK

Date: 5/28/2025

Stove ΔT: 149

Elapsed Time (min)	Temperature Data (°F)						
	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
48	378	378	378	726	324	437.0	N/A
49	380	380	378	727	324	437.9	N/A
50	382	382	379	729	325	439.3	N/A
51	384	384	381	731	325	440.8	N/A
52	386	385	382	735	325	442.7	N/A
53	387	387	383	736	326	444.0	N/A
54	389	389	385	735	326	444.7	N/A
55	391	391	385	729	327	444.6	N/A
56	393	393	387	724	327	444.7	N/A
57	394	394	387	718	327	444.2	N/A
58	395	396	389	714	328	444.4	N/A
59	397	398	389	710	329	444.5	N/A
60	398	400	391	703	328	443.8	N/A
61	399	401	391	691	328	441.9	N/A
62	399	403	391	679	328	440.0	N/A
63	400	404	391	667	329	438.1	N/A
64	400	406	391	659	329	436.9	N/A
65	401	407	392	644	333	435.3	N/A
66	401	409	393	673	335	442.1	N/A
67	402	410	394	696	338	447.9	N/A
68	402	412	395	701	339	449.8	N/A
69	403	413	396	698	338	449.8	N/A
70	404	414	395	694	338	449.2	N/A
71	404	416	394	691	336	448.3	N/A
72	405	417	393	690	334	447.8	N/A
73	405	419	392	688	330	446.6	N/A
74	404	420	390	685	328	445.2	N/A
75	404	421	388	680	325	443.7	N/A
76	403	421	386	674	322	441.4	N/A
77	403	422	385	667	318	439.1	N/A
78	402	423	382	661	315	436.7	N/A
79	402	423	381	653	312	434.4	N/A
80	401	423	380	650	309	432.5	N/A
81	400	423	379	649	305	431.4	N/A
82	400	423	378	649	303	430.6	N/A
83	399	423	377	647	300	429.2	N/A
84	398	423	376	645	297	427.7	N/A
85	397	423	376	643	295	426.6	N/A
86	397	422	375	637	294	424.9	N/A
87	396	422	374	633	292	423.5	N/A
88	395	422	373	629	291	422.0	N/A
89	394	421	372	623	290	420.2	N/A
90	394	421	371	618	290	418.7	N/A
91	392	420	370	614	289	416.9	N/A
92	391	420	369	609	288	415.3	N/A
93	390	419	367	605	288	413.8	N/A
94	389	419	366	602	288	412.5	N/A
95	387	418	365	599	287	411.2	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: IHP

Job #: 25-416

Model: Montecito-C

Tracking #: 223

Run #: 2

Technician: AK

Date: 5/28/2025

Stove ΔT: 149

Elapsed Time (min)	Temperature Data (°F)						
	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
96	386	417	364	598	287	410.5	N/A
97	385	416	363	598	287	409.7	N/A
98	384	416	362	596	286	408.7	N/A
99	383	415	360	596	286	407.9	N/A
100	382	414	359	595	286	407.1	N/A
101	381	413	358	593	286	406.0	N/A
102	380	412	357	592	285	405.3	N/A
103	379	411	356	592	285	404.7	N/A
104	378	411	356	591	285	404.1	N/A
105	377	410	354	591	285	403.5	N/A
106	377	409	354	592	285	403.2	N/A
107	376	408	353	592	285	402.9	N/A
108	375	407	352	590	285	401.9	N/A
109	375	406	351	589	285	401.4	N/A
110	374	406	351	588	285	400.8	N/A
111	374	405	351	587	284	400.1	N/A
112	373	404	350	587	284	399.6	N/A
113	373	403	350	586	284	399.1	N/A
114	373	403	350	585	284	398.9	N/A
115	372	402	349	585	284	398.5	N/A
116	372	402	349	584	284	398.2	N/A
117	372	401	349	584	284	397.9	N/A
118	371	401	348	584	284	397.8	N/A
119	371	401	348	582	285	397.3	N/A
120	371	401	348	579	285	396.9	N/A
121	371	401	349	577	285	396.5	N/A
122	371	401	349	575	286	396.1	N/A
123	371	401	349	572	286	395.9	N/A
124	370	401	349	570	286	395.2	N/A
125	370	401	349	566	286	394.6	N/A
126	369	402	349	564	286	394.1	N/A
127	369	402	350	560	286	393.5	N/A
128	368	403	350	558	287	393.2	N/A
129	370	404	351	535	290	390.0	N/A
130	371	406	352	547	296	394.2	N/A
131	371	406	354	628	298	411.5	N/A
132	370	407	356	709	299	428.0	N/A
133	370	408	359	758	298	438.4	N/A
134	371	409	361	789	297	445.1	N/A
135	371	410	363	806	295	449.2	N/A
136	372	412	364	821	294	452.7	N/A
137	373	414	365	831	293	455.3	N/A
138	374	417	365	839	292	457.2	N/A
139	375	419	365	842	290	458.2	N/A
140	376	421	365	844	288	458.6	N/A
141	376	423	364	840	287	457.9	N/A
142	376	425	364	835	285	456.9	N/A
143	376	426	363	827	284	455.1	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: IHP

Job #: 25-416

Model: Montecito-C

Tracking #: 223

Run #: 2

Technician: AK

Date: 5/28/2025

Stove ΔT: 149

Elapsed Time (min)	Temperature Data (°F)						
	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
144	376	428	361	819	282	453.1	N/A
145	376	429	361	809	280	450.7	N/A
146	376	429	360	800	277	448.3	N/A
147	375	430	359	789	276	445.8	N/A
148	375	431	357	780	274	443.5	N/A
149	374	432	356	779	272	442.6	N/A
150	374	433	356	785	269	443.3	N/A
151	374	433	355	789	267	443.6	N/A
152	374	434	355	788	265	443.1	N/A
153	374	434	355	787	263	442.7	N/A
154	375	435	355	788	262	442.7	N/A
155	375	435	355	794	260	443.7	N/A
156	376	436	355	792	258	443.4	N/A
157	376	436	354	785	257	441.5	N/A
158	376	436	354	773	255	438.8	N/A
159	377	436	352	760	254	435.7	N/A
160	376	436	351	749	252	433.0	N/A
161	376	436	349	737	251	429.7	N/A
162	376	435	349	725	248	426.6	N/A
163	375	435	346	716	247	423.8	N/A
164	374	434	344	707	246	421.0	N/A
165	373	434	342	699	245	418.5	N/A
166	373	433	340	692	243	416.2	N/A
167	372	432	338	685	242	413.7	N/A
168	371	431	336	677	241	411.1	N/A
169	370	430	334	670	239	408.7	N/A
170	369	429	331	665	238	406.6	N/A
171	368	428	330	661	237	404.9	N/A
172	368	427	328	660	236	403.7	N/A
173	367	426	326	658	235	402.4	N/A
174	367	425	324	655	234	401.0	N/A
175	366	424	323	654	233	399.8	N/A
176	365	424	322	652	232	398.7	N/A
177	364	423	320	649	231	397.6	N/A
178	364	422	319	646	230	396.3	N/A
179	364	421	318	643	230	395.0	N/A
180	363	421	316	640	229	393.8	N/A
181	363	419	315	635	228	392.1	N/A
182	363	418	314	627	227	389.8	N/A
183	363	417	313	616	227	387.0	N/A
184	363	416	312	606	226	384.2	N/A
185	363	414	310	598	225	382.1	N/A
186	363	412	309	589	224	379.5	N/A
187	362	411	307	581	223	376.9	N/A
188	362	409	306	573	223	374.4	N/A
189	362	407	304	565	222	372.0	N/A
190	361	405	303	558	222	369.6	N/A
191	360	402	302	551	221	367.4	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: IHP

Job #: 25-416

Model: Montecito-C

Tracking #: 223

Run #: 2

Technician: AK

Date: 5/28/2025

Stove ΔT: 149

Elapsed Time (min)	Temperature Data (°F)						
	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
192	360	400	301	546	220	365.4	N/A
193	360	398	300	541	220	363.6	N/A
194	359	396	298	537	219	361.9	N/A
195	359	394	297	534	219	360.4	N/A
196	358	392	296	532	218	359.1	N/A
197	358	390	296	531	217	358.2	N/A
198	357	388	295	531	216	357.7	N/A
199	357	387	295	529	216	356.7	N/A
200	357	385	294	528	216	356.0	N/A
201	356	384	295	526	215	355.3	N/A
202	356	383	295	527	215	355.1	N/A
203	355	382	295	528	214	354.8	N/A
204	354	382	295	528	213	354.4	N/A
205	353	381	295	528	213	353.8	N/A
206	352	380	295	528	212	353.4	N/A
207	352	379	295	528	212	353.1	N/A
208	351	379	295	529	212	353.1	N/A
209	351	378	295	530	211	353.0	N/A
210	350	377	296	532	211	353.2	N/A
211	350	377	296	534	211	353.6	N/A
212	350	377	297	537	211	354.0	N/A
213	349	376	297	539	210	354.4	N/A
214	349	376	298	542	210	354.9	N/A
215	349	376	299	545	209	355.8	N/A
216	349	376	300	549	209	356.6	N/A
217	348	376	300	552	209	357.3	N/A
218	348	377	301	556	209	358.2	N/A
219	348	377	303	560	209	359.4	N/A
220	348	378	304	563	209	360.3	N/A
221	349	378	304	567	208	361.3	N/A
222	349	379	305	570	208	362.2	N/A
223	349	380	307	573	208	363.1	N/A
224	349	380	308	575	208	364.0	N/A
225	350	381	310	577	208	364.9	N/A
226	350	382	311	579	208	365.6	N/A
227	350	383	312	581	208	366.5	N/A
228	350	383	312	584	208	367.4	N/A
229	351	384	313	588	208	368.8	N/A
230	351	385	315	590	208	369.6	N/A
231	352	385	316	590	208	370.2	N/A
232	353	386	317	589	208	370.4	N/A
233	353	387	318	586	208	370.3	N/A
234	353	388	319	581	208	369.7	N/A
235	354	389	320	577	208	369.3	N/A
236	354	389	320	572	208	368.8	N/A
237	354	390	321	569	209	368.5	N/A
238	354	391	322	565	208	367.9	N/A
239	354	391	322	561	209	367.4	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: IHP

Job #: 25-416

Model: Montecito-C

Tracking #: 223

Run #: 2

Technician: AK

Date: 5/28/2025

Stove ΔT: 149

Elapsed Time (min)	Temperature Data (°F)						
	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
240	354	392	322	556	208	366.5	N/A
241	354	392	322	553	209	365.9	N/A
242	354	392	322	549	209	365.2	N/A
243	354	392	322	545	209	364.5	N/A
244	354	392	321	541	209	363.5	N/A
245	354	392	321	538	209	362.7	N/A
246	354	392	321	533	210	361.9	N/A
247	354	392	320	529	210	360.8	N/A
248	353	391	319	526	209	359.9	N/A
249	353	391	319	523	210	359.2	N/A
250	353	391	319	520	210	358.4	N/A
251	352	390	318	517	210	357.4	N/A
252	351	390	318	515	210	356.7	N/A
253	351	390	317	511	210	355.7	N/A
254	350	389	316	507	210	354.6	N/A
255	350	389	315	502	211	353.4	N/A
256	349	388	315	498	211	352.2	N/A
257	349	388	315	496	211	351.5	N/A
258	348	387	314	493	211	350.6	N/A
259	348	386	313	491	211	349.9	N/A
260	347	385	312	487	212	348.7	N/A
261	347	385	312	484	211	347.7	N/A
262	346	384	312	482	212	347.0	N/A
263	345	383	312	479	212	346.2	N/A
264	345	382	312	476	212	345.2	N/A
265	344	381	311	473	212	344.1	N/A
266	343	381	311	470	212	343.3	N/A
267	343	380	311	468	212	342.5	N/A
268	342	379	310	464	212	341.6	N/A
269	341	378	310	462	212	340.7	N/A
270	341	377	310	460	212	340.0	N/A
271	340	376	309	458	212	339.0	N/A
272	339	375	309	456	212	338.3	N/A
273	338	375	309	453	212	337.3	N/A
274	337	374	309	451	212	336.5	N/A
275	337	373	308	450	212	335.8	N/A
276	336	372	308	449	211	335.2	N/A
277	335	371	308	449	212	335.0	N/A
278	334	371	307	450	211	334.5	N/A
279	333	370	307	449	212	334.1	N/A
280	332	369	306	448	212	333.4	N/A
281	332	369	306	447	212	333.0	N/A
282	331	368	306	446	212	332.6	N/A
283	330	368	306	444	212	331.8	N/A
284	330	367	306	442	212	331.2	N/A
285	329	366	305	440	212	330.4	N/A
286	328	366	305	438	212	329.7	N/A
287	328	365	304	437	212	329.2	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: IHP

Job #: 25-416

Model: Montecito-C

Tracking #: 223

Run #: 2

Technician: AK

Date: 5/28/2025

Stove ΔT: 149

Elapsed Time (min)	Temperature Data (°F)						
	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
288	327	364	304	435	212	328.5	N/A
289	327	364	304	434	212	328.0	N/A
290	327	363	303	433	212	327.5	N/A
291	326	362	303	431	211	326.5	N/A
292	326	361	303	429	211	325.8	N/A
293	325	360	303	427	211	325.2	N/A
294	325	360	303	423	211	324.1	N/A
295	324	359	302	418	211	322.7	N/A
296	324	358	302	413	210	321.3	N/A
297	323	357	301	408	210	319.8	N/A
298	322	357	300	403	210	318.2	N/A
299	321	356	299	398	210	316.7	N/A
300	320	355	298	393	210	315.2	N/A
301	319	354	297	389	209	313.7	N/A
302	318	353	295	385	209	312.0	N/A
303	317	352	294	382	209	310.6	N/A
304	316	351	292	378	209	309.1	N/A
305	315	350	290	375	208	307.6	N/A
306	314	349	289	372	208	306.2	N/A
307	313	348	287	369	207	304.6	N/A
308	312	347	286	366	207	303.4	N/A
309	310	346	284	363	207	302.1	N/A
310	309	345	283	361	207	300.8	N/A
311	308	344	281	359	206	299.7	N/A
312	307	342	280	356	206	298.3	N/A
313	306	341	279	354	206	297.2	N/A
314	305	340	278	352	205	296.1	N/A
315	303	339	277	351	205	295.0	N/A
316	302	338	275	349	205	294.0	N/A
317	302	337	275	348	204	293.0	N/A
318	300	336	273	347	204	292.0	N/A
319	299	335	272	344	203	290.8	N/A
320	298	334	271	344	203	290.0	N/A
321	297	333	270	342	203	289.0	N/A
322	296	333	269	341	203	288.1	N/A
323	294	332	268	340	202	287.1	N/A
324	294	331	267	339	202	286.5	N/A
325	292	330	267	339	202	285.8	N/A
326	291	329	265	338	201	285.0	N/A
327	290	329	265	338	201	284.4	N/A
328	289	328	263	337	201	283.8	N/A
329	289	328	263	337	200	283.3	N/A
330	288	327	262	336	200	282.7	N/A
331	287	327	261	336	200	282.0	N/A
332	286	326	261	335	200	281.5	N/A
333	285	326	260	335	200	281.0	N/A
334	285	325	259	334	200	280.6	N/A
335	284	325	259	333	199	280.0	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: IHP

Job #: 25-416

Model: Montecito-C

Tracking #: 223

Run #: 2

Technician: AK

Date: 5/28/2025

Stove ΔT : 149

Elapsed Time (min)	Temperature Data (°F)						
	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
336	283	324	259	333	199	279.4	N/A
337	283	323	258	332	199	279.0	N/A
338	282	323	258	332	198	278.6	N/A
339	282	322	258	331	198	278.2	N/A
340	281	322	257	330	197	277.5	N/A
341	281	321	257	330	197	277.0	N/A
342	280	321	257	329	197	276.7	N/A
343	280	320	256	329	197	276.3	N/A
344	279	320	256	328	196	275.7	N/A
345	279	319	256	328	196	275.5	N/A
346	278	319	256	327	196	275.0	N/A
347	278	318	256	326	196	274.6	N/A
348	277	317	256	325	195	274.1	N/A
349	277	317	255	324	195	273.7	N/A
350	276	316	255	324	195	273.3	N/A
351	276	316	255	323	194	272.8	N/A
352	275	316	255	323	194	272.4	N/A
353	275	315	254	322	193	272.0	N/A
354	274	315	254	322	193	271.5	N/A
355	274	314	254	321	193	271.0	N/A
356	274	314	253	321	192	270.7	N/A
357	273	313	253	320	192	270.1	N/A
358	273	313	253	320	192	269.9	N/A
359	272	312	253	318	191	269.3	N/A
360	272	311	253	317	191	268.8	N/A
361	271	311	253	317	190	268.3	N/A
362	271	310	252	316	190	267.7	N/A
363	270	310	252	315	190	267.3	N/A
364	270	309	251	315	190	266.9	N/A
365	269	309	251	314	189	266.3	N/A
366	269	308	251	313	189	266.0	N/A
367	268	308	251	313	188	265.5	N/A
368	268	307	250	312	188	265.1	N/A
369	267	307	250	312	188	264.5	N/A
370	267	306	250	311	188	264.1	N/A
371	267	305	249	310	187	263.6	N/A
372	266	305	249	309	187	263.1	N/A
373	266	304	249	308	187	262.6	N/A
374	265	304	249	307	186	262.1	N/A
375	265	303	248	306	186	261.7	N/A
376	264	303	248	305	186	261.2	N/A
377	264	302	247	305	185	260.6	N/A
378	264	301	247	303	185	260.0	N/A
379	263	301	247	302	185	259.4	N/A
380	263	300	246	301	184	258.8	N/A
381	262	300	246	299	184	258.2	N/A
382	262	299	245	298	184	257.7	N/A
383	261	299	245	297	184	257.1	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: IHP

Job #: 25-416

Model: Montecito-C

Tracking #: 223

Run #: 2

Technician: AK

Date: 5/28/2025

Stove ΔT : 149

Elapsed Time (min)	Temperature Data (°F)						Catalyst Exit
	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	
384	261	298	245	296	183	256.5	N/A
385	260	297	244	295	183	255.9	N/A
386	259	297	244	294	183	255.3	N/A
387	259	296	243	292	183	254.6	N/A
388	258	296	243	292	182	254.2	N/A
389	258	295	242	290	182	253.5	N/A
390	257	295	242	289	182	252.9	N/A
391	257	294	241	289	182	252.5	N/A
392	256	294	241	287	181	251.7	N/A
393	256	293	240	287	182	251.4	N/A
394	255	293	240	286	181	250.8	N/A
395	254	292	239	285	181	250.3	N/A
396	254	291	239	284	181	249.8	N/A
397	253	291	238	283	181	249.2	N/A
398	253	290	238	282	180	248.5	N/A
399	252	289	238	281	180	248.0	N/A
400	251	289	237	280	179	247.4	N/A
401	251	288	237	280	180	247.0	N/A
402	250	287	236	279	179	246.4	N/A
403	250	287	236	278	179	245.9	N/A
404	249	286	236	278	179	245.4	N/A
405	248	285	236	277	178	244.8	N/A
406	248	285	235	276	178	244.3	N/A
407	247	284	235	275	178	243.8	N/A
408	246	284	235	275	178	243.4	N/A
409	246	283	235	274	178	243.0	N/A
410	245	283	234	273	177	242.4	N/A
411	245	282	234	272	177	242.1	N/A
412	244	281	234	272	177	241.6	N/A
413	243	281	234	271	177	241.2	N/A
414	243	280	233	271	177	240.7	N/A
415	242	280	233	271	176	240.4	N/A
416	242	279	233	271	176	240.2	N/A
417	241	278	233	271	176	239.8	N/A
418	241	278	233	270	176	239.6	N/A
419	240	277	233	271	176	239.2	N/A
420	239	277	232	270	175	238.9	N/A
421	239	276	232	270	175	238.6	N/A
422	239	276	232	270	175	238.4	N/A
423	238	275	232	269	175	237.9	N/A
424	237	275	232	269	175	237.7	N/A
425	237	275	232	268	175	237.4	N/A
426	237	274	232	268	175	237.1	N/A
427	236	274	232	268	175	236.8	N/A
428	236	273	232	267	175	236.5	N/A
429	235	273	232	266	175	236.3	N/A
430	235	272	232	266	175	236.0	N/A
431	234	272	232	266	175	235.7	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: IHP

Job #: 25-416

Model: Montecito-C

Tracking #: 223

Run #: 2

Technician: AK

Date: 5/28/2025

Stove ΔT: 149

Elapsed Time (min)	Temperature Data (°F)						
	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
432	234	271	232	265	175	235.5	N/A
433	233	271	232	265	175	235.1	N/A
434	233	270	232	264	175	234.8	N/A
435	233	270	232	264	175	234.6	N/A
436	232	269	231	264	175	234.3	N/A
437	232	269	231	263	175	234.0	N/A
438	231	268	231	263	175	233.7	N/A
439	231	268	231	262	175	233.3	N/A
440	231	267	231	262	175	233.1	N/A
441	230	267	230	261	175	232.6	N/A
442	230	266	230	261	175	232.4	N/A
443	229	266	230	260	175	232.0	N/A
444	229	265	230	259	175	231.6	N/A
445	229	265	230	259	175	231.3	N/A
446	228	264	230	258	175	231.0	N/A
447	228	264	230	257	175	230.6	N/A
448	227	263	229	257	175	230.2	N/A
449	227	262	229	256	175	229.7	N/A
450	227	262	229	255	175	229.3	N/A
451	226	261	228	254	174	228.7	N/A
452	226	261	228	254	174	228.3	N/A
453	225	260	228	253	174	227.9	N/A
454	225	259	227	252	174	227.5	N/A
455	224	259	227	252	174	227.0	N/A
456	224	258	227	252	174	226.7	N/A
457	223	257	227	251	173	226.3	N/A
458	223	257	227	250	173	225.9	N/A
459	222	256	227	250	173	225.7	N/A
460	222	256	226	250	173	225.4	N/A
461	222	255	226	250	173	225.1	N/A
462	221	255	226	250	173	224.9	N/A
463	221	254	226	249	172	224.4	N/A
464	220	254	226	249	172	224.1	N/A
465	220	253	227	249	171	223.9	N/A
466	219	253	227	249	171	223.7	N/A
467	219	252	227	248	171	223.5	N/A
468	219	252	227	248	171	223.3	N/A
469	218	252	227	248	171	223.1	N/A
470	218	251	227	247	171	222.7	N/A
471	217	251	227	247	170	222.5	N/A
472	217	251	227	247	170	222.2	N/A
473	217	250	227	246	170	222.0	N/A
474	216	250	227	246	170	221.7	N/A
475	216	250	227	245	169	221.3	N/A
Average	312.8	344.0	297.3	504.3	227.6	337.2	N/A

LAB SAMPLE DATA - ASTM E2515

Client: IHP
Model: Montecito-C
Run #: 2

Job #: 25-416
Tracking #: 223
Technician: AK
Date: 5/28/2025

		Sample ID	Tare, mg	Final, mg	Catch, mg
Filters	A	G01253	236.4	238.0	1.6
	B	G01254	236.6	238.4	1.8
	Amb	G01255	237.6	237.7	0.1
Probes	A	15A	117249.5	117249.6	0.1
	B	15B	116761.8	116761.9	0.1
O-rings	A	15A	3567.6	3567.8	0.2
	B	15B	3569.0	3569.1	0.1

Placed in Dessicator on: 12/9/2024

Balance Audit (mg):		200.0		200.0		200.0			
		Weight (mg)	Date/Time	Weight (mg)	Date/Time	Weight (mg)	Date/Time	Weight (mg)	Date/Time
Filters	A	237.6	5/28 19:00	237.8	6/2 15:00	238.0	6/4 11:15		
	B	238.5	5/28 19:00	238.3	6/2 15:00	238.4	6/4 11:15		
		237.5	5/28 19:00	237.6	6/2 15:00	237.7	6/4 11:15		
Probes	A	117250.0	5/28 19:00	117249.6	6/2 15:00	117249.6	6/4 11:15		
	B	116762.9	5/28 19:00	116762.0	6/2 15:00	116761.9	6/4 11:15		
O-Rings	A	3568.7	5/28 19:00	3568.0	6/2 15:00	3567.8	6/4 11:15		
	B	3569.7	5/28 19:00	3569.1	6/2 15:00	3569.1	6/4 11:15		

Train A Aggregate, mg:	1.9
Train B Aggregate, mg:	2.0
Ambient, mg:	0.1

IDC Wood Heater Run Sheets

Client: IHP Job Number: 25-416 Tracking #: 223
 Model: Montecito-C Run Number: 2 Test Date: 5/28/25

Pre-Test Set-up Check List

Perform the following checks after a minimum of 30 minutes of warmup time

Leak Checks	Requirement	Pump Off (lpm)	Pump On, Probe Blocked (lpm)	Net (lpm)	Result
PM-2.5	<0.05 lpm (net)	0.36	0.36	0	☒ Pass ☐ Fail
PM-Course	<0.05 lpm (net)	0.14	0.15	0.01	☒ Pass ☐ Fail
Ambient	<0.05 lpm (net)	-0.03	-0.03	0	☒ Pass ☐ Fail

Flow Checks	Requirement	TEOM Indicated Flow (lpm) ¹	Measured Flow		Difference (%)	Result
			(lpm) ²	(lpm) ³		
PM-2.5	±2%	1.00	1.01	1.006	0.6%	☒ Pass ☐ Fail
PM-Course	±2%	1.00	1.01	1.006	0.6%	☒ Pass ☐ Fail
Ambient	±2%	3.00	2.99	2.978	0.7%	☒ Pass ☐ Fail

¹Indicated flow is at 20°C, 1 atm

²Measured flow with PFS equipment ID 197, which indicates flow at 21.1°C, 1 atm

³Adjusted value (Measured Flow * 99.6%) to match the STP used by TEOM

Initial Filter Setup

Use **black** filter tool when changing filters

	1 min. requirement	5 min. requirement	Result
PM-2.5	Frequency > 200Hz	Mass > -1 ug, noise < 2ug	☒ Pass ☐ Fail
PM- Course	Frequency > 200Hz	Mass > -1 ug, noise < 2ug	☒ Pass ☐ Fail
Ambient	Frequency > 200Hz	Mass > -1 ug, noise < 2ug	☒ Pass ☐ Fail

Pre-Fire Verifications	Time probe in Tunnel	Result
Place probe in tunnel at least 10 min prior to test start	9:30	
Verify Data is recording [In RPCOMM] - Dichot		☒ Okay
Verify Data is recording [In RPCOMM] - Ambient		☒ Okay

Flue Gas Analyzer Calibration Check

Calibration Gas Values: Span Gas Cylinder#: CC505834 CO₂ (%): 17.35 CO (%): 4.350
 Mid Gas Cylinder#: CC341544 CO₂ (%): 10.00 CO (%): 2.500

Calibration Results:

	Pre Test			Post Test		
	Zero	Span	Mid	Zero	Span	Mid
Time	9:41	9:43	9:45	19:00	19:01	19:03
CO ₂	0.00	17.33	10.32	0.00	17.38	10.36
CO	0.000	4.346	2.581	0.003	4.359	2.569

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

Technician Signature: 

Date: 6/27/2025

IDC Wood Heater Run Sheets

Client: IHP Job Number: 25-416 Tracking #: 223
Model: Montecito-C Run Number: 2 Test Date: 5/28/25

Pre-Test Conditions

		Requirements	Result
Room RH (%)	36.5		
Barometric Pressure	29.76		
Room Air Velocity (ft/min)	<50	Must be <50 ft/min within 2 ft of stove	☒ Pass ☐ Fail
Room Temperature (°F)	72	<87 °F	☒ Pass ☐ Fail
Average External Stove Temp (°F)	N/A	Within 2 °F of ambient (Run #1 only)	☐ Pass ☐ Fail ☒ N/A
Average Internal Stove Temp (°F)	N/A	Within 2 °F of ambient (Run #1 only)	☐ Pass ☐ Fail ☒ N/A
Time Coals Removed from Stove & Firebox Vacuumed	9:00	>1 hr before test (Runs #2 & 3 only)	☒ Pass ☐ Fail ☐ N/A
Earliest possible start time	10:42	24 hours from start of Run #1 (Runs #2 & 3 only)	☒ Pass ☐ Fail ☐ N/A



Technician Signature: 

Date: 6/27/2025

IDC Wood Heater Run Sheets

Client: IHP Job Number: 25-416 Tracking #: 223
Model: Montecito-C Run Number: 2 Test Date: 5/28/25

IDC FUELING NOTES

Fuel & Moisture Measurement

Fuel Type	Maple Cordwood
Moisture Meter Calibration 22%:	22.0
Moisture Meter Calibration 12%:	12.0
Moisture Reading Start Time:	08:15

L1 Test Notes

Scale Weight Prior to Loading (lbs):	0
Test Burn Start Time:	10:46
Air Control Setting (open/closed):	Open
Door Closed Time (5 min from start):	10:48
Bypass Closed Time:	N/A
Target End Weight (lbs):	1.84-2.03
Actual End Weight (lbs):	1.85
Phase End Time:	11:01

Additional Notes (Fuel adjustments, TEOM Filter Changes, etc.)

Time	Notes
	-None-

L2 Test Notes

Scale Weight Prior to Loading (lbs):	1.85
Load Time:	11:01
Air Control Setting (open/closed):	Open
Door Closed Time (immediately after loading):	11:02
Bypass Closed Time:	N/A
50% Target Weight (lbs):	7.02-7.75
Actual 50% Weight (lbs):	7.13
Air control closed time:	11:17
Target End Weight (lbs):	2.81-3.10
Actual End Weight (lbs):	2.81
Phase End Time:	11:50

Additional Notes (Fuel adjustments, TEOM Filter Changes, etc.)

Time	Notes
11:40	Changed TEOM Filters

Technician Signature: 

Date: 6/27/2025

IDC Wood Heater Run Sheets

Client: IHP Job Number: 25-416 Tracking #: 223
Model: Montecito-C Run Number: 2 Test Date: 5/28/25

L3 Test Notes

Scale Weight Prior to Loading (lbs):	2.81
Load Time:	11:50
Air Control Setting (5 min start-up allowed):	
Door Closed Time (immediately after loading):	11:51
Bypass Closed Time:	N/A
Target End Weight (lbs):	3.36-3.71
Actual End Weight (lbs):	3.41
Phase End Time:	12:54

Open @ 11:50 Closed @ 11:52

Additional Notes (Fuel adjustments, TEOM Filter Changes, etc.)

Time	Notes
12:48	Changed TEOM Filters

L4 Test Notes

Scale Weight Prior to Loading (lbs):	3.41
Load Time:	12:54
Air Control Setting (10 min start-up allowed):	
Door Closed Time (5 min after loading):	12:56
Bypass Closed Time:	N/A
Target End Weight (lbs):	3.25-3.59
Actual End Weight (lbs):	3.41
Phase End Time:	18:41

Open @ 12:54 Closed @ 12:58

Additional Notes (Fuel adjustments, TEOM Filter Changes, etc.)

Time	Notes

Post-Test Conditions

Room Air Velocity (ft/min)	<50
Room RH (%)	31.7
Barometric Pressure	29.83

Technician Signature: 

Date: 6/27/2025

IDC Wood Heater Run Sheets

Client: IHP Job Number: 25-416 Tracking #: 223
 Model: Montecito-C Run Number: 2 Test Date: 5/28/25

Post-Test Check List

Leak Checks	Requirement	Pump Off (lpm)	Pump On, Probe Blocked (lpm)	Net (lpm)	Result
PM-2.5	<0.05 lpm (net)	0.36	0.36	0	☒ Pass ☐ Fail
PM-Course	<0.05 lpm (net)	0.15	0.15	0	☒ Pass ☐ Fail
Ambient	<0.05 lpm (net)	0.05	0.06	0.01	☒ Pass ☐ Fail

Flow Checks	Requirement	TEOM Indicated Flow (lpm) ¹	Measured Flow		Difference (%)	Result
			(lpm) ²	(lpm) ³		
PM-2.5	±2%	1.00	1.02	1.016	1.6%	☒ Pass ☐ Fail
PM-Course	±2%	1.00	1.01	1.006	0.6%	☒ Pass ☐ Fail
Ambient	±2%	3.00	3.04	3.028	0.9%	☒ Pass ☐ Fail

¹Indicated flow is at 20°C, 1 atm

²Measured flow with PFS equipment ID 134, which indicates flow at 21.1°C, 1 atm

³Adjusted value (Measured Flow * 99.6%) to match the STP used by TEOM



Technician Signature: 

Date: 6/27/2025

IDC Wood Heater Run Sheets

Client: IHP
Model: Montecito-C

Job Number: 25-416
Run Number: 2

Tracking #: 223
Test Date: 5/28/25

Test Fuel Photos



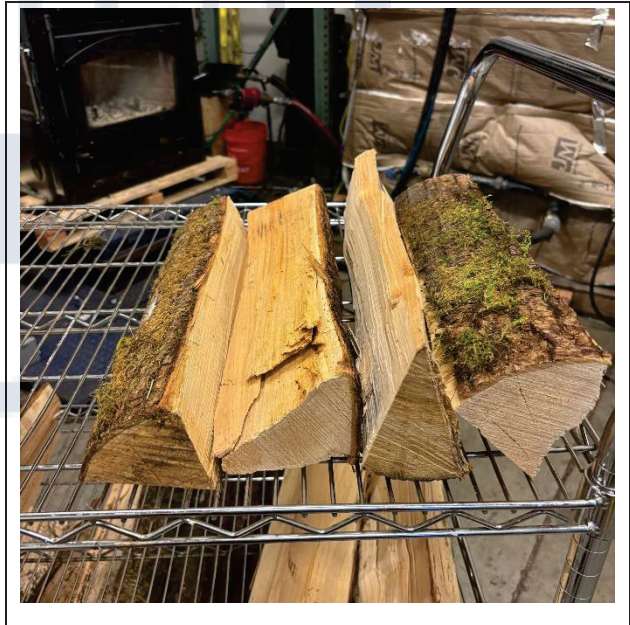
L1 Fuel Load



L1 Fuel Loaded



L1 Residual Fuel Load



L2 Fuel Load

Technician Signature: _____



Date: 6/27/2025

IDC Wood Heater Run Sheets

Client: IHP
Model: Montecito-C

Job Number: 25-416
Run Number: 2

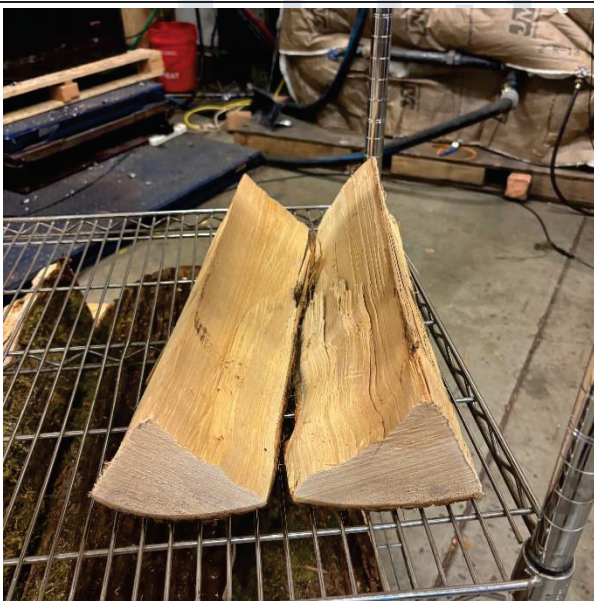
Tracking #: 223
Test Date: 5/28/25



L2 Fuel Loaded



L2 Residual Fuel Loaded



L3 Fuel Load



L3 Fuel Loaded

Technician Signature: 

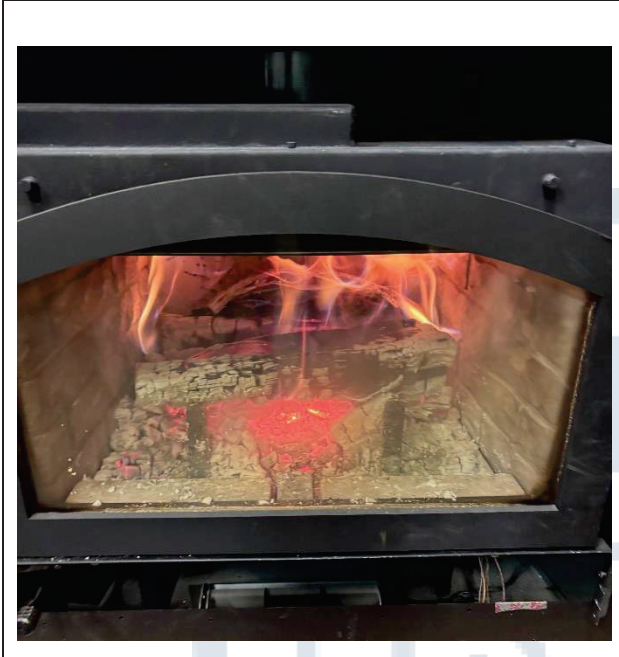
Date: 6/27/2025

IDC Wood Heater Run Sheets

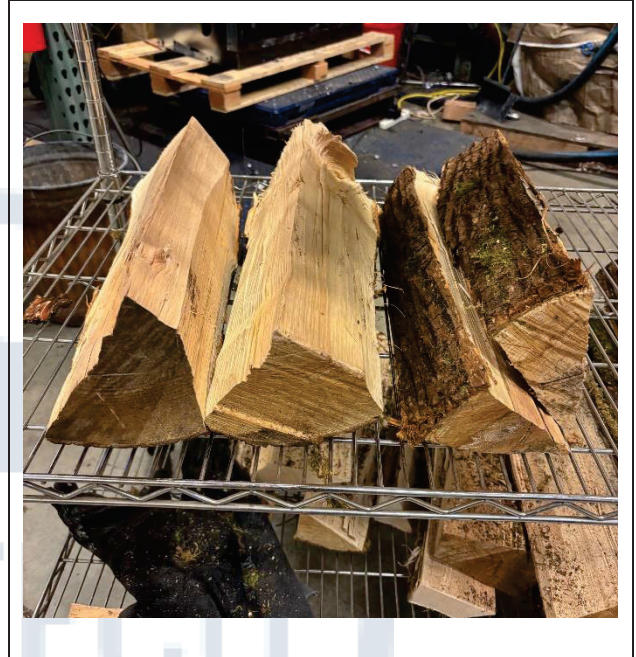
Client: IHP
Model: Montecito-C

Job Number: 25-416
Run Number: 2

Tracking #: 223
Test Date: 5/28/25



L3 Residual Fuel Loaded



L4 Fuel Load



L4 Fuel Loaded

Technician Signature: 

Date: 6/27/2025

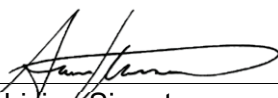
WOOD STOVE TEST DATA PACKET
IDC / ASTM E2515



Run 3 Data Summary

Client:	IHP
Model:	Montecito-C
Job #:	25-416
Tracking #:	223
Test Date:	5/29/2025

RUN ABORTED DUE TO FAILED TEOM PUMP



Technician Signature

6/27/2025

Date

TEST RESULTS - ASTM E2780 / ASTM E2515

Client: IHP

Model: Montecito-C

Run #: 3

Job #: 25-416

Tracking #: 223

Technician: AK

Date: 5/29/2025

Total Fuel Burned (kg-dry) 4.09

	Ambient Sample	Sample Train A	Sample Train B	1st Hour Filter
Total Sample Volume (ft ³)	12.589	8.518	8.754	-
Average Gas Velocity in Dilution Tunnel (ft/sec)	18.7			
Average Gas Flow Rate in Dilution Tunnel (dscf/hr)	49296.9			
Average Gas Meter Temperature (°F)	70.2	78.5	74.9	-
Total Sample Volume (dscf)	12.721	8.436	8.784	-
Average Tunnel Temperature (°F)	97.3			
Total Time of Test (min)	55			
Total Particulate Catch (mg)	0.1	0.9	1.0	-
Particulate Concentration, dry-standard (g/dscf)	0.0000079	0.0001067	0.0001138	-
Total PM Emissions (g)	0.36	4.47	4.79	-
Particulate Emission Rate (g/hr)	0.39	4.87	5.22	-
Emissions Factor (g/kg)	-	1.09	1.17	-
Difference from Average Total Particulate Emissions (g)	-	0.16	0.16	-
Difference from Average Total Particulate Emissions (%)	-	3.5%	3.5%	-
Difference from Average Emissions Factor (g/kg)	-	0.04	0.04	-

Final Average Results	
Total Particulate Emissions (g)	4.63
Particulate Emission Rate (g/hr)	5.05
Emissions Factor (g/kg)	1.13

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	<90 °F	87.0	OK
Face Velocity	< 30 ft/min	8.8	OK
Leakage Rate	Less than 4% of average sample rate	0 cfm	OK
Ambient Temp	55-90 °F	Min:69/Max:71.1	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

DILUTION TUNNEL & MISC. DATA - ASTM E2780 / E2515

Client: IHP
 Model: Montecito-C
 Run #: 3
 Test Start Time: 11:26

Job #: 25-416
 Tracking #: 223
 Technician: AK
 Date: 5/29/2025

Total Sampling Time (min): 55
 Recording Interval (min): 1

Meter Box γ Factor: 1.005 (A)
 Meter Box γ Factor: 1.011 (B)
 Meter Box γ Factor: - (C)
 Meter Box γ Factor: 1.012 (Ambient)

	Pre-Test	Post Test	Avg.
Barometric Pressure (in. Hg)	30.01	30.01	30.01
Relative Humidity (%)	35.4	36.7	
Room Air Velocity (ft/min)	<50	<50	
Pitot Tube Leak Check	0	0	
Ambient Sample Volume:		12.589	ft ³

Sample Train Leak Checks

	Pre-test	Post-test			
Induced Draft Check (in. H ₂ O):	0	(A)	0.000		cfm @ in. Hg
Smoke Capture Check (%):	100%	(B)	0.000		cfm @ in. Hg
Date Flue Pipe Last Cleaned:	5/26/2025	(C)	-		cfm @ in. Hg
Test Fuel Scale Audit (lbs)	10.00	(Ambient)	0.000		cfm @ in. Hg
Platform Scale Audit (lbs)	10.0				

DILUTION TUNNEL FLOW

Traverse Data

Point	dP (in H ₂ O)	Temp (°F)
1	0.064	67
2	0.080	67
3	0.072	67
4	0.078	67
5	0.069	67
6	0.056	67
7	0.060	67
8	0.074	67
9	0.072	67
10	0.072	67
11	0.072	67
12	0.064	67
Center	0.072	67

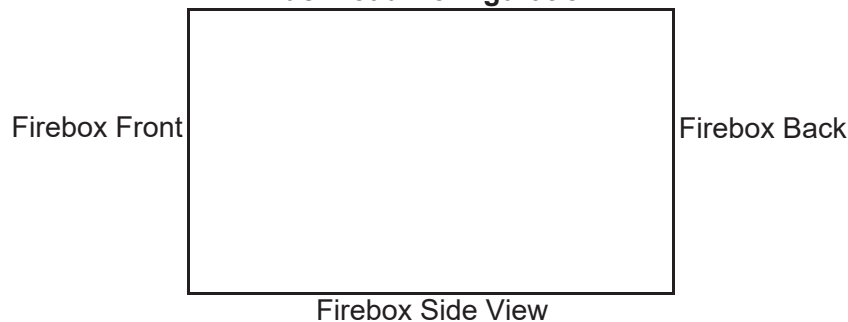
Dilution Tunnel H₂O: 2.00 percent
 Tunnel Diameter: 12 inches
 Pitot Tube Cp: 0.99 [unitless]
 Dilution Tunnel MW(dry): 29.00 lb/lb-mole
 Dilution Tunnel MW(wet): 28.78 lb/lb-mole
 Tunnel Area: 0.7854 ft²

V_{strav} : 17.40 ft/sec
 V_{scent} : 17.74 ft/sec
 F_p : 0.981 [ratio]
 Initial Tunnel Flow: 807.2 scf/min

Static Pressure: -0.202 in. H₂O

TEST FUEL PROPERTIES

Fuel Load Configuration



Actual Fuel Used Properties

Fuel Type: D. Fir
 HHV (kJ/kg): 19,810
 %C: 48.73
 %H: 6.87
 %O: 43.9
 %Ash: 0.5
 MC (%DB): #DIV/0!

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: IHP

Job #: 25-416

Model: Montecito-C

Tracking #: 223

Run #: 3

Technician: AK

Date: 5/29/2025

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	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		0.081	0.01	71	0.1		6.47		72	71	83	69
1	0.136	0.136	0.080	1.10	72	-0.9	-	6.22	-0.25	75	179	82	69
2	0.295	0.159	0.078	1.11	72	-0.9	-	5.81	-0.41	82	396	81	69
3	0.452	0.157	0.081	1.10	73	-0.8	-	5.47	-0.34	82	554	82	69
4	0.610	0.158	0.079	1.09	73	-0.8	-	5.12	-0.35	85	647	83	69
5	0.768	0.158	0.078	1.08	73	-0.8	-	4.74	-0.38	87	728	83	69
6	0.923	0.155	0.077	1.07	74	-0.9	-	4.34	-0.40	90	795	85	69
7	1.080	0.157	0.079	1.08	74	-0.8	-	3.98	-0.36	91	799	84	69
8	1.237	0.157	0.080	1.06	74	-0.9	-	3.61	-0.37	93	840	84	69
9	1.392	0.155	0.079	1.07	74	-0.9	-	3.23	-0.38	95	875	83	69
10	1.549	0.157	0.077	1.06	75	-0.9	100	2.89	-0.34	97	888	82	69
11	1.705	0.156	0.080	1.06	75	-0.9	-	2.57	-0.32	98	904	82	69
12	1.859	0.154	0.081	1.07	75	-0.9	-	2.27	-0.30	99	907	83	69
13	2.016	0.157	0.077	1.07	76	-0.9	-	2.00	-0.27	100	900	83	69
14	2.172	0.156	0.078	1.05	76	-0.9	-	1.80	-0.20	101	893	84	70
15	2.325	0.153	0.078	1.06	76	-0.9	-	12.27	10.47	108	788	84	70
16	2.481	0.156	0.079	1.06	77	-1.0	-	11.99	-0.28	105	852	85	70
17	2.637	0.156	0.078	1.07	77	-0.9	-	11.73	-0.26	104	861	83	70
18	2.791	0.154	0.078	1.06	77	-1.1	-	11.50	-0.23	104	852	83	70
19	2.946	0.155	0.080	1.05	77	-1.0	-	11.27	-0.23	103	850	82	70
20	3.102	0.156	0.079	1.07	78	-1.1	102	11.00	-0.27	104	882	82	70
21	3.256	0.154	0.078	1.06	78	-1.1	-	10.74	-0.26	104	891	83	70
22	3.411	0.155	0.080	1.05	78	-1.0	-	10.49	-0.25	104	886	83	70
23	3.567	0.156	0.079	1.06	79	-1.0	-	10.27	-0.22	104	881	83	70
24	3.722	0.155	0.079	1.06	79	-1.0	-	10.04	-0.23	104	877	84	70
25	3.875	0.153	0.079	1.03	79	-1.0	-	9.81	-0.23	105	887	84	70
26	4.030	0.155	0.080	1.06	79	-1.1	-	9.55	-0.26	106	906	84	70
27	4.185	0.155	0.077	1.06	79	-1.1	-	9.29	-0.26	107	928	84	70
28	4.339	0.154	0.079	1.05	79	-1.2	-	9.02	-0.27	107	935	85	70
29	4.493	0.154	0.078	1.04	80	-1.1	-	8.76	-0.26	108	940	84	70
30	4.649	0.156	0.079	1.05	80	-1.1	100	8.49	-0.27	106	947	83	70
31	4.804	0.155	0.078	1.07	80	-1.1	-	8.24	-0.25	105	948	82	70

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: IHP

Job #: 25-416

Model: Montecito-C

Tracking #: 223

Run #: 3

Technician: AK

Date: 5/29/2025

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	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
32	4.957	0.153	0.079	1.05	80	-1.1	-	8.01	-0.23	105	945	82	71
33	5.111	0.154	0.078	1.06	80	-1.2	-	7.79	-0.22	105	939	84	71
34	5.267	0.156	0.079	1.05	81	-1.2	-	7.58	-0.21	105	930	84	71
35	5.420	0.153	0.079	1.04	81	-1.2	-	7.37	-0.21	105	930	84	71
36	5.574	0.154	0.078	1.05	81	-1.2	-	7.17	-0.20	105	923	84	71
37	5.730	0.156	0.079	1.05	81	-1.2	-	6.97	-0.20	105	916	83	71
38	5.885	0.155	0.078	1.05	81	-1.2	-	6.77	-0.20	105	911	84	71
39	6.038	0.153	0.079	1.04	82	-1.2	-	6.64	-0.13	102	866	83	71
40	6.193	0.155	0.079	1.05	82	-1.2	100	6.50	-0.14	99	827	82	71
41	6.349	0.156	0.079	1.06	82	-1.2	-	6.39	-0.11	97	796	82	71
42	6.503	0.154	0.077	1.05	82	-1.2	-	6.29	-0.10	96	768	83	71
43	6.657	0.154	0.079	1.05	82	-1.3	-	6.19	-0.10	95	743	84	71
44	6.813	0.156	0.078	1.06	82	-1.2	-	6.10	-0.09	94	721	84	71
45	6.968	0.155	0.079	1.05	82	-1.3	-	6.02	-0.08	93	701	84	71
46	7.122	0.154	0.079	1.05	82	-1.2	-	5.92	-0.10	93	685	84	71
47	7.277	0.155	0.081	1.05	82	-1.3	-	5.83	-0.09	92	671	84	71
48	7.433	0.156	0.079	1.06	82	-1.2	-	5.74	-0.09	91	657	84	71
49	7.586	0.153	0.079	1.05	82	-1.3	-	5.66	-0.08	91	643	83	71
50	7.742	0.156	0.080	1.05	83	-1.2	99	5.58	-0.08	91	631	83	71
51	7.898	0.156	0.078	1.06	82	-1.2	-	5.50	-0.08	90	619	81	71
52	8.052	0.154	0.080	1.05	82	-1.2	-	5.41	-0.09	90	609	83	71
53	8.207	0.155	0.079	1.05	83	-1.3	-	5.34	-0.07	89	600	84	71
54	8.363	0.156	0.079	1.05	83	-1.2	-	5.26	-0.08	89	591	84	71
55	8.518	0.155	0.081	1.06	83	-1.4	98	5.18	-0.08	89	583	84	71
Avg/Tot	8.518	0.155	0.079	1.04	78.5	-1.1	100			97.3	780.1	83.3	70.2

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: IHP
 Model: Montecito-C
 Run #: 3

Job #: 25-416
 Tracking #: 223
 Technician: AK
 Date: 5/29/2025

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		0.01	71	-0.5		86	0.005	0.10	0.003
1	0.141	0.141	1.23	71	-1.4	-	86	0.004	1.22	0.132
2	0.304	0.163	1.21	71	-1.4	-	85	0.008	3.98	0.231
3	0.468	0.164	1.22	71	-1.4	-	85	0.001	10.91	0.491
4	0.629	0.161	1.20	71	-1.3	-	85	0.004	12.06	0.481
5	0.792	0.163	1.20	71	-1.5	-	85	0.003	14.36	0.340
6	0.953	0.161	1.21	71	-1.4	-	85	0.000	15.48	0.437
7	1.113	0.160	1.20	71	-1.4	-	86	0.004	14.95	0.121
8	1.275	0.162	1.20	71	-1.3	-	86	0.004	14.54	0.078
9	1.434	0.159	1.18	71	-1.3	-	86	0.004	16.27	0.319
10	1.596	0.162	1.19	72	-1.5	100	86	0.000	15.42	0.143
11	1.755	0.159	1.16	72	-1.4	-	86	0.002	15.36	0.099
12	1.917	0.162	1.18	72	-1.4	-	86	0.009	14.84	0.069
13	2.075	0.158	1.18	72	-1.4	-	86	0.009	14.01	0.043
14	2.237	0.162	1.19	72	-1.4	-	87	0.006	12.89	0.042
15	2.395	0.158	1.17	72	-1.4	-	86	0.004	4.92	0.164
16	2.556	0.161	1.18	73	-1.3	-	86	0.005	10.81	0.263
17	2.714	0.158	1.16	73	-1.3	-	86	0.009	11.13	0.209
18	2.874	0.160	1.18	73	-1.3	-	86	0.007	9.92	0.253
19	3.032	0.158	1.20	73	-1.3	-	86	0.006	9.66	0.188
20	3.193	0.161	1.19	73	-1.4	102	86	0.003	11.35	0.065
21	3.351	0.158	1.19	73	-1.5	-	86	0.005	12.24	0.036
22	3.511	0.160	1.17	74	-1.4	-	86	0.010	11.20	0.053
23	3.669	0.158	1.18	74	-1.5	-	86	0.006	10.44	0.101
24	3.829	0.160	1.17	74	-1.3	-	87	-0.003	10.26	0.100
25	3.987	0.158	1.17	74	-1.5	-	87	-0.001	10.60	0.067
26	4.147	0.160	1.17	74	-1.5	-	86	0.010	11.79	0.048
27	4.305	0.158	1.15	75	-1.4	-	86	0.007	12.77	0.040
28	4.464	0.159	1.16	75	-1.3	-	87	0.004	12.83	0.047
29	4.623	0.159	1.16	75	-1.4	-	87	0.004	12.42	0.042
30	4.781	0.158	1.14	76	-1.3	100	87	0.006	12.75	0.038
31	4.941	0.160	1.17	75	-1.4	-	87	0.009	12.74	0.046

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: IHP
 Model: Montecito-C
 Run #: 3

Job #: 25-416
 Tracking #: 223
 Technician: AK
 Date: 5/29/2025

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 (%)
32	5.098	0.157	1.17	75	-1.3	-	87	0.006	12.26	0.033
33	5.258	0.160	1.17	76	-1.3	-	87	0.010	11.77	0.028
34	5.415	0.157	1.15	76	-1.5	-	87	0.006	11.11	0.031
35	5.575	0.160	1.18	77	-1.3	-	87	0.003	11.23	0.049
36	5.732	0.157	1.15	77	-1.4	-	87	0.007	11.07	0.047
37	5.892	0.160	1.15	77	-1.5	-	87	0.005	10.74	0.057
38	6.049	0.157	1.16	77	-1.3	-	87	0.003	10.80	0.073
39	6.209	0.160	1.18	77	-1.4	-	87	0.006	11.08	0.100
40	6.368	0.159	1.16	78	-1.5	100	87	0.007	10.90	0.075
41	6.527	0.159	1.14	78	-1.5	-	87	0.005	9.08	0.152
42	6.686	0.159	1.17	78	-1.5	-	87	0.006	8.24	0.252
43	6.844	0.158	1.16	78	-1.4	-	86	0.010	7.79	0.265
44	7.004	0.160	1.17	79	-1.5	-	86	0.004	7.40	0.311
45	7.162	0.158	1.14	78	-1.4	-	86	0.001	7.26	0.392
46	7.322	0.160	1.18	78	-1.3	-	86	0.006	7.51	0.291
47	7.480	0.158	1.16	79	-1.3	-	86	0.010	7.57	0.276
48	7.641	0.161	1.17	79	-1.5	-	87	0.005	7.58	0.261
49	7.798	0.157	1.20	79	-1.4	-	87	0.007	7.25	0.345
50	7.959	0.161	1.18	79	-1.4	99	87	0.007	7.22	0.307
51	8.117	0.158	1.18	80	-1.4	-	87	0.004	7.22	0.306
52	8.277	0.160	1.18	79	-1.4	-	87	0.009	7.12	0.316
53	8.435	0.158	1.17	80	-1.3	-	86	0.008	7.08	0.304
54	8.596	0.161	1.18	80	-1.3	-	86	0.010	7.07	0.299
55	8.754	0.158	1.17	81	-1.5	98	86	0.002	7.06	0.289
Avg/Tot	8.754	0.159	1.16	74.9	-1.4	100	86.3	#REF!	10.31	0.172

WOODSTOVE SURFACE TEMPERATURE DATA

Client: IHP

Job #: 25-416

Model: Montecito-C

Tracking #: 223

Run #: 3

Technician: AK

Date: 5/29/2025

Stove ΔT: 324

Elapsed Time (min)	Temperature Data (°F)						
	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
0	73	73	74	71	74	73.0	N/A
1	73	73	74	93	74	77.5	N/A
2	76	74	76	147	75	89.2	N/A
3	79	74	79	269	76	115.3	N/A
4	84	75	83	391	79	142.2	N/A
5	92	77	90	497	84	167.9	N/A
6	102	80	99	583	91	190.9	N/A
7	113	84	114	645	99	210.8	N/A
8	122	90	130	694	110	229.1	N/A
9	130	97	148	739	123	247.3	N/A
10	137	105	161	773	136	262.4	N/A
11	143	114	174	804	150	277.1	N/A
12	149	123	182	829	164	289.2	N/A
13	154	132	191	843	180	300.1	N/A
14	161	141	207	848	198	310.7	N/A
15	170	148	223	815	217	314.6	N/A
16	179	157	240	813	237	325.2	N/A
17	187	162	257	819	258	336.6	N/A
18	195	169	273	811	278	345.1	N/A
19	203	177	287	801	298	353.2	N/A
20	211	184	300	803	317	363.0	N/A
21	219	192	312	812	333	373.6	N/A
22	227	200	322	813	349	382.2	N/A
23	235	208	332	811	363	389.6	N/A
24	243	216	341	807	375	396.3	N/A
25	251	224	349	807	385	403.0	N/A
26	259	231	357	815	396	411.5	N/A
27	267	238	365	831	407	421.4	N/A
28	275	246	373	847	416	431.5	N/A
29	283	254	380	858	418	438.4	N/A
30	290	263	372	855	375	431.0	N/A
31	297	273	367	851	355	428.4	N/A
32	304	283	364	846	341	427.4	N/A
33	311	292	362	841	333	427.6	N/A
34	318	301	360	833	329	427.9	N/A
35	323	309	360	823	326	428.2	N/A
36	329	317	361	811	325	428.5	N/A
37	335	324	362	800	325	429.1	N/A
38	340	331	363	790	326	430.0	N/A
39	345	338	365	778	327	430.5	N/A
40	349	344	367	761	330	430.2	N/A
41	354	350	368	738	332	428.5	N/A
42	358	356	368	719	334	426.9	N/A
43	362	361	368	697	336	424.7	N/A
44	365	365	368	676	338	422.1	N/A
45	367	368	367	656	338	419.4	N/A
46	370	371	366	639	339	416.9	N/A
47	372	373	365	626	339	414.9	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: IHP
Model: Montecito-C
Run #: 3

Job #: 25-416
Tracking #: 223
Technician: AK
Date: 5/29/2025

Stove ΔT: 324

Temperature Data (°F)							
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
48	373	375	363	615	338	413.0	N/A
49	375	376	361	603	338	410.6	N/A
50	376	377	360	591	337	408.2	N/A
51	377	378	359	580	336	405.9	N/A
52	377	378	357	570	335	403.4	N/A
53	378	378	356	560	334	401.1	N/A
54	378	378	354	552	333	399.0	N/A
55	378	378	353	544	331	396.8	N/A
Average	253.3	238.4	286.2	693.6	276.6	349.6	N/A

LAB SAMPLE DATA - ASTM E2515

Client: IHP
 Model: Montecito-C
 Run #: 3

Job #: 25-416
 Tracking #: 223
 Technician: AK
 Date: 5/29/2025

		Sample ID	Tare, mg	Final, mg	Catch, mg
Filters	A	G01256	237.0	237.7	0.7
	B	G01257	236.6	237.0	0.4
	Amb	G01258	238.0	238.1	0.1
Probes	A	15C	116848.6	116848.6	0.0
	B	16A	116379.6	116379.9	0.3
O-rings	A	15C	3392.3	3392.5	0.2
	B	16A	3569.9	3570.2	0.3

Placed in Dessicator on: 5/29/2025

Balance Audit (mg):

		200.0		200.0		200.0			
		Weight (mg)	Date/Time	Weight (mg)	Date/Time	Weight (mg)	Date/Time	Weight (mg)	Date/Time
Filters	A	238.0	5/29 13:00	237.6	6/2 15:00	237.7	6/4 11:15		
	B	237.3	5/29 13:00	236.8	6/2 15:00	237.0	6/4 11:15		
		238.3	5/29 13:00	238.2	6/2 15:00	238.1	6/4 11:15		
Probes	A	116848.6	5/29 13:00	116848.6	6/2 15:00	116848.6	6/4 11:15		
	B	116380.3	5/29 13:00	116380.1	6/2 15:00	116379.9	6/4 11:15		
O-Rings	A	3392.9	5/29 13:00	3392.7	6/2 15:00	3392.5	6/4 11:15		
	B	3570.6	5/29 13:00	3570.2	6/2 15:00	3570.2	6/4 11:15		

Train A Aggregate, mg:	0.9
Train B Aggregate, mg:	1.0
Ambient, mg:	0.1

IDC Wood Heater Run Sheets

Client: IHP Job Number: 25-416 Tracking #: 223
 Model: Montecito-C Run Number: 3 Test Date: 5/29/25

Pre-Test Set-up Check List

Perform the following checks after a minimum of 30 minutes of warmup time

Leak Checks	Requirement	Pump Off (lpm)	Pump On, Probe Blocked (lpm)	Net (lpm)	Result
PM-2.5	<0.05 lpm (net)	0.36	0.36	0	☒ Pass ☐ Fail
PM-Course	<0.05 lpm (net)	0.15	0.15	0	☒ Pass ☐ Fail
Ambient	<0.05 lpm (net)	0.05	0.06	0.01	☒ Pass ☐ Fail

Flow Checks	Requirement	TEOM Indicated Flow (lpm) ¹	Measured Flow		Difference (%)	Result
			(lpm) ²	(lpm) ³		
PM-2.5	±2%	1.00	1.02	1.016	1.6%	☒ Pass ☐ Fail
PM-Course	±2%	1.00	1.01	1.006	0.6%	☒ Pass ☐ Fail
Ambient	±2%	3.00	3.04	3.028	0.9%	☒ Pass ☐ Fail

¹Indicated flow is at 20°C, 1 atm

²Measured flow with PFS equipment ID 197, which indicates flow at 21.1°C, 1 atm

³Adjusted value (Measured Flow * 99.6%) to match the STP used by TEOM

Initial Filter Setup

Use **black** filter tool when changing filters

	1 min. requirement	5 min. requirement	Result
PM-2.5	Frequency > 200Hz	Mass > -1 ug, noise < 2ug	☒ Pass ☐ Fail
PM- Course	Frequency > 200Hz	Mass > -1 ug, noise < 2ug	☒ Pass ☐ Fail
Ambient	Frequency > 200Hz	Mass > -1 ug, noise < 2ug	☒ Pass ☐ Fail

Pre-Fire Verifications	Time probe in Tunnel	Result
Place probe in tunnel at least 10 min prior to test start	10:00	
Verify Data is recording [In RPCOMM] - Dichot		☒ Okay
Verify Data is recording [In RPCOMM] - Ambient		☒ Okay

Flue Gas Analyzer Calibration Check

Calibration Gas Values: Span Gas Cylinder#: CC505834 CO₂ (%): 17.35 CO (%): 4.350
 Mid Gas Cylinder#: CC341544 CO₂ (%): 10.00 CO (%): 2.500

Calibration Results:

	Pre Test			Post Test		
	Zero	Span	Mid	Zero	Span	Mid
Time	9:28	9:33	9:31			
CO ₂	0.00	17.32	10.27			
CO	0.000	4.344	2.562			

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

Technician Signature: 

Date: 6/27/2025

IDC Wood Heater Run Sheets

Client: IHP Job Number: 25-416 Tracking #: 223
 Model: Montecito-C Run Number: 3 Test Date: 5/29/25

Pre-Test Conditions

		Requirements	Result
Room RH (%)	51.2		
Barometric Pressure	30.01		
Room Air Velocity (ft/min)	<50	Must be <50 ft/min within 2 ft of stove	☒ Pass ☐ Fail
Room Temperature (°F)	61.2	<87 °F	☒ Pass ☐ Fail
Average External Stove Temp (°F)	N/A	Within 2 °F of ambient (Run #1 only)	☐ Pass ☐ Fail ☒ N/A
Average Internal Stove Temp (°F)	N/A	Within 2 °F of ambient (Run #1 only)	☐ Pass ☐ Fail ☒ N/A
Time Coals Removed from Stove & Firebox Vacuumed	9:15	>1 hr before test (Runs #2 & 3 only)	☒ Pass ☐ Fail ☐ N/A
Earliest possible start time	10:47	24 hours from start of Run #1 (Runs #2 & 3 only)	☒ Pass ☐ Fail ☐ N/A



Technician Signature: 

Date: 6/27/2025

IDC Wood Heater Run Sheets

Client: IHP Job Number: 25-416 Tracking #: 223
Model: Montecito-C Run Number: 3 Test Date: 5/29/25

IDC FUELING NOTES

Fuel & Moisture Measurement

Fuel Type	Maple Cordwood
Moisture Meter Calibration 22%:	22.0
Moisture Meter Calibration 12%:	12.0
Moisture Reading Start Time:	09:00

L1 Test Notes

Scale Weight Prior to Loading (lbs):	0
Test Burn Start Time:	11:26
Air Control Setting (open/closed):	Open
Door Closed Time (5 min from start):	11:28
Bypass Closed Time:	N/A
Target End Weight (lbs):	1.79-1.98
Actual End Weight (lbs):	1.80
Phase End Time:	11:40

Additional Notes (Fuel adjustments, TEOM Filter Changes, etc.)

Time	Notes
	-None-

L2 Test Notes

Scale Weight Prior to Loading (lbs):	1.80
Load Time:	11:40
Air Control Setting (open/closed):	Open
Door Closed Time (immediately after loading):	11:41
Bypass Closed Time:	N/A
50% Target Weight (lbs):	6.82-7.54
Actual 50% Weight (lbs):	7.37
Air control closed time:	12:01
Target End Weight (lbs):	2.73-3.02
Actual End Weight (lbs):	
Phase End Time:	

Additional Notes (Fuel adjustments, TEOM Filter Changes, etc.)

Time	Notes
12:21	Observed that TEOM pump failed, run aborted

Technician Signature: 

Date: 6/27/2025

IDC Wood Heater Run Sheets

Client: IHP Job Number: 25-416 Tracking #: 223
Model: Montecito-C Run Number: 3 Test Date: 5/29/25

L3 Test Notes

Scale Weight Prior to Loading (lbs):	
Load Time:	
Air Control Setting (5 min start-up allowed):	
Door Closed Time (immediately after loading):	
Bypass Closed Time:	
Target End Weight (lbs):	
Actual End Weight (lbs):	
Phase End Time:	

Open @ Closed @

Additional Notes (Fuel adjustments, TEOM Filter Changes, etc.)

Time	Notes

L4 Test Notes

Scale Weight Prior to Loading (lbs):	
Load Time:	
Air Control Setting (10 min start-up allowed):	
Door Closed Time (5 min after loading):	
Bypass Closed Time:	
Target End Weight (lbs):	
Actual End Weight (lbs):	
Phase End Time:	

Open @ Closed @

Additional Notes (Fuel adjustments, TEOM Filter Changes, etc.)

Time	Notes

Post-Test Conditions

Room Air Velocity (ft/min)	
Room RH (%)	
Barometric Pressure	

Technician Signature: 

Date: 6/27/2025

IDC Wood Heater Run Sheets

Client: IHP Job Number: 25-416 Tracking #: 223
 Model: Montecito-C Run Number: 3 Test Date: 5/29/25

Post-Test Check List

Leak Checks	Requirement	Pump Off (lpm)	Pump On, Probe Blocked (lpm)	Net (lpm)	Result
PM-2.5	<0.05 lpm (net)				☒ Pass ☐ Fail
PM-Course	<0.05 lpm (net)				☒ Pass ☐ Fail
Ambient	<0.05 lpm (net)				☒ Pass ☐ Fail

Flow Checks	Requirement	TEOM Indicated Flow (lpm) ¹	Measured Flow		Difference (%)	Result
			(lpm) ²	(lpm) ³		
PM-2.5	±2%					☒ Pass ☐ Fail
PM-Course	±2%					☒ Pass ☐ Fail
Ambient	±2%					☒ Pass ☐ Fail

¹Indicated flow is at 20°C, 1 atm

²Measured flow with PFS equipment ID 134, which indicates flow at 21.1°C, 1 atm

³Adjusted value (Measured Flow * 99.6%) to match the STP used by TEOM



Technician Signature: 

Date: 6/27/2025

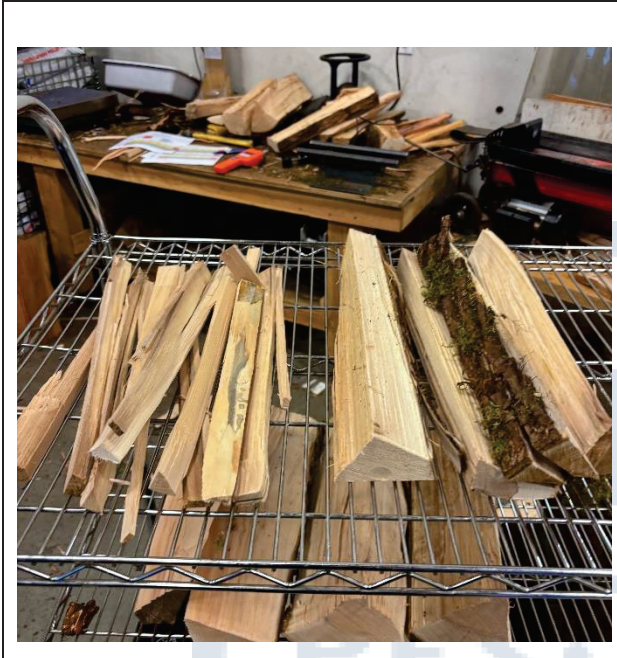
IDC Wood Heater Run Sheets

Client: IHP
Model: Montecito-C

Job Number: 25-416
Run Number: 3

Tracking #: 223
Test Date: 5/29/25

Test Fuel Photos



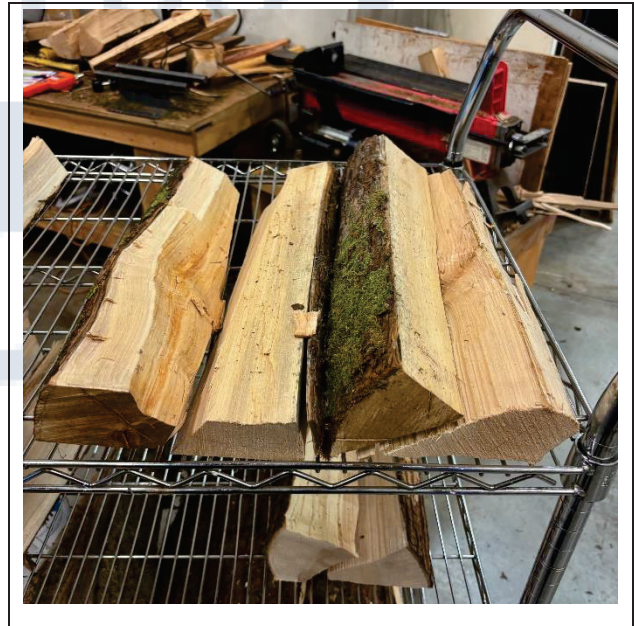
L1 Fuel Load



L1 Fuel Loaded



L1 Residual Fuel Load



L2 Fuel Load

Technician Signature: 

Date: 6/27/2025

IDC Wood Heater Run Sheets

Client: IHP

Job Number: 25-416

Tracking #: 223

Model: Montecito-C

Run Number: 3

Test Date: 5/29/25



L2 Fuel Loaded



L2 Residual Fuel Loaded

Technician Signature: _____

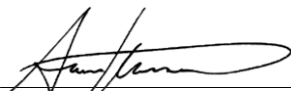
Date: 6/27/2025

WOOD STOVE TEST DATA PACKET
IDC / ASTM E2515



Run 4 Data Summary

Client:	IHP
Model:	Montecito-C
Job #:	25-416
Tracking #:	223
Test Date:	5/30/2025



Technician Signature

6/27/2025

Date

Run 1 Results Summary

Test Segments

	Clock	ET(min)
L1 Ignition	12:02 PM	0
L1 End	11:29 AM	14
L1 Duration		14
Fuel Consumed (lbs-wet)		4.33
Fuel Consumed (lbs-dry)		3.53

L2 Loaded	11:30 AM	15
L2 End	12:27 PM	80
L2 Duration		65
Fuel Consumed (lbs-wet)		9.97
Fuel Consumed (lbs-dry)		7.93

L3 Loaded	12:28 PM	81
L3 End	1:31 AM	146
L3 Duration		65
Fuel Consumed (lbs-wet)		7.06
Fuel Consumed (lbs-dry)		5.70

L4 Loaded	1:32 AM	147
L4 End	5:45 AM	448
L4 Duration		301
Fuel Consumed (lbs-wet)		18.67
Fuel Consumed (lbs-dry)		15.18

Total Fuel Burned (lbs-wet)	40.03	
Total Fuel Burned (lbs-dry)	32.33	14.67 (kg-dry)
		1.96 kg/hr dry

Firebox Avg Temps (F)

L1TS _{avg(i)}	68
L1TS _{avg(f)}	291
L2TS _{avg(i)}	293
L2TS _{avg(f)}	375
L3TS _{avg(i)}	373
L3TS _{avg(f)}	368
L4TS _{avg(i)}	364
L14TS _{avg(f)}	233

Burn Time Rating (hrs)

BTR	6
-----	---

Burn Rate (lbs-wet/hr) (dry kg/hr)

BR _{L2}	18.56	6.87
BR _{L2}	9.20	3.32
BR _{L3}	6.52	2.39
BR _{L4}	3.72	1.69
OVERALL	5.36	1.96

1st hr Loaded	12:02 PM	0
1st hr End	1:02 PM	60
L4 Duration		60
Fuel Consumed (lbs-wet)		12.86
Fuel Consumed (lbs-dry)		10.45

PM Results

Burn Phase:	L1	L2	L3	L4	1st Hr	Total
E _T :	1.3	1.6	0.6	4.9	2.8	8.3
E _{g/hr} :	5.5	1.5	0.5	0.97	2.82	1.11
E _{g/kg} :	0.80	0.44	0.22	0.71	0.59	0.57
E _{g/MJ output} :	0.06	0.04	0.02	0.06		0.047
E _{lb/mmbtu output} :	0.15	0.09	0.04	0.14	-	0.11
CO (g):	38.9	55.8	55.9	285.9		436.5
CO (g/min):	2.78	0.86	0.86	0.95		0.97
Output (BTU/hr)	81,385	37,200	27,410	15,865		22,577
Efficiency (%)	62.3%	61.0%	63.2%	61.7%		61.9%

Rolling Average Max Values

	1-min Avg.	5-min Avg.	60-min Avg.
PM (g/hr)	55.1	42.0	5.5

Quality Checks

Requirement

Observer Pass/Fail

Filter/Dewpt. Temp	Dewpoint must never exceed filter temp	Max Δ -22.3	PASS
Filter Temp	Must be between 80 and 90F at all times	80.1 / 87	PASS
Ambient Temp	Must be between 65 and 90F at all times	68.5 / 75.1	PASS
Minimum Tunnel Flow	>600 CFM	774.6	PASS
Weight Loss	Must be >0.1 lb per 20 min	Min -0.2 lb.	PASS

Test Input Data

Client: IHP
 Model: Montecito-C
 Run #: 4

Job #: 25-416
 Tracking #: 223
 Technician: AK
 Date: 5/30/2025

Traverse Data

pt	dP (in WC)
1	0.060
2	0.074
3	0.081
4	0.080
5	0.070
6	0.052
7	0.062
8	0.077
9	0.080
10	0.075
11	0.068
12	0.055
Center	0.080

Tunnel Data

Tunnel dia. (in):	12
Pitot Cp	0.99
Vs,cent (ft/s):	18.70
Vs, trav (ft/s):	17.38
Fp	0.930

	Pre-Test	Post Test
Barometric Pressure (in. Hg)	30.03	30.08
Lab Relative Humidity (%)	41.1	34.6

Traverse Temp:	67
Static Pressure:	-0.225

Fuel Data

Fuel Properties

Species	Maple
HHV (Btu/lb)	8587
%C	50.84%
%H	6.02%
%O	41.74%

	Wet Weight	MC (%db)	Dry Weight (lbs)
Kindling	1.59		
Starter	4.59	21.04	3.79
L2	10.90	23.08	8.86
L3	7.70	21.48	6.34
L4 _s	6.29	23.70	5.08
L4 _b	12.39	22.64	10.10
Avg. Moisture (%db)		22.39	

L1 Efficiency Results

Manufacturer: IHP
Model: Montecito-C
Date: 05/30/25
Run: 4
Control #: 223
Test Duration: 14
Output Category: L1

Test Results in Accordance with CSA B415.1-10

	HHV Basis	LHV Basis
Overall Efficiency	62.3%	66.6%
Combustion Efficiency	98.5%	98.5%
Heat Transfer Efficiency	63.2%	67.6%

Output Rate (kJ/h)	85,794	81,385	(Btu/h)
Burn Rate (kg/h)	6.90	15.21	(lb/h)
Input (kJ/h)	137,817	130,734	(Btu/h)

Test Load Weight (dry kg)	1.61	3.55	dry lb
MC wet (%)	18.43		
MC dry (%)	22.59		
Particulate (g)	N/A		
CO (g)	39		
Test Duration (h)	0.23		

Emissions	Particulate	CO
g/MJ Output	N/A	1.94
g/kg Dry Fuel	N/A	24.14
g/h	N/A	166.56
g/min	N/A	2.78
lb/MM Btu Output	N/A	4.51

Air/Fuel Ratio (A/F)	10.35
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VERSION:

2.4

4/15/2010

L2 Efficiency Results

Manufacturer: IHP
Model: Montecito-C
Date: 5/30/2025
Run: 4
Control #: 223
Test Duration: 65
Output Category: L2

Test Results in Accordance with CSA B415.1-10

	HHV Basis	LHV Basis
Overall Efficiency	61.0%	65.2%
Combustion Efficiency	99.1%	99.1%
Heat Transfer Efficiency	61.5%	65.8%

Output Rate (kJ/h)	39,216	37,200	(Btu/h)
Burn Rate (kg/h)	3.22	7.10	(lb/h)
Input (kJ/h)	64,308	61,003	(Btu/h)

Test Load Weight (dry kg)	3.49	7.69	dry lb
MC wet (%)	20.50		
MC dry (%)	25.79		
Particulate (g)	N/A		
CO (g)	56		
Test Duration (h)	1.08		

Emissions	Particulate	CO
g/MJ Output	N/A	1.31
g/kg Dry Fuel	N/A	16.01
g/h	N/A	51.55
g/min	N/A	0.86
lb/MM Btu Output	N/A	3.05

Air/Fuel Ratio (A/F)	12.52
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VERSION:

2.4

4/15/2010

L3 Efficiency Results

Manufacturer: IHP
Model: Montecito-C
Date: 05/30/25
Run: 4
Control #: 223
Test Duration: 65
Output Category: L3

Test Results in Accordance with CSA B415.1-10

	HHV Basis	LHV Basis
Overall Efficiency	63.2%	67.6%
Combustion Efficiency	98.9%	98.9%
Heat Transfer Efficiency	63.9%	68.4%

Output Rate (kJ/h)	28,895	27,410	(Btu/h)
Burn Rate (kg/h)	2.29	5.04	(lb/h)
Input (kJ/h)	45,711	43,362	(Btu/h)

Test Load Weight (dry kg)	2.48	5.46	dry lb
MC wet (%)	19.28		
MC dry (%)	23.89		
Particulate (g)	N/A		
CO (g)	56		
Test Duration (h)	1.08		

Emissions	Particulate	CO
g/MJ Output	N/A	1.79
g/kg Dry Fuel	N/A	22.56
g/h	N/A	51.63
g/min	N/A	0.86
lb/MM Btu Output	N/A	4.15

Air/Fuel Ratio (A/F)	14.25
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VERSION:

2.4

4/15/2010

L4 Efficiency Results

Manufacturer: IHP
Model: Montecito-C
Date: 05/30/25
Run: 4
Control #: 223
Test Duration: 301
Output Category: L4

Test Results in Accordance with CSA B415.1-10

	HHV Basis	LHV Basis
Overall Efficiency	61.7%	66.0%
Combustion Efficiency	97.7%	97.7%
Heat Transfer Efficiency	63.2%	67.5%

Output Rate (kJ/h)	16,724	15,865	(Btu/h)
Burn Rate (kg/h)	1.36	2.99	(lb/h)
Input (kJ/h)	27,094	25,702	(Btu/h)

Test Load Weight (dry kg)	6.81	15.00	dry lb
MC wet (%)	18.71		
MC dry (%)	23.01		
Particulate (g)	N/A		
CO (g)	286		
Test Duration (h)	5.02		

Emissions	Particulate	CO
g/MJ Output	N/A	3.41
g/kg Dry Fuel	N/A	42.01
g/h	N/A	56.99
g/min	N/A	0.95
lb/MM Btu Output	N/A	7.92

Air/Fuel Ratio (A/F)	18.53
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VERSION:

2.4

4/15/2010

Run 1 TEOM Data

ET (min)	Ci - 1-min avg PM (ug/m ³)	Tunnel dP (in WC)	sqrtdP	Tunnel Temp (F)	Tunnel Temp - 10 minute Avg. (F)	Tunnel RH - 10 minute avg. (%)	Tunnel Velocity - Vsi (ft/s)	Tunnel Flow - Q _{sdi} (m ³ /min)	E _i (mg)	E _{g/hr, i} (g/hr)	PM 5-min Rolling Avg (g/hr)	PM 30-min Rolling Avg (g/hr)	PM (cumulative g)
0	-175	0.080	0.2828	70.1	-	-	17.427	23.243	-4.058	-0.24	-	-	0.00
1	33	0.081	0.2846	74.7	-	-	17.612	23.287	0.774	0.05	-	-	0.00
2	13822	0.080	0.2828	79.8	-	-	17.586	23.033	318.356	19.10	-	-	0.32
3	9410	0.080	0.2828	80.9	-	-	17.604	23.009	216.511	12.99	-	-	0.53
4	8489	0.080	0.2828	83.7	-	-	17.650	22.950	194.833	11.69	8.72	-	0.73
5	7403	0.079	0.2811	85.9	-	-	17.574	22.760	168.488	10.11	10.79	-	0.89
6	5521	0.079	0.2811	88	-	-	17.608	22.716	125.407	7.52	12.28	-	1.02
7	2440	0.077	0.2775	90.4	-	-	17.422	22.378	54.592	3.28	9.12	-	1.07
8	1787	0.079	0.2811	91.6	-	-	17.666	22.642	40.458	2.43	7.01	-	1.12
9	1349	0.079	0.2811	93.7	83.88	149.43	17.700	22.599	30.490	1.83	5.03	-	1.15
10	1510	0.077	0.2775	94.3	86.3	167.59	17.483	22.299	33.660	2.02	3.42	-	1.18
11	1082	0.078	0.2793	95.1	88.34	186.54	17.609	22.427	24.266	1.46	2.20	-	1.20
12	973	0.079	0.2811	96.6	90.02	205.26	17.746	22.540	21.934	1.32	1.81	-	1.23
13	1234	0.081	0.2846	96.8	91.61	222.39	17.972	22.819	28.169	1.69	1.66	-	1.25
14	1186	0.079	0.2811	97.1	92.95	237.4	17.754	22.530	26.730	1.60	1.62	-	1.28
15	1029	0.077	0.2775	102.9	94.65	250.08	17.619	22.128	22.775	1.37	1.49	-	1.30
16	24231	0.076	0.2757	99.1	95.76	261.19	17.445	22.058	534.497	32.07	7.61	-	1.84
17	17986	0.077	0.2775	98	96.52	271.04	17.542	22.225	399.740	23.98	12.14	-	2.24
18	9453	0.079	0.2811	98.4	97.2	280.01	17.774	22.503	212.732	12.76	14.36	-	2.45
19	3146	0.077	0.2775	98.8	97.71	288.32	17.554	22.209	69.866	4.19	14.88	-	2.52
20	970	0.079	0.2811	100	98.28	296.43	17.800	22.471	21.796	1.31	14.86	-	2.54
21	666	0.078	0.2793	100.8	98.85	304.5	17.700	22.313	14.849	0.89	8.63	-	2.56
22	799	0.077	0.2775	102.2	99.41	312.68	17.608	22.141	17.683	1.06	4.04	-	2.57
23	504	0.077	0.2775	103.2	100.05	321.16	17.623	22.122	11.147	0.67	1.62	-	2.59
24	675	0.077	0.2775	103.8	100.72	330.09	17.633	22.110	14.933	0.90	0.96	-	2.60
25	754	0.080	0.2828	104.9	100.92	340.06	17.990	22.515	16.986	1.02	0.91	-	2.62
26	656	0.076	0.2757	105.5	101.56	350.64	17.544	21.933	14.386	0.86	0.90	-	2.63
27	564	0.079	0.2811	107.2	102.48	361.8	17.914	22.328	12.599	0.76	0.84	-	2.64
28	658	0.079	0.2811	107.7	103.41	373.35	17.922	22.318	14.678	0.88	0.88	-	2.66
29	554	0.077	0.2775	107.6	104.29	385.05	17.692	22.036	12.206	0.73	0.85	-	2.67
30	859	0.078	0.2793	108.5	105.14	396.65	17.821	22.161	19.041	1.14	0.87	-	2.69
31	554	0.078	0.2793	107.1	105.77	406.67	17.799	22.188	12.301	0.74	0.85	-	2.70
32	623	0.078	0.2793	106.4	106.19	414.73	17.788	22.202	13.824	0.83	0.86	-	2.72
33	552	0.080	0.2828	101.4	106.01	421.01	17.935	22.585	12.470	0.75	0.84	-	2.73
34	186	0.080	0.2828	98.7	105.5	425.35	17.891	22.639	4.202	0.25	0.74	-	2.73
35	28	0.079	0.2811	96.8	104.69	427.76	17.749	22.536	0.637	0.04	0.52	-	2.73
36	-66	0.077	0.2775	95.7	103.71	428.42	17.506	22.271	-1.468	-0.09	0.36	-	2.73
37	2	0.079	0.2811	95.2	102.51	427.46	17.723	22.568	0.046	0.00	0.19	-	2.73
38	-107	0.079	0.2811	94.7	101.21	425.01	17.715	22.578	-2.427	-0.15	0.01	-	2.73
39	172	0.079	0.2811	94	99.85	421.12	17.704	22.593	3.888	0.23	0.01	-	2.73
40	146	0.081	0.2846	93.3	98.33	415.88	17.916	22.891	3.351	0.20	0.04	-	2.74
41	449	0.080	0.2828	92.8	96.9	410.84	17.797	22.760	10.212	0.61	0.18	-	2.75
42	237	0.079	0.2811	92.2	95.48	406.38	17.676	22.630	5.367	0.32	0.24	-	2.75
43	212	0.078	0.2793	91.9	94.53	402.35	17.559	22.492	4.761	0.29	0.33	-	2.76
44	61	0.079	0.2811	91.5	93.81	398.93	17.664	22.644	1.380	0.08	0.30	-	2.76
45	48	0.079	0.2811	91.2	93.25	396.12	17.660	22.650	1.080	0.06	0.27	-	2.76
46	218	0.080	0.2828	90.7	92.75	393.89	17.763	22.803	4.970	0.30	0.21	-	2.77
47	82	0.079	0.2811	90.7	92.3	392.22	17.651	22.660	1.859	0.11	0.17	-	2.77
48	357	0.079	0.2811	90.2	91.85	391.05	17.643	22.671	8.088	0.49	0.21	-	2.78
49	85	0.078	0.2793	90.1	91.46	390.34	17.530	22.529	1.926	0.12	0.22	-	2.78
50	72	0.078	0.2793	90.2	91.15	390.03	17.531	22.527	1.615	0.10	0.22	-	2.78
51	180	0.079	0.2811	89.8	90.85	390.04	17.637	22.679	4.071	0.24	0.21	-	2.78
52	262	0.079	0.2811	89.8	90.61	390.33	17.637	22.679	5.932	0.36	0.26	-	2.79
53	158	0.079	0.2811	89.7	90.39	390.84	17.635	22.681	3.583	0.21	0.21	-	2.79
54	185	0.078	0.2793	89.4	90.18	391.55	17.519	22.543	4.181	0.25	0.23	-	2.80
55	179	0.077	0.2775	89.5	90.01	392.43	17.408	22.396	4.019	0.24	0.26	-	2.80
56	71	0.079	0.2811	89.1	89.85	393.42	17.626	22.693	1.602	0.10	0.23	-	2.80
57	287	0.080	0.2828	88.9	89.67	394.39	17.734	22.841	6.555	0.39	0.24	-	2.81
58	147	0.079	0.2811	89.1	89.56	395.3	17.626	22.693	3.326	0.20	0.24	-	2.81
59	131	0.079	0.2811	88.7	89.42	396.18	17.619	22.702	2.979	0.18	0.22	2.91	2.81
60	106	0.080	0.2828	88.7	89.27	396.95	17.731	22.845	2.429	0.15	0.20	2.91	2.82
61	84	0.080	0.2828	88.4	89.13	397.47	17.726	22.851	1.923	0.12	0.21	2.92	2.82
62	92	0.079	0.2811	88.2	88.97	397.7	17.611	22.712	2.099	0.13	0.15	2.59	2.82
63	122	0.080	0.2828	88.4	88.84	397.65	17.726	22.851	2.797	0.17	0.15	2.37	2.82
64	274	0.080	0.2828	87.7	88.67	397.32	17.714	22.866	6.273	0.38	0.19	2.17	2.83
65	375	0.079	0.2811	88	88.52	396.76	17.608	22.716	8.519	0.51	0.26	2.00	2.84
66	106	0.080	0.2828	87.9	88.4	396.01	17.718	22.862	2.432	0.15	0.27	1.87	2.84
67	183	0.079	0.2811	87.7	88.28	395.15	17.603	22.722	4.160	0.25	0.29	1.82	2.85
68	227	0.080	0.2828	87.5	88.12	394.21	17.711	22.870	5.199	0.31	0.32	1.79	2.85
69	20	0.081	0.2846	87.5	88	393.13	17.822	23.013	0.464	0.03	0.25	1.76	2.85
70	98	0.080	0.2828	87	87.83	392	17.703	22.880	2.240	0.13	0.17	1.73	2.85
71	154	0.081	0.2846	86.9	87.68	390.91	17.812	23.025	3.540	0.21	0.19	1.70	2.86
72	83	0.080	0.2828	87	87.56	389.91	17.703	22.880	1.902	0.11	0.16	1.68	2.86
73	200	0.081	0.2846	86.7	87.39	388.96	17.809	23.029	4.595	0.28	0.15	1.66	2.86
74	-14	0.080	0.2828	86.4	87.26	388.02	17.693	22.893	-0.325	-0.02	0.14	1.63	2.86
75	123	0.079	0.2811	86.5	87.11	387.06	17.584	22.747	2.794	0.17	0.15	1.61	2.87
76	93	0.080	0.2828	86.3	86.95	386.07	17.692	22.895	2.128	0.13	0.13	1.06	2.87
77	37	0.078	0.2793	85.9	86.77	385	17.463	22.615	0.832	0.05	0.12	0.65	2.87
78		0.078	0.2793	85.8	86.6	383.86					0.08	0.43	
79		0.080	0.2828	85.6	86.41	382.68					0.12	0.36	
80		0.080	0.2828	85.6	86.27	381.43					0.09	0.34	
81		0.079	0.2811	90.8	86.66	380.07					0.05	0.33	
82	2494	0.078	0.2793	91.6	87.12	379.11	17.554	22.498	56.110	3.37	3.37	0.32	2.92
83	1682	0.078	0.2793	93.1	87.76	378.68	17.578	22.468	37.799	2.27	2.82	0.31	2.96
84	1084	0.079	0.2811	94.6	88.58	378.94	17.714	22.581	24.482	1.47	2.37	0.36	2.99

Run 1 TEOM Data

85	904	0.078	0.2793	95.5	89.48	379.9	17.616	22.419	20.257	1.22	2.08	0.38	3.01
86	930	0.078	0.2793	92.4	90.09	381.3	17.566	22.482	20.909	1.25	1.91	0.39	3.03
87	661	0.081	0.2846	90.8	90.58	382.93	17.875	22.943	15.173	0.91	1.42	0.40	3.04
88	584	0.080	0.2828	90.2	91.02	384.73	17.755	22.814	13.325	0.80	1.13	0.41	3.06
89	571	0.081	0.2846	89.7	91.43	386.71	17.857	22.966	13.110	0.79	0.99	0.41	3.07
90	591	0.080	0.2828	89.7	91.84	388.84	17.747	22.824	13.489	0.81	0.91	0.41	3.08
91	390	0.079	0.2811	89.4	91.7	391.2	17.631	22.687	8.838	0.53	0.77	0.41	3.09
92	628	0.080	0.2828	89.2	91.46	393.28	17.739	22.835	14.348	0.86	0.76	0.41	3.11
93	404	0.079	0.2811	89.3	91.08	394.93	17.629	22.689	9.161	0.55	0.71	0.40	3.12
94	398	0.078	0.2793	89.1	90.53	396.01	17.514	22.549	8.984	0.54	0.66	0.41	3.12
95	738	0.079	0.2811	89.3	89.91	396.53	17.629	22.689	16.742	1.00	0.70	0.42	3.14
96	360	0.079	0.2811	89.1	89.58	396.75	17.626	22.693	8.160	0.49	0.69	0.44	3.15
97	203	0.079	0.2811	89.4	89.44	396.88	17.631	22.687	4.616	0.28	0.57	0.45	3.15
98	307	0.078	0.2793	89.2	89.34	396.95	17.516	22.547	6.915	0.41	0.55	0.47	3.16
99	153	0.080	0.2828	89.2	89.29	396.96	17.739	22.835	3.482	0.21	0.48	0.47	3.16
100	308	0.079	0.2811	89.2	89.24	396.92	17.627	22.691	6.988	0.42	0.36	0.47	3.17
101	213	0.080	0.2828	89.4	89.24	396.84	17.742	22.830	4.872	0.29	0.32	0.46	3.18
102	400	0.079	0.2811	89.3	89.25	396.67	17.629	22.689	9.084	0.55	0.38	0.47	3.19
103	141	0.079	0.2811	89.1	89.23	396.5	17.626	22.693	3.196	0.19	0.33	0.47	3.19
104	515	0.079	0.2811	89.1	89.23	396.33	17.626	22.693	11.698	0.70	0.43	0.47	3.20
105	54	0.079	0.2811	89.3	89.23	396.14	17.629	22.689	1.221	0.07	0.36	0.48	3.20
106	248	0.080	0.2828	89.1	89.23	395.94	17.737	22.837	5.665	0.34	0.37	0.48	3.21
107	425	0.080	0.2828	89.1	89.2	395.84	17.737	22.837	9.712	0.58	0.38	0.48	3.22
108	453	0.079	0.2811	89.1	89.19	395.9	17.626	22.693	10.281	0.62	0.46	0.48	3.23
109	161	0.078	0.2793	89.1	89.18	396.05	17.514	22.549	3.633	0.22	0.37	0.49	3.23
110	491	0.080	0.2828	89.1	89.17	396.28	17.737	22.837	11.217	0.67	0.49	0.50	3.24
111	252	0.077	0.2775	89.2	89.15	396.54	17.403	22.402	5.639	0.34	0.49	0.50	3.25
112	219	0.078	0.2793	89.3	89.15	396.91	17.517	22.545	4.945	0.30	0.43	0.50	3.25
113	229	0.079	0.2811	89.3	89.17	397.31	17.629	22.689	5.192	0.31	0.37	0.51	3.26
114	431	0.080	0.2828	89.3	89.19	397.72	17.740	22.832	9.838	0.59	0.44	0.51	3.27
115	303	0.079	0.2811	89.4	89.2	398.14	17.631	22.687	6.867	0.41	0.39	0.51	3.27
116	322	0.078	0.2793	89.2	89.21	398.55	17.516	22.547	7.258	0.44	0.41	0.52	3.28
117	306	0.081	0.2846	89.2	89.22	398.88	17.849	22.977	7.023	0.42	0.43	0.52	3.29
118	371	0.081	0.2846	89	89.21	399.06	17.846	22.981	8.529	0.51	0.47	0.52	3.30
119	278	0.078	0.2793	89.2	89.22	399.15	17.516	22.547	6.276	0.38	0.43	0.53	3.30
120	400	0.079	0.2811	89.1	89.22	399.18	17.626	22.693	9.073	0.54	0.46	0.53	3.31
121	108	0.081	0.2846	89	89.2	399.17	17.846	22.981	2.493	0.15	0.40	0.54	3.32
122	339	0.080	0.2828	89	89.17	399.06	17.735	22.839	7.736	0.46	0.41	0.55	3.32
123	45	0.079	0.2811	89	89.14	398.89	17.624	22.696	1.028	0.06	0.32	0.55	3.32
124	209	0.079	0.2811	89.2	89.13	398.62	17.627	22.691	4.738	0.28	0.30	0.55	3.33
125	307	0.081	0.2846	88.6	89.05	398.27	17.839	22.989	7.047	0.42	0.28	0.54	3.34
126	261	0.080	0.2828	88.8	89.01	397.85	17.732	22.843	5.956	0.36	0.32	0.54	3.34
127	296	0.078	0.2793	88.6	88.95	397.35	17.506	22.560	6.670	0.40	0.31	0.55	3.35
128	243	0.080	0.2828	88.8	88.93	396.79	17.732	22.843	5.540	0.33	0.36	0.55	3.35
129	32	0.079	0.2811	88.6	88.87	396.18	17.618	22.704	0.735	0.04	0.31	0.55	3.35
130	82	0.079	0.2811	88.5	88.81	395.51	17.616	22.706	1.869	0.11	0.25	0.56	3.36
131	201	0.082	0.2864	88.7	88.78	394.8	17.951	23.129	4.650	0.28	0.23	0.55	3.36
132	306	0.079	0.2811	88.7	88.75	394.05	17.619	22.702	6.952	0.42	0.24	0.55	3.37
133	188	0.081	0.2846	88.6	88.71	393.23	17.839	22.989	4.316	0.26	0.22	0.55	3.37
134	295	0.080	0.2828	88.5	88.64	392.38	17.727	22.849	6.729	0.40	0.29	0.56	3.38
135	33	0.081	0.2846	88.3	88.61	391.47	17.835	22.996	0.766	0.05	0.28	0.56	3.38
136	211	0.079	0.2811	88.4	88.57	390.46	17.615	22.708	4.795	0.29	0.28	0.57	3.38
137	-131	0.079	0.2811	87.9	88.5	389.36	17.607	22.718	-2.985	-0.18	0.16	0.57	3.38
138	39	0.080	0.2828	87.8	88.4	388.17	17.716	22.864	0.890	0.05	0.12	0.56	3.38
139		0.079	0.2811	88	88.34	386.87					0.05	0.55	
140		0.079	0.2811	87.6	88.25	385.49					0.05	0.54	
141		0.078	0.2793	87.6	88.14	384.01					-0.06	0.54	
142		0.079	0.2811	87.8	88.05	382.45					0.05	0.49	
143	351	0.079	0.2811	87.5	87.94	380.82	17.600	22.727	7.975	0.48	0.48	0.46	3.39
144	464	0.080	0.2828	87.3	87.82	379.15	17.708	22.874	10.605	0.64	0.56	0.44	3.40
145	580	0.079	0.2811	87.2	87.71	377.45	17.595	22.733	13.186	0.79	0.64	0.43	3.41
146	464	0.080	0.2828	87.2	87.59	375.77	17.706	22.876	10.625	0.64	0.64	0.41	3.43
147	983	0.078	0.2793	95.9	88.39	373.8	17.622	22.411	22.029	1.32	0.77	0.41	3.45
148	28366	0.078	0.2793	93.3	88.94	371.74	17.581	22.464	637.191	38.23	8.32	0.41	4.08
149	40902	0.078	0.2793	92.9	89.43	369.7	17.574	22.472	919.146	55.15	19.23	0.42	5.00
150	39495	0.078	0.2793	92.4	89.91	367.7	17.566	22.482	887.922	53.28	29.72	1.11	5.89
151	30359	0.078	0.2793	93.1	90.46	365.89	17.578	22.468	682.091	40.93	37.78	2.12	6.57
152	16619	0.078	0.2793	94.5	91.13	364.42	17.600	22.439	372.922	22.38	41.99	3.09	6.95
153	7572	0.079	0.2811	95.7	91.95	363.46	17.731	22.558	170.803	10.25	36.39	3.84	7.12
154	6702	0.078	0.2793	97.2	92.94	363.48	17.643	22.385	150.014	9.00	27.17	4.25	7.27
155	1493	0.078	0.2793	98.8	94.1	364.81	17.668	22.353	33.375	2.00	16.91	4.42	7.30
156	292	0.078	0.2793	100	95.38	367.23	17.687	22.329	6.514	0.39	8.80	4.58	7.31
157	98	0.077	0.2775	97.7	95.56	370.86	17.537	22.231	2.188	0.13	4.35	4.61	7.31
158	99	0.077	0.2775	95.8	95.81	375.1	17.507	22.269	2.213	0.13	2.33	4.61	7.31
159	256	0.079	0.2811	94.6	95.98	379.92	17.714	22.581	5.773	0.35	0.60	4.61	7.32
160	607	0.079	0.2811	94.1	96.15	385.04	17.706	22.591	13.706	0.82	0.36	4.60	7.33
161	504	0.079	0.2811	94.1	96.25	390.05	17.706	22.591	11.391	0.68	0.42	4.60	7.34
162	1004	0.080	0.2828	93.7	96.17	394.68	17.811	22.741	22.838	1.37	0.67	4.61	7.37
163	2550	0.079	0.2811	93.4	95.94	398.84	17.695	22.605	57.639	3.46	1.34	4.62	7.42
164	1651	0.078	0.2793	93.7	95.59	402.11	17.587	22.455	37.085	2.23	1.71	4.63	7.46
165	1706	0.079	0.2811	93.6	95.07	404.2	17.698	22.601	38.551	2.31	2.01	4.69	7.50
166	2744	0.076	0.2757	93.6	94.43	405.19	17.359	22.168	60.832	3.65	2.60	4.73	7.56
167	3319	0.079	0.2811	93.3	93.99	405.27	17.693	22.607	75.028	4.50	3.23	4.76	7.63
168	3311	0.078	0.2793	93.2	93.73	404.84	17.579	22.466	74.380	4.46	3.43	4.81	7.71
169	3156	0.078	0.2793	93.4	93.61	403.84	17.582	22.461	70.894	4.25	3.84	4.89	7.78
170	2848	0.078	0.2793	93	93.5	402.52	17.576	22.470	64.001	3.84	4.14	4.96	7.84
171	3058	0.077	0.2775	93.4	93.43	401.15	17.469	22.317	68.244	4.09	4.23	5.04	7.91
172	1335	0.079	0.2811	93.4	93.4	399.85	17.695	22.605	30.167	1.81	3.69	5.10	7.94

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173	692	0.078	0.2793	93.2	93.38	398.6	17.579	22.466	15.551	0.93	2.99	5.17	7.96
174	772	0.079	0.2811	93	93.31	397.33	17.688	22.613	17.467	1.05	2.35	5.19	7.98
175	887	0.077	0.2775	93.1	93.26	395.98	17.465	22.323	19.803	1.19	1.81	5.20	8.00
176	643	0.077	0.2775	92.9	93.19	394.62	17.461	22.327	14.346	0.86	1.17	5.21	8.01
177	569	0.080	0.2828	93	93.16	393.26	17.800	22.756	12.944	0.78	0.96	5.23	8.02
178	431	0.077	0.2775	92.8	93.12	391.92	17.460	22.329	9.622	0.58	0.89	5.24	8.03
179	1223	0.078	0.2793	92.8	93.06	390.61	17.573	22.474	27.496	1.65	1.01	5.24	8.06
180	665	0.078	0.2793	92.6	93.02	389.34	17.570	22.478	14.955	0.90	0.95	5.24	8.07
181	1103	0.078	0.2793	92.7	92.95	388.09	17.571	22.476	24.792	1.49	1.08	5.27	8.10
182	1040	0.078	0.2793	92.5	92.86	386.85	17.568	22.480	23.377	1.40	1.20	5.28	8.12
183	1594	0.079	0.2811	92.4	92.78	385.59	17.679	22.625	36.075	2.16	1.52	5.31	8.16
184	1144	0.079	0.2811	92.3	92.71	384.32	17.677	22.628	25.884	1.55	1.50	5.33	8.18
185	1460	0.079	0.2811	92.2	92.62	383.11	17.676	22.630	33.038	1.98	1.72	5.36	8.22
186	1281	0.080	0.2828	92.4	92.57	382.03	17.790	22.768	29.164	1.75	1.77	5.38	8.25
187	1024	0.078	0.2793	92.5	92.52	381.11	17.568	22.480	23.022	1.38	1.77	5.41	8.27
188	739	0.080	0.2828	92.3	92.47	380.34	17.789	22.770	16.830	1.01	1.54	5.44	8.29
189	602	0.079	0.2811	92.3	92.42	379.72	17.677	22.628	13.617	0.82	1.39	5.46	8.30
190	197	0.078	0.2793	92.6	92.42	379.22	17.570	22.478	4.424	0.27	1.04	5.48	8.30
191	63	0.078	0.2793	92.3	92.38	378.85	17.565	22.484	1.405	0.08	0.71	5.49	8.31
192	90	0.080	0.2828	92.7	92.4	378.63	17.795	22.762	2.058	0.12	0.46	5.48	8.31
193	86	0.076	0.2757	92.8	92.44	378.58	17.346	22.184	1.911	0.11	0.28	5.48	8.31
194	-67	0.078	0.2793	92.5	92.46	378.69	17.568	22.480	-1.500	-0.09	0.10	5.48	8.31
195	18	0.078	0.2793	92.6	92.5	378.92	17.570	22.478	0.396	0.02	0.05	5.48	8.31
196	-8	0.079	0.2811	92.4	92.5	379.25	17.679	22.625	-0.181	-0.01	0.03	5.47	8.31
197	87	0.078	0.2793	92.8	92.53	379.65	17.573	22.474	1.948	0.12	0.03	5.47	8.31
198	-39	0.078	0.2793	92.7	92.57	380.09	17.571	22.476	-0.875	-0.05	0.00	5.47	8.31
199	-84	0.079	0.2811	92.9	92.63	380.58	17.687	22.615	-1.897	-0.11	-0.01	5.38	8.31
200	-74	0.077	0.2775	92.7	92.64	381.13	17.458	22.331	-1.644	-0.10	-0.03	5.28	8.31
201	-50	0.078	0.2793	93	92.71	381.78	17.576	22.470	-1.121	-0.07	-0.04	5.18	8.31
202	57	0.079	0.2811	92.6	92.7	382.52	17.682	22.621	1.282	0.08	-0.05	5.09	8.31
203	90	0.077	0.2775	93	92.72	383.25	17.463	22.325	2.009	0.12	-0.02	5.08	8.31
204	46	0.080	0.2828	92.8	92.75	384.01	17.797	22.760	1.051	0.06	0.02	5.07	8.31
205	98	0.079	0.2811	92.9	92.78	384.75	17.687	22.615	2.222	0.13	0.07	5.06	8.31
206	86	0.079	0.2811	93.1	92.85	385.48	17.690	22.611	1.941	0.12	0.10	5.05	8.31
207	-8	0.080	0.2828	93	92.87	386.16	17.800	22.756	-0.178	-0.01	0.08	5.03	8.31
208	66	0.080	0.2828	92.7	92.87	386.82	17.795	22.762	1.493	0.09	0.08	4.37	8.31
209	81	0.079	0.2811	92.8	92.86	387.47	17.685	22.617	1.831	0.11	0.09	3.42	8.32
210	-8	0.078	0.2793	92.8	92.87	388.07	17.573	22.474	-0.177	-0.01	0.06	2.51	8.32
211	50	0.079	0.2811	93	92.87	388.61	17.688	22.613	1.123	0.07	0.05	1.80	8.32
212	72	0.080	0.2828	92.9	92.9	389.1	17.798	22.758	1.631	0.10	0.07	1.42	8.32
213	112	0.078	0.2793	92.8	92.88	389.6	17.573	22.474	2.517	0.15	0.08	1.24	8.32
214	207	0.079	0.2811	93.1	92.91	390.07	17.690	22.611	4.683	0.28	0.12	1.09	8.33
215	211	0.077	0.2775	93.1	92.93	390.49	17.465	22.323	4.708	0.28	0.18	1.06	8.33
216	138	0.077	0.2775	93	92.92	390.86	17.463	22.325	3.070	0.18	0.20	1.05	8.33
217	168	0.079	0.2811	93.1	92.93	391.19	17.690	22.611	3.792	0.23	0.23	1.06	8.34
218	68	0.079	0.2811	92.8	92.94	391.43	17.685	22.617	1.528	0.09	0.21	1.06	8.34
219	7	0.077	0.2775	92.7	92.93	391.55	17.458	22.331	0.149	0.01	0.16	1.06	8.34
220	111	0.078	0.2793	92.8	92.93	391.63	17.573	22.474	2.488	0.15	0.13	1.04	8.34
221	-22	0.079	0.2811	92.7	92.9	391.65	17.684	22.619	-0.505	-0.03	0.09	1.03	8.34
222	9	0.077	0.2775	92.6	92.87	391.55	17.457	22.333	0.198	0.01	0.05	1.01	8.34
223	-17	0.078	0.2793	92.7	92.86	391.4	17.571	22.476	-0.374	-0.02	0.02	0.95	8.34
224	70	0.077	0.2775	92.5	92.8	391.14	17.455	22.335	1.569	0.09	0.04	0.91	8.34
225	-110	0.078	0.2793	92.6	92.75	390.82	17.570	22.478	-2.471	-0.15	-0.02	0.87	8.34
226	-39	0.081	0.2846	92.8	92.73	390.46	17.908	22.902	-0.896	-0.05	-0.02	0.81	8.34
227	-3	0.078	0.2793	92.5	92.67	390.03	17.568	22.480	-0.071	0.00	-0.03	0.73	8.34
228	91	0.078	0.2793	92.6	92.65	389.59	17.570	22.478	2.040	0.12	0.00	0.65	8.34
229	9	0.080	0.2828	92.3	92.61	389.15	17.789	22.770	0.203	0.01	-0.01	0.58	8.34
230	-12	0.078	0.2793	92.3	92.56	388.64	17.565	22.484	-0.262	-0.02	0.01	0.52	8.34
231	71	0.077	0.2775	92.5	92.54	388.09	17.455	22.335	1.595	0.10	0.04	0.44	8.34
232	36	0.079	0.2811	92.1	92.49	387.56	17.674	22.632	0.814	0.05	0.05	0.41	8.34
233	68	0.079	0.2811	92	92.42	387	17.672	22.634	1.544	0.09	0.05	0.40	8.35
234	109	0.078	0.2793	91.8	92.35	386.46	17.557	22.494	2.445	0.15	0.07	0.38	8.35
235	63	0.078	0.2793	92	92.29	386.01	17.560	22.490	1.420	0.09	0.09	0.36	8.35
236	74	0.079	0.2811	92.1	92.22	385.6	17.674	22.632	1.681	0.10	0.09	0.35	8.35
237	54	0.080	0.2828	92	92.17	385.27	17.784	22.777	1.220	0.07	0.10	0.34	8.35
238	-85	0.079	0.2811	91.9	92.1	384.99	17.671	22.636	-1.934	-0.12	0.06	0.33	8.35
239	144	0.080	0.2828	91.7	92.04	384.73	17.779	22.783	3.280	0.20	0.07	0.30	8.35
240	105	0.079	0.2811	91.8	91.99	384.53	17.669	22.638	2.369	0.14	0.08	0.29	8.36
241	156	0.079	0.2811	91.6	91.9	384.33	17.666	22.642	3.533	0.21	0.10	0.26	8.36
242	114	0.078	0.2793	91.8	91.87	384.15	17.557	22.494	2.560	0.15	0.12	0.24	8.36
243	75	0.079	0.2811	91.6	91.83	383.93	17.666	22.642	1.691	0.10	0.16	0.21	8.36
244	19	0.078	0.2793	91.5	91.8	383.7	17.552	22.500	0.432	0.03	0.13	0.18	8.36
245	19	0.079	0.2811	91.5	91.75	383.38	17.664	22.644	0.422	0.03	0.10	0.15	8.36
246	-52	0.078	0.2793	91.3	91.67	383.03	17.549	22.504	-1.169	-0.07	0.05	0.12	8.36
247	-129	0.081	0.2846	91.2	91.59	382.65	17.882	22.935	-2.953	-0.18	-0.02	0.10	8.36
248	-8	0.079	0.2811	91.3	91.53	382.28	17.661	22.648	-0.176	-0.01	-0.04	0.08	8.36
249	-32	0.080	0.2828	91.2	91.48	381.94	17.771	22.793	-0.735	-0.04	-0.06	0.06	8.36
250	42	0.079	0.2811	91.4	91.44	381.64	17.663	22.646	0.943	0.06	-0.05	0.06	8.36
251	182	0.078	0.2793	91.3	91.41	381.38	17.549	22.504	4.089	0.25	0.01	0.06	8.36
252	12	0.080	0.2828	90.9	91.32	381.14	17.766	22.799	0.284	0.02	0.05	0.05	8.37
253	8	0.077	0.2775	91	91.26	380.97	17.431	22.366	0.183	0.01	0.06	0.06	8.37
254	27	0.080	0.2828	91.3	91.24	380.88	17.773	22.791	0.607	0.04	0.07	0.06	8.37
255	39	0.078	0.2793	91.1	91.2	380.88	17.546	22.508	0.888	0.05	0.07	0.06	8.37
256	2	0.079	0.2811	90.9	91.16	380.93	17.655	22.656	0.040	0.00	0.02	0.06	8.37
257	54	0.079	0.2811	90.7	91.11	381.02	17.651	22.660	1.233	0.07	0.04	0.06	8.37
258	-37	0.079	0.2811	90.9	91.07	381.16	17.655	22.656	-0.830	-0.05	0.02	0.06	8.37
259	-81	0.080	0.2828	90.8	91.03	381.31	17.764	22.801	-1.842	-0.11	-0.01	0.06	8.37
260	55	0.079	0.2811	90.7	90.96	381.42	17.651	22.660	1.235	0.07	0.00	0.06	8.37

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261	-190	0.079	0.2811	91	90.93	381.53	17.656	22.654	-4.299	-0.26	-0.05	0.06	8.36
262	-1	0.080	0.2828	90.9	90.93	381.63	17.766	22.799	-0.029	0.00	-0.07	0.06	8.36
263	-596	0.079	0.2811	90.9	90.92	381.7	17.655	22.656	-13.512	-0.81	-0.22	0.06	8.35
264	-96	0.081	0.2846	91	90.89	381.75	17.878	22.939	-2.202	-0.13	-0.23	0.05	8.35
265	172	0.080	0.2828	90.7	90.85	381.84	17.763	22.803	3.930	0.24	-0.19	0.04	8.35
266	20	0.080	0.2828	90.7	90.83	382	17.763	22.803	0.461	0.03	-0.14	0.03	8.35
267	151	0.080	0.2828	90.7	90.83	382.2	17.763	22.803	3.436	0.21	-0.09	0.04	8.35
268	73	0.079	0.2811	90.6	90.8	382.3	17.650	22.662	1.657	0.10	0.09	0.04	8.36
269	61	0.079	0.2811	90.8	90.8	382.26	17.653	22.658	1.376	0.08	0.13	0.04	8.36
270	228	0.079	0.2811	90.6	90.79	382.12	17.650	22.662	5.172	0.31	0.15	0.04	8.36
271	-41	0.079	0.2811	90.2	90.71	381.88	17.643	22.671	-0.926	-0.06	0.13	0.04	8.36
272	74	0.079	0.2811	90.6	90.68	381.51	17.650	22.662	1.667	0.10	0.11	0.04	8.36
273	144	0.077	0.2775	90.4	90.63	381.07	17.422	22.378	3.232	0.19	0.13	0.04	8.37
274	188	0.080	0.2828	90.4	90.57	380.52	17.758	22.810	4.296	0.26	0.16	0.04	8.37
275	11	0.079	0.2811	90.3	90.53	379.82	17.645	22.669	0.243	0.01	0.10	0.04	8.37
276	265	0.077	0.2775	89.8	90.44	378.95	17.412	22.390	5.935	0.36	0.18	0.04	8.38
277	77	0.078	0.2793	89.8	90.35	377.95	17.525	22.535	1.741	0.10	0.19	0.03	8.38
278	-23	0.080	0.2828	90	90.29	376.95	17.752	22.818	-0.529	-0.03	0.14	0.04	8.38
279	77	0.081	0.2846	90	90.21	376.02	17.862	22.960	1.773	0.11	0.11	0.04	8.38
280	105	0.079	0.2811	89.9	90.14	375.12	17.639	22.677	2.392	0.14	0.14	0.04	8.38
281	51	0.077	0.2775	89.7	90.09	374.27	17.411	22.392	1.131	0.07	0.08	0.04	8.38
282	100	0.077	0.2775	89.8	90.01	373.5	17.412	22.390	2.245	0.13	0.08	0.04	8.39
283	-58	0.079	0.2811	89.7	89.94	372.76	17.635	22.681	-1.324	-0.08	0.07	0.04	8.38
284	142	0.081	0.2846	89.7	89.87	372.07	17.857	22.966	3.269	0.20	0.09	0.04	8.39
285	35	0.080	0.2828	89.4	89.78	371.41	17.742	22.830	0.790	0.05	0.07	0.05	8.39
286	-71	0.078	0.2793	89.6	89.76	370.77	17.522	22.539	-1.606	-0.10	0.04	0.05	8.39
287	-29	0.079	0.2811	89.4	89.72	370.21	17.631	22.687	-0.649	-0.04	0.01	0.05	8.39
288	265	0.079	0.2811	89.5	89.67	369.67	17.632	22.685	6.004	0.36	0.09	0.05	8.39
289	-11	0.079	0.2811	89.6	89.63	369.13	17.634	22.683	-0.241	-0.01	0.05	0.05	8.39
290	129	0.079	0.2811	89.4	89.58	368.56	17.631	22.687	2.929	0.18	0.08	0.05	8.39
291	16	0.080	0.2828	89.4	89.55	367.94	17.742	22.830	0.357	0.02	0.10	0.05	8.40
292	-42	0.079	0.2811	89.1	89.48	367.28	17.626	22.693	-0.946	-0.06	0.10	0.05	8.39
293	-72	0.079	0.2811	89.4	89.45	366.58	17.631	22.687	-1.636	-0.10	0.01	0.05	8.39
294	-40	0.078	0.2793	88.9	89.37	365.84	17.511	22.553	-0.908	-0.05	0.00	0.05	8.39
295	-83	0.079	0.2811	88.8	89.31	365.11	17.621	22.700	-1.883	-0.11	-0.06	0.04	8.39
296	-28	0.078	0.2793	89.1	89.26	364.38	17.514	22.549	-0.637	-0.04	-0.07	0.04	8.39
297	11	0.080	0.2828	89	89.22	363.6	17.735	22.839	0.240	0.01	-0.06	0.04	8.39
298	10	0.080	0.2828	89	89.17	362.77	17.735	22.839	0.218	0.01	-0.04	0.04	8.39
299	-39	0.079	0.2811	88.8	89.09	361.83	17.621	22.700	-0.893	-0.05	-0.04	0.04	8.39
300	-155	0.080	0.2828	88.5	89	360.84	17.727	22.849	-3.549	-0.21	-0.06	0.03	8.39
301	-54	0.080	0.2828	88.5	88.91	359.8	17.727	22.849	-1.243	-0.07	-0.06	0.03	8.38
302	97	0.079	0.2811	88.4	88.84	358.66	17.615	22.708	2.207	0.13	-0.04	0.02	8.39
303	20	0.079	0.2811	88.6	88.76	357.46	17.618	22.704	0.450	0.03	-0.04	0.02	8.39
304	-41	0.079	0.2811	88.2	88.69	356.18	17.611	22.712	-0.937	-0.06	-0.04	0.02	8.39
305	41	0.077	0.2775	88.1	88.62	354.8	17.385	22.425	0.916	0.05	0.02	0.02	8.39
306	-23	0.078	0.2793	87.8	88.49	353.34	17.493	22.576	-0.515	-0.03	0.03	0.02	8.39
307	-84	0.077	0.2775	88.1	88.4	351.76	17.385	22.425	-1.893	-0.11	-0.02	0.03	8.38
308	105	0.078	0.2793	87.8	88.28	350.13	17.493	22.576	2.382	0.14	0.00	0.03	8.39
309	-78	0.078	0.2793	87.4	88.14	348.52	17.487	22.584	-1.755	-0.11	-0.01	0.03	8.38
310	-50	0.078	0.2793	87.7	88.06	346.93	17.492	22.578	-1.125	-0.07	-0.03	0.03	8.38
311	68	0.078	0.2793	87.3	87.94	345.36	17.485	22.586	1.525	0.09	-0.01	0.02	8.39
312	-199	0.079	0.2811	87.2	87.82	343.81	17.595	22.733	-4.523	-0.27	-0.04	0.02	8.38
313	89	0.081	0.2846	87.1	87.67	342.26	17.815	23.021	2.057	0.12	-0.05	0.02	8.38
314	125	0.079	0.2811	87	87.55	340.74	17.592	22.737	2.851	0.17	0.01	0.02	8.39
315	-136	0.079	0.2811	86.7	87.41	339.22	17.587	22.743	-3.094	-0.19	-0.01	0.02	8.38
316	58	0.079	0.2811	86.7	87.3	337.7	17.587	22.743	1.317	0.08	-0.02	0.02	8.38
317	146	0.079	0.2811	86.8	87.17	336.22	17.589	22.741	3.331	0.20	0.08	0.02	8.39
318	-91	0.078	0.2793	86.5	87.04	334.75	17.472	22.603	-2.061	-0.12	0.03	0.02	8.39
319	-14	0.079	0.2811	86.5	86.95	333.32	17.584	22.747	-0.308	-0.02	-0.01	0.02	8.38
320	-21	0.079	0.2811	86.6	86.84	331.91	17.586	22.745	-0.471	-0.03	0.02	0.02	8.38
321	0	0.077	0.2775	86.2	86.73	330.54	17.355	22.464	-0.006	0.00	0.01	0.02	8.38
322	-46	0.079	0.2811	86.4	86.65	329.23	17.582	22.750	-1.042	-0.06	-0.05	0.02	8.38
323	117	0.077	0.2775	86.4	86.58	327.96	17.358	22.460	2.628	0.16	0.01	0.04	8.39
324	28	0.079	0.2811	86.1	86.49	326.73	17.578	22.756	0.627	0.04	0.02	0.04	8.39
325	-64	0.078	0.2793	86.1	86.43	325.56	17.466	22.611	-1.453	-0.09	0.01	0.04	8.39
326	-64	0.078	0.2793	86.3	86.39	324.42	17.469	22.607	-1.437	-0.09	-0.01	0.04	8.38
327	-40	0.079	0.2811	86.2	86.33	323.32	17.579	22.754	-0.916	-0.05	-0.01	0.03	8.38
328	-2	0.079	0.2811	86	86.28	322.26	17.576	22.758	-0.034	0.00	-0.04	0.03	8.38
329	23	0.078	0.2793	86.2	86.25	321.23	17.468	22.609	0.514	0.03	-0.04	0.03	8.38
330	-1	0.079	0.2811	85.9	86.18	320.23	17.574	22.760	-0.015	0.00	-0.02	0.02	8.38
331	142	0.079	0.2811	85.5	86.11	319.23	17.568	22.768	3.227	0.19	0.03	0.02	8.39
332	-63	0.078	0.2793	85.9	86.06	318.28	17.463	22.615	-1.416	-0.08	0.03	0.02	8.39
333	-55	0.078	0.2793	85.6	85.98	317.38	17.458	22.622	-1.243	-0.07	0.01	0.02	8.38
334	94	0.078	0.2793	85.8	85.95	316.51	17.461	22.618	2.128	0.13	0.03	0.01	8.39
335	246	0.079	0.2811	85.7	85.91	315.67	17.571	22.764	5.604	0.34	0.10	0.01	8.39
336	-13	0.078	0.2793	85.6	85.84	314.86	17.458	22.622	-0.294	-0.02	0.06	0.01	8.39
337	-82	0.080	0.2828	85.6	85.78	314.1	17.680	22.910	-1.871	-0.11	0.05	0.01	8.39
338	368	0.078	0.2793	85.8	85.76	313.37	17.461	22.618	8.321	0.50	0.17	0.01	8.40
339	25	0.078	0.2793	85.7	85.71	312.66	17.460	22.620	0.564	0.03	0.15	0.01	8.40
340	-50	0.078	0.2793	85.6	85.68	312	17.458	22.622	-1.131	-0.07	0.07	0.02	8.40
341	-54	0.079	0.2811	85.7	85.7	311.38	17.571	22.764	-1.232	-0.07	0.06	0.02	8.40
342	-75	0.078	0.2793	85.6	85.67	310.77	17.458	22.622	-1.696	-0.10	0.06	0.01	8.39
343	8	0.079	0.2811	85.7	85.68	310.18	17.571	22.764	0.187	0.01	-0.04	0.01	8.39
344	54	0.079	0.2811	85.6	85.66	309.61	17.570	22.766	1.230	0.07	-0.03	0.01	8.40
345	-88	0.079	0.2811	85.4	85.63	309.04	17.566	22.770	-2.003	-0.12	-0.04	0.01	8.39
346	34	0.078	0.2793	85.5	85.62	308.47	17.456	22.624	0.779	0.05	-0.02	0.01	8.39
347	-47	0.078	0.2793	85.4	85.6	307.9	17.455	22.626	-1.072	-0.06	-0.01	0.01	8.39
348	-28	0.079	0.2811	85.5	85.57	307.33	17.568	22.768	-0.640	-0.04	-0.02	0.00	8.39

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349	199	0.079	0.2811	85.4	85.54	306.78	17.566	22.770	4.541	0.27	0.02	0.00	8.40
350	22	0.079	0.2811	85.3	85.51	306.21	17.565	22.772	0.492	0.03	0.05	0.00	8.40
351	-71	0.078	0.2793	85.3	85.47	305.64	17.453	22.628	-1.608	-0.10	0.02	0.00	8.40
352	-163	0.078	0.2793	85.4	85.45	305.07	17.455	22.626	-3.680	-0.22	-0.01	0.00	8.39
353	-56	0.078	0.2793	85.3	85.41	304.48	17.453	22.628	-1.258	-0.08	-0.02	0.00	8.39
354	-65	0.079	0.2811	85	85.35	303.88	17.560	22.779	-1.489	-0.09	-0.09	0.00	8.39
355	-24	0.078	0.2793	84.9	85.3	303.27	17.447	22.636	-0.543	-0.03	-0.10	0.00	8.39
356	56	0.079	0.2811	84.8	85.23	302.67	17.557	22.783	1.285	0.08	-0.07	0.00	8.39
357	72	0.079	0.2811	85	85.19	302.04	17.560	22.779	1.643	0.10	0.00	0.00	8.39
358	-251	0.079	0.2811	84.7	85.11	301.42	17.555	22.785	-5.709	-0.34	-0.06	0.00	8.39
359	-79	0.078	0.2793	85	85.07	300.75	17.448	22.634	-1.785	-0.11	-0.06	0.00	8.38
360	-96	0.078	0.2793	84.9	85.03	300.07	17.447	22.636	-2.182	-0.13	-0.08	0.00	8.38
361	20	0.078	0.2793	84.7	84.97	299.39	17.444	22.640	0.461	0.03	-0.09	0.00	8.38
362	-2	0.077	0.2775	84.8	84.91	298.67	17.333	22.493	-0.048	0.00	-0.11	0.00	8.38
363	-36	0.078	0.2793	84.8	84.86	297.94	17.445	22.638	-0.820	-0.05	-0.05	0.00	8.38
364	33	0.078	0.2793	84.8	84.84	297.19	17.445	22.638	0.749	0.04	-0.02	0.00	8.38
365	81	0.078	0.2793	84.6	84.81	296.42	17.442	22.642	1.828	0.11	0.03	0.00	8.38
366	-205	0.078	0.2793	84.6	84.79	295.64	17.442	22.642	-4.635	-0.28	-0.04	0.00	8.38
367	-64	0.077	0.2775	84.6	84.75	294.86	17.330	22.497	-1.431	-0.09	-0.05	0.00	8.38
368	-84	0.079	0.2811	84.6	84.74	294.04	17.553	22.787	-1.914	-0.11	-0.06	-0.01	8.38
369	134	0.079	0.2811	84.5	84.69	293.21	17.552	22.789	3.045	0.18	-0.04	-0.01	8.38
370	100	0.079	0.2811	84.3	84.63	292.37	17.549	22.793	2.270	0.14	-0.03	-0.01	8.38
371	-117	0.079	0.2811	84.4	84.6	291.51	17.550	22.791	-2.662	-0.16	-0.01	-0.01	8.38
372	-4	0.080	0.2828	84.3	84.55	290.65	17.659	22.937	-0.092	-0.01	0.01	0.00	8.38
373	-7	0.078	0.2793	84.3	84.5	289.78	17.437	22.649	-0.157	-0.01	0.03	0.00	8.38
374	-40	0.078	0.2793	84.1	84.43	288.91	17.434	22.653	-0.897	-0.05	-0.02	-0.01	8.38
375	9	0.079	0.2811	84.3	84.4	288.04	17.549	22.793	0.198	0.01	-0.04	0.00	8.38
376	16	0.079	0.2811	84.3	84.37	287.16	17.549	22.793	0.376	0.02	-0.01	-0.01	8.38
377	-127	0.079	0.2811	84.2	84.33	286.27	17.547	22.796	-2.899	-0.17	-0.04	-0.01	8.38
378	-94	0.078	0.2793	84.1	84.28	285.37	17.434	22.653	-2.132	-0.13	-0.06	-0.01	8.37
379	-89	0.077	0.2775	84.3	84.26	284.49	17.325	22.503	-2.002	-0.12	-0.08	-0.01	8.37
380	-130	0.076	0.2757	84.3	84.26	283.61	17.212	22.356	-2.911	-0.17	-0.11	-0.01	8.37
381	-90	0.078	0.2793	84.1	84.23	282.71	17.434	22.653	-2.037	-0.12	-0.14	-0.01	8.37
382	-24	0.078	0.2793	84.1	84.21	281.82	17.434	22.653	-0.553	-0.03	-0.12	-0.02	8.37
383	-120	0.078	0.2793	84.1	84.19	280.95	17.434	22.653	-2.727	-0.16	-0.12	-0.02	8.36
384	105	0.078	0.2793	83.8	84.16	280.07	17.429	22.659	2.384	0.14	-0.07	-0.02	8.37
385	-164	0.079	0.2811	83.8	84.11	279.19	17.541	22.804	-3.733	-0.22	-0.08	-0.02	8.36
386	-14	0.079	0.2811	83.8	84.06	278.33	17.541	22.804	-0.308	-0.02	-0.06	-0.02	8.36
387	23	0.080	0.2828	83.7	84.01	277.47	17.650	22.950	0.525	0.03	-0.05	-0.02	8.36
388	-155	0.078	0.2793	83.6	83.96	276.63	17.426	22.663	-3.503	-0.21	-0.06	-0.02	8.36
389	4	0.079	0.2811	83.7	83.9	275.79	17.539	22.806	0.091	0.01	-0.08	-0.02	8.36
390	-121	0.079	0.2811	83.6	83.83	274.96	17.537	22.808	-2.768	-0.17	-0.07	-0.03	8.36
391	-28	0.078	0.2793	83.6	83.78	274.15	17.426	22.663	-0.627	-0.04	-0.08	-0.03	8.36
392	-25	0.078	0.2793	83.6	83.73	273.36	17.426	22.663	-0.565	-0.03	-0.09	-0.03	8.35
393	-103	0.081	0.2846	83.6	83.68	272.56	17.758	23.095	-2.387	-0.14	-0.08	-0.03	8.35
394	-236	0.078	0.2793	83.5	83.65	271.77	17.424	22.665	-5.349	-0.32	-0.14	-0.03	8.35
395	-76	0.079	0.2811	83.3	83.6	271	17.532	22.814	-1.736	-0.10	-0.13	-0.04	8.35
396	14	0.080	0.2828	83.2	83.54	270.23	17.641	22.960	0.321	0.02	-0.12	-0.05	8.35
397	105	0.078	0.2793	83.4	83.51	269.47	17.423	22.667	2.371	0.14	-0.08	-0.05	8.35
398	21	0.079	0.2811	83.4	83.49	268.72	17.534	22.812	0.476	0.03	-0.05	-0.05	8.35
399	-111	0.078	0.2793	83.2	83.44	267.98	17.420	22.672	-2.518	-0.15	-0.01	-0.05	8.35
400	-64	0.078	0.2793	83.4	83.42	267.25	17.423	22.667	-1.451	-0.09	-0.01	-0.05	8.34
401	-98	0.078	0.2793	83.2	83.38	266.53	17.420	22.672	-2.215	-0.13	-0.04	-0.05	8.34
402	-75	0.078	0.2793	83.4	83.36	265.79	17.423	22.667	-1.698	-0.10	-0.09	-0.05	8.34
403	-97	0.078	0.2793	83.1	83.31	265.07	17.418	22.674	-2.198	-0.13	-0.12	-0.05	8.34
404	-54	0.079	0.2811	83.2	83.28	264.37	17.531	22.817	-1.223	-0.07	-0.11	-0.06	8.34
405	-35	0.080	0.2828	83.2	83.27	263.68	17.641	22.960	-0.799	-0.05	-0.10	-0.06	8.34
406	-56	0.080	0.2828	83.2	83.27	262.98	17.641	22.960	-1.295	-0.08	-0.09	-0.06	8.34
407	-86	0.078	0.2793	83.2	83.25	262.28	17.420	22.672	-1.943	-0.12	-0.09	-0.06	8.33
408	-314	0.078	0.2793	83.2	83.23	261.59	17.420	22.672	-7.119	-0.43	-0.15	-0.06	8.33
409	21	0.080	0.2828	83.1	83.22	260.9	17.640	22.963	0.481	0.03	-0.13	-0.07	8.33
410	-24	0.079	0.2811	82.9	83.17	260.21	17.526	22.823	-0.557	-0.03	-0.13	-0.07	8.33
411	123	0.079	0.2811	83	83.15	259.53	17.528	22.821	2.805	0.17	-0.08	-0.07	8.33
412	49	0.079	0.2811	83.1	83.12	258.86	17.529	22.819	1.120	0.07	-0.04	-0.07	8.33
413	-36	0.078	0.2793	83	83.11	258.18	17.416	22.676	-0.810	-0.05	0.04	-0.06	8.33
414	-116	0.078	0.2793	82.8	83.07	257.5	17.413	22.680	-2.632	-0.16	0.00	-0.06	8.33
415	-8	0.080	0.2828	82.9	83.04	256.81	17.637	22.967	-0.191	-0.01	0.00	-0.06	8.33
416	-19	0.078	0.2793	83	83.02	256.13	17.416	22.676	-0.441	-0.03	-0.04	-0.07	8.33
417	-138	0.078	0.2793	83	83	255.46	17.416	22.676	-3.132	-0.19	-0.09	-0.07	8.32
418	113	0.079	0.2811	82.8	82.96	254.79	17.524	22.825	2.579	0.15	-0.05	-0.06	8.33
419	12	0.080	0.2828	82.8	82.93	254.12	17.635	22.969	0.281	0.02	-0.01	-0.06	8.33
420	-105	0.080	0.2828	82.6	82.9	253.45	17.632	22.973	-2.414	-0.14	-0.04	-0.06	8.32
421	45	0.078	0.2793	82.6	82.86	252.77	17.410	22.684	1.024	0.06	-0.02	-0.06	8.32
422	-130	0.079	0.2811	82.5	82.8	252.11	17.520	22.831	-2.969	-0.18	-0.02	-0.06	8.32
423	354	0.077	0.2775	82.4	82.74	251.46	17.295	22.542	7.987	0.48	0.05	-0.06	8.33
424	-261	0.079	0.2811	82.3	82.69	250.81	17.516	22.835	-5.970	-0.36	-0.03	-0.06	8.32
425	-23	0.079	0.2811	82.3	82.63	250.16	17.516	22.835	-0.525	-0.03	-0.01	-0.06	8.32
426	-139	0.080	0.2828	82.2	82.55	249.5	17.625	22.982	-3.190	-0.19	-0.06	-0.06	8.32
427	-88	0.077	0.2775	82.2	82.47	248.86	17.292	22.547	-1.974	-0.12	-0.04	-0.06	8.32
428	-98	0.079	0.2811	82.1	82.4	248.21	17.513	22.840	-2.235	-0.13	-0.17	-0.06	8.32
429	-63	0.080	0.2828	82.4	82.36	247.58	17.628	22.977	-1.449	-0.09	-0.11	-0.06	8.31
430	-102	0.078	0.2793	82.3	82.33	246.95	17.405	22.690	-2.320	-0.14	-0.13	-0.07	8.31
431	-43	0.079	0.2811	82.4	82.31	246.32	17.518	22.833	-0.979	-0.06	-0.11	-0.07	8.31
432	434	0.079	0.2811	82.4	82.3	245.68	17.518	22.833	9.918	0.60	0.04	-0.07	8.32
433	-267	0.078	0.2793	82.4	82.3	245.04	17.407	22.688	-6.060	-0.36	-0.01	-0.07	8.31
434	-68	0.079	0.2811	82.3	82.3	244.41	17.516	22.835	-1.554	-0.09	-0.01	-0.06	8.31
435	-229	0.077	0.2775	82.4	82.31	243.78	17.295	22.542	-5.163	-0.31	-0.05	-0.07	8.31
436	-36	0.078	0.2793	82.2	82.31	243.17	17.404	22.693	-0.820	-0.05	-0.04	-0.07	8.31

Run 1 TEOM Data

437	50	0.079	0.2811	82.3	82.32	242.56	17.516	22.835	1.146	0.07	-0.15	-0.07	8.31
438	229	0.078	0.2793	82.3	82.34	241.96	17.405	22.690	5.196	0.31	-0.01	-0.07	8.31
439	-163	0.078	0.2793	82.1	82.31	241.36	17.402	22.695	-3.696	-0.22	-0.04	-0.07	8.31
440	-66	0.078	0.2793	82.2	82.3	240.76	17.404	22.693	-1.498	-0.09	0.00	-0.06	8.31
441	0	0.078	0.2793	82	82.26	240.17	17.400	22.697	-0.009	0.00	0.01	-0.06	8.31
442	-96	0.079	0.2811	82	82.22	239.58	17.512	22.842	-2.197	-0.13	-0.03	-0.06	8.31
443	-60	0.079	0.2811	82	82.18	238.99	17.512	22.842	-1.368	-0.08	-0.11	-0.06	8.30
444	-24	0.079	0.2811	82	82.15	238.39	17.512	22.842	-0.540	-0.03	-0.07	-0.06	8.30
445	214	0.077	0.2775	82	82.11	237.81	17.288	22.551	4.829	0.29	0.01	-0.06	8.31
446	-90	0.079	0.2811	82	82.09	237.22	17.512	22.842	-2.047	-0.12	-0.02	-0.06	8.31
447	-39	0.079	0.2811	82	82.06	236.62	17.512	22.842	-0.891	-0.05	0.00	-0.06	8.31
448	-70	0.078	0.2793	81.9	82.02	236	17.399	22.699	-1.590	-0.10	0.00	-0.05	8.30

TEST RESULTS - ASTM E2780 / ASTM E2515

Client: IHP

Model: Montecito-C

Run #: 4

Job #: 25-416

Tracking #: 223

Technician: AK

Date: 5/30/2025

Total Fuel Burned (kg-dry) 14.67

	Ambient Sample	Sample Train A	Sample Train B	1st Hour Filter
Total Sample Volume (ft ³)	110.580	70.039	72.104	-
Average Gas Velocity in Dilution Tunnel (ft/sec)	17.6			
Average Gas Flow Rate in Dilution Tunnel (dscf/hr)	47071.9			
Average Gas Meter Temperature (°F)	73.7	87.0	87.5	-
Total Sample Volume (dscf)	111.168	68.402	70.798	-
Average Tunnel Temperature (°F)	89.2			
Total Time of Test (min)	448			
Total Particulate Catch (mg)	0.0	3.1	2.9	-
Particulate Concentration, dry-standard (g/dscf)	0.0000000	0.0000453	0.0000410	-
Total PM Emissions (g)	0.00	15.93	14.40	-
Particulate Emission Rate (g/hr)	0.00	2.13	1.93	-
Emissions Factor (g/kg)	-	1.09	0.98	-
Difference from Average Total Particulate Emissions (g)	-	0.77	0.77	-
Difference from Average Total Particulate Emissions (%)	-	5.1%	5.1%	-
Difference from Average Emissions Factor (g/kg)	-	0.05	0.05	-

Final Average Results	
Total Particulate Emissions (g)	15.16
Particulate Emission Rate (g/hr)	2.03
Emissions Factor (g/kg)	1.03

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	<90 °F	87.0	OK
Face Velocity	< 30 ft/min	8.9	OK
Leakage Rate	Less than 4% of average sample rate	0.001 cfm	OK
Ambient Temp	55-90 °F	Min:68.5/Max:75.1	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

DILUTION TUNNEL & MISC. DATA - ASTM E2780 / E2515

Client: IHP
 Model: Montecito-C
 Run #: 4
 Test Start Time: 12:02

Job #: 25-416
 Tracking #: 223
 Technician: AK
 Date: 5/30/2025

Total Sampling Time (min): 448
 Recording Interval (min): 1

Meter Box γ Factor: 1.005 (A)
 Meter Box γ Factor: 1.011 (B)
 Meter Box γ Factor: - (C)
 Meter Box γ Factor: 1.012 (Ambient)

Induced Draft Check (in. H₂O): 0
 Smoke Capture Check (%): 100%
 Date Flue Pipe Last Cleaned: 5/26/2025
 Test Fuel Scale Audit (lbs): 10.00
 Platform Scale Audit (lbs): 10.0

	Pre-Test	Post Test	Avg.
Barometric Pressure (in. Hg)	30.03	30.08	30.06
Relative Humidity (%)	41.1	34.6	
Room Air Velocity (ft/min)	<50	<50	
Pitot Tube Leak Check	0	0	
Ambient Sample Volume:		110.580	ft ³

Sample Train Leak Checks

	Pre-test	Post-test		
(A)	0.000	0.000	cfm @	-8 in. Hg
(B)	0.000	0.001	cfm @	-8 in. Hg
(C)	-	-	cfm @	- in. Hg
(Ambient)	0.000	0.000	cfm @	-13 in. Hg

DILUTION TUNNEL FLOW

Traverse Data

Point	dP (in H ₂ O)	Temp (°F)
1	0.060	69
2	0.074	69
3	0.081	69
4	0.080	69
5	0.070	69
6	0.052	69
7	0.062	69
8	0.077	69
9	0.080	69
10	0.075	69
11	0.068	69
12	0.055	69
Center	0.080	69

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}: 17.42 ft/sec

V_{scent}: 18.73 ft/sec

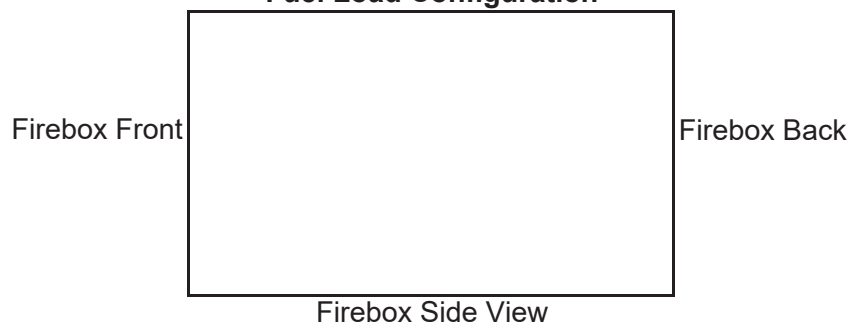
F_p: 0.930 [ratio]

Initial Tunnel Flow: 805.6 scf/min

Static Pressure: -0.225 in. H₂O

TEST FUEL PROPERTIES

Fuel Load Configuration



Actual Fuel Used Properties

Fuel Type: D. Fir
 HHV (kJ/kg): 19,810
 %C: 48.73
 %H: 6.87
 %O: 43.9
 %Ash: 0.5
 MC (%DB): #DIV/0!

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: IHP

Job #: 25-416

Model: Montecito-C

Tracking #: 223

Run #: 4

Technician: AK

Date: 5/30/2025

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	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		0.080	0.01	70	-0.4		6.20		70	69	85	69
1	0.135	0.135	0.081	1.11	71	-1.4	-	5.94	-0.26	75	212	80	69
2	0.293	0.158	0.080	1.10	71	-1.3	-	5.63	-0.31	80	409	81	69
3	0.452	0.159	0.080	1.08	72	-1.1	-	5.32	-0.31	81	558	81	69
4	0.608	0.156	0.080	1.08	72	-1.2	-	4.96	-0.36	84	670	82	69
5	0.765	0.157	0.079	1.09	72	-1.2	-	4.64	-0.32	86	699	83	69
6	0.922	0.157	0.079	1.08	73	-1.2	-	4.31	-0.33	88	746	84	69
7	1.077	0.155	0.077	1.07	73	-1.1	-	3.93	-0.38	90	796	84	69
8	1.235	0.158	0.079	1.08	73	-1.0	-	3.56	-0.37	92	826	83	69
9	1.390	0.155	0.079	1.07	73	-1.1	-	3.20	-0.36	94	850	82	69
10	1.545	0.155	0.077	1.07	74	-1.1	101	2.89	-0.31	94	852	81	69
11	1.702	0.157	0.078	1.08	74	-1.0	-	2.61	-0.28	95	857	81	69
12	1.857	0.155	0.079	1.07	75	-1.1	-	2.33	-0.28	97	860	82	69
13	2.012	0.155	0.081	1.07	75	-1.0	-	2.07	-0.26	97	860	83	69
14	2.168	0.156	0.079	1.06	75	-1.0	-	1.85	-0.22	97	851	84	69
15	2.324	0.156	0.077	1.06	76	-1.2	-	12.45	10.60	103	721	84	69
16	2.477	0.153	0.076	1.07	76	-1.1	-	12.22	-0.23	99	759	84	70
17	2.636	0.159	0.077	1.07	76	-1.2	-	11.98	-0.24	98	767	83	70
18	2.789	0.153	0.079	1.06	76	-1.1	-	11.74	-0.24	98	785	83	70
19	2.942	0.153	0.077	1.06	77	-1.2	-	11.45	-0.29	99	824	82	70
20	3.097	0.155	0.079	1.05	77	-1.1	103	11.15	-0.30	100	857	81	70
21	3.253	0.156	0.078	1.05	77	-1.2	-	10.84	-0.31	101	879	82	70
22	3.407	0.154	0.077	1.06	78	-1.2	-	10.53	-0.31	102	903	83	70
23	3.561	0.154	0.077	1.05	78	-1.1	-	10.22	-0.31	103	928	84	70
24	3.716	0.155	0.077	1.06	78	-1.2	-	9.90	-0.32	104	953	83	70
25	3.871	0.155	0.080	1.06	79	-1.3	-	9.59	-0.31	105	966	83	70
26	4.024	0.153	0.076	1.06	79	-1.3	-	9.29	-0.30	106	979	83	70
27	4.179	0.155	0.079	1.04	79	-1.2	-	8.99	-0.30	107	989	82	70
28	4.335	0.156	0.079	1.04	79	-1.3	-	8.71	-0.28	108	996	82	70
29	4.489	0.154	0.077	1.05	80	-1.3	-	8.42	-0.29	108	1,002	83	70
30	4.642	0.153	0.078	1.05	80	-1.2	102	8.15	-0.27	109	1,004	83	71
31	4.797	0.155	0.078	1.06	80	-1.3	-	7.88	-0.27	107	999	83	71

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: IHP

Job #: 25-416

Model: Montecito-C

Tracking #: 223

Run #: 4

Technician: AK

Date: 5/30/2025

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	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
32	4.953	0.156	0.078	1.05	80	-1.2	-	7.63	-0.25	106	991	83	71
33	5.108	0.155	0.080	1.05	80	-1.3	-	7.42	-0.21	101	927	82	71
34	5.261	0.153	0.080	1.06	81	-1.2	-	7.27	-0.15	99	882	82	71
35	5.416	0.155	0.079	1.06	81	-1.3	-	7.15	-0.12	97	846	83	71
36	5.571	0.155	0.077	1.07	81	-1.2	-	7.04	-0.11	96	816	83	71
37	5.725	0.154	0.079	1.06	81	-1.4	-	6.91	-0.13	95	789	83	71
38	5.880	0.155	0.079	1.04	81	-1.2	-	6.79	-0.12	95	765	84	71
39	6.036	0.156	0.079	1.05	82	-1.2	-	6.66	-0.13	94	743	83	71
40	6.189	0.153	0.081	1.06	82	-1.3	101	6.55	-0.11	93	727	82	71
41	6.345	0.156	0.080	1.06	82	-1.3	-	6.42	-0.13	93	714	81	71
42	6.501	0.156	0.079	1.06	82	-1.4	-	6.30	-0.12	92	705	83	71
43	6.655	0.154	0.078	1.07	82	-1.3	-	6.17	-0.13	92	697	83	71
44	6.810	0.155	0.079	1.05	82	-1.3	-	6.05	-0.12	92	689	83	71
45	6.966	0.156	0.079	1.05	83	-1.4	-	5.92	-0.13	91	684	83	71
46	7.121	0.155	0.080	1.06	83	-1.3	-	5.79	-0.13	91	680	84	71
47	7.275	0.154	0.079	1.06	83	-1.4	-	5.66	-0.13	91	677	84	71
48	7.430	0.155	0.079	1.05	83	-1.5	-	5.54	-0.12	90	674	83	71
49	7.589	0.159	0.078	1.06	83	-1.5	-	5.41	-0.13	90	672	83	71
50	7.740	0.151	0.078	1.05	83	-1.4	100	5.28	-0.13	90	672	82	71
51	7.896	0.156	0.079	1.06	83	-1.5	-	5.15	-0.13	90	671	82	71
52	8.052	0.156	0.079	1.06	84	-1.4	-	5.03	-0.12	90	671	84	71
53	8.206	0.154	0.079	1.07	83	-1.5	-	4.90	-0.13	90	670	84	71
54	8.361	0.155	0.078	1.06	83	-1.4	-	4.78	-0.12	89	669	83	72
55	8.517	0.156	0.077	1.06	83	-1.5	-	4.66	-0.12	90	667	83	72
56	8.672	0.155	0.079	1.06	84	-1.5	-	4.55	-0.11	89	663	82	72
57	8.827	0.155	0.080	1.05	84	-1.5	-	4.43	-0.12	89	659	82	72
58	8.983	0.156	0.079	1.05	84	-1.6	-	4.33	-0.10	89	657	83	72
59	9.139	0.156	0.079	1.05	84	-1.5	-	4.22	-0.11	89	655	82	72
60	9.293	0.154	0.080	1.05	84	-1.5	100	4.13	-0.09	89	647	84	72
61	9.450	0.157	0.080	1.06	84	-1.6	-	4.04	-0.09	88	638	83	72
62	9.605	0.155	0.079	1.05	85	-1.5	-	3.95	-0.09	88	628	84	72
63	9.760	0.155	0.080	1.05	84	-1.5	-	3.86	-0.09	88	621	83	72

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: IHP

Job #: 25-416

Model: Montecito-C

Tracking #: 223

Run #: 4

Technician: AK

Date: 5/30/2025

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	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
64	9.916	0.156	0.080	1.05	85	-1.6	-	3.78	-0.08	88	614	83	72
65	10.072	0.156	0.079	1.04	85	-1.5	-	3.71	-0.07	88	608	83	72
66	10.226	0.154	0.080	1.06	84	-1.6	-	3.63	-0.08	88	602	83	72
67	10.382	0.156	0.079	1.06	85	-1.5	-	3.55	-0.08	88	597	84	72
68	10.539	0.157	0.080	1.05	84	-1.5	-	3.48	-0.07	88	592	84	72
69	10.693	0.154	0.081	1.05	85	-1.5	-	3.41	-0.07	88	586	84	72
70	10.849	0.156	0.080	1.06	85	-1.6	99	3.33	-0.08	87	581	82	72
71	11.006	0.157	0.081	1.05	85	-1.6	-	3.28	-0.05	87	576	82	72
72	11.160	0.154	0.080	1.06	85	-1.7	-	3.20	-0.08	87	571	83	72
73	11.317	0.157	0.081	1.06	85	-1.7	-	3.15	-0.05	87	565	83	72
74	11.474	0.157	0.080	1.06	85	-1.6	-	3.08	-0.07	86	560	82	72
75	11.628	0.154	0.079	1.07	86	-1.6	-	3.03	-0.05	87	556	84	72
76	11.784	0.156	0.080	1.05	86	-1.6	-	2.97	-0.06	86	549	83	72
77	11.941	0.157	0.078	1.07	85	-1.7	-	2.92	-0.05	86	542	84	72
78	12.096	0.155	0.078	1.05	85	-1.7	-	2.87	-0.05	86	536	84	72
79	12.252	0.156	0.080	1.06	85	-1.7	-	2.83	-0.04	86	530	83	72
80	12.409	0.157	0.080	1.07	84	-1.7	99	2.80	-0.03	86	525	82	72
81	12.566	0.157	0.079	1.06	85	-1.7	-	10.19	7.39	91	517	83	72
82	12.723	0.157	0.078	1.05	85	-1.7	-	10.00	-0.19	92	600	84	72
83	12.877	0.154	0.078	1.07	86	-1.7	-	9.79	-0.21	93	661	83	72
84	13.031	0.154	0.079	1.06	86	-1.6	-	9.57	-0.22	95	714	83	72
85	13.187	0.156	0.078	1.06	85	-1.8	-	9.33	-0.24	96	751	83	72
86	13.344	0.157	0.078	1.06	86	-1.8	-	9.23	-0.10	92	690	83	72
87	13.498	0.154	0.081	1.04	85	-1.7	-	9.07	-0.16	91	664	82	72
88	13.655	0.157	0.080	1.05	86	-1.8	-	8.94	-0.13	90	656	83	73
89	13.812	0.157	0.081	1.05	86	-1.7	-	8.80	-0.14	90	649	83	73
90	13.966	0.154	0.080	1.05	86	-1.7	99	8.66	-0.14	90	645	84	73
91	14.123	0.157	0.079	1.05	86	-1.8	-	8.53	-0.13	89	641	84	73
92	14.279	0.156	0.080	1.06	86	-1.8	-	8.39	-0.14	89	638	83	73
93	14.434	0.155	0.079	1.06	86	-1.7	-	8.26	-0.13	89	637	82	73
94	14.591	0.157	0.078	1.07	86	-1.8	-	8.12	-0.14	89	635	83	73
95	14.747	0.156	0.079	1.06	86	-1.7	-	7.99	-0.13	89	633	83	73

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: IHP

Job #: 25-416

Model: Montecito-C

Tracking #: 223

Run #: 4

Technician: AK

Date: 5/30/2025

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	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
96	14.902	0.155	0.079	1.06	86	-1.7	-	7.87	-0.12	89	632	83	73
97	15.062	0.160	0.079	1.05	86	-1.7	-	7.73	-0.14	89	631	84	73
98	15.217	0.155	0.078	1.07	86	-1.7	-	7.60	-0.13	89	629	84	73
99	15.370	0.153	0.080	1.06	87	-1.6	-	7.48	-0.12	89	628	84	73
100	15.527	0.157	0.079	1.05	86	-1.7	100	7.35	-0.13	89	627	83	73
101	15.683	0.156	0.080	1.06	86	-1.7	-	7.23	-0.12	89	626	83	73
102	15.839	0.156	0.079	1.05	86	-1.7	-	7.11	-0.12	89	624	83	73
103	15.996	0.157	0.079	1.06	86	-1.7	-	6.99	-0.12	89	623	83	73
104	16.151	0.155	0.079	1.06	86	-1.6	-	6.86	-0.13	89	621	83	73
105	16.307	0.156	0.079	1.05	87	-1.6	-	6.74	-0.12	89	620	84	73
106	16.464	0.157	0.080	1.04	86	-1.7	-	6.62	-0.12	89	620	83	73
107	16.619	0.155	0.080	1.05	86	-1.7	-	6.49	-0.13	89	624	84	73
108	16.776	0.157	0.079	1.07	87	-1.6	-	6.38	-0.11	89	627	83	73
109	16.933	0.157	0.078	1.06	86	-1.7	-	6.26	-0.12	89	626	82	73
110	17.088	0.155	0.080	1.07	87	-1.6	99	6.14	-0.12	89	625	83	73
111	17.245	0.157	0.077	1.05	86	-1.7	-	6.03	-0.11	89	624	83	73
112	17.402	0.157	0.078	1.06	87	-1.6	-	5.91	-0.12	89	623	84	73
113	17.559	0.157	0.079	1.05	87	-1.7	-	5.80	-0.11	89	622	84	73
114	17.716	0.157	0.080	1.06	87	-1.6	-	5.69	-0.11	89	621	83	73
115	17.870	0.154	0.079	1.06	87	-1.7	-	5.58	-0.11	89	620	83	73
116	18.025	0.155	0.078	1.06	87	-1.6	-	5.47	-0.11	89	618	83	73
117	18.182	0.157	0.081	1.07	86	-1.7	-	5.37	-0.10	89	617	82	73
118	18.338	0.156	0.081	1.07	87	-1.6	-	5.26	-0.11	89	615	83	73
119	18.494	0.156	0.078	1.06	86	-1.7	-	5.17	-0.09	89	614	84	73
120	18.651	0.157	0.079	1.06	87	-1.7	100	5.07	-0.10	89	611	84	73
121	18.807	0.156	0.081	1.06	87	-1.7	-	4.97	-0.10	89	609	83	73
122	18.962	0.155	0.080	1.06	87	-1.7	-	4.87	-0.10	89	605	83	74
123	19.120	0.158	0.079	1.06	88	-1.7	-	4.78	-0.09	89	601	82	74
124	19.275	0.155	0.079	1.05	87	-1.6	-	4.71	-0.07	89	597	83	74
125	19.432	0.157	0.081	1.06	87	-1.7	-	4.63	-0.08	89	593	83	74
126	19.589	0.157	0.080	1.06	87	-1.7	-	4.55	-0.08	89	588	83	74
127	19.743	0.154	0.078	1.04	86	-1.7	-	4.47	-0.08	89	585	83	74

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: IHP

Job #: 25-416

Model: Montecito-C

Tracking #: 223

Run #: 4

Technician: AK

Date: 5/30/2025

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	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
128	19.903	0.160	0.080	1.04	87	-1.7	-	4.39	-0.08	89	582	84	74
129	20.060	0.157	0.079	1.05	87	-1.8	-	4.32	-0.07	89	580	83	74
130	20.215	0.155	0.079	1.06	87	-1.7	100	4.25	-0.07	89	577	84	74
131	20.369	0.154	0.082	1.06	86	-1.7	-	4.18	-0.07	89	574	83	74
132	20.526	0.157	0.079	1.05	87	-1.8	-	4.11	-0.07	89	570	83	74
133	20.681	0.155	0.081	1.05	87	-1.8	-	4.05	-0.06	89	565	83	74
134	20.838	0.157	0.080	1.06	88	-1.8	-	3.99	-0.06	89	559	83	74
135	20.995	0.157	0.081	1.05	88	-1.8	-	3.93	-0.06	88	554	84	74
136	21.150	0.155	0.079	1.05	88	-1.7	-	3.88	-0.05	88	548	84	74
137	21.307	0.157	0.079	1.06	88	-1.8	-	3.83	-0.05	88	543	83	74
138	21.463	0.156	0.080	1.06	87	-1.7	-	3.77	-0.06	88	538	83	74
139	21.619	0.156	0.079	1.05	86	-1.8	-	3.73	-0.04	88	534	83	74
140	21.776	0.157	0.079	1.07	86	-1.8	100	3.68	-0.05	88	529	83	74
141	21.931	0.155	0.078	1.05	87	-1.8	-	3.63	-0.05	88	525	83	74
142	22.088	0.157	0.079	1.06	88	-1.7	-	3.59	-0.04	88	521	83	74
143	22.245	0.157	0.079	1.05	88	-1.8	-	3.54	-0.05	88	516	84	74
144	22.400	0.155	0.080	1.07	88	-1.8	-	3.50	-0.04	87	512	84	74
145	22.557	0.157	0.079	1.06	88	-1.8	-	3.47	-0.03	87	510	84	74
146	22.714	0.157	0.080	1.05	89	-1.9	-	3.42	-0.05	87	507	84	74
147	22.868	0.154	0.078	1.06	89	-1.8	-	21.88	18.46	96	353	84	75
148	23.025	0.157	0.078	1.06	89	-1.8	-	21.61	-0.27	93	435	83	75
149	23.183	0.158	0.078	1.06	89	-1.9	-	21.50	-0.11	93	458	83	75
150	23.340	0.157	0.078	1.05	89	-1.9	100	21.33	-0.17	92	506	83	75
151	23.498	0.158	0.078	1.06	88	-1.8	-	21.13	-0.20	93	568	83	75
152	23.653	0.155	0.078	1.05	87	-1.9	-	20.93	-0.20	95	630	84	75
153	23.809	0.156	0.079	1.06	90	-1.8	-	20.72	-0.21	96	664	84	75
154	23.964	0.155	0.078	1.05	88	-1.9	-	20.42	-0.30	97	744	83	75
155	24.120	0.156	0.078	1.06	90	-1.9	-	20.18	-0.24	99	785	84	75
156	24.275	0.155	0.078	1.06	89	-1.9	-	19.91	-0.27	100	822	84	75
157	24.433	0.158	0.077	1.06	89	-1.8	-	19.72	-0.19	98	778	83	75
158	24.588	0.155	0.077	1.07	89	-1.9	-	19.52	-0.20	96	751	83	75
159	24.745	0.157	0.079	1.06	89	-1.9	-	19.35	-0.17	95	742	83	75

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: IHP

Job #: 25-416

Model: Montecito-C

Tracking #: 223

Run #: 4

Technician: AK

Date: 5/30/2025

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	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
160	24.902	0.157	0.079	1.06	89	-1.9	100	19.17	-0.18	94	733	82	75
161	25.057	0.155	0.079	1.05	88	-1.8	-	19.01	-0.16	94	719	83	75
162	25.214	0.157	0.080	1.05	89	-1.8	-	18.85	-0.16	94	706	83	75
163	25.371	0.157	0.079	1.06	90	-1.8	-	18.69	-0.16	93	702	84	75
164	25.527	0.156	0.078	1.05	90	-1.7	-	18.54	-0.15	94	698	84	75
165	25.684	0.157	0.079	1.05	90	-1.7	-	18.38	-0.16	94	695	84	75
166	25.840	0.156	0.076	1.06	88	-1.7	-	18.22	-0.16	94	688	84	75
167	25.999	0.159	0.079	1.06	90	-1.7	-	18.07	-0.15	93	682	84	75
168	26.156	0.157	0.078	1.07	90	-1.7	-	17.91	-0.16	93	678	83	75
169	26.311	0.155	0.078	1.06	89	-1.7	-	17.76	-0.15	93	674	83	75
170	26.466	0.155	0.078	1.05	89	-1.6	100	17.62	-0.14	93	670	83	75
171	26.623	0.157	0.077	1.07	90	-1.6	-	17.48	-0.14	93	669	83	75
172	26.778	0.155	0.079	1.05	89	-1.7	-	17.33	-0.15	93	669	84	75
173	26.936	0.158	0.078	1.06	89	-1.7	-	17.18	-0.15	93	666	84	75
174	27.093	0.157	0.079	1.05	89	-1.6	-	17.04	-0.14	93	663	84	75
175	27.248	0.155	0.077	1.07	89	-1.7	-	16.91	-0.13	93	660	85	75
176	27.405	0.157	0.077	1.06	90	-1.7	-	16.76	-0.15	93	657	85	75
177	27.562	0.157	0.080	1.06	89	-1.7	-	16.63	-0.13	93	655	84	75
178	27.717	0.155	0.077	1.06	90	-1.6	-	16.49	-0.14	93	651	84	75
179	27.875	0.158	0.078	1.06	90	-1.6	-	16.34	-0.15	93	648	84	75
180	28.031	0.156	0.078	1.06	89	-1.7	101	16.21	-0.13	93	646	83	75
181	28.187	0.156	0.078	1.06	89	-1.7	-	16.08	-0.13	93	643	83	75
182	28.345	0.158	0.078	1.06	89	-1.7	-	15.95	-0.13	93	640	83	75
183	28.503	0.158	0.079	1.05	89	-1.6	-	15.81	-0.14	92	636	84	75
184	28.660	0.157	0.079	1.05	89	-1.6	-	15.68	-0.13	92	635	83	75
185	28.815	0.155	0.079	1.06	90	-1.6	-	15.56	-0.12	92	634	84	75
186	28.970	0.155	0.080	1.06	89	-1.6	-	15.41	-0.15	92	637	84	75
187	29.127	0.157	0.078	1.06	90	-1.7	-	15.28	-0.13	93	639	84	75
188	29.284	0.157	0.080	1.05	89	-1.7	-	15.14	-0.14	92	642	83	75
189	29.440	0.156	0.079	1.05	89	-1.6	-	15.00	-0.14	92	645	83	75
190	29.597	0.157	0.078	1.05	90	-1.6	100	14.84	-0.16	93	649	83	75
191	29.753	0.156	0.078	1.07	89	-1.7	-	14.72	-0.12	92	651	83	75

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: IHP

Job #: 25-416

Model: Montecito-C

Tracking #: 223

Run #: 4

Technician: AK

Date: 5/30/2025

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	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
192	29.910	0.157	0.080	1.06	90	-1.7	-	14.57	-0.15	93	653	84	75
193	30.067	0.157	0.076	1.07	90	-1.7	-	14.42	-0.15	93	656	84	75
194	30.223	0.156	0.078	1.06	90	-1.6	-	14.27	-0.15	93	659	84	75
195	30.380	0.157	0.078	1.05	90	-1.7	-	14.13	-0.14	93	660	84	75
196	30.537	0.157	0.079	1.05	90	-1.6	-	14.00	-0.13	92	660	84	75
197	30.693	0.156	0.078	1.06	91	-1.6	-	13.85	-0.15	93	662	84	75
198	30.853	0.160	0.078	1.05	90	-1.7	-	13.71	-0.14	93	663	83	75
199	31.009	0.156	0.079	1.07	91	-1.6	-	13.58	-0.13	93	663	83	75
200	31.166	0.157	0.077	1.06	90	-1.7	101	13.44	-0.14	93	664	83	75
201	31.320	0.154	0.078	1.05	89	-1.7	-	13.32	-0.12	93	664	83	75
202	31.476	0.156	0.079	1.05	90	-1.6	-	13.18	-0.14	93	664	84	75
203	31.633	0.157	0.077	1.06	90	-1.7	-	13.04	-0.14	93	664	84	75
204	31.790	0.157	0.080	1.05	91	-1.7	-	12.91	-0.13	93	665	83	75
205	31.945	0.155	0.079	1.05	90	-1.7	-	12.78	-0.13	93	666	84	75
206	32.103	0.158	0.079	1.05	90	-1.7	-	12.64	-0.14	93	666	83	75
207	32.260	0.157	0.080	1.07	90	-1.6	-	12.52	-0.12	93	665	83	75
208	32.415	0.155	0.080	1.05	90	-1.7	-	12.39	-0.13	93	666	83	75
209	32.573	0.158	0.079	1.06	90	-1.7	-	12.25	-0.14	93	666	83	75
210	32.729	0.156	0.078	1.06	90	-1.7	101	12.13	-0.12	93	667	83	75
211	32.886	0.157	0.079	1.05	90	-1.7	-	12.00	-0.13	93	667	84	75
212	33.043	0.157	0.080	1.06	90	-1.7	-	11.87	-0.13	93	668	84	75
213	33.201	0.158	0.078	1.06	89	-1.7	-	11.74	-0.13	93	667	83	75
214	33.359	0.158	0.079	1.05	89	-1.7	-	11.62	-0.12	93	666	83	75
215	33.516	0.157	0.077	1.06	90	-1.7	-	11.49	-0.13	93	664	83	75
216	33.669	0.153	0.077	1.05	89	-1.7	-	11.39	-0.10	93	662	83	75
217	33.826	0.157	0.079	1.07	90	-1.7	-	11.27	-0.12	93	660	84	75
218	33.983	0.157	0.079	1.07	90	-1.7	-	11.16	-0.11	93	658	83	75
219	34.139	0.156	0.077	1.05	90	-1.7	-	11.04	-0.12	93	655	84	75
220	34.296	0.157	0.078	1.06	89	-1.8	101	10.93	-0.11	93	653	84	75
221	34.452	0.156	0.079	1.05	90	-1.8	-	10.82	-0.11	93	651	83	75
222	34.609	0.157	0.077	1.07	90	-1.8	-	10.70	-0.12	93	649	83	75
223	34.766	0.157	0.078	1.05	90	-1.7	-	10.60	-0.10	93	647	83	75

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: <u>IHP</u>	Job #: <u>25-416</u>	
Model: <u>Montecito-C</u>	Tracking #: <u>223</u>	
Run #: <u>4</u>	Technician: <u>AK</u>	
	Date: <u>5/30/2025</u>	

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	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
224	34.922	0.156	0.077	1.06	90	-1.8	-	10.50	-0.10	93	645	82	75
225	35.079	0.157	0.078	1.06	90	-1.8	-	10.41	-0.09	93	642	83	75
226	35.236	0.157	0.081	1.06	90	-1.7	-	10.31	-0.10	93	638	83	75
227	35.394	0.158	0.078	1.06	90	-1.8	-	10.21	-0.10	93	635	83	75
228	35.552	0.158	0.078	1.05	90	-1.8	-	10.11	-0.10	93	633	84	75
229	35.707	0.155	0.080	1.06	90	-1.8	-	10.01	-0.10	92	630	83	75
230	35.862	0.155	0.078	1.05	89	-1.8	101	9.92	-0.09	92	627	84	75
231	36.020	0.158	0.077	1.07	89	-1.8	-	9.82	-0.10	93	625	83	75
232	36.175	0.155	0.079	1.06	90	-1.8	-	9.74	-0.08	92	624	83	75
233	36.332	0.157	0.079	1.04	90	-1.8	-	9.64	-0.10	92	622	83	75
234	36.490	0.158	0.078	1.06	90	-1.8	-	9.56	-0.08	92	621	84	75
235	36.645	0.155	0.078	1.05	90	-1.9	-	9.45	-0.11	92	620	83	75
236	36.803	0.158	0.079	1.06	91	-1.8	-	9.36	-0.09	92	619	84	75
237	36.959	0.156	0.080	1.06	90	-1.8	-	9.26	-0.10	92	618	84	75
238	37.115	0.156	0.079	1.05	90	-1.9	-	9.18	-0.08	92	615	83	75
239	37.273	0.158	0.080	1.06	90	-1.8	-	9.09	-0.09	92	614	82	75
240	37.429	0.156	0.079	1.06	90	-1.9	100	9.00	-0.09	92	612	83	75
241	37.588	0.159	0.079	1.06	90	-1.9	-	8.92	-0.08	92	610	83	75
242	37.746	0.158	0.078	1.07	89	-1.9	-	8.84	-0.08	92	608	84	75
243	37.901	0.155	0.079	1.05	90	-2.0	-	8.76	-0.08	92	606	84	75
244	38.056	0.155	0.078	1.05	90	-2.0	-	8.69	-0.07	92	604	84	75
245	38.213	0.157	0.079	1.04	89	-2.0	-	8.61	-0.08	92	602	83	75
246	38.369	0.156	0.078	1.06	90	-2.0	-	8.53	-0.08	91	601	84	75
247	38.526	0.157	0.081	1.05	90	-2.0	-	8.46	-0.07	91	601	83	75
248	38.683	0.157	0.079	1.05	90	-2.0	-	8.38	-0.08	91	600	83	75
249	38.839	0.156	0.080	1.05	90	-2.0	-	8.29	-0.09	91	600	82	75
250	38.997	0.158	0.079	1.05	88	-2.1	100	8.22	-0.07	91	599	84	75
251	39.152	0.155	0.078	1.05	89	-2.1	-	8.14	-0.08	91	599	83	75
252	39.309	0.157	0.080	1.06	90	-2.1	-	8.07	-0.07	91	599	84	75
253	39.467	0.158	0.077	1.05	89	-2.0	-	7.99	-0.08	91	600	84	75
254	39.625	0.158	0.080	1.07	89	-2.1	-	7.91	-0.08	91	600	84	75
255	39.783	0.158	0.078	1.06	89	-2.2	-	7.84	-0.07	91	600	83	75

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: IHP

Job #: 25-416

Model: Montecito-C

Tracking #: 223

Run #: 4

Technician: AK

Date: 5/30/2025

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	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
256	39.938	0.155	0.079	1.06	90	-2.1	-	7.76	-0.08	91	601	82	75
257	40.093	0.155	0.079	1.06	90	-2.1	-	7.69	-0.07	91	601	83	75
258	40.250	0.157	0.079	1.05	90	-2.1	-	7.62	-0.07	91	601	84	75
259	40.406	0.156	0.080	1.06	89	-2.1	-	7.54	-0.08	91	600	84	75
260	40.563	0.157	0.079	1.05	89	-2.2	100	7.47	-0.07	91	600	84	75
261	40.721	0.158	0.079	1.05	90	-2.2	-	7.41	-0.06	91	598	84	75
262	40.876	0.155	0.080	1.05	90	-2.3	-	7.34	-0.07	91	597	84	75
263	41.033	0.157	0.079	1.06	90	-2.2	-	7.27	-0.07	91	597	83	75
264	41.190	0.157	0.081	1.05	91	-2.3	-	7.21	-0.06	91	596	82	75
265	41.346	0.156	0.080	1.06	90	-2.3	-	7.14	-0.07	91	597	83	75
266	41.504	0.158	0.080	1.05	90	-2.3	-	7.07	-0.07	91	598	83	75
267	41.662	0.158	0.080	1.05	90	-2.2	-	7.01	-0.06	91	596	83	75
268	41.819	0.157	0.079	1.05	90	-2.3	-	6.95	-0.06	91	590	83	75
269	41.977	0.158	0.079	1.05	89	-2.3	-	6.90	-0.05	91	588	84	75
270	42.130	0.153	0.079	1.05	89	-2.3	100	6.85	-0.05	91	584	84	75
271	42.287	0.157	0.079	1.05	90	-2.3	-	6.80	-0.05	90	580	84	75
272	42.444	0.157	0.079	1.05	89	-2.4	-	6.75	-0.05	91	577	83	75
273	42.600	0.156	0.077	1.05	89	-2.3	-	6.70	-0.05	90	575	82	75
274	42.758	0.158	0.080	1.06	89	-2.4	-	6.65	-0.05	90	573	83	75
275	42.914	0.156	0.079	1.07	91	-2.3	-	6.61	-0.04	90	571	83	75
276	43.070	0.156	0.077	1.07	89	-2.4	-	6.55	-0.06	90	568	84	75
277	43.228	0.158	0.078	1.06	90	-2.4	-	6.50	-0.05	90	567	84	75
278	43.383	0.155	0.080	1.07	90	-2.4	-	6.46	-0.04	90	564	84	75
279	43.540	0.157	0.081	1.06	90	-2.4	-	6.41	-0.05	90	561	84	75
280	43.700	0.160	0.079	1.07	90	-2.5	100	6.36	-0.05	90	557	82	75
281	43.856	0.156	0.077	1.06	91	-2.5	-	6.31	-0.05	90	555	83	75
282	44.014	0.158	0.077	1.07	91	-2.5	-	6.27	-0.04	90	552	82	75
283	44.169	0.155	0.079	1.05	90	-2.5	-	6.22	-0.05	90	551	83	75
284	44.324	0.155	0.081	1.07	90	-2.5	-	6.18	-0.04	90	549	84	75
285	44.482	0.158	0.080	1.06	90	-2.5	-	6.13	-0.05	89	547	84	75
286	44.637	0.155	0.078	1.06	89	-2.5	-	6.08	-0.05	90	545	85	75
287	44.794	0.157	0.079	1.06	90	-2.6	-	6.04	-0.04	89	544	84	75

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: IHP

Job #: 25-416

Model: Montecito-C

Tracking #: 223

Run #: 4

Technician: AK

Date: 5/30/2025

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	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
288	44.952	0.158	0.079	1.06	89	-2.6	-	6.01	-0.03	90	543	83	75
289	45.107	0.155	0.079	1.05	89	-2.7	-	5.96	-0.05	90	541	83	75
290	45.265	0.158	0.079	1.06	90	-2.7	99	5.92	-0.04	89	537	82	75
291	45.422	0.157	0.080	1.07	91	-2.6	-	5.88	-0.04	89	535	83	75
292	45.578	0.156	0.079	1.05	90	-2.6	-	5.85	-0.03	89	531	83	75
293	45.735	0.157	0.079	1.07	90	-2.7	-	5.81	-0.04	89	528	84	75
294	45.894	0.159	0.078	1.06	90	-2.7	-	5.78	-0.03	89	526	83	75
295	46.051	0.157	0.079	1.05	89	-2.8	-	5.74	-0.04	89	523	83	75
296	46.208	0.157	0.078	1.05	90	-2.8	-	5.70	-0.04	89	521	83	75
297	46.364	0.156	0.080	1.05	89	-2.7	-	5.68	-0.02	89	519	84	75
298	46.519	0.155	0.080	1.07	89	-2.8	-	5.65	-0.03	89	514	84	75
299	46.676	0.157	0.079	1.06	90	-2.8	-	5.62	-0.03	89	507	84	75
300	46.831	0.155	0.080	1.06	89	-2.9	99	5.60	-0.02	89	502	83	75
301	46.989	0.158	0.080	1.06	89	-2.9	-	5.57	-0.03	89	496	83	75
302	47.145	0.156	0.079	1.05	89	-2.8	-	5.55	-0.02	88	491	83	75
303	47.302	0.157	0.079	1.05	89	-2.8	-	5.53	-0.02	89	486	83	75
304	47.460	0.158	0.079	1.06	89	-2.9	-	5.51	-0.02	88	481	82	75
305	47.616	0.156	0.077	1.07	88	-3.0	-	5.48	-0.03	88	477	83	75
306	47.773	0.157	0.078	1.05	88	-3.0	-	5.46	-0.02	88	473	83	75
307	47.932	0.159	0.077	1.05	88	-3.0	-	5.44	-0.02	88	469	84	75
308	48.089	0.157	0.078	1.06	90	-3.0	-	5.42	-0.02	88	466	84	75
309	48.247	0.158	0.078	1.07	89	-3.0	-	5.39	-0.03	87	462	84	75
310	48.402	0.155	0.078	1.06	89	-3.0	100	5.37	-0.02	88	458	82	75
311	48.557	0.155	0.078	1.06	89	-3.0	-	5.35	-0.02	87	453	83	75
312	48.714	0.157	0.079	1.05	89	-3.1	-	5.34	-0.01	87	449	83	75
313	48.870	0.156	0.081	1.06	88	-3.0	-	5.31	-0.03	87	445	84	75
314	49.027	0.157	0.079	1.06	88	-3.1	-	5.30	-0.01	87	441	84	75
315	49.185	0.158	0.079	1.05	88	-3.1	-	5.28	-0.02	87	438	85	75
316	49.341	0.156	0.079	1.05	88	-3.2	-	5.26	-0.02	87	435	83	75
317	49.498	0.157	0.079	1.05	88	-3.1	-	5.24	-0.02	87	433	83	75
318	49.654	0.156	0.078	1.05	88	-3.2	-	5.22	-0.02	87	430	82	75
319	49.811	0.157	0.079	1.05	87	-3.1	-	5.20	-0.02	87	427	83	75

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: IHP

Job #: 25-416

Model: Montecito-C

Tracking #: 223

Run #: 4

Technician: AK

Date: 5/30/2025

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	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
320	49.972	0.161	0.079	1.06	88	-3.1	100	5.19	-0.01	87	425	83	75
321	50.127	0.155	0.077	1.07	88	-3.2	-	5.17	-0.02	86	422	84	75
322	50.285	0.158	0.079	1.07	89	-3.2	-	5.15	-0.02	86	420	83	75
323	50.441	0.156	0.077	1.05	89	-3.2	-	5.13	-0.02	86	418	84	75
324	50.595	0.154	0.079	1.05	88	-3.3	-	5.11	-0.02	86	416	83	74
325	50.753	0.158	0.078	1.07	88	-3.3	-	5.10	-0.01	86	415	84	74
326	50.909	0.156	0.078	1.05	88	-3.2	-	5.08	-0.02	86	413	84	74
327	51.066	0.157	0.079	1.06	88	-3.2	-	5.06	-0.02	86	412	83	75
328	51.223	0.157	0.079	1.04	89	-3.2	-	5.04	-0.02	86	411	83	74
329	51.379	0.156	0.078	1.05	89	-3.2	-	5.02	-0.02	86	410	83	74
330	51.536	0.157	0.079	1.07	89	-3.3	99	5.00	-0.02	86	409	84	74
331	51.694	0.158	0.079	1.05	88	-3.3	-	4.98	-0.02	86	408	84	74
332	51.852	0.158	0.078	1.05	88	-3.3	-	4.96	-0.02	86	407	84	74
333	52.010	0.158	0.078	1.06	88	-3.2	-	4.94	-0.02	86	407	84	74
334	52.165	0.155	0.078	1.06	88	-3.3	-	4.93	-0.01	86	406	83	74
335	52.323	0.158	0.079	1.05	89	-3.3	-	4.91	-0.02	86	406	83	74
336	52.478	0.155	0.078	1.05	90	-3.4	-	4.89	-0.02	86	405	82	74
337	52.633	0.155	0.080	1.06	89	-3.3	-	4.87	-0.02	86	405	82	74
338	52.791	0.158	0.078	1.07	88	-3.3	-	4.84	-0.03	86	405	83	74
339	52.948	0.157	0.078	1.06	89	-3.4	-	4.83	-0.01	86	404	83	74
340	53.104	0.156	0.078	1.07	88	-3.3	100	4.81	-0.02	86	404	84	74
341	53.261	0.157	0.079	1.06	88	-3.4	-	4.79	-0.02	86	403	84	74
342	53.417	0.156	0.078	1.05	88	-3.4	-	4.77	-0.02	86	403	84	74
343	53.577	0.160	0.079	1.06	88	-3.3	-	4.76	-0.01	86	402	84	74
344	53.735	0.158	0.079	1.06	89	-3.3	-	4.74	-0.02	86	400	83	74
345	53.890	0.155	0.079	1.06	87	-3.4	-	4.72	-0.02	85	399	82	74
346	54.048	0.158	0.078	1.06	88	-3.4	-	4.70	-0.02	86	398	83	74
347	54.204	0.156	0.078	1.05	87	-3.3	-	4.69	-0.01	85	397	83	74
348	54.358	0.154	0.079	1.06	87	-3.4	-	4.67	-0.02	86	396	83	74
349	54.516	0.158	0.079	1.06	88	-3.4	-	4.65	-0.02	85	395	84	74
350	54.672	0.156	0.079	1.04	89	-3.3	100	4.63	-0.02	85	394	84	74
351	54.828	0.156	0.078	1.06	87	-3.4	-	4.61	-0.02	85	393	84	74

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: IHP

Job #: 25-416

Model: Montecito-C

Tracking #: 223

Run #: 4

Technician: AK

Date: 5/30/2025

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	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
352	54.986	0.158	0.078	1.04	89	-3.4	-	4.59	-0.02	85	391	84	74
353	55.141	0.155	0.078	1.06	88	-3.3	-	4.58	-0.01	85	390	84	74
354	55.299	0.158	0.079	1.06	87	-3.4	-	4.57	-0.01	85	388	84	74
355	55.457	0.158	0.078	1.04	88	-3.3	-	4.55	-0.02	85	387	82	74
356	55.614	0.157	0.079	1.05	88	-3.3	-	4.53	-0.02	85	386	83	74
357	55.772	0.158	0.079	1.06	88	-3.3	-	4.51	-0.02	85	385	83	74
358	55.928	0.156	0.079	1.06	88	-3.3	-	4.50	-0.01	85	384	84	74
359	56.085	0.157	0.078	1.05	88	-3.3	-	4.48	-0.02	85	383	84	74
360	56.240	0.155	0.078	1.05	89	-3.4	100	4.47	-0.01	85	381	84	74
361	56.395	0.155	0.078	1.06	89	-3.4	-	4.46	-0.01	85	380	84	74
362	56.553	0.158	0.077	1.07	89	-3.4	-	4.44	-0.02	85	378	84	74
363	56.711	0.158	0.078	1.05	88	-3.3	-	4.43	-0.01	85	376	83	74
364	56.866	0.155	0.078	1.06	89	-3.4	-	4.41	-0.02	85	375	83	74
365	57.024	0.158	0.078	1.05	89	-3.4	-	4.40	-0.01	85	373	82	74
366	57.182	0.158	0.078	1.06	88	-3.3	-	4.38	-0.02	85	372	83	74
367	57.339	0.157	0.077	1.06	89	-3.4	-	4.37	-0.01	85	370	83	74
368	57.497	0.158	0.079	1.04	87	-3.3	-	4.35	-0.02	85	368	84	74
369	57.652	0.155	0.079	1.05	89	-3.4	-	4.34	-0.01	85	367	84	74
370	57.810	0.158	0.079	1.06	88	-3.4	100	4.32	-0.02	84	365	83	74
371	57.965	0.155	0.079	1.06	88	-3.3	-	4.31	-0.01	84	364	84	74
372	58.120	0.155	0.080	1.05	88	-3.5	-	4.30	-0.01	84	363	83	74
373	58.278	0.158	0.078	1.06	88	-3.5	-	4.28	-0.02	84	361	83	74
374	58.434	0.156	0.078	1.06	88	-3.4	-	4.27	-0.01	84	360	83	74
375	58.591	0.157	0.079	1.06	88	-3.3	-	4.26	-0.01	84	358	83	74
376	58.749	0.158	0.079	1.06	87	-3.4	-	4.24	-0.02	84	357	83	74
377	58.907	0.158	0.079	1.05	88	-3.3	-	4.23	-0.01	84	356	84	74
378	59.064	0.157	0.078	1.05	88	-3.3	-	4.21	-0.02	84	354	83	74
379	59.221	0.157	0.077	1.05	89	-3.3	-	4.20	-0.01	84	353	84	74
380	59.377	0.156	0.076	1.06	88	-3.4	100	4.18	-0.02	84	352	84	74
381	59.535	0.158	0.078	1.05	87	-3.5	-	4.17	-0.01	84	350	83	74
382	59.689	0.154	0.078	1.06	88	-3.4	-	4.16	-0.01	84	349	83	74
383	59.845	0.156	0.078	1.06	88	-3.3	-	4.15	-0.01	84	348	83	74

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: IHP

Job #: 25-416

Model: Montecito-C

Tracking #: 223

Run #: 4

Technician: AK

Date: 5/30/2025

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	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
384	60.003	0.158	0.078	1.06	88	-3.3	-	4.13	-0.02	84	347	83	74
385	60.158	0.155	0.079	1.06	89	-3.3	-	4.12	-0.01	84	345	83	74
386	60.316	0.158	0.079	1.05	89	-3.4	-	4.11	-0.01	84	345	84	74
387	60.473	0.157	0.080	1.06	88	-3.4	-	4.09	-0.02	84	344	83	74
388	60.632	0.159	0.078	1.06	88	-3.4	-	4.08	-0.01	84	343	84	74
389	60.789	0.157	0.079	1.05	88	-3.4	-	4.06	-0.02	84	342	82	74
390	60.945	0.156	0.079	1.07	88	-3.4	100	4.06	0.00	84	341	82	74
391	61.103	0.158	0.078	1.05	89	-3.5	-	4.04	-0.02	84	340	84	74
392	61.257	0.154	0.078	1.06	87	-3.3	-	4.03	-0.01	84	339	83	74
393	61.413	0.156	0.081	1.06	87	-3.4	-	4.02	-0.01	84	338	84	74
394	61.570	0.157	0.078	1.06	88	-3.4	-	4.01	-0.01	84	337	83	74
395	61.728	0.158	0.079	1.05	89	-3.4	-	3.99	-0.02	83	336	82	74
396	61.884	0.156	0.080	1.06	88	-3.5	-	3.98	-0.01	83	335	83	74
397	62.041	0.157	0.078	1.07	88	-3.4	-	3.97	-0.01	83	333	82	74
398	62.198	0.157	0.079	1.05	88	-3.4	-	3.96	-0.01	83	332	83	74
399	62.357	0.159	0.078	1.06	88	-3.4	-	3.94	-0.02	83	331	83	74
400	62.515	0.158	0.078	1.05	89	-3.5	100	3.93	-0.01	83	331	84	74
401	62.670	0.155	0.078	1.06	88	-3.5	-	3.92	-0.01	83	330	84	74
402	62.828	0.158	0.078	1.05	88	-3.3	-	3.91	-0.01	83	329	83	74
403	62.983	0.155	0.078	1.06	88	-3.4	-	3.89	-0.02	83	328	84	74
404	63.138	0.155	0.079	1.06	88	-3.5	-	3.89	0.00	83	327	83	74
405	63.296	0.158	0.080	1.05	87	-3.5	-	3.87	-0.02	83	326	82	74
406	63.452	0.156	0.080	1.07	87	-3.4	-	3.86	-0.01	83	325	83	74
407	63.608	0.156	0.078	1.05	88	-3.4	-	3.85	-0.01	83	323	83	74
408	63.766	0.158	0.078	1.06	88	-3.4	-	3.84	-0.01	83	323	84	74
409	63.925	0.159	0.080	1.06	88	-3.5	-	3.83	-0.01	83	322	84	74
410	64.082	0.157	0.079	1.07	87	-3.4	100	3.81	-0.02	83	321	83	74
411	64.239	0.157	0.079	1.05	88	-3.5	-	3.81	0.00	83	320	84	74
412	64.395	0.156	0.079	1.06	88	-3.5	-	3.79	-0.02	83	319	84	74
413	64.553	0.158	0.078	1.06	88	-3.4	-	3.78	-0.01	83	318	83	74
414	64.707	0.154	0.078	1.06	88	-3.4	-	3.77	-0.01	83	317	82	74
415	64.863	0.156	0.080	1.06	88	-3.5	-	3.76	-0.01	83	316	83	74

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: IHP

Job #: 25-416

Model: Montecito-C

Tracking #: 223

Run #: 4

Technician: AK

Date: 5/30/2025

Elapsed Time (min)	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
	Gas Meter (ft³)	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
416	65.021	0.158	0.078	1.07	89	-3.5	-	3.74	-0.02	83	315	83	74
417	65.176	0.155	0.078	1.06	89	-3.4	-	3.73	-0.01	83	314	83	74
418	65.334	0.158	0.079	1.05	89	-3.4	-	3.73	0.00	83	313	84	74
419	65.491	0.157	0.080	1.06	89	-3.5	-	3.72	-0.01	83	312	84	74
420	65.650	0.159	0.080	1.06	89	-3.5	99	3.70	-0.02	83	312	84	74
421	65.807	0.157	0.078	1.06	88	-3.4	-	3.69	-0.01	83	311	82	74
422	65.963	0.156	0.079	1.07	90	-3.5	-	3.68	-0.01	83	310	82	74
423	66.121	0.158	0.077	1.06	88	-3.4	-	3.68	0.00	82	309	83	74
424	66.278	0.157	0.079	1.05	88	-3.5	-	3.66	-0.02	82	308	82	74
425	66.431	0.153	0.079	1.06	88	-3.4	-	3.65	-0.01	82	307	83	74
426	66.588	0.157	0.080	1.06	88	-3.4	-	3.64	-0.01	82	306	83	74
427	66.746	0.158	0.077	1.05	88	-3.4	-	3.63	-0.01	82	306	84	74
428	66.902	0.156	0.079	1.05	88	-3.5	-	3.62	-0.01	82	305	83	74
429	67.059	0.157	0.080	1.06	88	-3.4	-	3.61	-0.01	82	304	84	74
430	67.216	0.157	0.078	1.06	88	-3.5	99	3.60	-0.01	82	303	82	74
431	67.375	0.159	0.079	1.05	89	-3.4	-	3.59	-0.01	82	302	83	74
432	67.533	0.158	0.079	1.05	88	-3.4	-	3.58	-0.01	82	301	83	74
433	67.688	0.155	0.078	1.06	89	-3.5	-	3.57	-0.01	82	300	83	74
434	67.846	0.158	0.079	1.05	88	-3.5	-	3.56	-0.01	82	300	84	74
435	68.003	0.157	0.077	1.05	88	-3.4	-	3.55	-0.01	82	299	83	74
436	68.156	0.153	0.078	1.05	87	-3.4	-	3.54	-0.01	82	298	83	74
437	68.313	0.157	0.079	1.06	88	-3.4	-	3.53	-0.01	82	297	83	74
438	68.470	0.157	0.078	1.05	88	-3.5	-	3.52	-0.01	82	297	83	74
439	68.626	0.156	0.078	1.05	87	-3.4	-	3.51	-0.01	82	296	82	74
440	68.784	0.158	0.078	1.05	88	-3.5	100	3.50	-0.01	82	295	83	74
441	68.943	0.159	0.078	1.06	87	-3.4	-	3.49	-0.01	82	294	83	74
442	69.100	0.157	0.079	1.06	88	-3.4	-	3.47	-0.02	82	293	84	74
443	69.257	0.157	0.079	1.05	89	-3.4	-	3.46	-0.01	82	292	84	74
444	69.413	0.156	0.079	1.07	89	-3.5	-	3.46	0.00	82	291	83	74
445	69.568	0.155	0.077	1.04	88	-3.4	-	3.46	0.00	82	290	83	74
446	69.725	0.157	0.079	1.06	88	-3.5	-	3.44	-0.02	82	289	83	74
447	69.881	0.156	0.079	1.05	87	-3.5	-	3.44	0.00	82	287	83	74

BOX A TEST DATA - ASTM E2780 / ASTM E2515

Client: IHPJob #: 25-416Model: Montecito-CTracking #: 223Run #: 4Technician: AKDate: 5/30/2025

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
448	70.039	0.158	0.078	1.04	88	-3.5	100	3.43	-0.01	82	286	83	74
Avg/Tot	70.039	0.156	0.079	1.06	87.0	-2.3	100			89.2	551.3	83.2	73.7

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: IHPJob #: 25-416Model: Montecito-CTracking #: 223Run #: 4Technician: AKDate: 5/30/2025

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		-0.01	69	-0.5		85	0.003	0.08	0.006
1	0.141	0.141	1.22	69	-1.4	-	85	0.001	1.62	0.142
2	0.303	0.162	1.21	69	-1.4	-	85	0.002	5.44	0.160
3	0.467	0.164	1.23	70	-1.4	-	85	0.008	10.02	0.225
4	0.628	0.161	1.20	70	-1.5	-	84	0.004	12.87	0.551
5	0.789	0.161	1.18	70	-1.5	-	85	0.007	11.89	0.360
6	0.951	0.162	1.20	70	-1.4	-	85	0.006	11.93	0.227
7	1.111	0.160	1.21	70	-1.5	-	85	0.007	14.54	0.183
8	1.273	0.162	1.18	69	-1.3	-	85	0.008	14.61	0.082
9	1.432	0.159	1.18	70	-1.5	-	85	0.006	15.16	0.180
10	1.594	0.162	1.20	70	-1.4	102	85	0.003	13.86	0.115
11	1.753	0.159	1.17	70	-1.4	-	85	0.004	13.56	0.110
12	1.914	0.161	1.19	71	-1.5	-	85	0.004	13.33	0.129
13	2.073	0.159	1.19	70	-1.5	-	85	0.005	12.65	0.123
14	2.234	0.161	1.18	71	-1.4	-	85	0.006	11.94	0.075
15	2.392	0.158	1.20	71	-1.3	-	86	0.004	5.83	0.133
16	2.553	0.161	1.19	71	-1.5	-	86	0.005	7.79	0.742
17	2.714	0.161	1.17	71	-1.5	-	86	0.002	7.95	0.717
18	2.872	0.158	1.20	72	-1.4	-	86	0.006	8.85	0.586
19	3.029	0.157	1.18	72	-1.3	-	86	0.005	11.02	0.183
20	3.190	0.161	1.16	72	-1.3	103	85	0.007	12.53	0.088
21	3.347	0.157	1.19	72	-1.4	-	85	0.004	12.67	0.076
22	3.508	0.161	1.18	72	-1.3	-	85	0.009	13.30	0.060
23	3.665	0.157	1.17	72	-1.4	-	86	0.005	13.62	0.060
24	3.826	0.161	1.16	73	-1.3	-	86	0.005	13.88	0.077
25	3.983	0.157	1.17	73	-1.5	-	86	0.004	14.15	0.071
26	4.144	0.161	1.17	73	-1.3	-	86	0.005	13.91	0.041
27	4.301	0.157	1.18	74	-1.3	-	86	0.000	13.90	0.048
28	4.461	0.160	1.18	74	-1.5	-	86	0.004	13.68	0.044
29	4.619	0.158	1.18	74	-1.4	-	86	0.009	13.57	0.040
30	4.778	0.159	1.17	75	-1.4	103	86	0.005	13.34	0.035
31	4.937	0.159	1.17	74	-1.5	-	86	0.006	12.83	0.030

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: IHP
 Model: Montecito-C
 Run #: 4

Job #: 25-416
 Tracking #: 223
 Technician: AK
 Date: 5/30/2025

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 (%)
32	5.096	0.159	1.16	75	-1.3	-	86	0.006	12.60	0.035
33	5.257	0.161	1.18	75	-1.4	-	86	0.008	13.38	0.308
34	5.413	0.156	1.16	76	-1.3	-	86	0.001	11.01	0.109
35	5.573	0.160	1.15	76	-1.4	-	86	0.006	9.52	0.150
36	5.731	0.158	1.17	76	-1.3	-	86	0.006	8.87	0.197
37	5.892	0.161	1.17	76	-1.4	-	86	0.006	8.64	0.235
38	6.050	0.158	1.18	77	-1.3	-	86	0.002	8.52	0.266
39	6.210	0.160	1.18	77	-1.5	-	86	0.003	8.42	0.293
40	6.368	0.158	1.19	77	-1.5	102	85	0.006	8.64	0.284
41	6.529	0.161	1.17	77	-1.5	-	86	0.003	9.01	0.232
42	6.686	0.157	1.16	77	-1.5	-	86	0.008	9.32	0.195
43	6.847	0.161	1.18	78	-1.3	-	86	0.001	9.52	0.169
44	7.005	0.158	1.19	78	-1.3	-	86	0.014	9.61	0.138
45	7.166	0.161	1.16	78	-1.5	-	86	0.006	9.73	0.106
46	7.324	0.158	1.17	78	-1.3	-	86	0.008	9.89	0.098
47	7.485	0.161	1.19	78	-1.4	-	86	0.009	10.01	0.085
48	7.643	0.158	1.16	78	-1.3	-	86	0.006	10.20	0.069
49	7.807	0.164	1.20	79	-1.5	-	86	0.001	10.26	0.075
50	7.962	0.155	1.18	79	-1.3	100	86	0.008	10.40	0.071
51	8.124	0.162	1.18	79	-1.4	-	86	0.002	10.47	0.078
52	8.282	0.158	1.17	80	-1.3	-	86	0.010	10.57	0.079
53	8.443	0.161	1.17	80	-1.3	-	85	0.005	10.45	0.064
54	8.601	0.158	1.17	80	-1.3	-	86	0.008	10.49	0.068
55	8.762	0.161	1.17	80	-1.3	-	86	0.007	10.26	0.070
56	8.921	0.159	1.16	80	-1.3	-	86	0.001	9.99	0.075
57	9.082	0.161	1.18	80	-1.3	-	86	0.005	9.88	0.082
58	9.240	0.158	1.19	81	-1.4	-	86	0.005	9.86	0.100
59	9.402	0.162	1.18	81	-1.3	-	86	0.007	9.83	0.095
60	9.560	0.158	1.16	81	-1.3	101	85	0.005	9.45	0.102
61	9.721	0.161	1.18	81	-1.3	-	85	0.011	8.73	0.181
62	9.880	0.159	1.19	81	-1.4	-	86	0.005	8.27	0.232
63	10.041	0.161	1.15	82	-1.4	-	86	0.008	8.21	0.220

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: IHP
 Model: Montecito-C
 Run #: 4

Job #: 25-416
 Tracking #: 223
 Technician: AK
 Date: 5/30/2025

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 (%)
64	10.200	0.159	1.19	81	-1.3	-	87	0.007	8.05	0.188
65	10.362	0.162	1.20	82	-1.4	-	87	0.003	7.88	0.209
66	10.520	0.158	1.18	82	-1.4	-	86	0.009	7.83	0.189
67	10.681	0.161	1.20	82	-1.3	-	86	0.005	7.82	0.183
68	10.841	0.160	1.19	83	-1.4	-	86	0.004	7.73	0.164
69	11.001	0.160	1.18	83	-1.4	-	86	0.010	7.64	0.148
70	11.161	0.160	1.19	82	-1.3	100	85	0.004	7.55	0.164
71	11.321	0.160	1.17	83	-1.3	-	86	0.003	7.43	0.150
72	11.482	0.161	1.18	83	-1.4	-	87	0.010	7.32	0.146
73	11.641	0.159	1.16	83	-1.4	-	87	0.007	7.21	0.141
74	11.803	0.162	1.19	83	-1.3	-	87	0.004	7.12	0.146
75	11.962	0.159	1.17	84	-1.3	-	86	0.014	7.04	0.153
76	12.124	0.162	1.18	84	-1.3	-	86	0.003	6.94	0.145
77	12.283	0.159	1.18	83	-1.4	-	86	0.010	6.61	0.170
78	12.445	0.162	1.19	83	-1.4	-	86	0.006	6.43	0.174
79	12.604	0.159	1.17	84	-1.3	-	87	-0.002	6.40	0.159
80	12.766	0.162	1.19	84	-1.3	99	87	0.007	6.31	0.174
81	12.928	0.162	1.18	84	-1.4	-	87	0.005	2.54	0.194
82	13.089	0.161	1.18	84	-1.5	-	87	0.002	6.92	0.314
83	13.246	0.157	1.18	84	-1.3	-	86	0.005	8.74	0.310
84	13.407	0.161	1.18	85	-1.4	-	86	0.000	10.40	0.099
85	13.567	0.160	1.19	84	-1.4	-	86	0.007	10.96	0.067
86	13.727	0.160	1.17	84	-1.4	-	86	0.008	11.89	0.271
87	13.887	0.160	1.19	85	-1.3	-	86	0.000	9.62	0.116
88	14.047	0.160	1.18	85	-1.3	-	86	0.007	9.61	0.122
89	14.208	0.161	1.18	85	-1.3	-	87	0.008	9.66	0.112
90	14.368	0.160	1.20	85	-1.5	99	87	0.010	9.65	0.118
91	14.530	0.162	1.17	85	-1.4	-	86	0.005	9.78	0.111
92	14.689	0.159	1.19	85	-1.5	-	86	0.012	9.81	0.118
93	14.851	0.162	1.18	85	-1.5	-	86	0.005	9.88	0.102
94	15.010	0.159	1.19	85	-1.3	-	86	0.004	9.90	0.102
95	15.172	0.162	1.17	86	-1.3	-	86	0.006	9.93	0.092

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: IHP
 Model: Montecito-C
 Run #: 4

Job #: 25-416
 Tracking #: 223
 Technician: AK
 Date: 5/30/2025

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 (%)
96	15.331	0.159	1.18	85	-1.4	-	86	0.005	9.91	0.095
97	15.495	0.164	1.21	86	-1.3	-	86	0.009	9.85	0.092
98	15.656	0.161	1.17	86	-1.4	-	86	0.008	9.79	0.098
99	15.814	0.158	1.18	86	-1.4	-	86	0.009	9.80	0.107
100	15.974	0.160	1.21	86	-1.4	100	86	0.011	9.66	0.109
101	16.134	0.160	1.17	86	-1.4	-	86	0.008	9.55	0.120
102	16.295	0.161	1.18	86	-1.4	-	86	0.004	9.53	0.132
103	16.455	0.160	1.18	86	-1.4	-	86	0.002	9.56	0.119
104	16.617	0.162	1.18	86	-1.4	-	86	0.008	9.52	0.119
105	16.776	0.159	1.18	86	-1.3	-	86	0.008	9.45	0.128
106	16.938	0.162	1.21	86	-1.4	-	86	0.010	9.53	0.133
107	17.098	0.160	1.18	86	-1.3	-	87	0.010	9.75	0.117
108	17.260	0.162	1.17	86	-1.4	-	87	0.008	10.21	0.113
109	17.419	0.159	1.17	86	-1.3	-	87	0.005	9.88	0.116
110	17.581	0.162	1.19	86	-1.3	100	86	0.009	9.71	0.114
111	17.741	0.160	1.19	87	-1.3	-	86	0.008	9.64	0.125
112	17.902	0.161	1.19	87	-1.4	-	86	0.007	9.71	0.120
113	18.065	0.163	1.17	87	-1.3	-	86	-0.001	9.65	0.141
114	18.225	0.160	1.20	87	-1.3	-	87	0.012	9.66	0.117
115	18.384	0.159	1.20	87	-1.4	-	87	0.007	9.56	0.140
116	18.543	0.159	1.19	87	-1.3	-	87	0.008	9.55	0.140
117	18.705	0.162	1.17	87	-1.4	-	87	0.007	9.48	0.145
118	18.865	0.160	1.17	87	-1.4	-	86	0.007	9.46	0.151
119	19.027	0.162	1.19	87	-1.4	-	86	0.005	9.31	0.148
120	19.186	0.159	1.16	87	-1.4	99	86	0.011	9.18	0.151
121	19.348	0.162	1.17	87	-1.3	-	86	0.009	9.08	0.165
122	19.508	0.160	1.18	87	-1.4	-	86	0.008	8.91	0.147
123	19.669	0.161	1.16	87	-1.4	-	87	0.007	8.61	0.143
124	19.830	0.161	1.17	88	-1.3	-	86	0.005	8.42	0.149
125	19.990	0.160	1.18	87	-1.4	-	86	0.009	8.23	0.128
126	20.151	0.161	1.19	87	-1.4	-	86	0.004	8.13	0.127
127	20.311	0.160	1.19	87	-1.4	-	86	0.004	8.05	0.120

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: IHP
 Model: Montecito-C
 Run #: 4

Job #: 25-416
 Tracking #: 223
 Technician: AK
 Date: 5/30/2025

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 (%)
128	20.476	0.165	1.20	88	-1.4	-	86	0.009	7.99	0.111
129	20.635	0.159	1.18	88	-1.3	-	86	0.005	8.00	0.102
130	20.797	0.162	1.17	88	-1.3	100	86	0.004	7.96	0.099
131	20.954	0.157	1.20	88	-1.4	-	86	0.011	7.88	0.101
132	21.116	0.162	1.17	88	-1.4	-	86	0.013	7.72	0.104
133	21.276	0.160	1.19	88	-1.3	-	86	0.006	7.23	0.144
134	21.437	0.161	1.17	88	-1.4	-	86	0.002	6.94	0.146
135	21.598	0.161	1.19	88	-1.3	-	86	0.005	6.81	0.138
136	21.758	0.160	1.18	88	-1.3	-	86	0.005	6.64	0.173
137	21.919	0.161	1.18	88	-1.3	-	86	0.007	6.50	0.181
138	22.079	0.160	1.17	88	-1.4	-	86	0.009	6.42	0.182
139	22.241	0.162	1.17	88	-1.3	-	86	0.006	6.32	0.214
140	22.401	0.160	1.19	88	-1.4	99	86	0.010	6.29	0.217
141	22.563	0.162	1.19	88	-1.4	-	86	0.011	6.17	0.227
142	22.723	0.160	1.18	89	-1.3	-	86	0.010	6.11	0.213
143	22.885	0.162	1.21	88	-1.3	-	87	0.008	6.06	0.217
144	23.045	0.160	1.19	88	-1.3	-	87	0.006	6.06	0.229
145	23.206	0.161	1.16	88	-1.4	-	87	0.007	6.01	0.204
146	23.367	0.161	1.19	89	-1.3	-	87	0.010	6.09	0.197
147	23.526	0.159	1.18	89	-1.4	-	87	0.007	2.22	0.238
148	23.689	0.163	1.15	89	-1.4	-	86	0.013	3.45	0.563
149	23.848	0.159	1.16	89	-1.4	-	87	0.008	4.26	0.613
150	24.013	0.165	1.17	88	-1.4	100	87	0.009	5.47	0.680
151	24.173	0.160	1.15	89	-1.3	-	87	0.008	6.94	0.542
152	24.335	0.162	1.20	89	-1.4	-	87	0.005	8.26	0.441
153	24.495	0.160	1.17	89	-1.4	-	87	0.011	8.79	0.409
154	24.654	0.159	1.18	89	-1.4	-	86	0.007	10.25	0.378
155	24.814	0.160	1.18	89	-1.4	-	86	0.007	12.31	0.166
156	24.975	0.161	1.17	89	-1.4	-	86	0.005	12.05	0.128
157	25.136	0.161	1.17	89	-1.3	-	86	0.004	15.33	0.347
158	25.296	0.160	1.17	90	-1.4	-	86	0.008	12.86	0.366
159	25.458	0.162	1.17	89	-1.3	-	87	0.009	11.99	0.503

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: IHP
 Model: Montecito-C
 Run #: 4

Job #: 25-416
 Tracking #: 223
 Technician: AK
 Date: 5/30/2025

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 (%)
160	25.618	0.160	1.18	89	-1.4	100	87	0.004	11.52	0.330
161	25.780	0.162	1.19	90	-1.4	-	87	0.009	10.23	0.355
162	25.940	0.160	1.19	90	-1.3	-	86	0.006	9.60	0.384
163	26.102	0.162	1.22	89	-1.3	-	86	0.003	10.11	0.366
164	26.263	0.161	1.18	90	-1.4	-	86	0.008	10.09	0.343
165	26.423	0.160	1.20	90	-1.4	-	87	0.006	10.17	0.359
166	26.585	0.162	1.19	90	-1.4	-	86	0.002	9.69	0.377
167	26.747	0.162	1.19	89	-1.3	-	86	0.004	9.42	0.373
168	26.910	0.163	1.17	89	-1.4	-	86	0.004	9.40	0.377
169	27.070	0.160	1.17	90	-1.4	-	86	0.006	9.28	0.349
170	27.230	0.160	1.17	90	-1.3	100	86	0.004	9.38	0.354
171	27.390	0.160	1.15	90	-1.4	-	86	0.008	9.44	0.325
172	27.551	0.161	1.19	90	-1.3	-	86	0.007	9.77	0.285
173	27.712	0.161	1.18	90	-1.3	-	86	0.008	9.52	0.289
174	27.872	0.160	1.18	90	-1.4	-	87	0.010	9.41	0.288
175	28.035	0.163	1.16	90	-1.4	-	87	0.009	9.30	0.287
176	28.195	0.160	1.16	90	-1.4	-	87	0.011	9.15	0.279
177	28.357	0.162	1.18	90	-1.3	-	87	0.011	9.33	0.263
178	28.517	0.160	1.18	90	-1.4	-	87	0.007	9.07	0.288
179	28.679	0.162	1.20	90	-1.4	-	87	0.008	9.11	0.319
180	28.840	0.161	1.16	90	-1.4	100	87	0.010	9.00	0.303
181	29.001	0.161	1.18	90	-1.4	-	87	0.009	8.97	0.334
182	29.162	0.161	1.18	90	-1.3	-	87	0.005	8.88	0.344
183	29.325	0.163	1.17	90	-1.4	-	87	0.006	8.84	0.327
184	29.488	0.163	1.19	90	-1.4	-	87	0.009	8.93	0.308
185	29.645	0.157	1.18	90	-1.3	-	87	0.007	9.09	0.312
186	29.807	0.162	1.19	90	-1.3	-	87	0.010	9.27	0.305
187	29.967	0.160	1.19	91	-1.3	-	87	0.012	9.51	0.283
188	30.129	0.162	1.17	90	-1.3	-	87	0.009	9.60	0.290
189	30.290	0.161	1.21	90	-1.3	-	87	0.008	9.84	0.258
190	30.451	0.161	1.19	91	-1.3	100	87	0.009	9.96	0.221
191	30.613	0.162	1.18	90	-1.4	-	87	0.010	9.95	0.209

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: IHP
 Model: Montecito-C
 Run #: 4

Job #: 25-416
 Tracking #: 223
 Technician: AK
 Date: 5/30/2025

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 (%)
192	30.773	0.160	1.20	91	-1.3	-	87	0.010	10.05	0.191
193	30.936	0.163	1.18	91	-1.3	-	86	0.004	10.07	0.195
194	31.096	0.160	1.18	90	-1.3	-	86	0.013	10.30	0.149
195	31.258	0.162	1.18	91	-1.4	-	87	0.004	10.22	0.141
196	31.419	0.161	1.18	90	-1.3	-	87	0.004	10.17	0.140
197	31.580	0.161	1.17	91	-1.4	-	87	0.009	10.22	0.153
198	31.744	0.164	1.17	91	-1.4	-	87	0.013	10.11	0.142
199	31.904	0.160	1.18	91	-1.3	-	87	0.012	10.07	0.139
200	32.067	0.163	1.17	90	-1.3	101	87	0.013	10.10	0.152
201	32.223	0.156	1.19	91	-1.2	-	87	0.010	10.14	0.148
202	32.386	0.163	1.17	90	-1.3	-	87	0.009	10.02	0.152
203	32.546	0.160	1.16	91	-1.4	-	87	0.013	9.99	0.159
204	32.708	0.162	1.20	90	-1.4	-	87	0.008	10.09	0.156
205	32.869	0.161	1.20	91	-1.3	-	87	0.012	10.07	0.162
206	33.029	0.160	1.18	91	-1.4	-	86	0.008	9.96	0.150
207	33.192	0.163	1.19	91	-1.4	-	87	0.005	9.92	0.152
208	33.352	0.160	1.18	90	-1.4	-	86	0.009	10.01	0.163
209	33.515	0.163	1.17	90	-1.3	-	86	0.009	10.04	0.140
210	33.675	0.160	1.18	90	-1.3	101	87	0.007	10.07	0.136
211	33.837	0.162	1.20	91	-1.4	-	87	0.006	10.14	0.134
212	33.998	0.161	1.19	91	-1.3	-	87	0.008	10.21	0.126
213	34.161	0.163	1.19	90	-1.3	-	87	0.014	10.11	0.116
214	34.324	0.163	1.19	91	-1.4	-	87	0.008	9.91	0.110
215	34.484	0.160	1.18	91	-1.4	-	87	0.007	9.82	0.104
216	34.644	0.160	1.18	91	-1.3	-	87	0.009	9.68	0.111
217	34.804	0.160	1.18	91	-1.4	-	87	0.006	9.53	0.093
218	34.966	0.162	1.17	91	-1.4	-	87	0.015	9.41	0.099
219	35.127	0.161	1.18	90	-1.3	-	87	0.011	9.35	0.100
220	35.288	0.161	1.15	90	-1.4	101	87	0.010	9.37	0.096
221	35.450	0.162	1.18	90	-1.4	-	86	0.005	9.29	0.089
222	35.610	0.160	1.16	90	-1.3	-	87	0.013	9.24	0.098
223	35.773	0.163	1.17	91	-1.4	-	87	0.006	9.17	0.090

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: IHP
 Model: Montecito-C
 Run #: 4

Job #: 25-416
 Tracking #: 223
 Technician: AK
 Date: 5/30/2025

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 (%)
224	35.933	0.160	1.18	90	-1.4	-	87	0.003	8.94	0.093
225	36.096	0.163	1.16	90	-1.4	-	87	0.005	8.83	0.095
226	36.256	0.160	1.16	91	-1.4	-	87	0.006	8.74	0.095
227	36.419	0.163	1.18	91	-1.4	-	87	0.008	8.65	0.104
228	36.582	0.163	1.20	91	-1.3	-	87	0.001	8.54	0.107
229	36.742	0.160	1.19	91	-1.4	-	87	0.003	8.47	0.107
230	36.902	0.160	1.19	91	-1.3	101	87	0.010	8.38	0.119
231	37.062	0.160	1.19	91	-1.3	-	87	0.009	8.40	0.122
232	37.225	0.163	1.19	90	-1.4	-	87	0.004	8.41	0.118
233	37.385	0.160	1.19	91	-1.4	-	87	0.004	8.44	0.110
234	37.546	0.161	1.16	91	-1.4	-	87	0.016	8.41	0.109
235	37.708	0.162	1.16	91	-1.4	-	87	0.009	8.38	0.114
236	37.868	0.160	1.18	91	-1.4	-	87	0.007	8.40	0.119
237	38.031	0.163	1.18	91	-1.4	-	87	0.005	8.59	0.136
238	38.191	0.160	1.19	91	-1.4	-	87	0.005	8.46	0.130
239	38.353	0.162	1.19	91	-1.3	-	86	0.010	8.39	0.137
240	38.514	0.161	1.17	91	-1.4	100	86	0.006	8.38	0.122
241	38.677	0.163	1.19	90	-1.3	-	87	0.002	8.30	0.134
242	38.840	0.163	1.17	91	-1.4	-	86	0.008	8.20	0.126
243	39.000	0.160	1.18	91	-1.4	-	86	0.009	8.15	0.122
244	39.160	0.160	1.18	91	-1.3	-	86	0.004	7.99	0.128
245	39.320	0.160	1.20	91	-1.3	-	87	0.006	7.85	0.129
246	39.482	0.162	1.16	91	-1.3	-	86	0.010	7.92	0.126
247	39.643	0.161	1.20	91	-1.4	-	87	0.007	7.97	0.104
248	39.805	0.162	1.18	91	-1.4	-	87	0.007	8.06	0.100
249	39.966	0.161	1.19	91	-1.3	-	87	0.004	8.06	0.092
250	40.126	0.160	1.18	91	-1.4	100	87	0.009	8.13	0.088
251	40.289	0.163	1.16	91	-1.4	-	87	0.007	8.20	0.079
252	40.449	0.160	1.19	90	-1.4	-	87	0.007	8.24	0.065
253	40.612	0.163	1.18	90	-1.3	-	87	0.010	8.36	0.064
254	40.775	0.163	1.16	91	-1.4	-	87	0.007	8.42	0.064
255	40.936	0.161	1.18	91	-1.3	-	87	0.005	8.41	0.059

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: IHP
 Model: Montecito-C
 Run #: 4

Job #: 25-416
 Tracking #: 223
 Technician: AK
 Date: 5/30/2025

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 (%)
256	41.098	0.162	1.18	91	-1.4	-	87	0.009	8.32	0.057
257	41.256	0.158	1.17	90	-1.4	-	87	0.004	8.26	0.067
258	41.418	0.162	1.19	91	-1.4	-	87	0.011	8.22	0.072
259	41.578	0.160	1.16	91	-1.4	-	87	0.011	8.24	0.073
260	41.741	0.163	1.17	91	-1.3	100	87	0.014	8.17	0.069
261	41.901	0.160	1.19	91	-1.4	-	87	0.002	8.11	0.071
262	42.064	0.163	1.18	90	-1.3	-	87	0.008	8.07	0.071
263	42.225	0.161	1.20	91	-1.4	-	87	0.006	8.11	0.069
264	42.385	0.160	1.19	91	-1.4	-	87	0.008	8.13	0.056
265	42.548	0.163	1.16	91	-1.4	-	86	0.007	8.27	0.050
266	42.708	0.160	1.19	91	-1.3	-	87	0.006	8.31	0.038
267	42.873	0.165	1.20	91	-1.3	-	86	0.006	8.03	0.063
268	43.034	0.161	1.20	91	-1.4	-	87	0.007	7.65	0.118
269	43.195	0.161	1.18	91	-1.3	-	86	0.003	7.59	0.135
270	43.354	0.159	1.17	91	-1.3	100	87	0.013	7.49	0.147
271	43.514	0.160	1.19	91	-1.4	-	86	0.006	7.43	0.161
272	43.677	0.163	1.18	91	-1.3	-	86	0.007	7.38	0.168
273	43.837	0.160	1.20	91	-1.4	-	87	0.006	7.48	0.170
274	44.000	0.163	1.18	91	-1.3	-	86	0.009	7.43	0.179
275	44.160	0.160	1.20	91	-1.4	-	87	0.009	7.36	0.181
276	44.323	0.163	1.16	91	-1.4	-	87	0.006	7.37	0.179
277	44.483	0.160	1.19	90	-1.4	-	87	0.011	7.34	0.179
278	44.644	0.161	1.18	91	-1.4	-	86	0.009	7.27	0.197
279	44.807	0.163	1.16	91	-1.3	-	87	0.007	7.23	0.197
280	44.970	0.163	1.16	91	-1.4	100	87	0.009	7.17	0.186
281	45.132	0.162	1.17	91	-1.3	-	87	0.013	7.17	0.185
282	45.293	0.161	1.17	91	-1.4	-	87	0.004	7.17	0.202
283	45.454	0.161	1.16	91	-1.4	-	87	0.007	7.11	0.216
284	45.613	0.159	1.17	91	-1.4	-	86	0.011	7.10	0.192
285	45.774	0.161	1.18	91	-1.4	-	86	0.011	7.08	0.196
286	45.936	0.162	1.19	91	-1.3	-	87	0.001	7.05	0.193
287	46.096	0.160	1.16	91	-1.4	-	86	0.012	6.95	0.206

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: IHP
 Model: Montecito-C
 Run #: 4

Job #: 25-416
 Tracking #: 223
 Technician: AK
 Date: 5/30/2025

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 (%)
288	46.259	0.163	1.17	91	-1.4	-	87	0.007	6.91	0.193
289	46.420	0.161	1.19	91	-1.4	-	87	0.004	6.88	0.200
290	46.582	0.162	1.20	91	-1.4	99	87	0.003	6.51	0.180
291	46.743	0.161	1.16	91	-1.4	-	86	0.011	6.43	0.180
292	46.903	0.160	1.19	90	-1.4	-	86	0.005	6.36	0.192
293	47.066	0.163	1.17	91	-1.3	-	87	0.013	6.29	0.210
294	47.229	0.163	1.19	91	-1.5	-	87	0.009	6.22	0.218
295	47.392	0.163	1.17	91	-1.4	-	86	0.013	6.21	0.227
296	47.553	0.161	1.20	91	-1.4	-	86	0.005	6.29	0.201
297	47.713	0.160	1.16	91	-1.4	-	86	0.008	6.26	0.196
298	47.873	0.160	1.17	91	-1.3	-	87	0.008	6.17	0.193
299	48.033	0.160	1.19	91	-1.5	-	86	0.003	5.66	0.211
300	48.196	0.163	1.22	91	-1.3	99	87	0.007	5.48	0.253
301	48.356	0.160	1.19	91	-1.3	-	86	0.008	5.39	0.263
302	48.520	0.164	1.18	91	-1.4	-	87	0.010	5.25	0.304
303	48.680	0.160	1.16	91	-1.3	-	87	0.012	5.19	0.356
304	48.842	0.162	1.18	91	-1.4	-	86	0.008	5.24	0.395
305	49.004	0.162	1.18	91	-1.5	-	86	0.011	5.23	0.382
306	49.164	0.160	1.19	91	-1.4	-	87	0.011	5.24	0.373
307	49.330	0.166	1.19	91	-1.4	-	86	0.005	5.24	0.378
308	49.491	0.161	1.18	91	-1.4	-	87	0.007	5.14	0.364
309	49.652	0.161	1.19	91	-1.3	-	86	0.006	5.10	0.365
310	49.814	0.162	1.17	91	-1.3	100	86	0.013	5.04	0.400
311	49.972	0.158	1.17	90	-1.4	-	86	0.005	4.99	0.438
312	50.135	0.163	1.18	91	-1.5	-	86	0.010	4.93	0.452
313	50.295	0.160	1.17	91	-1.3	-	87	0.003	4.86	0.476
314	50.458	0.163	1.19	91	-1.3	-	86	0.012	4.85	0.483
315	50.618	0.160	1.19	91	-1.3	-	86	0.011	4.83	0.529
316	50.781	0.163	1.18	91	-1.4	-	86	0.006	4.84	0.511
317	50.942	0.161	1.18	91	-1.3	-	86	0.005	4.84	0.508
318	51.102	0.160	1.18	91	-1.3	-	86	0.006	4.84	0.536
319	51.266	0.164	1.19	91	-1.5	-	86	0.010	4.81	0.442

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: IHP
 Model: Montecito-C
 Run #: 4

Job #: 25-416
 Tracking #: 223
 Technician: AK
 Date: 5/30/2025

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 (%)
320	51.429	0.163	1.18	91	-1.5	100	86	0.012	4.81	0.436
321	51.591	0.162	1.19	91	-1.5	-	86	0.010	4.85	0.431
322	51.752	0.161	1.19	91	-1.4	-	87	0.002	4.81	0.438
323	51.913	0.161	1.18	91	-1.4	-	87	0.009	4.86	0.448
324	52.073	0.160	1.19	91	-1.5	-	87	0.007	4.84	0.459
325	52.233	0.160	1.18	90	-1.4	-	86	0.012	4.83	0.451
326	52.396	0.163	1.20	91	-1.4	-	86	0.003	4.81	0.453
327	52.557	0.161	1.18	91	-1.3	-	86	0.009	4.86	0.447
328	52.720	0.163	1.20	91	-1.4	-	86	0.003	4.87	0.454
329	52.880	0.160	1.17	91	-1.5	-	86	0.011	4.85	0.443
330	53.041	0.161	1.18	91	-1.5	99	86	0.005	4.88	0.431
331	53.204	0.163	1.19	91	-1.3	-	86	0.001	4.92	0.438
332	53.367	0.163	1.19	91	-1.4	-	87	0.010	4.90	0.443
333	53.530	0.163	1.19	91	-1.5	-	86	0.008	4.94	0.429
334	53.691	0.161	1.18	91	-1.3	-	87	0.009	4.94	0.424
335	53.852	0.161	1.19	91	-1.3	-	86	0.008	4.93	0.419
336	54.011	0.159	1.19	91	-1.3	-	87	0.007	4.92	0.415
337	54.172	0.161	1.19	91	-1.4	-	86	0.008	4.93	0.412
338	54.335	0.163	1.15	91	-1.4	-	86	0.009	4.87	0.425
339	54.495	0.160	1.17	91	-1.3	-	86	0.005	4.88	0.413
340	54.658	0.163	1.16	91	-1.4	100	87	0.004	4.88	0.417
341	54.819	0.161	1.15	91	-1.3	-	87	0.012	4.88	0.421
342	54.980	0.161	1.17	91	-1.4	-	87	0.006	4.80	0.409
343	55.145	0.165	1.18	91	-1.5	-	86	0.009	4.76	0.421
344	55.305	0.160	1.18	91	-1.4	-	87	0.006	4.68	0.416
345	55.468	0.163	1.20	90	-1.4	-	87	0.006	4.66	0.413
346	55.629	0.161	1.20	91	-1.3	-	86	0.008	4.69	0.418
347	55.790	0.161	1.20	90	-1.4	-	87	0.007	4.64	0.417
348	55.949	0.159	1.19	91	-1.3	-	86	0.011	4.60	0.410
349	56.110	0.161	1.16	91	-1.3	-	87	0.007	4.59	0.418
350	56.272	0.162	1.18	91	-1.3	100	86	0.014	4.55	0.413
351	56.433	0.161	1.18	91	-1.3	-	86	0.006	4.56	0.411

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: IHP
 Model: Montecito-C
 Run #: 4

Job #: 25-416
 Tracking #: 223
 Technician: AK
 Date: 5/30/2025

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 (%)
352	56.596	0.163	1.19	91	-1.4	-	86	0.006	4.46	0.377
353	56.756	0.160	1.19	91	-1.5	-	86	0.008	4.43	0.371
354	56.919	0.163	1.17	91	-1.3	-	86	0.007	4.39	0.371
355	57.080	0.161	1.21	91	-1.3	-	86	0.008	4.40	0.382
356	57.243	0.163	1.17	91	-1.4	-	86	0.007	4.38	0.390
357	57.406	0.163	1.17	91	-1.4	-	87	0.007	4.39	0.390
358	57.566	0.160	1.17	91	-1.3	-	86	0.008	4.34	0.401
359	57.729	0.163	1.18	91	-1.5	-	87	0.002	4.36	0.412
360	57.886	0.157	1.21	91	-1.4	99	86	0.011	4.36	0.411
361	58.049	0.163	1.20	91	-1.3	-	86	0.011	4.12	0.418
362	58.210	0.161	1.16	91	-1.4	-	86	0.012	4.10	0.412
363	58.370	0.160	1.19	91	-1.3	-	86	0.008	4.08	0.414
364	58.533	0.163	1.17	91	-1.5	-	86	0.009	4.04	0.413
365	58.694	0.161	1.19	91	-1.4	-	86	0.007	4.01	0.416
366	58.859	0.165	1.17	91	-1.3	-	86	0.007	3.99	0.422
367	59.020	0.161	1.16	91	-1.3	-	86	0.007	3.99	0.422
368	59.181	0.161	1.21	91	-1.4	-	86	0.005	3.94	0.425
369	59.344	0.163	1.20	91	-1.4	-	86	0.004	3.92	0.411
370	59.504	0.160	1.17	91	-1.3	100	86	0.013	3.93	0.408
371	59.664	0.160	1.17	91	-1.4	-	87	0.007	3.92	0.404
372	59.824	0.160	1.21	91	-1.4	-	87	0.003	3.90	0.401
373	59.987	0.163	1.18	91	-1.4	-	86	0.010	3.88	0.396
374	60.148	0.161	1.18	90	-1.3	-	86	0.007	3.86	0.388
375	60.309	0.161	1.18	91	-1.3	-	86	0.009	3.85	0.392
376	60.472	0.163	1.16	91	-1.4	-	86	0.007	3.83	0.389
377	60.635	0.163	1.18	91	-1.3	-	86	0.005	3.84	0.390
378	60.798	0.163	1.17	91	-1.4	-	86	0.009	3.80	0.379
379	60.959	0.161	1.18	91	-1.3	-	86	0.009	3.81	0.380
380	61.120	0.161	1.18	91	-1.4	100	86	0.003	3.74	0.380
381	61.282	0.162	1.19	91	-1.3	-	87	0.005	3.74	0.372
382	61.440	0.158	1.18	91	-1.4	-	86	0.009	3.75	0.377
383	61.603	0.163	1.17	91	-1.3	-	86	0.004	3.74	0.375

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: IHP
 Model: Montecito-C
 Run #: 4

Job #: 25-416
 Tracking #: 223
 Technician: AK
 Date: 5/30/2025

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 (%)
384	61.763	0.160	1.18	91	-1.3	-	87	0.006	3.73	0.375
385	61.926	0.163	1.17	91	-1.3	-	87	0.006	3.70	0.368
386	62.086	0.160	1.19	91	-1.5	-	87	0.009	3.71	0.372
387	62.248	0.162	1.20	91	-1.3	-	87	0.006	3.70	0.369
388	62.413	0.165	1.18	91	-1.4	-	86	0.012	3.70	0.360
389	62.573	0.160	1.19	91	-1.5	-	86	0.007	3.65	0.361
390	62.736	0.163	1.18	91	-1.3	100	86	0.009	3.62	0.363
391	62.897	0.161	1.19	91	-1.5	-	86	0.004	3.63	0.365
392	63.057	0.160	1.19	91	-1.5	-	86	0.009	3.59	0.359
393	63.218	0.161	1.16	90	-1.3	-	86	0.010	3.57	0.359
394	63.379	0.161	1.17	91	-1.3	-	86	0.004	3.58	0.358
395	63.541	0.162	1.19	91	-1.4	-	86	0.007	3.55	0.355
396	63.701	0.160	1.17	90	-1.4	-	86	0.005	3.53	0.352
397	63.864	0.163	1.19	91	-1.3	-	86	0.003	3.51	0.352
398	64.025	0.161	1.18	91	-1.5	-	86	-0.001	3.54	0.359
399	64.189	0.164	1.18	91	-1.4	-	86	0.009	3.54	0.360
400	64.352	0.163	1.18	91	-1.4	99	87	0.004	3.55	0.352
401	64.512	0.160	1.17	91	-1.4	-	86	0.009	3.49	0.356
402	64.675	0.163	1.18	91	-1.3	-	87	0.003	3.49	0.352
403	64.832	0.157	1.18	90	-1.3	-	86	0.004	3.46	0.346
404	64.995	0.163	1.20	91	-1.5	-	86	0.008	3.44	0.346
405	65.156	0.161	1.18	91	-1.4	-	86	0.004	3.45	0.346
406	65.318	0.162	1.16	91	-1.3	-	86	0.008	3.43	0.342
407	65.480	0.162	1.18	91	-1.5	-	86	0.004	3.39	0.342
408	65.640	0.160	1.19	91	-1.4	-	86	0.006	3.39	0.331
409	65.806	0.166	1.14	91	-1.4	-	86	0.008	3.39	0.335
410	65.967	0.161	1.19	91	-1.4	99	86	0.008	3.35	0.329
411	66.128	0.161	1.17	90	-1.3	-	86	0.009	3.35	0.329
412	66.290	0.162	1.18	91	-1.5	-	86	0.006	3.34	0.326
413	66.451	0.161	1.18	91	-1.4	-	86	0.005	3.33	0.322
414	66.611	0.160	1.20	91	-1.4	-	86	0.011	3.32	0.324
415	66.771	0.160	1.20	91	-1.4	-	87	0.007	3.32	0.321

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: IHP
 Model: Montecito-C
 Run #: 4

Job #: 25-416
 Tracking #: 223
 Technician: AK
 Date: 5/30/2025

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 (%)
416	66.934	0.163	1.17	91	-1.4	-	87	0.007	3.30	0.319
417	67.095	0.161	1.16	91	-1.4	-	87	0.004	3.29	0.316
418	67.257	0.162	1.19	91	-1.4	-	86	0.008	3.28	0.320
419	67.418	0.161	1.18	91	-1.3	-	86	0.011	3.24	0.313
420	67.582	0.164	1.16	91	-1.3	99	86	0.007	3.26	0.309
421	67.745	0.163	1.16	91	-1.5	-	86	0.010	3.23	0.313
422	67.906	0.161	1.17	91	-1.3	-	86	0.006	3.17	0.311
423	68.068	0.162	1.18	91	-1.4	-	86	0.007	3.17	0.304
424	68.229	0.161	1.20	91	-1.3	-	87	0.010	3.15	0.302
425	68.388	0.159	1.18	91	-1.4	-	87	0.011	3.15	0.309
426	68.550	0.162	1.18	91	-1.3	-	87	0.005	3.14	0.306
427	68.711	0.161	1.19	91	-1.3	-	86	0.010	3.15	0.309
428	68.874	0.163	1.17	91	-1.5	-	87	0.008	3.11	0.315
429	69.034	0.160	1.16	91	-1.3	-	86	0.005	3.11	0.307
430	69.197	0.163	1.19	91	-1.5	99	86	0.007	3.09	0.305
431	69.361	0.164	1.19	91	-1.3	-	86	0.009	3.10	0.315
432	69.521	0.160	1.21	91	-1.3	-	86	0.007	3.08	0.312
433	69.684	0.163	1.19	91	-1.3	-	86	0.006	3.10	0.309
434	69.844	0.160	1.20	91	-1.3	-	86	0.014	3.05	0.309
435	70.007	0.163	1.18	91	-1.4	-	86	0.009	3.03	0.306
436	70.165	0.158	1.18	90	-1.3	-	86	0.005	3.03	0.309
437	70.327	0.162	1.19	91	-1.3	-	86	0.009	3.02	0.308
438	70.489	0.162	1.19	91	-1.5	-	86	0.006	3.02	0.308
439	70.649	0.160	1.19	91	-1.3	-	86	0.011	2.99	0.309
440	70.812	0.163	1.18	91	-1.4	100	86	0.011	2.99	0.310
441	70.976	0.164	1.17	91	-1.3	-	86	0.006	2.97	0.301
442	71.138	0.162	1.17	91	-1.3	-	86	0.010	2.97	0.306
443	71.300	0.162	1.18	91	-1.3	-	86	0.004	2.91	0.297
444	71.460	0.160	1.18	91	-1.3	-	86	0.010	2.93	0.299
445	71.620	0.160	1.20	91	-1.4	-	86	0.009	2.81	0.288
446	71.781	0.161	1.17	91	-1.3	-	86	0.009	2.77	0.284
447	71.944	0.163	1.17	91	-1.4	-	86	0.015	2.75	0.279

BOX B TEST DATA - ASTM E2780 / ASTM E2515

Client: IHPJob #: 25-416Model: Montecito-CTracking #: 223Run #: 4Technician: AKDate: 5/30/2025

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 (%)
448	72.104	0.160	1.21	91	-1.3	100	87	0.016	2.72	0.280
Avg/Tot	72.104	0.161	1.18	87.5	-1.4	100	86.3	0.007	7.33	0.241

WOODSTOVE SURFACE TEMPERATURE DATA

Client: IHP

Job #: 25-416

Model: Montecito-C

Tracking #: 223

Run #: 4

Technician: AK

Date: 5/30/2025

Stove ΔT: 165

Elapsed Time (min)	Temperature Data (°F)						
	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
0	68	68	68	68	68	68.2	N/A
1	69	68	69	89	68	72.4	N/A
2	71	69	71	150	68	85.8	N/A
3	75	70	74	270	68	111.2	N/A
4	79	71	78	405	69	140.5	N/A
5	85	73	85	517	71	166.3	N/A
6	92	76	94	600	75	187.4	N/A
7	102	79	105	659	81	205.3	N/A
8	112	84	119	700	89	220.8	N/A
9	122	91	134	736	99	236.4	N/A
10	129	99	152	759	110	249.8	N/A
11	136	108	167	777	121	261.9	N/A
12	141	118	177	795	134	273.0	N/A
13	147	127	185	807	147	282.5	N/A
14	153	135	198	808	160	290.7	N/A
15	161	139	213	777	175	293.0	N/A
16	168	147	228	762	188	298.5	N/A
17	175	152	242	749	201	303.8	N/A
18	180	157	255	743	218	310.5	N/A
19	186	163	266	747	235	319.5	N/A
20	192	171	277	763	252	330.9	N/A
21	198	179	288	780	269	342.5	N/A
22	205	186	298	799	285	354.8	N/A
23	212	194	309	821	301	367.3	N/A
24	220	202	319	843	316	380.0	N/A
25	228	210	331	864	331	392.7	N/A
26	236	218	342	881	344	404.4	N/A
27	245	226	354	896	357	415.4	N/A
28	253	235	365	909	368	426.0	N/A
29	262	244	377	921	380	436.5	N/A
30	271	253	388	932	391	446.9	N/A
31	278	262	385	928	361	442.8	N/A
32	286	272	377	909	334	435.5	N/A
33	293	283	371	886	318	430.1	N/A
34	300	292	366	849	310	423.4	N/A
35	306	300	362	811	305	416.8	N/A
36	311	307	359	776	302	410.9	N/A
37	316	314	355	745	299	405.8	N/A
38	320	319	352	719	298	401.5	N/A
39	323	324	349	696	296	397.6	N/A
40	326	328	347	677	295	394.6	N/A
41	328	332	344	664	294	392.4	N/A
42	331	335	342	654	293	390.8	N/A
43	333	337	340	646	293	389.8	N/A
44	335	340	339	641	292	389.2	N/A
45	336	342	338	636	291	388.7	N/A
46	338	344	338	634	290	388.6	N/A
47	340	346	337	633	289	389.1	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: IHP

Job #: 25-416

Model: Montecito-C

Tracking #: 223

Run #: 4

Technician: AK

Date: 5/30/2025

Stove ΔT : 165

Elapsed Time (min)	Temperature Data (*F)						
	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
48	342	348	337	634	288	389.8	N/A
49	343	350	337	636	287	390.5	N/A
50	345	352	337	637	287	391.4	N/A
51	346	354	338	639	286	392.5	N/A
52	348	356	339	641	286	393.8	N/A
53	349	358	340	643	285	394.9	N/A
54	350	360	341	646	285	396.3	N/A
55	352	362	342	648	284	397.5	N/A
56	353	365	343	648	283	398.5	N/A
57	354	367	344	645	284	398.8	N/A
58	356	369	345	643	283	398.9	N/A
59	357	370	346	641	282	399.3	N/A
60	358	372	347	636	282	399.1	N/A
61	359	374	348	626	282	397.7	N/A
62	360	376	349	613	283	396.0	N/A
63	361	377	350	602	283	394.4	N/A
64	362	378	351	591	283	393.0	N/A
65	362	379	352	583	284	391.9	N/A
66	363	380	352	577	284	391.0	N/A
67	364	380	352	570	285	390.2	N/A
68	364	381	353	564	286	389.5	N/A
69	364	381	353	558	287	388.5	N/A
70	365	381	353	553	287	387.7	N/A
71	365	381	353	547	289	386.8	N/A
72	365	381	354	541	290	386.0	N/A
73	365	381	353	535	291	384.9	N/A
74	365	381	353	528	291	383.7	N/A
75	364	381	353	522	292	382.3	N/A
76	364	381	353	515	294	381.2	N/A
77	364	380	352	508	294	379.5	N/A
78	364	380	352	500	295	378.1	N/A
79	363	380	351	494	297	376.7	N/A
80	362	379	350	487	297	375.3	N/A
81	363	380	350	474	300	373.2	N/A
82	362	380	349	488	303	376.4	N/A
83	361	379	349	511	304	380.6	N/A
84	360	379	348	539	306	386.2	N/A
85	360	379	348	566	307	391.9	N/A
86	360	379	349	582	307	395.2	N/A
87	360	380	349	584	307	395.8	N/A
88	360	380	349	584	307	396.1	N/A
89	361	382	349	584	308	396.5	N/A
90	361	382	349	584	307	396.6	N/A
91	361	383	349	585	306	396.8	N/A
92	361	384	348	587	306	397.2	N/A
93	361	385	347	588	305	397.1	N/A
94	362	385	346	589	304	397.0	N/A
95	362	386	346	590	303	397.1	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: IHP

Job #: 25-416

Model: Montecito-C

Tracking #: 223

Run #: 4

Technician: AK

Date: 5/30/2025

Stove ΔT: 165

Elapsed Time (min)	Temperature Data (°F)						
	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
96	362	386	346	591	302	397.3	N/A
97	362	387	346	592	300	397.1	N/A
98	362	387	346	591	298	396.7	N/A
99	363	387	345	591	297	396.6	N/A
100	363	388	346	589	295	396.2	N/A
101	364	388	346	589	293	396.0	N/A
102	364	389	346	587	291	395.6	N/A
103	364	390	347	586	291	395.4	N/A
104	364	390	348	586	289	395.3	N/A
105	365	391	348	585	288	395.2	N/A
106	365	391	349	585	287	395.3	N/A
107	365	392	349	589	286	396.1	N/A
108	365	392	350	595	285	397.4	N/A
109	366	393	350	598	284	398.2	N/A
110	366	393	350	600	283	398.5	N/A
111	366	394	351	599	283	398.6	N/A
112	367	395	352	600	283	399.2	N/A
113	367	396	353	599	283	399.4	N/A
114	367	397	353	599	282	399.4	N/A
115	368	398	353	597	281	399.4	N/A
116	368	398	354	596	281	399.4	N/A
117	369	399	354	595	280	399.4	N/A
118	369	399	355	593	280	399.2	N/A
119	369	400	355	591	280	399.0	N/A
120	370	401	355	588	280	398.8	N/A
121	370	401	356	586	279	398.5	N/A
122	371	402	356	583	279	398.1	N/A
123	372	402	357	579	280	397.7	N/A
124	372	402	357	574	279	396.7	N/A
125	372	402	357	568	280	395.9	N/A
126	373	403	358	563	280	395.2	N/A
127	373	403	358	558	281	394.5	N/A
128	374	403	358	554	280	393.7	N/A
129	374	403	358	550	280	392.9	N/A
130	374	402	358	547	280	392.1	N/A
131	375	402	358	542	280	391.4	N/A
132	375	402	358	539	280	390.6	N/A
133	375	401	358	534	279	389.5	N/A
134	376	401	357	529	279	388.3	N/A
135	376	400	357	522	279	386.8	N/A
136	376	400	357	515	279	385.1	N/A
137	375	399	356	508	279	383.4	N/A
138	375	398	356	502	278	381.6	N/A
139	374	398	355	496	277	379.9	N/A
140	374	397	354	491	276	378.3	N/A
141	373	396	354	486	275	376.6	N/A
142	372	395	353	480	275	375.0	N/A
143	372	394	352	475	274	373.2	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: IHP

Job #: 25-416

Model: Montecito-C

Tracking #: 223

Run #: 4

Technician: AK

Date: 5/30/2025

Stove ΔT: 165

Elapsed Time (min)	Temperature Data (°F)						Catalyst Exit
	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	
144	370	393	351	470	273	371.5	N/A
145	369	392	350	466	272	369.8	N/A
146	368	392	349	462	271	368.3	N/A
147	369	393	348	436	273	363.7	N/A
148	370	392	347	420	276	361.1	N/A
149	369	392	346	414	277	359.5	N/A
150	367	390	344	414	276	358.3	N/A
151	366	388	341	422	275	358.4	N/A
152	364	386	338	440	274	360.2	N/A
153	362	384	335	465	273	363.6	N/A
154	360	382	331	514	272	371.7	N/A
155	359	380	329	578	270	383.1	N/A
156	358	379	328	629	268	392.5	N/A
157	358	379	328	671	265	400.1	N/A
158	359	379	327	690	262	403.5	N/A
159	359	379	326	713	260	407.7	N/A
160	360	380	327	723	258	409.5	N/A
161	361	381	326	719	257	408.6	N/A
162	362	381	325	711	255	406.6	N/A
163	362	381	324	705	254	405.2	N/A
164	363	381	324	703	252	404.4	N/A
165	363	380	322	704	250	404.0	N/A
166	363	380	322	699	249	402.4	N/A
167	363	379	321	693	247	400.8	N/A
168	364	378	321	688	245	399.2	N/A
169	364	378	320	683	244	397.7	N/A
170	364	377	321	678	243	396.3	N/A
171	364	376	320	674	241	394.9	N/A
172	364	375	320	670	239	393.6	N/A
173	363	374	320	669	237	392.7	N/A
174	363	373	320	667	236	391.7	N/A
175	363	372	320	663	234	390.6	N/A
176	363	372	321	656	233	388.8	N/A
177	362	371	321	650	231	387.2	N/A
178	362	370	321	646	229	385.8	N/A
179	362	370	321	642	228	384.6	N/A
180	361	369	322	638	227	383.6	N/A
181	361	369	322	634	226	382.4	N/A
182	361	368	323	630	225	381.2	N/A
183	360	368	323	627	224	380.1	N/A
184	360	367	323	623	222	379.0	N/A
185	360	366	322	623	221	378.4	N/A
186	359	366	323	622	221	378.0	N/A
187	359	366	323	623	219	378.0	N/A
188	359	365	323	625	218	378.0	N/A
189	358	365	324	628	217	378.4	N/A
190	358	365	324	629	217	378.6	N/A
191	358	365	325	630	216	378.7	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: IHP

Job #: 25-416

Model: Montecito-C

Tracking #: 223

Run #: 4

Technician: AK

Date: 5/30/2025

Stove ΔT: 165

Elapsed Time (min)	Temperature Data (°F)						
	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
192	358	366	326	631	215	379.0	N/A
193	358	366	326	634	214	379.6	N/A
194	358	367	327	636	214	380.1	N/A
195	358	367	328	637	213	380.7	N/A
196	358	368	330	639	212	381.3	N/A
197	359	369	331	641	212	382.0	N/A
198	359	370	331	642	211	382.5	N/A
199	359	371	332	644	211	383.2	N/A
200	360	372	333	647	210	384.1	N/A
201	360	373	334	649	210	385.1	N/A
202	360	374	336	652	210	386.4	N/A
203	361	375	336	654	209	386.9	N/A
204	361	376	337	656	209	387.7	N/A
205	362	376	338	656	209	388.1	N/A
206	362	377	339	657	208	388.6	N/A
207	363	378	339	656	208	388.7	N/A
208	363	379	341	656	207	389.1	N/A
209	363	380	342	657	207	389.8	N/A
210	364	380	342	658	207	390.1	N/A
211	364	381	343	658	207	390.6	N/A
212	364	382	345	659	206	391.3	N/A
213	365	383	345	660	206	391.9	N/A
214	365	384	347	660	206	392.4	N/A
215	366	385	347	659	206	392.3	N/A
216	366	385	349	656	206	392.3	N/A
217	367	386	350	652	205	392.1	N/A
218	367	387	351	648	205	391.5	N/A
219	367	388	352	644	205	391.0	N/A
220	368	388	353	641	205	390.9	N/A
221	368	389	354	638	205	390.8	N/A
222	368	390	355	635	204	390.3	N/A
223	369	390	356	633	205	390.4	N/A
224	369	391	356	629	204	389.8	N/A
225	369	392	357	625	204	389.1	N/A
226	369	392	358	621	204	388.7	N/A
227	370	393	357	616	204	387.8	N/A
228	370	393	358	611	204	387.1	N/A
229	371	393	358	608	204	386.6	N/A
230	371	394	358	604	203	385.8	N/A
231	371	394	357	601	203	385.3	N/A
232	371	394	357	599	203	385.0	N/A
233	371	395	357	598	203	384.8	N/A
234	372	395	357	596	203	384.4	N/A
235	372	395	357	596	203	384.6	N/A
236	372	395	356	597	203	384.6	N/A
237	372	395	356	597	203	384.5	N/A
238	372	396	355	596	203	384.3	N/A
239	372	396	355	595	203	384.0	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: IHP

Job #: 25-416

Model: Montecito-C

Tracking #: 223

Run #: 4

Technician: AK

Date: 5/30/2025

Stove ΔT: 165

Elapsed Time (min)	Temperature Data (°F)						
	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
240	372	396	354	594	203	383.8	N/A
241	372	396	354	592	203	383.3	N/A
242	372	396	355	590	203	383.2	N/A
243	372	396	354	588	203	382.6	N/A
244	372	396	354	585	203	382.1	N/A
245	372	397	354	582	203	381.5	N/A
246	372	396	353	581	203	381.1	N/A
247	372	396	353	579	204	380.7	N/A
248	372	396	353	579	204	380.7	N/A
249	372	396	352	579	204	380.6	N/A
250	372	396	351	581	204	380.8	N/A
251	372	396	351	581	204	380.7	N/A
252	372	396	351	582	204	380.8	N/A
253	372	396	350	581	205	380.9	N/A
254	372	396	351	583	205	381.2	N/A
255	372	396	350	584	205	381.4	N/A
256	372	395	350	585	206	381.7	N/A
257	372	395	350	586	206	381.6	N/A
258	372	395	350	587	206	382.0	N/A
259	373	395	350	586	206	382.1	N/A
260	373	395	350	586	207	381.9	N/A
261	373	395	349	585	207	381.8	N/A
262	373	395	350	584	208	381.8	N/A
263	373	395	349	583	208	381.6	N/A
264	373	395	349	584	207	381.6	N/A
265	374	394	349	586	208	382.3	N/A
266	374	395	350	589	208	383.2	N/A
267	375	395	349	591	209	383.6	N/A
268	375	395	349	587	210	383.1	N/A
269	375	395	349	580	210	381.7	N/A
270	375	395	348	574	211	380.5	N/A
271	375	395	347	568	211	379.4	N/A
272	375	395	347	562	212	378.1	N/A
273	375	395	346	558	212	377.2	N/A
274	375	395	346	553	212	376.2	N/A
275	375	395	345	550	213	375.3	N/A
276	375	395	344	546	213	374.5	N/A
277	374	395	343	542	214	373.6	N/A
278	374	395	342	540	215	373.0	N/A
279	374	395	341	537	215	372.4	N/A
280	374	395	340	533	216	371.5	N/A
281	373	395	340	530	216	370.9	N/A
282	373	395	338	529	217	370.4	N/A
283	373	394	338	527	218	369.9	N/A
284	373	395	337	524	219	369.3	N/A
285	372	394	336	522	219	368.7	N/A
286	372	394	335	520	220	368.1	N/A
287	371	394	334	519	221	367.9	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: IHP

Job #: 25-416

Model: Montecito-C

Tracking #: 223

Run #: 4

Technician: AK

Date: 5/30/2025

Stove ΔT: 165

Elapsed Time (min)	Temperature Data (°F)						
	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
288	371	394	334	518	222	367.6	N/A
289	371	394	333	516	222	367.0	N/A
290	370	393	333	511	223	365.9	N/A
291	370	393	332	506	223	364.7	N/A
292	370	392	331	502	224	363.8	N/A
293	369	392	330	498	225	362.8	N/A
294	369	392	329	494	225	361.9	N/A
295	369	391	329	493	226	361.4	N/A
296	368	391	328	492	226	360.9	N/A
297	367	390	328	490	226	360.2	N/A
298	367	390	327	487	227	359.3	N/A
299	366	390	326	480	227	357.6	N/A
300	366	389	325	473	227	355.9	N/A
301	365	388	325	467	227	354.3	N/A
302	364	387	324	460	227	352.4	N/A
303	363	386	323	454	227	350.8	N/A
304	362	385	323	449	227	349.2	N/A
305	362	384	322	443	227	347.6	N/A
306	361	383	321	439	227	346.1	N/A
307	360	382	320	435	226	344.4	N/A
308	359	381	320	430	226	343.0	N/A
309	358	379	319	425	226	341.6	N/A
310	356	378	319	421	226	340.0	N/A
311	355	377	318	416	226	338.6	N/A
312	354	376	318	411	226	336.9	N/A
313	353	374	317	406	226	335.3	N/A
314	352	373	316	403	226	333.9	N/A
315	351	372	315	399	226	332.4	N/A
316	350	371	314	396	226	331.0	N/A
317	349	369	313	392	225	329.6	N/A
318	348	368	312	389	226	328.3	N/A
319	346	367	311	386	226	327.2	N/A
320	345	366	309	383	226	325.9	N/A
321	344	364	308	382	226	324.9	N/A
322	343	363	307	380	227	323.8	N/A
323	341	362	305	377	227	322.6	N/A
324	340	361	305	376	227	321.6	N/A
325	339	360	303	374	227	320.7	N/A
326	338	359	303	372	226	319.6	N/A
327	337	358	301	371	227	318.6	N/A
328	335	357	300	369	227	317.7	N/A
329	334	356	299	368	227	316.9	N/A
330	333	354	299	367	227	315.9	N/A
331	332	353	298	365	226	314.9	N/A
332	331	352	297	365	226	314.3	N/A
333	330	351	296	365	226	313.6	N/A
334	329	350	295	364	226	312.8	N/A
335	328	349	295	364	226	312.3	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: IHP

Job #: 25-416

Model: Montecito-C

Tracking #: 223

Run #: 4

Technician: AK

Date: 5/30/2025

Stove ΔT: 165

Elapsed Time (min)	Temperature Data (°F)						
	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
336	327	348	294	363	225	311.5	N/A
337	326	347	294	362	225	311.0	N/A
338	326	346	293	362	226	310.4	N/A
339	325	346	293	361	225	309.8	N/A
340	324	345	292	360	226	309.3	N/A
341	324	344	292	360	225	308.7	N/A
342	323	343	292	359	225	308.2	N/A
343	322	342	292	358	225	307.7	N/A
344	322	341	291	358	224	307.2	N/A
345	321	340	291	357	224	306.6	N/A
346	320	339	290	356	224	305.8	N/A
347	320	338	289	355	224	305.3	N/A
348	319	338	289	354	224	304.7	N/A
349	319	337	289	353	224	304.3	N/A
350	318	336	288	352	224	303.6	N/A
351	318	335	288	351	224	303.0	N/A
352	317	335	287	350	224	302.5	N/A
353	316	334	286	349	224	301.8	N/A
354	315	333	286	348	224	301.2	N/A
355	315	332	285	346	224	300.5	N/A
356	314	331	285	345	224	299.8	N/A
357	314	330	284	344	224	299.1	N/A
358	313	330	284	343	224	298.5	N/A
359	312	329	283	341	223	297.6	N/A
360	312	328	283	340	223	296.8	N/A
361	311	327	282	338	223	296.1	N/A
362	310	326	282	336	222	295.3	N/A
363	309	325	282	335	222	294.5	N/A
364	309	324	281	333	222	293.7	N/A
365	308	323	281	331	221	292.8	N/A
366	307	322	280	330	221	292.0	N/A
367	307	321	279	328	221	291.1	N/A
368	306	321	279	326	220	290.3	N/A
369	305	320	278	325	220	289.3	N/A
370	304	319	277	323	219	288.4	N/A
371	304	318	277	321	219	287.6	N/A
372	303	317	276	320	218	286.6	N/A
373	302	316	275	318	217	285.8	N/A
374	301	315	275	317	217	285.0	N/A
375	301	314	274	316	216	284.1	N/A
376	300	313	274	315	215	283.2	N/A
377	299	312	273	313	215	282.2	N/A
378	298	311	272	312	213	281.3	N/A
379	297	310	271	311	213	280.5	N/A
380	296	310	271	309	212	279.6	N/A
381	295	309	270	308	211	278.6	N/A
382	295	308	269	307	211	277.8	N/A
383	293	307	269	306	210	277.1	N/A

WOODSTOVE SURFACE TEMPERATURE DATA

Client: IHP
Model: Montecito-C
Run #: 4

Job #: 25-416
Tracking #: 223
Technician: AK
Date: 5/30/2025

	Stove ΔT:					165	
	Temperature Data (°F)						
Elapsed Time (min)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Stove Surface Average	Catalyst Exit
384	293	306	268	305	210	276.1	N/A
385	292	305	267	304	209	275.3	N/A
386	291	304	267	303	208	274.6	N/A
387	290	303	266	302	208	273.7	N/A
388	289	302	265	302	207	272.9	N/A
389	288	302	264	301	206	272.1	N/A
390	287	301	263	300	206	271.3	N/A
391	286	300	263	299	205	270.5	N/A
392	285	299	262	298	205	269.9	N/A
393	285	298	262	297	205	269.1	N/A
394	284	297	261	296	204	268.3	N/A
395	283	296	260	296	203	267.6	N/A
396	282	295	260	295	202	266.9	N/A
Average	328.2	343.4	312.1	513.2	233.5	346.1	N/A

LAB SAMPLE DATA - ASTM E2515

Client: IHP
 Model: Montecito-C
 Run #: 4

Job #: 25-416
 Tracking #: 223
 Technician: AK
 Date: 5/30/2025

		Sample ID	Tare, mg	Final, mg	Catch, mg
Filters	A	G01258	236.5	239.4	2.9
	B	G01259	236.6	239.1	2.5
	Amb	G01284	236.9	236.9	0.0
Probes	A	16B	115862.7	115862.8	0.1
	B	16C	114147.4	114147.6	0.2
O-rings	A	16B	3634.8	3634.9	0.1
	B	16C	3597.5	3597.7	0.2

Placed in Dessicator on: 5/30/2025

Balance Audit (mg):

		200.0		200.0		200.0			
		Weight (mg)	Date/Time	Weight (mg)	Date/Time	Weight (mg)	Date/Time	Weight (mg)	Date/Time
Filters	A	239.7	5/30 20:00	239.4	6/2 15:00	239.4	6/4 11:15		
	B	239.3	5/30 20:00	239.0	6/2 15:00	239.1	6/4 11:15		
		237.2	5/30 20:00	236.9	6/2 15:00	236.9	6/4 11:15		
Probes	A	115863.4	5/30 20:00	115862.8	6/2 15:00	115862.8	6/4 11:15		
	B	114148.2	5/30 20:00	114147.6	6/2 15:00	114147.6	6/4 11:15		
O-Rings	A	3635.6	5/30 20:00	3635.0	6/2 15:00	3634.9	6/4 11:15		
	B	3598.0	5/30 20:00	3597.9	6/2 15:00	3597.7	6/4 11:15		

Train A Aggregate, mg: 3.1

Train B Aggregate, mg: 2.9

Ambient, mg: 0.0

IDC Wood Heater Run Sheets

Client: IHP Job Number: 25-416 Tracking #: 223
 Model: Montecito-C Run Number: 4 Test Date: 5/30/25

Pre-Test Set-up Check List

Perform the following checks after a minimum of 30 minutes of warmup time

Leak Checks	Requirement	Pump Off (lpm)	Pump On, Probe Blocked (lpm)	Net (lpm)	Result
PM-2.5	<0.05 lpm (net)	0.36	0.36	0	☒ Pass ☐ Fail
PM-Course	<0.05 lpm (net)	0.15	0.16	0	☒ Pass ☐ Fail
Ambient	<0.05 lpm (net)	0.05	0.06	0	☒ Pass ☐ Fail

Flow Checks	Requirement	TEOM Indicated Flow (lpm) ¹	Measured Flow		Difference (%)	Result
			(lpm) ²	(lpm) ³		
PM-2.5	±2%	1.00	1.02	1.016	1.6%	☒ Pass ☐ Fail
PM-Course	±2%	1.00	1.01	1.006	0.6%	☒ Pass ☐ Fail
Ambient	±2%	3.00	3.04	3.028	0.9%	☒ Pass ☐ Fail

¹Indicated flow is at 20°C, 1 atm

²Measured flow with PFS equipment ID 197, which indicates flow at 21.1°C, 1 atm

³Adjusted value (Measured Flow * 99.6%) to match the STP used by TEOM

Initial Filter Setup

Use **black** filter tool when changing filters

	1 min. requirement	5 min. requirement	Result
PM-2.5	Frequency > 200Hz	Mass > -1 ug, noise < 2ug	☒ Pass ☐ Fail
PM- Course	Frequency > 200Hz	Mass > -1 ug, noise < 2ug	☒ Pass ☐ Fail
Ambient	Frequency > 200Hz	Mass > -1 ug, noise < 2ug	☒ Pass ☐ Fail

Pre-Fire Verifications	Time probe in Tunnel	Result
Place probe in tunnel at least 10 min prior to test start	10:30	
Verify Data is recording [In RPCOMM] - Dichot		☒ Okay
Verify Data is recording [In RPCOMM] - Ambient		☒ Okay

Flue Gas Analyzer Calibration Check

Calibration Gas Values: Span Gas Cylinder#: CC505834 CO₂ (%): 17.35 CO (%): 4.350
 Mid Gas Cylinder#: CC341544 CO₂ (%): 10.00 CO (%): 2.500

Calibration Results:

	Pre Test			Post Test		
	Zero	Span	Mid	Zero	Span	Mid
Time	9:26	9:27	9:28	20:25	20:26	20:27
CO ₂	0.00	17.20	10.19	0.13	17.16	10.10
CO	0.000	4.311	2.487	0.024	4.309	2.519

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

Technician Signature: _____

Date: 6/27/2025

IDC Wood Heater Run Sheets

Client: IHP Job Number: 25-416 Tracking #: 223
Model: Montecito-C Run Number: 4 Test Date: 5/30/25

Pre-Test Conditions

		Requirements	Result
Room RH (%)	41.1		
Barometric Pressure	30.03		
Room Air Velocity (ft/min)	<50	Must be <50 ft/min within 2 ft of stove	☒ Pass ☐ Fail
Room Temperature (°F)	69	<87 °F	☒ Pass ☐ Fail
Average External Stove Temp (°F)	N/A	Within 2 °F of ambient (Run #1 only)	☐ Pass ☐ Fail ☒ N/A
Average Internal Stove Temp (°F)	N/A	Within 2 °F of ambient (Run #1 only)	☐ Pass ☐ Fail ☒ N/A
Time Coals Removed from Stove & Firebox Vacuumed	10:00	>1 hr before test (Runs #2 & 3 only)	☒ Pass ☐ Fail ☐ N/A
Earliest possible start time	11:27	24 hours from start of Run #1 (Runs #2 & 3 only)	☒ Pass ☐ Fail ☐ N/A



Technician Signature: 

Date: 6/27/2025

IDC Wood Heater Run Sheets

Client: IHP Job Number: 25-416 Tracking #: 223
Model: Montecito-C Run Number: 4 Test Date: 5/30/25

IDC FUELING NOTES

Fuel & Moisture Measurement

Fuel Type	Maple Cordwood
Moisture Meter Calibration 22%:	22.0
Moisture Meter Calibration 12%:	12.0
Moisture Reading Start Time:	9:30

L1 Test Notes

Scale Weight Prior to Loading (lbs):	0
Test Burn Start Time:	12:02
Air Control Setting (open/closed):	Open
Door Closed Time (5 min from start):	12:05
Bypass Closed Time:	N/A
Target End Weight (lbs):	1.81-2.00
Actual End Weight (lbs):	1.85
Phase End Time:	12:16

Additional Notes (Fuel adjustments, TEOM Filter Changes, etc.)

Time	Notes
	-None-

L2 Test Notes

Scale Weight Prior to Loading (lbs):	1.85
Load Time:	12:16
Air Control Setting (open/closed):	Open
Door Closed Time (immediately after loading):	12:17
Bypass Closed Time:	N/A
50% Target Weight (lbs):	6.94-7.67
Actual 50% Weight (lbs):	7.42
Air control closed time:	12:35
Target End Weight (lbs):	2.79-3.09
Actual End Weight (lbs):	2.80
Phase End Time:	13:22

Additional Notes (Fuel adjustments, TEOM Filter Changes, etc.)

Time	Notes
13:13	Changed TEOM Filters

Technician Signature: 

Date: 6/27/2025

IDC Wood Heater Run Sheets

Client: IHP Job Number: 25-416 Tracking #: 223
Model: Montecito-C Run Number: 4 Test Date: 5/30/25

L3 Test Notes

Scale Weight Prior to Loading (lbs):	2.80
Load Time:	13:22
Air Control Setting (5 min start-up allowed):	
Door Closed Time (immediately after loading):	13:23
Bypass Closed Time:	N/A
Target End Weight (lbs):	3.39-3.75
Actual End Weight (lbs):	3.42
Phase End Time:	14:28

Open @ 13:22 Closed @ 13:27

Additional Notes (Fuel adjustments, TEOM Filter Changes, etc.)

Time	Notes
14:21	Changed TEOM Filters

L4 Test Notes

Scale Weight Prior to Loading (lbs):	3.42
Load Time:	14:28
Air Control Setting (10 min start-up allowed):	
Door Closed Time (5 min after loading):	1
Bypass Closed Time:	N/A
Target End Weight (lbs):	3.23-3.57
Actual End Weight (lbs):	3.43
Phase End Time:	19:30

Open @ 14:28 Closed @ 14:36

Additional Notes (Fuel adjustments, TEOM Filter Changes, etc.)

Time	Notes

Post-Test Conditions

Room Air Velocity (ft/min)	<50
Room RH (%)	24.4
Barometric Pressure	29.84

Technician Signature: 

Date: 6/27/2025

IDC Wood Heater Run Sheets

Client: IHP Job Number: 25-416 Tracking #: 223
 Model: Montecito-C Run Number: 4 Test Date: 5/30/25

Post-Test Check List

Leak Checks	Requirement	Pump Off (lpm)	Pump On, Probe Blocked (lpm)	Net (lpm)	Result
PM-2.5	<0.05 lpm (net)	0.36	0.36	0	☒ Pass ☐ Fail
PM-Course	<0.05 lpm (net)	0.14	0.15	0.01	☒ Pass ☐ Fail
Ambient	<0.05 lpm (net)	-0.03	-0.03	0.01	☒ Pass ☐ Fail

Flow Checks	Requirement	TEOM Indicated Flow (lpm) ¹	Measured Flow		Difference (%)	Result
			(lpm) ²	(lpm) ³		
PM-2.5	±2%	1.00	1.02	1.016	1.6%	☒ Pass ☐ Fail
PM-Course	±2%	1.00	1.01	1.006	0.6%	☒ Pass ☐ Fail
Ambient	±2%	3.00	3.02	3.008	0.3%	☒ Pass ☐ Fail

¹Indicated flow is at 20°C, 1 atm

²Measured flow with PFS equipment ID 134, which indicates flow at 21.1°C, 1 atm

³Adjusted value (Measured Flow * 99.6%) to match the STP used by TEOM



Technician Signature: 

Date: 6/27/2025

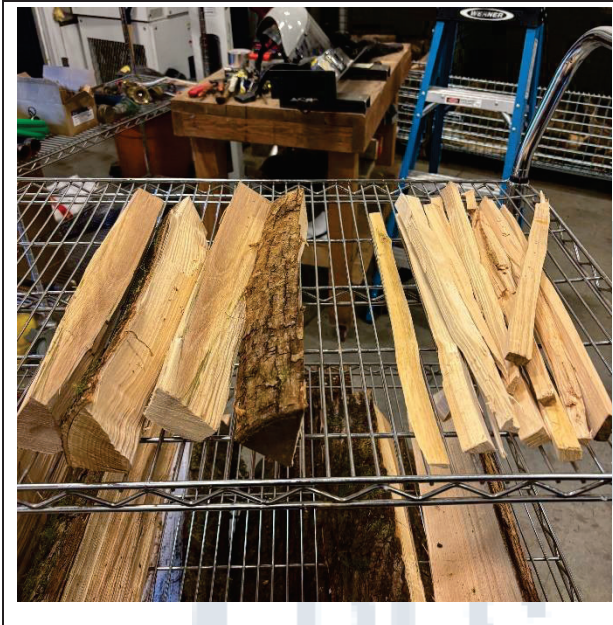
IDC Wood Heater Run Sheets

Client: IHP
Model: Montecito-C

Job Number: 25-416
Run Number: 4

Tracking #: 223
Test Date: 5/30/25

Test Fuel Photos



L1 Fuel Load



L1 Fuel Loaded



L1 Residual Fuel Load



L2 Fuel Load

Technician Signature: _____



Date: 6/27/2025

IDC Wood Heater Run Sheets

Client: IHP
Model: Montecito-C

Job Number: 25-416
Run Number: 4

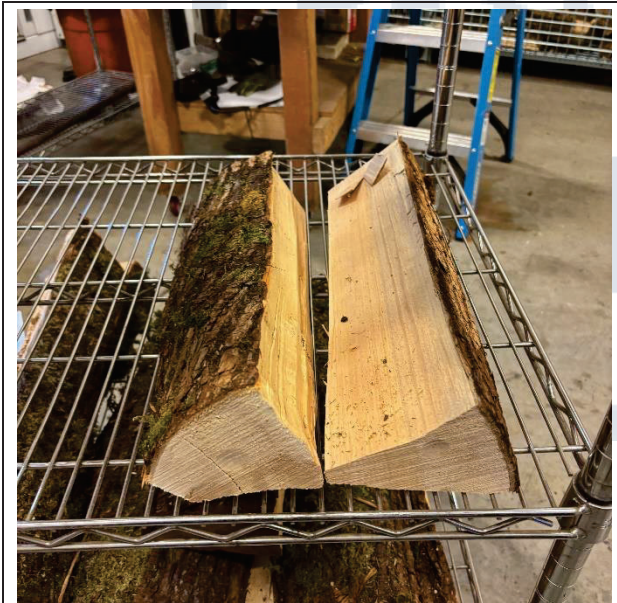
Tracking #: 223
Test Date: 5/30/25



L2 Fuel Loaded



L2 Residual Fuel Loaded



L3 Fuel Load



L3 Fuel Loaded

Technician Signature: 

Date: 6/27/2025

IDC Wood Heater Run Sheets

Client: IHP
Model: Montecito-C

Job Number: 25-416
Run Number: 4

Tracking #: 223
Test Date: 5/30/25



L3 Residual Fuel Loaded



L4 Fuel Load



L4 Fuel Loaded

Technician Signature: _____

Date: 6/27/2025

NYSERDA 2015 NSPS Fuel Calculator

1- Stove and Lab Information

1.1 Stove Information

Appliance manufacturer:	IHP
Appliance model:	Montecito-C

1.2 Number of Runs

Total Number of Test Runs:	4
----------------------------	---

1.3 Firebox Information

Firebox Shape:	☒ Cubic	☐ Cylindrica
Firebox width:	19.71	in.
Firebox depth:	11.86	in.
Firebox height:	11.24	in.
Volume adjustment:	0.000	ft ³
Firebox Net Volume:	1.520	ft ³

The firebox shape is not cubic

← Enter a number between -1 and +1 for volume adjustment

1.4 Test Lab Information

Lab name:	PFS
Test lab location:	Oregon
Primary testing staff name:	Aaron Kravitz
Test lab phone:	503-650-0088
Test lab contact email:	aaron.kravitz@pfsteco.com
Third party certifier:	PFS
Third party phone:	aaron.kravitz@pfsteco.com
Third party email:	503-6500088
Other people participating or witnessing the test, either in person or remotely:	

These timestamps cannot be edited

Calculation Started at:	8/7/2023 15:01
Saved and Finished at:	Still in progress

Next >>

Integrated Duty Cycle Fuel Calculator

2- Fuel Load Information

2.1 Fuel Load General Information			
Wood species:	Maple		
Wood density:	0.61	10 ³ kg/m ³	
Firebox Volume:	1.52	ft ³	
Loadind direction:	East-West		
Target log length:	16.4	±0.5 in.	

= 38.1 lb/ft3

2.2 Load Piece Details				
Load	Total load weight (lb)	Min. piece weight (lb)	Max. piece weight (lb)	Target piece number per load
L1 - Kindling	1.52	0.10	0.20	11
L1 - Starter	4.56	1.00	1.91	4
L2 - Small pieces	10.64	1.93	3.84	4
L3 - Large pieces	7.60	3.04	4.56	2
L4 - Small pieces	6.08	1.93	3.84	3
L4 - Large pieces	12.16	3.88	6.90	3

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NYSERDA 2015 NSPS Fuel Calculator

3.1 Run #1 Details - Test Date: 05/27/2025

Detailed Fuel Information

Enter the number of fuel pieces first, then enter the weight and MC details in Tables 3.2 through 3.6 ↓↓

3.1 Fuel Load Data			
	Target load (lb)	Actual weight (lb)	Actual # of pieces
L1 - Kindling weight	1.44 – 1.60	1.56	12
L1 - Starter	4.33 – 4.79	4.73	4
L2 - Small pieces	10.11 – 11.17	10.32	4
L3 - Large pieces	7.22 – 7.98	7.80	2
L4 - Small pieces	5.78 – 6.38	6.32	2
L4 - Large pieces	11.55 – 12.77	11.98	2
Total fuel load:	40.43 – 44.68	42.71	26
Total fuel burnt wet-basis: 38.52 lb			
Total fuel burnt dry-basis: 31.40 lb			

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3.2 Load 1 - Kindling and starter fuel

set the # of logs	Weight (lb)	pin 1 (%)	pin 2 (%)	pin 3 (%)	pin 4 (%)	Avg moisture
Kindling total:	1.56	Not applicable				
Piece 1:	1.34	21.9	19.3	24.3	26.1	18.1
Piece 2:	1.19	19.1	18.7	19.6	21.3	22.1
Piece 3:	1.08	21.7	19.3	23.9	18.1	19.6
Piece 4:	1.12	21.9	18.4	24.2	23.0	24.7
Piece 5:						
Piece 6:						
Piece 7:						
Piece 8:						
Piece 9:						
Piece 10:						
Starter total:	4.73	L1 Total: 6.29 lb				21.29

✓ Total load weight is currently in the target range of 5.78–6.38 lb.

Allowed weight of each starter piece: 1.00–1.91 lb.

3.3 Load 2 - Small pieces

set the # of logs	Weight (lb)	pin 1 (%)	pin 2 (%)	pin 3 (%)	pin 4 (%)	Avg moisture
Piece 1:	2.64	26.6	19.1	19.1	26.9	26.2
Piece 2:	2.13	22.7	21.5	20.3	24.3	21.4
Piece 3:	2.55	21.3	18.5	25.8	19.1	25.1
Piece 4:	3.00	26.5	26.3	19.9	25.9	18.6
Piece 5:						23.4
Piece 6:						
Piece 7:						
Piece 8:						
Piece 9:						
Piece 10:						
Load total:	10.32					22.82

✓ Total load weight is in the target range of 10.11–11.17 lb.

Allowed weight of each piece: 1.93–3.84 lb.

3.4 Load 3 - Large pieces

set the # of logs	Weight (lb)	pin 1 (%)	pin 2 (%)	pin 3 (%)	pin 4 (%)	Avg moisture
Piece 1:	4.51	24.6	25.3	26.6	23.0	20.2
Piece 2:	3.29	18.2	19.6	25.3	25.2	25.1
Piece 3:						22.7
Load total:	7.80					23.41

✓ Load weight is in the target range of 7.22–7.98 lb.

Allowed weight of each piece: 3.04–4.56 lb.

3.5 Load 4 - Small pieces

set the # of logs	Weight (lb)	pin 1 (%)	pin 2 (%)	pin 3 (%)	pin 4 (%)	Avg moisture
Piece 1:	3.78	25.5	20.6	25.2	19.6	25.9
Piece 2:	2.54	21.8	21.3	18.6	21.8	22.0
Piece 3:						21.1
Piece 4:						
Piece 5:						
Piece 6:						
Load total:	6.32					22.45

✓ Load weight is in the target range of 5.78–6.38 lb.

Allowed weight of each piece: 1.93–3.84 lb.

3.6 Load 4 - Large pieces						
set the # of logs	Weight (lb)	pin 1 (%)	pin 2 (%)	pin 3 (%)	pin 4 (%)	Avg moisture
Piece 1:	6.83	21.8	26.2	22.1	26.9	20.5
Piece 2:	5.15	18.8	22.4	23.7	18.2	26.3
Piece 3:						
Piece 4:						
Piece 5:						
Piece 6:						
Load total:	11.98					22.80

✓ Load weight is in the target range of 11.55–12.77 lb.

Allowed weight of each piece: 3.88–6.90 lb.

Total L4 load weight (small+large):	18.30	Average MC%:	22.68
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NYSERDA 2015 NSPS Fuel Calculator

3.2 Run #2 Details - Test Date: 12/09/2024

Detailed Fuel Information

Enter the number of fuel pieces first, then enter the weight and MC details in Tables 3.2 through 3.6 ↓↓

3.1 Fuel Load Data			
	Target load (lb)	Actual weight (lb)	Actual # of pieces
L1 - Kindling weight	1.44 – 1.60	1.50	13
L1 - Starter	4.33 – 4.79	4.47	4
L2 - Small pieces	10.11 – 11.17	11.07	4
L3 - Large pieces	7.22 – 7.98	7.25	2
L4 - Small pieces	5.78 – 6.38	6.09	3
L4 - Large pieces	11.55 – 12.77	12.48	3
Total fuel load:	40.43 – 44.68	42.86	27
Total fuel burnt wet-basis:	38.67 lb	Total fuel burnt dry-basis: 31.67 lb	

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3.2 Load 1 - Kindling and starter fuel

set the # of logs	Weight (lb)	pin 1 (%)	pin 2 (%)	pin 3 (%)	pin 4 (%)	Avg moisture
Kindling total:	1.50	Not applicable				
Piece 1:	1.28	22.4	25.1	24.0	26.4	23.3
Piece 2:	1.13	24.1	18.6	19.3	20.1	23.9
Piece 3:	1.03	22.7	21.0	24.8	23.9	20.6
Piece 4:	1.03	18.5	18.9	26.0	23.3	21.0
Piece 5:						
Piece 6:						
Piece 7:						
Piece 8:						
Piece 9:						
Piece 10:						
Starter total:	4.47	L1 Total: 5.97 lb				22.47

✓ Total load weight is currently in the target range of 5.78–6.38 lb.

Allowed weight of each starter piece: 1.00–1.91 lb.

3.3 Load 2 - Small pieces

set the # of logs	Weight (lb)	pin 1 (%)	pin 2 (%)	pin 3 (%)	pin 4 (%)	Avg moisture
Piece 1:	2.76	19.9	22.3	21.9	25.0	24.8
Piece 2:	3.09	24.6	25.7	18.8	25.5	26.7
Piece 3:	2.78	19.9	24.3	21.9	21.6	26.7
Piece 4:	2.44	23.2	23.4	24.3	19.8	18.6
Piece 5:						21.9
Piece 6:						
Piece 7:						
Piece 8:						
Piece 9:						
Piece 10:						
Load total:	11.07					23.02

✓ Total load weight is in the target range of 10.11–11.17 lb.

Allowed weight of each piece: 1.93–3.84 lb.

3.4 Load 3 - Large pieces

set the # of logs	Weight (lb)	pin 1 (%)	pin 2 (%)	pin 3 (%)	pin 4 (%)	Avg moisture
Piece 1:	3.85	23.0	20.1	18.5	18.8	20.8
Piece 2:	3.40	23.3	26.0	23.3	25.7	18.6
Piece 3:						23.4
Load total:	7.25					21.71

✓ Load weight is in the target range of 7.22–7.98 lb.

Allowed weight of each piece: 3.04–4.56 lb.

3.5 Load 4 - Small pieces

set the # of logs	Weight (lb)	pin 1 (%)	pin 2 (%)	pin 3 (%)	pin 4 (%)	Avg moisture
Piece 1:	3.17	18.3	22.7	18.7	24.3	22.4
Piece 2:	2.92	18.5	18.1	21.1	25.8	19.1
Piece 3:						20.5
Piece 4:						
Piece 5:						
Piece 6:						
Load total:	6.09					20.92

✓ Load weight is in the target range of 5.78–6.38 lb.

Allowed weight of each piece: 1.93–3.84 lb.

3.6 Load 4 - Large pieces						
set the # of logs	Weight (lb)	pin 1 (%)	pin 2 (%)	pin 3 (%)	pin 4 (%)	Avg moisture
Piece 1:	6.14	19.7	19.6	24.9	20.6	18.7
Piece 2:	6.34	18.7	23.5	26.5	26.3	22.4
Piece 3:						23.5
Piece 4:						
Piece 5:						
Piece 6:						
Load total:	12.48					22.11

✓ Load weight is in the target range of 11.55–12.77 lb.

Allowed weight of each piece: 3.88–6.90 lb.

Total L4 load weight (small+large):	18.57	Average MC%:	21.72
-------------------------------------	-------	--------------	-------

3.3 Load 2 - Small pieces						
<u>set the # of logs</u>	Weight (lb)	pin 1 (%)	pin 2 (%)	pin 3 (%)	pin 4 (%)	Avg moisture
Piece 1:	2.25	25.5	21.8	24.1	18.1	20.2
Piece 2:	2.95	24.3	22.0	21.8	25.6	26.1
Piece 3:	2.27	26.4	23.1	26.0	22.9	24.8
Piece 4:	3.29	26.3	20.8	19.8	24.0	26.9
Piece 5:						
Piece 6:						
Piece 7:						
Piece 8:						
Piece 9:						
Piece 10:						
Load total:	10.76					23.56

✓ Total load weight is in the target range of 10.11–11.17 lb.
Allowed weight of each piece: 1.93–3.84 lb.

NYSERDA 2015 NSPS Fuel Calculator

3.1 Run #1 Details - Test Date: 12/09/2024

Detailed Fuel Information

Enter the number of fuel pieces first, then enter the weight and MC details in Tables 3.2 through 3.6 ↓↓

3.1 Fuel Load Data			
	Target load (lb)	Actual weight (lb)	Actual # of pieces
L1 - Kindling weight	1.44 – 1.60	1.59	13
L1 - Starter	4.33 – 4.79	4.59	4
L2 - Small pieces	10.11 – 11.17	10.90	4
L3 - Large pieces	7.22 – 7.98	7.70	2
L4 - Small pieces	5.78 – 6.38	6.29	3
L4 - Large pieces	11.55 – 12.77	12.39	3
Total fuel load:	40.43 – 44.68	43.46	27
Total fuel burnt wet-basis:	39.36 lb	Total fuel burnt dry-basis: 32.12 lb	

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3.2 Load 1 - Kindling and starter fuel

set the # of logs	Weight (lb)	pin 1 (%)	pin 2 (%)	pin 3 (%)	pin 4 (%)	Avg moisture
Kindling total:	1.59	Not applicable				
Piece 1:	1.30	23.9	23.8	21.7	24.7	25.8
Piece 2:	1.04	19.5	19.7	19.3	21.5	21.2
Piece 3:	1.09	20.6	18.0	18.5	19.3	19.5
Piece 4:	1.16	18.5	20.9	20.1	20.2	21.4
Piece 5:						
Piece 6:						
Piece 7:						
Piece 8:						
Piece 9:						
Piece 10:						
Starter total:	4.59	L1 Total: 6.18 lb				21.04

✓ Total load weight is currently in the target range of 5.78–6.38 lb.
Allowed weight of each starter piece: 1.00–1.91 lb.

3.3 Load 2 - Small pieces

set the # of logs	Weight (lb)	pin 1 (%)	pin 2 (%)	pin 3 (%)	pin 4 (%)	Avg moisture
Piece 1:	2.71	20.7	23.2	20.9	18.1	18.7
Piece 2:	2.28	25.2	26.5	20.7	26.3	25.5
Piece 3:	3.31	26.0	20.3	22.7	21.5	25.6
Piece 4:	2.60	22.8	25.8	25.4	21.6	25.5
Piece 5:						24.2
Piece 6:						
Piece 7:						
Piece 8:						
Piece 9:						
Piece 10:						
Load total:	10.90					23.08

✓ Total load weight is in the target range of 10.11–11.17 lb.

Allowed weight of each piece: 1.93–3.84 lb.

3.4 Load 3 - Large pieces

set the # of logs	Weight (lb)	pin 1 (%)	pin 2 (%)	pin 3 (%)	pin 4 (%)	Avg moisture
Piece 1:	3.67	19.6	25.0	25.7	24.5	18.8
Piece 2:	4.03	21.1	19.3	22.5	19.6	19.3
Piece 3:						20.4
Load total:	7.70					21.48

✓ Load weight is in the target range of 7.22–7.98 lb.

Allowed weight of each piece: 3.04–4.56 lb.

3.5 Load 4 - Small pieces

set the # of logs	Weight (lb)	pin 1 (%)	pin 2 (%)	pin 3 (%)	pin 4 (%)	Avg moisture
Piece 1:	3.64	24.6	25.1	26.2	18.5	20.7
Piece 2:	2.65	24.9	26.1	23.8	25.1	23.3
Piece 3:						24.6
Piece 4:						
Piece 5:						
Piece 6:						
Load total:	6.29					23.70

✓ Load weight is in the target range of 5.78–6.38 lb.

Allowed weight of each piece: 1.93–3.84 lb.

3.6 Load 4 - Large pieces						
set the # of logs	Weight (lb)	pin 1 (%)	pin 2 (%)	pin 3 (%)	pin 4 (%)	Avg moisture
Piece 1:	5.51	18.7	26.5	26.0	21.4	23.8
Piece 2:	6.88	18.5	20.7	20.7	24.6	21.7
Piece 3:						
Piece 4:						
Piece 5:						
Piece 6:						
Load total:	12.39					22.64

✓ Load weight is in the target range of 11.55–12.77 lb.

Allowed weight of each piece: 3.88–6.90 lb.

Total L4 load weight (small+large):	18.68	Average MC%:	23.00
-------------------------------------	-------	--------------	-------

ASTM E2515 - Glass Fiber Filters

Paired Filter Weights

Date:	5/27/25	5/28/25	-	-			
Time:	1430	0800	-	-			
	Weight 1	Weight 2	Weight 3	Weight 4	Initial	Project	Run
G01253	236.3	236.4	-	-	A	25-416	#2
G01254	236.5	236.6	-	-	A		↓
G01255	237.6	237.6	-	-	A		↓
G01256	237.0	237.0	-	-	A		#3
G01257	236.4	236.6	-	-	A		↓
G01258	238.1	238.0	-	-	A		↓
G01259	236.4	236.5	-	-	A		#4
G01260	236.4	236.6	-	-	A		↓
G01261	236.5	236.3	-	-	A		
G01262	237.1	237.1	-	-	A		
G01263	236.8	237.0	-	-	A		
G01264	236.4	236.3	-	-	A		
G01265	236.6	236.7	-	-	A		
G01266	236.3	236.3	-	-	A		
G01267	237.5	237.4	-	-	A		
G01268	237.5	237.6	-	-	A		

Date:	4/11/25	4/14/25	-	-			
Time:	9:19	9:00	-	-			
	Weight 1	Weight 2	Weight 3	Weight 4	Initial	Project	Run
G01269	237.4	237.3	-	-	A	24-201	#5
G01270	237.6	237.5	-	-	A		↓
G01271	236.0	235.9	-	-	A		↓
G01272	236.9	236.8	-	-	A		↓
G01273	236.6	236.6	-	-	A	25-404	#1
G01274	237.5	237.4	-	-	A		↓
G01275	236.6	236.6	-	-	A		↓
G01276	236.0	236.0	-	-	A		↓
G01277	236.8	236.7	-	-	A		
G01278	236.5	236.4	-	-	A		
G01279	236.0	235.9	-	-	A		
G01280	235.9	235.9	-	-	A		
G01281	237.1	236.9	-	-	A	25-416	#1
G01282	235.8	235.9	-	-	A		↓
G01283	236.9	236.9	-	-	A		↓
G01284	237.0	236.9	-	-	A		#4

ASTM E2515 - O-Ring Samples 11-20

Paired Weights

Date:	4/11/25	4/11/25	4/14/25				
Time:	9:30 a-	20:15	10:00				
	Weight 1	Weight 2	Weight 3	Weight 4	Initial	Project	Run
11A	3419.2	3418.5	3418.6	-	A	24-201	#5
11B	4230.8	4230.3	4230.2	-	A		
11C	3583.9	3583.5	3583.4	-	A		
12A	3581.5	3581.5	3581.5	-	A	25-404	#1
12B	3611.2	3611.2	-	-	A		
12C	3546.9	3546.8	-	-	A		
13A	3591.9	3592.2	3592.9	-	A		
13B	3637.3	3637.3	-	-	A		
13C	4404.6	4404.6	-	-	A		
14A	3338.3	3338.3	-	-	A	25-416	#1
14B	3362.6	3362.7	-	-	A		
14C	3438.9	3439.0	-	-	A		
15A	3567.7	3567.4	3567.6	-	A	25-416	#2
15B	3568.9	3569.0	-	-	A		
15C	3392.1	3392.3	-	-	A		

Date:	5/27/25						
Time:	11:30 a-						
	Weight 1	Weight 2	Weight 3	Weight 4	Initial	Project	Run
16A	3569.7	3569.7				25-416	#3
16B	3634.6	3634.8					
16C	3597.3	3597.5					
17A	3609.4	3609.5					
17B	3566.2	3566.5					
17C	3593.3						
18A	3598.3	3599.3	3599.4				
18B	3541.5	3542.3	3542.5				
18C	3524.2	3525.3	3525.7				
19A	3581.9	3582.9	3582.9				
19B	3628.0	3629.0	3628.9				
19C	3610.4	3611.7	3611.6				
20A	3555.1	3556.4	3556.3				
20B	3610.3	3611.7	3611.6				
20C	3606.3	3607.5	3607.5				

ASTM E2515 - Probe Samples 11-20

Date:	4/11/25	4/11/25	4/11/25				
Time:	9:45a	20:30	10:30				
	Weight 1	Weight 2	Weight 3	Weight 4	Initial	Project	Run
11A	116876.8	116877.0	-	-	A	24-201	#5
11B	117349.4	117349.6	-	-	L		
11C	116197.6	116198.6	116198.4	-	B		
12A	116719.2	116719.7	116719.6	-	A	25-404	#1
12B	117782.1	117782.5	117782.3	-	A		
12C	117180.4	117180.6	-	-	A		
13A	117320.5	117320.8	117320.7	-	A		
13B	116946.5	116946.7	-	-	A		
13C	115653.7	115653.7	-	-	X		
14A	116637.0	116637.2	-	-	A	25-416	#1
14B	116627.8	116627.8	-	-	A		
14C	116536.6	116537.0	116537.0	-	X		
15A	116749.3 117249.5	117249.5	-	-	A	25-416	#2
15B	116761.5	116761.9	116761.8	-	A		
15C	116848.2	116848.5	116848.6	-	A	25-416	#3

Date:	5/27/25	6/8/25	6/9/25	-			
Time:	11:30	11:30	14:30	-			
	Weight 1	Weight 2	Weight 3	Weight 4	Initial	Project	Run
16A	116379.4	116379.6	-	-	A	25-416	#3
16B	115862.5	115862.7	-	-	A		
16C	114147.2	114147.4	-	-	A	25-416	#4
17A	116810.6	116810.8	-	-	A	No	Myplel
17B	117140.6	117140.7	-	-	A		
17C	113140.7	113141.8	113141.7	-	A		
18A	117500.2	117500.3	-	-	A	24-364	#1
18B	117331.9	117332.6	117332.8	-	A		
18C	114230.4	114335.3	114335.5	-	A		
19A	117026.5	117026.6	-	-	A	24-364	#2
19B	117013.2	117013.9	117013.4	-	A		
19C	114230.8	114231.7	114231.8	-	A		
20A	115627.8	115628.5	115628.3	-	A	24-364	#3
20B	115967.2	115967.9	115968.0	-	A		
20C	113775.6	113776.8	113776.6	-	A		

Summary of Conditioning Fuel Loads

3/28/2025

IDC Load	Total Load wb (lb)	Number of Pieces	Flue Temp at load start	Max temp during burn	Total Fuel Burnt - wb (lb)	Avg. MC%	Duration (hr)	Total Fuel Burnt - db (lb)	DBR (kg/hr)
L1 - Kindling	1.48	10	70	891	3.70	19.0	0.58	3.11	2.42
L1 - Starter	4.52	4							
L2	10.55	4	740	1083	9.08	22.3	1.02	7.43	3.31
L3	7.19	2	499	959	6.50	22.6	1.13	5.30	2.12
L4 - Small pieces	5.49	2	535	886	16.68	22.9	4.47	13.57	1.38
L4 - Large pieces	10.97	2							
Full Run	40.20	24			35.97	22.1	7.20	29.41	1.85

4/1/2025

IDC Load	Total Load wb (lb)	Number of Pieces	Flue Temp at load start	Max temp during burn	Total Fuel Burnt - wb (lb)	Avg. MC%	Duration (hr)	Total Fuel Burnt - db (lb)	DBR (kg/hr)
L1 - Kindling	1.51	11	68	894	4.08	20.6	0.37	3.39	4.19
L1 - Starter	4.54	4							
L2	9.76	4	898	1113	8.71	20.69	0.93	7.22	3.51
L3	7.51	2	579	898	6.79	20.53	1.28	5.63	1.99
L4 - Small pieces	5.99	2	443	824	17.20	22.25	5.40	14.07	1.18
L4 - Large pieces	11.03	2							
Full Run	40.34	25			36.78	21.31	7.98	29.57	1.68

4/7/2025

IDC Load	Total Load wb (lb)	Number of Pieces	Flue Temp at load start	Max temp during burn	Total Fuel Burnt - wb (lb)	Avg. MC%	Duration (hr)	Total Fuel Burnt - db (lb)	DBR (kg/hr)
L1 - Kindling	1.50	10	69	870	5.72	25.0	0.23	2.95	5.73
L1 - Starter	4.22	4							
L2	9.61	4	712	1233	9.61	25.0	0.95	6.88	3.29
L3	7.57	2	490	899	7.57	21.6	1.15	5.62	2.22
L4 - Small pieces	6.05	2	450	905	17.31	23.3	5.23	14.19	1.23
L4 - Large pieces	11.26	2							
Full Run	40.21	24			40.21	23.65	7.57	29.57	1.77

4/9/2025

IDC Load	Total Load wb (lb)	Number of Pieces	Flue Temp at load start	Max temp during burn	Total Fuel Burnt - wb (lb)	Avg. MC%	Duration (hr)	Total Fuel Burnt - db (lb)	DBR (kg/hr)
L1 - Kindling	1.45	10	68	746	3.72	25.0	0.33	2.97	4.05
L1 - Starter	4.43	4							
L2	10.37	4	656	902	9.25	25.0	1.00	7.40	3.35
L3	7.91	2	405	759	7.14	25.0	1.05	5.71	2.47
L4 - Small pieces	5.81	2	448	929	18.25	25.0	3.47	14.60	1.91
L4 - Large pieces	12.24	2							
Full Run	42.21	24			38.36	19.90	5.85	30.68	2.38

4/10/2025

IDC Load	Total Load wb (lb)	Number of Pieces	Flue Temp at load start	Max temp during burn	Total Fuel Burnt - wb (lb)	Avg. MC%	Duration (hr)	Total Fuel Burnt - db (lb)	DBR (kg/hr)
L1 - Kindling	1.50	12	68	781	5.67	1.9	0.38	4.53	5.37
L1 - Starter	4.78	3							
L2	10.13	5	777	1228	9.08	3.4	0.80	7.63	4.33
L3	7.90	2	961	961	7.15	19.0	1.35	6.01	2.02
L4 - Small pieces	5.92	2	679	847	17.84	19.0	4.62	14.99	1.47
L4 - Large pieces	11.73	3							
Full Run	41.96	27			39.74	19.90	7.45	33.17	2.02

5/5/2025

IDC Load	Total Load wb (lb)	Number of Pieces	Flue Temp at load start	Max temp during burn	Total Fuel Burnt - wb (lb)	Avg. MC%	Duration (hr)	Total Fuel Burnt - db (lb)	DBR (kg/hr)
L1 - Kindling	1.53	11	64	861	3.78	20.0	0.35	3.15	4.08
L1 - Starter	4.43	4							
L2	10.93	4	803	1135	9.77	21.0	0.73	8.07	4.99
L3	7.96	2	635	1032	7.20	22.0	1.38	5.90	1.94
L4 - Small pieces	6.30	2	313	803	18.07	22.4	4.98	14.76	1.34
L4 - Large pieces	11.56	2							
Full Run	42.71	25			38.82	21.6	7.45	31.89	1.94

5/6/2025

IDC Load	Total Load wb (lb)	Number of Pieces	Flue Temp at load start	Max temp during burn	Total Fuel Burnt - wb (lb)	Avg. MC%	Duration (hr)	Total Fuel Burnt - db (lb)	DBR (kg/hr)
L1 - Kindling	1.59	13	78	957	3.99	20.0	0.27	3.33	5.66
L1 - Starter	4.49	4							
L2	10.43	4	897	1135	9.83	21.0	1.08	8.12	3.40
L3	7.66	2	388	813	6.92	22.0	1.40	5.67	1.84
L4 - Small pieces	5.79	2	301	817	17.76	21.7	4.33	14.59	1.53
L4 - Large pieces	11.78	2							
Full Run	41.74	27			38.50	21.3	7.08	31.71	2.03

Total Hrs: 50.58

Sample Calculations – ASTM E2780 & E2515

Client: IHP
 Model: Montecito-C
 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_{Sdb} – Weight of test fuel spacers, dry basis, kg

M_{Cdb} – Weight of test fuel crib, excluding nails and spacers, dry basis, kg

D_{Cdb} - Density of fuel crib, excluding spacers and nails, dry basis, lbs/ft³

M_{FTAdb} - Total weight of fuel crib excluding nails, dry basis, kg

BR – Dry burn rate, kg/hr

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_R – Particulate emissions for test run, g/hr

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

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

ASTM E2515 equations (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 H₂O
 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. H₂O; (in Hg = in H₂O/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:

$$F_p = \frac{17.41}{17.75} = 0.981$$

$$V_s = 0.981 \times 85.49 \times 0.99 \times 0.266 \times \left(\left(\frac{89.9}{29.87} + \frac{460}{-0.20} \right) \times 28.78 \right)^{1/2}$$

$$V_s = 17.66 \text{ ft/s}$$

*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:

$$Q_{sd} = 3600 \times (1 - 0.02) \times 17.66 \times 0.7854 \times \frac{528}{89.9 + 460} \times \frac{29.87 + \frac{-0.20}{13.6}}{29.92}$$

$$Q_{sd} = 46877.3 \quad \text{dscf/hr}$$

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

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

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 A:

$$V_{m(std)} = 17.64 \times 63.752 \times 1.005 \times \frac{\left(29.87 + \frac{1.05}{13.6} \right)}{\left(87.4 + 460 \right)}$$

$$V_{m(std)} = \mathbf{61.825} \text{ dscf}$$

Using equation for Train B:

$$V_{m(std)} = 17.64 \times 64.717 \times 1.011 \times \frac{\left(29.87 + \frac{1.15}{13.6} \right)}{\left(87.3 + 460 \right)}$$

$$V_{m(std)} = \mathbf{63.156} \text{ dscf}$$

Using equation for ambient train:

$$V_{m(std)} = 17.64 \times 99.21 \times 1.012 \times \frac{\left(\underline{29.865} + \frac{0.00}{13.6} \right)}{\left(74.1 + 460 \right)}$$

$$V_{m(std)} = \mathbf{99.041} \text{ dscf}$$

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:

$$m_n = 0.1 + 1.7 + 0.0$$

$$m_n = 1.8 \text{ mg}$$

Using equation for Train B:

$$m_n = 0.1 + 1.6 + 0.2$$

$$m_n = 1.9 \text{ mg}$$

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/mg

m_n = Total mass of particulate matter collected in the sampling train, mg

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

Sample calculation:

For Train A:

$$C_s = 0.001 \times \frac{1.8}{61.82}$$

$$C_s = \mathbf{0.00003} \text{ g/dscf}$$

For Train B

$$C_s = 0.001 \times \frac{1.9}{63.16}$$

$$C_s = \mathbf{0.00003} \text{ g/dscf}$$

For Ambient Train

$$C_r = 0.001 \times \frac{0.0}{99.04}$$

$$C_r = \mathbf{0.000000} \text{ g/dscf}$$

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 A

$$E_T = (0.000029 - 0.000000) \times 46877.3 \times 408 / 60$$

$$E_T = \mathbf{9.28} \text{ g}$$

For Train B

$$E_T = (0.000030 - 0.000000) \times 46877.3 \times 408 / 60$$

$$E_T = \mathbf{9.59} \text{ g}$$

Average

$$E = \mathbf{9.44} \text{ g}$$

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 10-min interval of Train 1):

$$PR = \left(\frac{408 \times 1.6 \times 17.66 \times (91.0 + 460) \times (87.4 + 460)}{10 \times 63.752 \times 17.59 \times (89.9 + 460) \times (72.2 + 460)} \right) \times 100$$

$$PR = 106 \%$$

PM_R – Particulate emissions for test run, g/hr

ASTM E2780 equation (6)

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

Where,

E_T = Total particulate emissions, grams

θ = Total length of full integrated test run, min

Sample Calculation:

$$E_T \text{ (Dual train average)} = 9.44 \text{ g}$$

$$\theta = 408 \text{ min}$$

$$PM_R = 60 \times (9.44 / 408)$$

$$PM_R = 1.39 \text{ g/hr}$$

PM_F – Particulate emission factor for test run, g/dry kg of fuel burned
ASTM E2780 equation (7)

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

Sample Calculation:

$$\begin{aligned} E_T (\text{Dual train average}) &= 9.44 \text{ g} \\ M_{Bdb} &= 14.37 \text{ kg} \\ PM_F &= 9.44 / 14.37 \\ PM_F &= \mathbf{0.66} \text{ g/kg} \end{aligned}$$



OFFICE OF AIR QUALITY PLANNING AND STANDARDS
RESEARCH TRIANGLE PARK, NC 27711

May 21, 2025

Mr. Matthew Romanow, PE
Director, Engineering
Innovative Hearth Products
1502 14th Street Northwest
Auburn, Washington 98001

Dear Mr. Romanow,

I am writing in response to your letter received on May 5th, 2025, in which you request approval of an alternative test method for demonstrating compliance with 40 CFR part 60, Subpart AAA, Standards of Performance for New Residential Wood Heaters (Subpart AAA). The U.S. Environmental Protection Agency's (EPA) Office of Air Quality Planning and Standards is the delegated authority for approval/disapproval determinations on any major alternatives to test methods and other compliance determination procedures required under 40 CFR parts 59, 60, 61, 63, and 65.

According to the information provided in your correspondence, you seek an alternative test method and testing procedures for use when conducting testing on the Innovative Hearth Products (IHP) Montecito-C Series room heater. The Montecito-C series is a built-in, zero-clearance heater. There is no freestanding or insert version of this appliance. Currently, as required by section 60.534(a)(2) of Subpart AAA, a manufacturer, when using the 2020 cord wood alternative compliance option, must have their appliance tested by an EPA-approved test laboratory and the testing conducted with cord wood using an alternative cord wood test method approved by the EPA Administrator or their delegated authority to establish the certification test conditions and the particulate matter (PM) emission values.

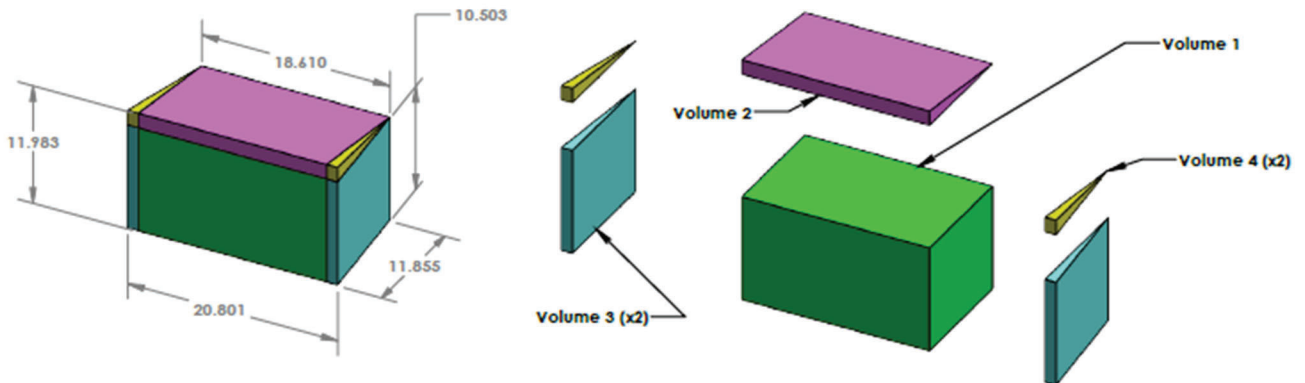
You request to use the specified modifications detailed below, coupled with the New York State Energy Research and Development Authority (NYSERDA) Test Method for Certification of Cordwood-Fired Stoves Under the 2015 New Source Performance Standard (attached) as the alternative cord wood test method to certify the Montecito-C Series model line. In your request, you state that the Montecito-C Series is a built-in room heater that is subject to the cordwood emissions standards in 40 CFR 60, subpart AAA and that you are seeking a cord wood alternative test method to use for this compliance testing. You also state that your appliance has a usable firebox volume of 1.52 ft³ with an overall firebox volume of 2.19 ft³. As a freestanding model is not planned for this model line, testing the Montecito-C in its built-in configuration will meet the requirements of the 2015 New Source Performance Standard with respect to testing the model in its least efficient design configuration.

In your request, you state that you would like to use Big Leaf maple (*Acer macrophyllum*) cord wood for compliance testing. This fuel is among the allowable fuel species specified in the fuel load calculator that accompanies the NYSERDA Test Method for Certification of Cordwood-Fired Stoves Under the 2015 New Source Performance Standard. Fuel weight and length targets are determined by the Fuel Load Calculator referenced by the NYSERDA test method mentioned above. The test report used to support

your compliance application must provide documentation that the Fuel Load Calculator targets were met throughout each of your compliance test runs.

We understand from your request, that you also seek to use several alternative testing procedures, detailed in the second list below, when conducting sampling as required by 40 CFR 60.534(c), which requires that PM emission concentrations be measured using ASTM E2515-11 *Standard Test Method for Determination of Particulate Matter Emissions Collected by a Dilution Tunnel* (ASTM E2515-11). Additionally, in your request, you seek to use the NYSERDA 1405D tapered element oscillating microbalance (TEOM) EPA Protocol to measure the first hour of PM emissions, as is required by 40 CFR 60.534(d).

1. The firebox specifications you provided relevant to the Montecito-C series model are:
 - a. A usable firebox volume of 1.52 ft³. (Measurements and calculations attached)
 - b. An overall firebox volume of 2.19 ft³. (CAD attached)
 - c. An average firebox width of 19.71 in. (the average of front and rear widths of 20.81 in. and 18.61 in., attached)
 - d. An average firebox height of 11.24 in. (the average of front and rear heights of 11.98 in. and 10.5 in., attached)
 - e. Overall firebox volume and usable firebox volume must also be reported in the test report and must agree with dimensions stated in this letter and shown below.



$$V1 = 18.610 \times 11.855 \times 10.503 \\ = 2317.239 \text{ in}^3$$

$$V2 = \frac{1}{2} (11.983 - 10.503) \times 11.855 \times 18.61 \\ = 163.254 \text{ in}^3$$

$$V3 = \frac{1}{2} (20.801 - 18.610) \times \frac{1}{2} \times 11.855 \times 10.503 \\ = 68.220 \text{ in}^3$$

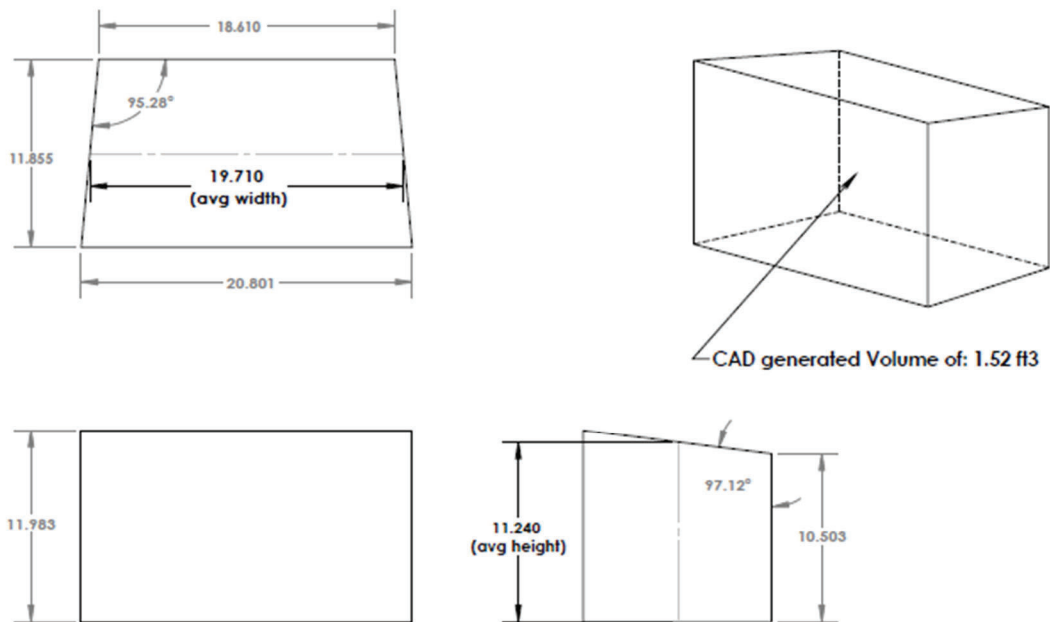
$$V4 = \frac{1}{2} (20.801 - 18.610) \times (11.983 - 10.503) \times 11.855 / 3 \\ = 6.408 \text{ in}^3$$

$$\text{Total Useable Firebox Volume: } V1 + V2 + 2V3 + 2V4 \\ = 2629.749 \text{ in}^3 \\ = 1.52 \text{ ft}^3$$

NYSERDA Firebox Volume Calculator
(using avg height and width)

1.3 Firebox Information		
Firebox Shape:	☒ Cubic	☐ Cylindrical
Firebox width:	19.71	in.
Firebox depth:	11.86	in.
Firebox height:	11.24	in.
Volume adjustment:		ft ³
Firebox Net Volume:	1.520	ft ³

- f. Montecito-C schematic:



2. Fuel specifications:

- The fuel load density and specifications are based on calculations within the NYSERDA Fuel Load Calculator.
- The fuel loading is in an East to West (parallel with the face of the unit) configuration.
- The fuel for this test will consist entirely of Big Leaf Maple (*Acer macrophyllum*).

3. Owner's manual specifications:

- A complete copy of the Owner's manual (without data and claims that can only be made after testing is completed) will be provided to the test laboratory prior to testing. This Owner's manual will be the same manual provided to all owners upon purchase, and all fuel loading details will include the requirements of Section 11 in the NYSERDA Test Method for Certification of Cordwood-Fired Stoves under the 2015 New Source Performance Standards.
- All certification test procedures will be consistent with the Owner's manual and no other operating instructions provided to the test lab.
- The usable firebox dimensions will be illustrated in the Owner's manual with instructions to the end user for appropriate fueling/loading. These will agree with the documentation provided herein to support usable firebox dimensions claimed above.
- All fuel loading procedures and air control / door closing procedures will be included in the Owner's manual (including fuel piece length information as per section 11.3.4.1.3 of the test method). These will agree with the fuel piece requirements as determined by the NYSERDA Fuel Load Calculator. The locked version of the Fuel Load Calculator to be used is dated August 7, 2023.
- Kindling and start-up instructions in the Owner's manual will describe both top-down start or bottom-up start directions. General guidance on kindling and start-up fuel arrangement will be supplied in adherence and agreement with the requirements of the

NYSERDA Fuel Load Calculator. For the purposes of this testing, a bottom-up start will be required. There must be no discussion regarding fuel spacing and piece size in the instructions to the lab.

- f. Neither the Owner's manual or any instructions provided to the test lab by the manufacturer may override any requirement of this alternate test method, ASTM E-2515-11, or The NYSERDA Test Method for Certification of Cordwood-Fired Stoves under the 2015 New Source Performance Standard, or any provision stipulated within 40 CFR 60, Subpart AAA.

Based on the information you have provided, and with the caveats set forth below, we are approving your request to use the NYSERDA Test Method for Certification of Cordwood-Fired Stoves Under the 2015 New Source Performance Standard as the alternative cord wood test method when conducting certification testing as required by Subpart AAA, section 60.534(a)(2) on the Montecito-C Series room heater with ASTM E-2515 using the modifications detailed below.

1. Additional requirements:

- a. Emissions must be measured and reported from all valid test runs and all test data for all test runs (complete or incomplete) must be included in the test report.
- b. The NYSERDA Test Method for Certification of Cordwood-Fired Stoves Under the 2015 New Source Performance Standards is meant to be run in triplicate, with no test runs excluded (no option to replace one test run with two others) and the reported test result is the average of these three replicate tests.
- c. The sampling trains must not be disassembled until after a post-test leak check has been performed.
- d. The blower of the Montecito-C series is operated manually, with a thermostatic on/off switch. Per section 11.6.5.2 of the NYSERDA Test Method for Certification of Cordwood-Fired Stoves Under the 2015 New Source Performance Standards, section 11.11.1.1 states: "All test runs should have the fan "ON" at the highest setting except for 1) the duration of L1, and 2) When the door is open in all loads (L1, L2, L3, and L4) and, 3) From the end of L3 to when the air control is set to the lowest position for L4."
- e. Per section 11.6.7.1 of the NYSERDA Test Method for Certification of Cordwood-Fired Stoves Under the 2015 New Source Performance Standards, section 11.6.7.2 states: "all test runs must be video recorded in their entirety or at least at 1-minute intervals, and remote witness capability must be made available by the test lab upon request."
- f. Follow Technical Information Document 024 - Memo on Rounding and Significant Figures for rounding conventions: <https://www.epa.gov/emc/technical-information-document-024-memo-rounding-and-significant-figures>.

The following items are ASTM E2515-11 requirements to be modified:

1. Section 7.1.1 – Additional option:
 - a. Pall TX-40 (PTFE coated) filters should be used. Certified organic binder free glass fiber filters meeting the same filtration specifications are also acceptable.
2. Section 9.2.2 – Modification of requirement:

- a. Tunnel flow rate must be sufficient to maintain tunnel temperature below 125°F (maximum) and 104°F on a 10-minute rolling average, excluding periods when the appliance door is open. Two exceedances are allowed of the 10-minute rolling average points in each test run. The tunnel relative humidity must be below 90% humidity at 80°F (ASTM E2515-11 minimum filter temperature as required in this alternative test method) based on 1-minute data excluding periods when the appliance door is open.
 - i. Optionally, real-time tunnel dewpoint temperature measurements recorded at a minimum rate of one reading per minute can be made to override the maximum tunnel temperature requirement (125°F maximum and 104°F on a 10-minute rolling average). One-minute dewpoint temperature measurements in the dilution tunnel must be below the one-minute ASTM E2515-11 filter temperature measurement. If there is an exceedance of the tunnel dewpoint temperature above the ASTM E2515-11 filter temperature, then the test run is invalid and must be repeated.
 - ii. As an alternative to 2.a.i, the tunnel relative humidity may be measured using a psychrometer to measure the wet bulb temperature in the dilution tunnel. These measurements must be taken and recorded, at a minimum of every 2 minutes. ASTM E0377-15 Standard Test Method for Measuring Humidity with a Psychrometer (the Measurement of Wet- and Dry- Bulb Temperatures) may be followed for these purposes.
 - b. With respect to the last sentence in ASTM E2515-11 section 9.2.2, you are excluded from the following requirement: “The maximum tunnel flow rate shall not exceed five times the minimum flow rate determined as shown in 9.2.4.”
3. Sections 9.8.1, 10.2.1 and 11.7 – Additional requirements:
- a. The filter temperature must be maintained between 80 and 90°F during testing.
 - b. Filters must be weighed in pairs using EPA ALT-154.
 - c. Only one point per sampling train is allowed outside the ± 10 percent proportionality range per test run.
 - d. Non-desiccated post-test filter weights must be taken within an hour after the post-test leak check. These initial weights must be included in the test report.
 - e. Oven drying or applying heat to the filter as a form of desiccation is not allowed.
 - f. Dual train comparison (precision) must be calculated in terms of percent difference between the two sample trains and in terms of calculated emissions difference on a g/kg basis. These values must both be clearly reported for each test run.
 - g. Negative filter weights must be discussed in the test report. Where negative mass (i.e., filter material left on O-rings and gaskets) is subtracted from the overall PM mass, the resultant PM mass must be reported with the mass subtracted and with the mass not subtracted for comparison purposes. Given the gravimetric procedures in ALT-154, we do not expect to encounter any negative mass issues with the filters but if any should be present, there must be a full discussion in the test report on how this may have come to be the case and what impact it may have on the measured emissions.
4. Sections 9.5.2 to 11.4R.2 – Additional requirement:

- a. Ambient background sampling and filter collection must be conducted per the NYSERDA Test Method for Certification of Cordwood-Fired Stoves Under the 2015 New Source Performance Standards, section 11.12, ASTM E2515-11, section 4.3 and all other method specific room air sampling requirements.
5. Sections 9.6.4 through 9.6.5.1 - Additional requirement:
 - a. Particulate matter emission concentrations must be measured with ASTM E2515-11 with the following exceptions, eliminate section 9.6.5.1 of ASTM E2515-11 and perform the post-test leak checks as specified below:
 - i. Post-Test Leak Check: A leak check of each sampling train is mandatory at the conclusion of each sampling run before sample recovery. The leak check must be performed in accordance with the procedures of ASTM E2515-11, section 9.6.4.1, except that it must be conducted at a vacuum equal to or greater than the maximum value reached during the sampling run. If the leakage rate is found to be no greater than 0.0003 m³/min (0.01 cfm) or 4% of the average sampling rate (whichever is less), the leak check results are acceptable. If a higher leakage rate is obtained, the sampling run is invalid.
 - b. Additionally, if a component change of either sampling train is needed during sampling, then perform the leak check specified below:
 - i. Leak Checks During Sample Run: If, during a sampling run, a component (e.g., filter assembly) change becomes necessary, a leak check must be conducted immediately before the change is made. Record the sample volume before and after the leak test. **The sample volume collected during any leak checks must not be included in the total sample volume for the test run.** The leak check must be done according to the procedure outlined in ASTM E2515-11, section 9.6.4.1, except that it must be done at a vacuum equal to or greater than the maximum value recorded up to that point in the sampling run. If the leakage rate is found to be no greater than 0.0003 m³/min (0.01 cfm) or 4% of the average sampling rate (whichever is less), the leak check results are acceptable. If a higher leakage rate is obtained, the sampling run is invalid.
 - c. **NOTE:** Immediately after component changes, leak checks are optional but are highly recommended. If such leak checks are performed, they will be performed using the post-test leak check procedures referenced above.
6. To conduct first hour PM sampling as required by section 60.534(d), these changes and modifications will be made:
 - a. To determine the first hour PM emissions as required by section 60.534(d), the NYSERDA Test Method for Certification of Cordwood-Fired Stoves Under the 2015 New Source Performance Standards, section 10.2.3, requires the use of a TEOM operated per NYSERDA 1405D TEOM EPA Protocol to report the first-hour emission rate, to provide data for phased emissions, and real-time data reporting requirements. All TEOM measurements shall run through the entirety of the test to obtain a full data set. This means that no ASTM E2515-11 sampling will be done for the first hour emissions.

All other requirements of the NYSERDA Test Method for Certification of Cordwood-Fired Stoves Under the 2015 New Source Performance Standards and ASTM E2515-11 must be followed during the testing, and all requirements of 40 CFR part 60, Subpart AAA must be satisfied and described in your test report.

This approval is based on the understanding that the lowest heat output setting on the Montecito-C series room heater available to the user will correspond to the lowest burn rate to be evaluated during certification testing and the test report will fully document that the certification testing was conducted as such. This is consistent with section 60.534(a)(1) of Subpart AAA, which states, "the burn rate for the low burn category must be no greater than the rate that an operator can achieve in home use and no greater than is advertised by the manufacturer or retailer."

A copy of this letter must be included in any certification test report where this Alternative Test Method determination is used for compliance to 40 CFR 60, Subpart AAA requirements.

If you have additional questions regarding this approval, please contact me at 919-541-4790 or johnson.steffan@epa.gov.

Sincerely,

Steffan M. Johnson
Group Leader
Measurement Technology Group

attachment

cc: Sara Ayers – EPA/OECA/OC
Shannon Banner – EPA/OAQPS/SPPD
Marc Houyoux – EPA/OAQPS/AQAD
Eleana Little – EPA /OECA/OC
Rafael Sanchez – EPA/OECA
Bill Schrock - EPA/OAQPS/SPPD
Nick Swanson – EPA/OAQPS/SPPD
Karen Wesson – EPA/OAQPS/AQAD
Ryan Wolbert – EPA/OAQPS/SPPD

NYSERDA Test Method for Certification of Cordwood-Fired Stoves Under the 2015 New Source Performance Standard

Note: This method does not include all the specifications (e.g. equipment and supplies) and procedures (e.g., sample and analytical) essential to its performance. Some material is incorporated by reference from other methods. Therefore, to obtain reliable results, persons using this method shall have a thorough knowledge of at least the following EPA Tests:

- Method 1- Sample and Velocity Traverses for Stationary Sources
- Method 2- Determination of Stack Gas Velocity and Volumetric Flow Rate (Standard Type Pitot Tube)
- Method 3 – Gas Analysis for the Determination of Dry Molecular Weight
- Method 4 – Determination of Moisture Content in Stack Gases
- Method 5G – Determination of Particulate Matter from Wood Heaters (Dilution Tunnel Sampling Location)
- Method 10 - Carbon Monoxide - Instrumental Analyzer
- Method 28 – Certification and Auditing of Wood Heaters

1. Scope and Application

- 1.1. This test method specifies operation and fueling for certification and auditing of manually fed wood-fired stoves and heaters with manual or automatic controls.
- 1.2. This test method measures particulate matter (PM) emissions, heat output, and efficiency.
- 1.3. Carbon monoxide emissions are measured per CSA B415.1 *Performance Testing of Solid-Fuel-Burning Heating Appliances*.
- 1.4. Particulate emissions are measured using the dilution tunnel method.
 - 1.4.1. As specified in ASTM E2515-11, *Standard Test Method for Determination of Particulate Matter Emissions Collected in a Dilution Tunnel*, with modifications described in Section 10.1 of this test method.
 - 1.4.2. Using the Tapered Element Oscillating Microbalance (TEOM) continuous PM method as detailed in this test method.
- 1.5. Efficiency using CSA B415.1 with the following exceptions:
 - 1.5.1. No substitution of data is allowed.

- 1.5.2. 10-minute average data must be used to calculate efficiency
- 1.6. Analyte. Particulate matter (PM). No CAS number assigned.
- 1.7. Applicability. This method is applicable for the certification and auditing of wood space heaters that burn cordwood fuel. The test quantifies PM and CO emissions and provides overall efficiency ratings, maximum burn time, and heat output.
- 1.8. Data Quality Objectives. Adherence to the requirements of this method will enhance the quality of the data obtained from air pollutant sampling methods.
- 1.9. Distinguishing features of appliances covered by this standard include:
 - 1.9.1. Cordwood fuel is hand-fed into the firebox.
 - 1.9.2. A chimney or vent that exhausts combustion products from the appliance.
- 1.10. The values stated are to be regarded as the standard, whether in I-P (British) or SI units. The values given in parentheses are for information only.
- 1.11. Data Quality Objectives.
 - 1.11.1. Adherence to the requirements of this method will enhance the quality of the data obtained from air pollutant sampling methods.
 - 1.11.2. Measurement of emissions and heating efficiency provides a uniform basis for comparison of product performance that is useful to the consumer. It is also required to relate emissions produced to useful heat production.
 - 1.11.3. This is a laboratory method intended to capture operating periods that are representative of actual field use without excessive test burden.

2. Referenced Methods

- 2.1. NYSERDA Standard Operation Procedures for use of a Thermo Scientific 1405-D TEOM™ in a dilution tunnel with wood-fired stoves, hydronic heaters, and furnaces
- 2.2. ASTM 2515-11: Test Method for Determination of Particulate Matter Emissions Collected by a Dilution Tunnel.
- 2.3. CSA B415.1 Performance Testing of Solid-Fuel-Burning Heating Appliances.

3. Definitions

- 3.1. Aborted Test Run – The run shall be considered aborted if a force majeure event occurs, such as a power outage or equipment operation failure. Aborted test runs are treated differently than incomplete or invalid test runs.

- 3.2. Active Period – the active period of a test is defined as the following events: (1) Door opening and closing, damper adjustments, adjustments of air controls, (2) Kindling and start-up wood within the stove and prior to ignition; (3) Coal bed raking, ((4) Fuel pieces before loading; (5) Fuel in firebox immediately after loading, (6) Fuel adjustments; (7) End of the test run coal bed conditions (this requires opening the door at the end of test), or (8) any other event where the user engages with the appliance.
- 3.3. Appliance – a wood heater capable of and intended for space heating defined in the applicable regulation. The appliance includes a combustion chamber, combustion air settings, operating controls, and a thermostat if specified, and any other accessory required for standard operation, such as a barometric damper.
- 3.4. Automatically controlled appliance – an appliance whose air controls are controlled automatically controlled throughout the appliance operation and can only be disabled by a technician or when in a power-out mode. Appliances controlling air for portions of a burn cycle are not automatically controlled appliances for this test method.
- 3.5. Centroidal Area – means the central area of the stack or duct that is no greater than 1 percent of the stack or duct cross-section. This area has the same geometric shape as the stack or duct.
- 3.6. Certification or audit test – a series of at least three test runs (four runs, if use of a fan is an option) conducted for certification or audit purposes that meets the specifications detailed in this protocol.
- 3.7. Chop – using a poker or another piece of wood to strike a piece of the fuel charge to break it into smaller pieces.
- 3.8. Coal-bed Stirring – prior to adding a new fuel charge, using a poker or piece of wood to stir or level the coal bed of the appliance for the sole purpose of ensuring ease of loading of the fuel charge. No special formations can be made, such as creating coal bed formations or pushing coals to one side or creating slopes with the coals.
- 3.9. Data recorder – The equipment that permanently records the concentrations reported by the analyzers.
- 3.10. Drift – Difference between pre and post run calibration system bias (or system calibration error) checks at a specific calibration concentration level.
- 3.11. East-west stove – a stove where the firebox dimension parallel to the loading door is greater or equal to the stove depth measurement. Logs are loaded so that they are viewed on the long length of the stove.
- 3.12. Emission factor – the emission of a pollutant expressed in mass per unit of energy (typically) output from the appliance.
- 3.13. Firebox – the portion of the chamber in the wood heater in which the test fuel charge is placed and combusted.

- 3.14. Firebox depth – the horizontal length of the fire chamber dimension measured perpendicular to the loading door. The manufacturer can only subtract the volume of the actual firebox if fuel cannot be loaded in the area removed from the firebox volume. If the manufacturer believes that a portion of the firebox depth is not usable for firebox volume calculation, photo documentation and a written basis must be included in the test report.
- 3.15. Firebox Height – the vertical distance extending above the top of the firebox to the floor of the firebox. Firebox height is not necessarily uniform. The measurement must account for variations caused by internal baffles, air channels, or other permanent obstructions. The manufacturer can only subtract the volume of the actual firebox if fuel cannot be loaded in the area removed from the firebox volume. The manufacturer can only subtract the volume of the actual firebox if fuel cannot be loaded in the area removed from the firebox volume.
- 3.16. Firebox width – the horizontal fire chamber dimension that is parallel to the loading door. The manufacturer can only subtract the volume of the actual firebox if fuel cannot be loaded in the area removed from the firebox volume. If the manufacturer believes that a portion of the firebox width is not usable for firebox volume calculation, photo documentation and a written basis must be included in the test report.
- 3.17. Flue Gas Measurement System – All the equipment used to measure stack gas components of interest. This system comprises five major subsystems: sample acquisition, sample transport, sample conditioning, gas analyzer, and data recorder.
- 3.18. Fuel Adjustment – manipulations to the fuel charge to reflect typical owner practices that allow the cordwood fuel to burn appropriately during the test period. A fuel adjustment includes minor changes in fuel placement. It does not include chopping the wood, stirring the coal bed, or reorganizing fuel placement.
- 3.19. Fuel load calculator – The locked excel spreadsheet tool that determines the allowable test fuel load weights and required piece sizes for each individual load.
- 3.20. Fuel loading direction – For loads 2, 3, and 4 fuel shall be loaded based parallel to the dimension with the largest value. If the firebox length and width are within 2”, fuel shall be loaded in an east/west fashion, parallel to the loading door. A crisscross configuration is allowed for L1 but cannot be used as a load configuration for loads 2, 3, or 4.
- 3.21. Gas analyzer – Instrument that measures and transmits an output proportional to a gas concentration.
- 3.22. Incomplete Test Run – Any test run that does not successfully complete all six test phases continuously due to stopped fuel combustion or other appliance issues, as detailed in Section 12.24.11.
- 3.23. Invalid Test Run – Any complete or partial test that does not meet the specifications detailed in this test method as the fault of the system operation.

- 3.24. Kindling pieces – small pieces of wood less than 1” in diameter. No bark or moisture requirements for these pieces, however kindling pieces shall not be dried or stored anywhere but in laboratory ambient conditions. Kindling length shall be of the same wood species as the fuel charge length. Individual kindling pieces may weigh no less than 1.5 ounces.
- 3.25. Large fuel pieces – pieces that are larger for the appliance as defined by the fuel load calculator.
- 3.26. L1 Start-up – period of the test when the unit has kindling and startup fuel under the conditions described in Section 11.6.7.
- 3.27. L2 High-fire Phase – period of the test when the unit has a small coal bed and the stoves air settings are fully open. It is intended to replicate periods when homeowners are trying to quickly heat an area, shortly after starting or restarting the appliance.
- 3.28. L3 Maintenance-fire phase– period of the test when a fire is maintained with a medium-sized coal bed, and a smaller batch of wood made up of two large pieces. This is intended to simulate a period when the operator is trying to maintain consistent heat output.
- 3.29. L4 Low-burn Rate Phase – period of the test when the stove has a large coal bed, the stove is fully loaded, and the adjustable air settings are set to produce the lowest possible burn rate and have the lowest air settings. It is intended to simulate when the operator is trying to maintain heat over a long time, such as overnight or while away for significant periods of time.
- 3.30. North-south stove – a firebox that has its longest dimension measurement perpendicular to the loading door. In this stove type, logs are loaded so that the ends of the fuel are viewed when loaded.
- 3.31. Phase – A distinct period in the test run with its own operational procedures and conditions.
- 3.32. Primary air supply – air supply that introduces air to the wood heater in the combustion chamber and is adjusted to target a desired burn rate. The wood heater manufacturer or test facility can document this through design drawings.
- 3.33. Secondary air supply – air supply that introduces air to the wood heater such that the burn rate is not altered by more than 10 percent when the secondary air supply is adjusted during the test run. The wood heater manufacturer or test facility can document this through design drawings that show the secondary air is introduced only into a mixing chamber or secondary chamber outside the firebox.
- 3.34. Significant figure – is any digit that is necessary to define the specific value or quantity. Zeros may be used either to indicate a specific value, like any other digit or to indicate the magnitude of a number.
- 3.35. Small fuel pieces – pieces that are small for the appliance as defined by the fuel load calculator.
- 3.36. Starter fuel – pieces of cordwood that can be smaller than small and large pieces but larger than kindling, as defined by the fuel load calculator.

- 3.37. System calibration mode – The introduction of calibration gases into the measurement system at the flue gas inlet probe upstream of conditioning components, filtration, and flue gas sample transport equipment.
- 3.38. Test data – means the data for all test runs conducted on the wood heater, including any data collected during failed and invalid runs and includes records of preparation of standards, identification of equipment used and personnel present, records of calibrations, raw data sheets for field sampling, raw data sheets for field and laboratory analyses, chain-of-custody documentation, and example calculations for reported results.
- 3.39. Test facility – the area in which the wood heater is installed, operated, and sampled for emissions.
- 3.40. Test fuel charge– the collection of test fuel pieces used in each of the four phases of the test run. L2, L3, and L4 recommend that at least 75% of the individual pieces with at least 80% bark on one side of the fuel piece. Bark shall not be removed for certification testing. Any fuel charge that suggests bark was purposely removed or shaped shall be deemed invalid. Examples of fuel piece manipulation are provided in Section 11. If 75% of the fuel load pieces for L2, L3, and L4 do not have bark, document in the test report, and provide a basis for the lack of bark.
- 3.41. Test fuel load – the group of test fuel pieces that are loaded, as specified by phase, throughout the test run.
- 3.42. Test fuel loading – the arrangement of the test fuel charge.
- 3.43. Total run fuel load – the amount of wood burned during the entire test run.
- 3.44. Test fuel loading density – the calculation determining the weight of the as-fired test fuel load. The calculation is based on the usable volume of the firebox.
- 3.45. Test run – an individual emission test that includes the four operational phases required by the fueling protocol.
- 3.46. Usable firebox volume – the calculated volume of the firebox determined using its height, width, and depth as defined in this section. This calculation represents the area where wood is likely to be loaded. If the manufacturer claims that portions of the firebox may not be used in the calculation, a justification must be submitted with the test report. If the justification is not approved, the test results will be deemed unrepresentative for certification purposes. It is highly recommended that manufacturers obtain regulatory approval if making claims that portions of the firebox are not appropriate for inclusion in the calculation.
- 3.47. Wood heater – an enclosed, wood-burning appliance capable of and intended for space heating or domestic water heating, as defined in the applicable regulation.

4. Interferences

None.

5. *Summary of Method*

- 5.1. Particulate matter emissions are measured from a wood heater burning cordwood test fuel in a test facility maintained at a set of prescribed ambient conditions. Procedures for operating the appliance, measuring PM and CO emission rates, and methods for reducing data and calculating results are provided.
- 5.2. *Dilution Tunnel.* A dilution tunnel following the specifications detailed in ASTM E2515-11 shall be used for particulate measurements.
- 5.3. *Particulate Matter:* PM emissions are measured in a dilution tunnel specified in ASTM 2515-11 *Standard Test Method for Determination of Particulate Matter Emissions Collected in a Dilution Tunnel* with exceptions as defined in Section 10.1. The flow rate in the dilution tunnel is maintained at a constant rate throughout the test cycle and accurately measured. PM emissions are measured in the dilution tunnel using both the filter method specified in ASTM 2515-11 and with a Thermo model 1405-D using NYSERDA Standard Operation Procedures for use of a Thermo Scientific 1405-D TEOM™ in a dilution tunnel with wood-fired stoves, hydronic heaters, and furnaces.
- 5.4. *Operation.* Appliance operation is conducted on a cold-to-hot test cycle, meaning that the appliance starts the first test run at room temperature and ends with the appliance in a heated state. The second and third test runs may start at a slightly warmer temperature if the appliance is designed to retain the heat from the first run. The appliance is operated at operational phases representing start-up emissions, high heat demand, low heat demand, changing air conditions, and refueling. To complete the certification test, the appliance shall complete three valid test runs for manually air-controlled appliances and four test runs for appliances with automatic air controls. Overall results average all valid test runs to determine the test results.
- 5.5. *Repeatability.*
 - 5.5.1. For manual air control stoves, a series of at least three test runs are conducted for certification or audit purposes.
 - 5.5.2. For appliances with automatic air controls, a series of at least three test runs using automatic controls and a single run completed with the heater and controls disconnected from any external power source shall be conducted for certification and audit purposes.

6. *Significance and Use*

- 6.1. The measurement of particulate matter emission rates is an important test method widely used in the practice of air pollution control.
 - 6.1.1. These measurements, when approved by state or federal agencies, are often required for the purpose of determining compliance with regulations and statutes.

- 6.1.2. The measurements made before and after design modifications are necessary to demonstrate the effectiveness of design changes in reducing emissions and make this standard an important tool in manufacturers' research and development programs.
- 6.2. Measurement of heating efficiency provides a uniform basis for comparison of product performance that is useful to the consumer. It is also required to relate emissions produced to the useful heat production.

7. Safety

- 7.1. Disclaimer. This method may involve hazardous materials, operations, and equipment. This test method may not address all the safety problems associated with its use. It is the responsibility of the user of this test method to establish appropriate safety and health practices and to determine the applicability of regulatory limitations prior to performing this test method.
- 7.2. These tests involve combustion of wood, which releases substantial amounts of heat and combustion products. The heating system also produces large quantities of very hot water and the potential for steam production and system pressurization. Appropriate precautions must be taken to protect personnel from burn hazards and respiration of products of combustion. Exposure of personnel to unsafe levels of carbon monoxide must be avoided, and the use of continuous ambient carbon monoxide monitoring is strongly recommended.

8. Equipment and Supplies. The following items are required for sample collection:

- 8.1. Anemometer. A device capable of detecting air velocities less than 0.10 m/sec (20 ft/min), for measuring air velocities near the test appliance.
- 8.2. *Appliance Flue.*
 - 8.2.1. Steel flue pipe extending to 8.5 ± 0.5 ft. (2.6 ± 0.15 m) above the top of the platform scale, and above this level, insulated solid pack type chimney extending to 15 ± 1 ft. (4.6 ± 0.3 m) above the platform scale, and of the size specified by the appliance manufacturer. This applies to both freestanding and inserts type appliances.
 - 8.2.2. Other chimney types (e.g., solid pack insulated pipe) may be used in place of the steel flue pipe if the appliance manufacturer's written appliance specifications require such chimney for home installation (e.g., zero clearance appliance inserts). Such alternative chimney or flue pipe must remain and be sealed with the appliance following the certification test. This applies only to appliances requiring a specialized chimney.

- 8.2.3. Solid pack insulated chimneys shall have a minimum of 2.5 cm (1 in.) solid-pack insulating material surrounding the entire flue and possess a label demonstrating conformance to U.L. 103 (incorporated by reference—see §60.17).
- 8.3. Appliance Platform Scale and Monitor. For monitoring of fuel load weight change. The scale shall be capable of measuring weight to within 0.01 kg (0.02 lb.) and calibrated to NIST traceable standards at least annually.
- 8.4. Barometer. Aneroid or another barometer capable of measuring atmospheric pressure to within 0.1 in. Hg (2.5 mm Hg) with an uncertainty of +/- 0.05 in. Hg (+/- 1.27 mm Hg).
- 8.5. CO Gas Analyzer. A continuous nondispersive infrared (NDIR) analyzer, or equivalent, that measures the CO concentration in the flue gas stream. A dual-range analyzer is acceptable. These analyzers are often equipped with automated range-switching capability, so that when readings exceed the full-scale of the low measurement range, they are recorded on the high range. As an alternative to using a dual-range analyzer, you may use two segments of a single, large measurement scale to serve as the low and high ranges. In all cases, when two ranges are used, you must quality-assure both ranges using the proper sets of calibration gases.
- 8.6. CO₂ Gas Analyzer. A continuous NDIR analyzer, or equivalent, that measures the CO₂ concentration in the flue gas stream. Dual-range analyzer is acceptable. These analyzers are often equipped with automated range-switching capability, so that when readings exceed the full-scale of the low measurement range, they are recorded on the high range. As an alternative to using a dual-range analyzer, you may use two segments of a single, large measurement scale to serve as the low and high ranges. In all cases, when two ranges are used, you must quality-assure both ranges using the proper sets of calibration gases.
- 8.7. Dilution Tunnel must meet the requirements of ASTM E2515-11, clauses 6.1.6 and 9.2.
- 8.8. Dilution Tunnel temperature and relative humidity measurement. A probe with analog or digital data outputs capable of measuring tunnel temperature to within 0.5 °C (1.0 °F) and tunnel RH to within 2% between 5 and 95% RH at maximum tunnel temperatures, such as the Omega HX85A or equivalent. The probe should also report calculated dewpoint.
- 8.9. Draft Gauge. Electromanometer or other devices for the determination of flue draft or static pressure readable to within 0.005 in. H₂O (1.2 Pa)
- 8.10. Flue Gas Sample Probe. Stainless steel or other approved material of sufficient length to measure the sample point in stack.
- 8.11. Flue Gas Particulate Filters. The filter(s) must be made of material that is non-reactive to the gas being sampled and placed upstream of the gas analyzer.

- 8.12. Flue Gas Sample Line. The sample line from the probe to the conditioning system/sample pump should be made of Teflon or other material that does not adsorb or otherwise alter the sample gas.
- 8.13. Flue Gas Calibration Line. The sample line from the flue gas probe to the calibration gas shall be made of Teflon or other material that does not adsorb or otherwise alter the sample gas.
- 8.14. Flue Gas Conditioning Equipment. A condenser, dryer or other suitable system which removes moisture, condensable organic material and particulate continuously from the sample flue gas.
- 8.15. Flue Gas Sampling Pump. A leak-free pump is needed to pull the sample gas through the system at a flow rate sufficient to minimize the response time of the measurement system. The pump may be constructed of any material that is non- reactive to the gas being sampled.
- 8.16. Flue Gas Temperature Measurement. A type K thermocouple or equivalent located in the centroid of the stack located 8.0 +/- 0.5 ft (2.44 m +/- 150 mm) above the platform scale, capable of measuring with an accuracy of 4.0°F (2.2°C) or 0.75% of reading, whichever is greater.
- 8.17. Flue Gas Composition Measurement. A sample probe and continuous infrared analyzer or equivalent capable of measuring span of carbon monoxide (CO) and carbon dioxide (CO₂) in the flue gas produced by the appliance tested. Continuous analyzers (or equivalent) shall have maximum zero and span drift, over a 24 h period, of 1% of full scale.
- 8.18. Fuel Scale. Balance capable of weighing the test fuel charge to within 0.02 kg (0.05 lb.) and calibrated to NIST traceable standards at least annually.
- 8.19. Humidity Gauge. Psychrometer or hygrometer for measuring room humidity to within +/- 4% from 25 to 95% RH.
- 8.20. Moisture Meter. Calibrated electrical resistance meter for measuring test fuel moisture to within 2 percent moisture content.
- 8.21. Surface Temperatures. Capable of measuring temperature to within 1.5 percent of expected absolute temperatures with an accuracy of 4.0°F (2.2°C) or 0.75% of reading, whichever is greater.
- 8.22. Test Facility Temperature Monitor. A thermistor, RTD, Type T-Special thermocouple, or other equivalent device, located centrally in a vertically oriented 150 mm (6 in.) long, 50 mm (2 in.) diameter pipe shield that is open at both ends, capable of measuring temperature to within 1°F of expected temperatures.
- 8.23. TEOM – Thermo Fisher Scientific TEOM model 1405-D (Thermo part # 1405D-ANF, excluding models 1405, 1405-DF, or 1405-F) to measure and report continuous particulate matter (PM) measurements in an ASTM 2515-11 dilution tunnel or equivalent dilution method, and operated according to the NYSERDA Dichot TEOM Standard Operating Procedures. For lab air PM

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measurements, Thermo Fisher Scientific TEOM model 1405 (Thermo part # 1405-ANF, excluding model 1405-F), operated according to the NYSERDA Dichot TEOM Standard Operating Procedures.

9. Calibration and Standardizations

- 9.1. ASTM E2515-11. Perform all calibrations required by ASTM E2515-11.
- 9.2. Anemometer. Calibrate the anemometer as specified by the manufacturer's instructions before the first certification test every six months thereafter.
- 9.3. Appliance Platform Scale. Perform a multipoint calibration (at least five points spanning the operational range) of the platform scale before its initial use. The scale manufacturer's calibration results are sufficient for this purpose. Before each certification test, audit the scale with the wood heater in place by weighing at least one calibration weight (Class F) that corresponds to between 20 percent and 80 percent of the expected test fuel charge weight. If the scale cannot reproduce the value of the calibration weight within 0.0045 kg (0.01 lb.) or 1 percent of the expected test fuel charge weight, whichever is greater, recalibrate the scale before use with at least five calibration weights spanning the operational range of the scale.
- 9.4. Barometer. Calibrate using a reference pressure monitor calibrator before the first certification test and semiannually after.
- 9.5. Draft Gauge. Calibrate as per the manufacturer's instructions; a liquid manometer does not require calibration (but must be properly leveled, zeroed, and the system leak checked).
- 9.6. Humidity Gauge. Calibrate as per the manufacturer's instructions before the first certification test and annually thereafter.
- 9.7. Fuel Scale. Calibrate as described in 9.2.
- 9.8. Moisture Meter. Calibrate as per the manufacturer's instructions before the first certification test and semiannually thereafter.
- 9.9. Temperature Sensors. Calibrate using at least five points with an operating range within specification and in compliance with NIST Monograph 175. To be calibrated before the first certification test and semiannually thereafter.

10. Sampling, Test Specimens, and Test Appliances

- 10.1. Particulate matter sampling shall follow ASTM except for the following modifications listed here.
 - 10.1.1. Liquid water should not be present anywhere in the sampling system for a valid sample. The presence of condensed water anywhere in the sampling system invalidates the test run. All data from all invalid test runs shall be included in the report. The reviewing authority shall make a final determination on invalidated runs. Data from any invalidated test run shall

not be used to calculate results. If the testing agency believes a run has been invalidated, the test run shall be repeated.

10.1.2. Dilution tunnel temperature and relative humidity shall be measured electronically and logged at one-minute intervals near the sample probe to calculate dewpoint.

10.1.3. The following section details test conditions that shall be maintained for a valid test run. A valid test shall have no more than two individual deviations from the conditions below to remain a valid run. An example of an individual deviation is a single, ten-minute rolling average where the dilution tunnel exceeded temperature thresholds. Another ten-minute period exceeding the tunnel temperature requirement shall be considered a second deviation.

10.1.3.1. Tunnel flow rate must be sufficient to maintain tunnel temperature below 125 °F (maximum) and 113 °F on a 10-minute rolling average, excluding periods when the appliance door is open. Two exceedances are allowed of the 10-minute rolling average points in each test run. The tunnel relative humidity must be below 90% humidity at 80 °F (ASTM E2515-11 minimum filter temperature as required in this alternative test method) based on 1-minute data excluding periods when the appliance door is open.

10.1.3.1.1. Optionally, real-time tunnel dewpoint temperature measurements recorded at a minimum rate of one reading per minute can be made to override the maximum tunnel temperature requirement (125 °F maximum and 113 °F on a 10-minute rolling average). One-minute dewpoint temperature measurements in the dilution tunnel must be below the one-minute ASTM E2515-11 filter temperature measurement. If there is an exceedance of the tunnel dewpoint temperature above the ASTM E2515-11 filter temperature, then the test run is invalid and must be repeated.

10.1.3.1.2. As an alternative, the tunnel relative humidity may be measured using a psychrometer to measure the wet bulb temperature in the dilution tunnel. These measurements must be taken and recorded, at a minimum of every 2 minutes. ASTM E0377-15 Standard Test Method for Measuring Humidity with a Psychrometer (the Measurement of Wet- and Dry Bulb Temperatures) may be followed for these purposes.

10.1.3.2. A minimum average tunnel flow of 600 DSCFM is required. Higher tunnel flows may be required to meet the parameters of Section 10.1.3. With respect to the last sentence in ASTM 2515-11 Section 9.2.2, tests are excluded from the following requirement, *“The maximum tunnel flow rate shall not exceed five times the minimum flow rate determined as shown in 9.2.4.”*

10.1.3.3. All exceedances must be reported in the test anomalies section, even if deviations are within the test method tolerances.

10.1.3.4. ASTM 2515-11 filter trains 1 and 2 must meet a precision requirement of 7.5% or lower, regardless of g/kg comparison.

10.1.3.5. Use rounding requirements specified in Section 13.2 of this test method.

10.1.3.6. Use processes specified in Section 10.2.

10.2. Sample Collection. The following are required for sample collection:

10.2.1. Teflon coated glass fiber filters as supplied by the TEOM manufacturer for use with the TEOM model 1405-D. These are Pallflex Emfab (TX40) with an exposed diameter of 13 mm, without organic binder, exhibiting at least 99.95 percent efficiency.

10.2.2. *Test Specimens.* Appliances shall be supplied as complete systems, including all controls and accessories necessary for installation at the test facility. A full set of specifications, designs, and assembly drawings shall be provided when the product is placed under certification of a third-party agency.

10.2.3. Particulate Matter Sampling uses two ASTM 2515-11 sampling trains and a TEOM to obtain real-time data. TEOM data shall be used to report the first-hour emission rate, to provide data for phased emissions, and real-time data reporting requirements. All measurements shall run through the entirety of the test to obtain full run data.

10.2.3.1. Train 1 and 2 shall provide dual sampling trains that shall measure PM emissions from run start to run completion. Trains 1 and 2 must meet a precision requirement of 7.5% or lower per ASTM 2515-11, regardless of g/kg comparison.

10.2.3.1.1. Proportional rate variation shall meet ASTM 2515-11 requirements for all phases.

10.2.3.1.2. Filter conditions must be monitored, and filter changes are required to avoid filter clogging.

10.2.3.2. TEOM data shall be collected at 1-minute intervals for reporting. TEOM operation shall follow the procedures listed on the most recent NYSERDA Standard Operation Procedures for Thermo Scientific 1405-D TEOM for use in a dilution tunnel, found in the EPA docket.

10.3. *Flue Gas Measurement System Setup and Calibration*

10.3.1. Install Flue Gas Sample probe 2 in. (50 mm) above the flue gas temperature measurement in the stack.

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10.3.2. Setup Flue Gas Measurement System with an appropriate sample flow rate to reach 90% of their final reading within 30 seconds when beginning at ambient levels and responding to a high-level calibration gas.

10.3.3. Flue Gas Measurement System shall record CO and CO₂ concentrations at one-minute intervals.

10.4. Preparation of Apparatus

10.4.1. Wood Heater Installation for Certification Testing. Assemble the wood heater appliance and parts in conformance with the manufacturer's provided User Guide. These instructions must match all instructions materials developed by the manufacturer and/or their distributors. Place the wood heater on the platform scale and connect the chimney to the appliance. Clean the flue with an appropriately sized, wire chimney brush before initiating Run 1 of the certification test. Test documentation should include the date and time of flue cleaning.

10.4.2. Wood Heater Temperature Monitors.

10.4.2.1. For catalyst-equipped wood heaters, locate a temperature monitor (optional) about 25 mm (1 in.) upstream of the catalyst at the centroid of the catalyst face area, and locate a temperature monitor (mandatory) that will indicate the catalyst exhaust temperature. This temperature monitor is centrally located within 25 mm (1 in.) downstream at the centroid of the catalyst face area. Record these locations.

10.4.2.2. Locate wood heater surface temperature monitors at five locations on the wood heater firebox exterior surface. Position the temperature monitors centrally on the top surface, centrally on two sidewall surfaces, and centrally on the bottom and back surfaces. Position the monitor sensing tip on the exterior of the firebox surface inside of any heat shield, room air circulation walls, or other wall or shield separated from the firebox exterior surface. Surface temperature locations for unusual design shapes (e.g., spherical, etc.) shall be positioned so that there are four surface temperature monitors positioned to average stove temperature across various points on the appliance.

10.5. Conditioning

10.5.1. Wood Heater Aging Prior to Certification Testing. A wood heater of any type shall be aged at least 50 hours before initiating a certification test. The aging procedure shall be conducted by the manufacturer or a manufacturer's agent prior to sending the appliance to the testing laboratory.

During aging, the appliance shall be operated at a variety of burn rates. Documentation for wood heating aging must be included in the test report to include data on individual hourly burn rates.

10.5.1.1. The manufacturer shall supply wood heater aging information for the final test reports. Aging data that shall be reported include all fuel parameters (species, moisture content, load weights, piece amounts, and size), air settings used, time spent in each air setting phase, amount of fuel burned, and appliance burn rates.

10.5.1.2. If an appliance uses a catalytic combustor, it must be engaged according to the manufacturer's instructions and operate with the catalyst engaged for at least 50 hours during the break-in period. In addition to the reporting requirements listed in 8.1.1, catalytic appliances shall also report hourly catalyst exit temperature data to include the dates and hours of operation.

11. Procedure

11.1. Test Facility Conditions. The test facility shall meet the following requirements during testing.

11.1.1. The test facility temperature shall be maintained between 65 and 87 °F (13 and 31 °C) during each test run.

11.1.2. The flue shall discharge into the same space or into a space freely communicating with the test facility. Any hood or similar device used to vent combustion products shall not induce a draft greater than 0.005 in. H₂O (1.25 Pa) on the wood heater measured when the wood heater is not operating.

11.1.3. For test facilities with artificially induced barometric pressures (e.g., pressurized chambers), the barometric pressure in the test facility shall not exceed 30.5 in. Hg (775 mm Hg) during any test run.

11.1.4. Locate the test facility temperature monitor on the horizontal plane that includes the primary air intake opening for the wood heater. Locate the temperature monitor 3 to 6 ft. (0.9 to 1.8 m) from the front of the wood heater in the 90° sector in front of the wood heater.

11.1.5. Use an anemometer, or equivalent device, to measure the air velocity. Measure and record the room air velocity before the ignition period in L1 Startup and once immediately following the test run completion. Air velocities within 0.6 m (2 ft.) of the test appliance and exhaust system shall be less than 0.25 m/sec (50 ft./min) without fire in the unit.

11.1.6. Measure and record the test facility's ambient relative humidity, barometric pressure, and temperature before and after each test run using equipment as specified in Section 6.

11.2. Wood Heater Firebox Volume.

- 11.2.1. Determine the firebox volume using the definitions for height, width, and length. Volume adjustments due to the presence of firebrick and other permanent fixtures may be necessary. All adjustments shall be detailed in the test report and shall conform to the definition of usable firebox volume contained in this test method. Measurements shall include areas adjacent to and above a baffle.
- 11.2.2. If a manufacturer deems certain areas of the firebox as unusable for fuel load calculations, written documentation stating the basis for that claim and supporting photographic image(s) must be provided and approved by the regulatory authority prior to conducting the certification test. If approval is not granted prior to the test, then the test may be invalidated if the reviewing agency determines the firebox volume is inaccurate.
- 11.3. Test Fuel. The test fuel shall conform to the following requirements and meet specifications as required by the fuel loading calculator:
 - 11.3.1. Fuel Species. Untreated, air-dried, cordwood fuel.
 - 11.3.1.1. Allowable species: maple (big leaf, red, silver), Douglas fir, or birch (black, white, yellow, paper).
 - 11.3.1.2. Kiln-dried fuel is not permitted. Kiln-dried fuel includes drying at elevated air temperature settings above 90 °F.
 - 11.3.1.3. Fuel shall be free of decay, fungus, or other contaminants.
 - 11.3.2. Fuel Moisture.
 - 11.3.2.1. Determine fuel moisture for each fuel piece by averaging five moisture meter readings, one from each of three sides, and each of the ends in the middle, measured parallel to the wood grain.
 - 11.3.2.2. The test fuel load shall have an average moisture content from 19% to 25%, dry basis.
 - 11.3.2.3. Individual fuel pieces shall have an average moisture content of 19% to 25% dry basis.
 - 11.3.2.4. The addition of moisture to previously dried wood is not allowed.
 - 11.3.2.5. It is recommended that the test fuel be stored in a temperature and humidity-controlled room.

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11.3.2.6. Fuel moisture shall be measured within 24 hours of using the fuel for the test and shall be bagged or stored in a humidity-controlled environment until 2 hours prior to testing. A humidity-controlled environment is one where fuel is not subject to conditions that would remove moisture from the fuel, such as fans or a heating source, and maintain relative humidity levels greater than 75%.

11.3.3. Fuel Temperature. The test fuel shall be at the test facility temperature of 55 to 87 °F (13 to 30.6 °C) $\pm$ 2 °F.

11.3.4. Fuel Dimensions. The dimensions of each test fuel piece shall conform to definitions specified by the protocols using the fuel load calculator.

11.3.4.1. Fuel length:

11.3.4.1.1. The length of the fuel pieces will be determined by the fuel load calculator.

11.3.4.1.2. Measurements shall be taken, and the length of the test fuel will be determined by entering the firebox dimensions.

11.3.4.1.3. Piece length specified by the fuel calculator shall be communicated and specified for use in the owner's manual and website. Piece size shall be within 0.5" of the log length determined by the calculator, as measured on the shortest length measurement.

11.3.5. Fuel Loading Direction

11.3.5.1. Fuel loading direction shall be determined by the firebox measurement.

11.3.5.1.1. Stoves with a depth measurement greater than two inches from the width measurement shall be tested with the fuel in a north-south configuration and may not test with fuel in an east-west or crisscross configuration in any load other than Load 1 and Load 2.

11.3.5.1.2. Stoves with a width measurement greater than the depth measurement or a width measurement within two inches of the depth measurement shall be tested with the fuel loaded in an east-west configuration and may not test with fuel in a north/south configuration or crisscross configuration in any load other than Load 1.

11.3.6. Fuel piece weight for each phase of the protocol shall be determined by the fuel load calculator.

11.3.6.1. Kindling – shall be:

11.3.6.1.1. Pieces of wood less than or equal to 1” in diameter.

11.3.6.1.2. No bark requirements for kindling fuel.

11.3.6.1.3. Fuel species may be any species allowed in 7.2.1.1.

11.3.6.1.4. No moisture requirements.

11.3.6.1.5. Length of kindling shall be the fuel length specified by the fuel load calculator.

11.3.6.1.6. Kindling fuel shall conform to the rule that 7 to 10 pieces of kindling equal 1 pound of kindling fuel (+/- 5%).

11.3.6.2. Trapezoidal pieces. The top of any trapezoidal-shaped piece may not be greater in dimension than 70% of the base dimension of the trapezoid and must conform to the piece limits specifications.

11.3.6.3. Starter fuel: pieces of cordwood shall be used during the startup phase. Individual piece weight for starter fuel shall be determined by the fuel load calculator. Each piece shall be triangular, irregular, or circular in cross-section. Square-like or rectangle-like pieces shall not be used (see Figure 1). Pieces that have squared cross sections shall be split to represent the typical triangle nature of wood (see Figure 3). Trapezoidal pieces must be minimized to the extent possible, and fuel load pieces shall be composed to include different shapes of wood if using any trapezoidal pieces. .

11.3.6.4. Small fuel pieces: smaller pieces of cordwood by weight and pre-defined length, as defined by the fuel load calculator. Square-like or rectangle-like cross sections pieces shall not be used (see Figure 1). Pieces that have square cross-sections shall be split to represent the typical triangle nature of wood (see Figure 3). Trapezoidal pieces must be minimized to the extent possible. No more than two (2) small fuel pieces can be trapezoidal in shape (Figure 2) per fuel load.

11.3.6.5. Large fuel pieces: larger pieces of cordwood, by weight and pre-defined length, as defined by the fuel load calculator. Each piece shall be triangular, irregular, or circular in cross-section. Square-like or rectangle-like cross section pieces shall not be used (see Figure 1). Pieces that have square cross-sections shall be split to represent the typical triangle nature of wood (see Figure 3). Trapezoidal pieces must be minimized

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to the extent possible. No more than one (1) large fuel piece can be trapezoidal in shape (Figure 2) per fuel load.

Figure 1. Schematic of unacceptable cross-sectional profiles



Figure 2. Schematic of undesirable and limited use shapes



Figure 3. Schematics of acceptable cross-sectional profiles



11.4. Sampling Equipment.

11.4.1. Prepare the tunnel and lab air PM sampling equipment as defined by the NYSERDA Standard Operation Procedures for use of a Thermo Scientific 1405-D TEOM™ in a dilution tunnel with wood-fired stoves, hydronic heaters, and furnaces.

11.4.2. Prepare all other equipment as defined by method EPA Method 1, 2, 3, 4, and ASTM 2515-11, other than deviations from ASTM 2515-11 that are specified in this test method.

11.5. Manufacturer participation in certification testing.

11.5.1. A representative of the manufacturer may observe testing but may not provide instructions to the certification lab, in any form, with testing staff or equipment once the certification tests begin. The names of testing witnesses cannot be withheld as confidential business information (CBI). All correspondence between the manufacturer and lab, written or verbal, must be included in the test report.

11.6. Test Run Procedure.

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- 11.6.1. Before each test series, the firebox shall be vacuumed. Testing shall begin without any ash or other materials in the appliance.
- 11.6.2. Before initiating the compliance test series, clean the flue and dilution tunnel with an appropriately sized wire chimney brush before each certification test. Test documentation should include the date and time of flue cleaning.
- 11.6.3. Record fuel weight data, temperature measurements, and gas concentrations at 1-minute intervals.
- 11.6.4. Wood Heater Operation and Adjustments. Record all adjustments made to the air supply controls, adjustments to and additions or subtractions of fuel, and any other changes to wood heater operations that occur during the test period.
- 11.6.5. Appliance operation –
 - 11.6.5.1. Bypass operation for all appliances shall follow operational instructions contained in the appliance owner's manual.
 - 11.6.5.2. For appliances that can be sold with blowers, test runs must be conducted with automatic blowers turned on at the highest setting for all test runs.
- 11.6.6. The weight of fuel remaining at the end of the test run is determined as the difference between the weight of the wood heater with the remaining coals and fuel and the weight after loading the fuel charge. The starting weight is the tare weight of the cleaned, dry wood heater.
- 11.6.7. Run Documentations. Tests shall conform to one of the options listed below. Failure to comply with one of the options will result in an invalid test run.
 - 11.6.7.1. All runs shall be video recorded in their entirety. The video shall be of sufficient quality to determine fuel characteristics, fuel loading procedures, and firebox conditions during any testing or aging conducted by the test lab. The testing lab shall have the capacity to allow appropriate agencies the opportunity to remotely witness the test.
 - 11.6.7.2. All active periods, as defined by this test method, shall be video recorded and inactive periods, if not video recorded in real time, shall be video recorded at no more than 1-minute intervals.
- 11.6.8. *L1: Start-up Phase*

11.6.8.1. L1 Appliance requirements.

11.6.8.1.1. Stove temperature: internal and external stove temperature must not be greater than the ambient temperature $\pm 2^{\circ}\text{F}$ (1.1°C) for Run 1. There is no stove starting temperature requirement for Runs 2 and 3 except in the case of a failed first run. In this case, if Run 1 is invalid or incomplete, the stove must meet Run 1 condition for at least one valid run. Temperature measurements for the external and internal temperatures shall be taken within 15 minutes before starting the test and shall be reported in the test report.

11.6.8.1.2. Tare the appliance scale before starting the test. Record appliance scale weights at the start and end of L1 phase.

11.6.8.2. L1 Fuel requirements.

11.6.8.2.1. L1 Fuel type – during the startup phase, newspaper (optional up to six full sheets of traditional newspaper size), kindling, and starter fuel pieces are used. No other additions are allowed.

11.6.8.2.2. L1 Loading density

11.6.8.2.2.1. Kindling loading density: 1 lb. per cubic foot for dry kindling, $\pm 5\%$. The fuel load calculator determines the amount of kindling that can be used.

11.6.8.2.2.2. Starter Fuel loading density: 3 lb. per cubic foot, $\pm 5\%$. The fuel load calculator will determine the minimum piece weight that can be used as starter fuel.

11.6.8.3. L1 Fuel loading structure: The loading structure of the fire shall be a bottom-up configuration with newspaper on the bottom, kindling on top of the paper, and starter fuel on top of the kindling. Kindling and starter fuel shall be loaded in a crisscross configuration.

11.6.8.4. L1 Operational parameters.

11.6.8.4.1. All kindling, starter fuel, and newspaper must be in the firebox for light off.

11.6.8.4.2. Settings

11.6.8.4.2.1. Manual appliances: All air settings are fully open.

11.6.8.4.2.2. Automatically controlled appliances: settings used to achieve maximum heat output. Air control settings shall not be modified setting, and the appliance shall operate as dictated by the automatic controls.

11.6.8.4.3. Light the fire with a torch for a period of no more than 30 seconds.

11.6.8.4.4. Immediately after lighting the fire, the appliance door shall be moved to a cracked open position. Cracked open position is defined as opening no more than one inch. The appliance door shall be closed within 5 minutes after ignition.

11.6.8.5. L1 Fuel Adjustments: up to three fuel adjustments are allowed in the startup phase. The door may be open for 30 seconds during each fuel adjustment.

11.6.8.6. L1 End of Phase – the end of the startup phase is defined by the weight specified by the fuel load calculator.

11.6.8.7. L1 Documentation – Video of the test to clearly show appliance settings, fuel charge placement while loading, changes in appliance settings, coalbed, and fire when the door is closed sufficient to determine fueling positioning, coal bed conditions, appliance operation, and fuel charge combustion conditions. Photo of the fuel charge.

11.6.9. L2: *High-fire Phase* – the high-fire phase commences immediately after the startup phase ends.

11.6.9.1. L2 Appliance Requirements.

11.6.9.1.1. Record the weight of the stove prior to loading the L2 fuel charge, the weight of the fuel charge prior to loading, and the scale weight after loading the L2 fuel charge.

11.6.9.2. L2 Fuel requirements.

11.6.9.2.1. L2 piece size – during the high-fire phase, small cordwood pieces by weight, as defined by the fuel load calculator, are used.

11.6.9.2.2. L2 loading density: 7 lb. per cubic foot, +/- 5%. The fuel load calculator will define the total load weight and the range of allowable piece sizes by weight.

11.6.9.3. L2 Operational parameters:

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11.6.9.3.1. Door opening: Open the door upon completion of the startup phase and load the L2 fuel load within 60 seconds. Once the fuel has been loaded, the appliance doors shall be closed immediately.

11.6.9.3.2. Air settings

11.6.9.3.2.1. Manually controlled appliances. During the start of the phase air settings shall be fully open to achieve maximum heat output. When 50% of the L2 fuel load mass has been consumed, the air settings shall be moved to the lowest settings.

11.6.9.3.2.2. Automatically controlled appliances: At the start of the phase settings shall be set at those used to achieve maximum heat output. When 50% of the L2 fuel load mass has been consumed, the control systems shall be moved to the control settings to achieve the lowest burn rate. Air control settings shall not be modified after moving to lowest heat output setting, and the appliance shall operate as dictated by the automatic controls.

11.6.9.4. L2 Fuel Adjustments.

11.6.9.4.1. One fuel adjustment may be made during the high-fire phase prior to moving the primary air control(s) to their lowest setting. The fuel adjustment shall optimize fuel placement for burn conditions. The door shall remain open for 30 seconds for fuel adjustments.

11.6.9.4.2. Additional fuel adjustments shall be made if there is a five-minute period without a weight change of 0.10 pounds at any point during the high-fire phase.

11.6.9.4.3. If there is a five-minute period without a weight change (0.10 lb) at any point during the high-fire phase, the appliance door may be opened for 30 seconds for fuel adjustments.

11.6.9.4.4. All fuel adjustments must be documented in the test report notes and summary.

11.6.9.5. End of L2 Phase –The high-fire phase ends when the scale indicates that 90% of the high-fire fuel mass has been consumed.

11.6.9.6. L2 Documentation – Video of the test during active periods to clearly show appliance settings, fuel charge placement while loading, changes in appliance settings,

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coal-bed, and fire when the door is closed sufficient to determine fuel positioning, coal bed conditions, appliance operation, and fuel charge combustion conditions.
Photo of the fuel charge prior to loading.

11.6.10. *L3: Maintenance-fire Phase* – the L3 maintenance-fire phase commences immediately after the L2 high-fire phase ends.

11.6.10.1. L3 Appliance Requirements.

11.6.10.1.1. Record the weight of the stove prior to loading the maintenance-fire fuel charge, the weight of the fuel charge prior to loading, and the scale weight after loading the maintenance-fire fuel charge.

11.6.10.2. L3 Fuel Requirements.

11.6.10.2.1. Fuel type – during the L3 phase, large cordwood pieces are used. The fuel load calculator will define the total load weight and the range of allowable piece sizes by weight.

11.6.10.2.2. L3 Fuel loading structure: fuel shall be loaded in the direction specified by the fueling calculator.

11.6.10.2.3. L3 loading density: 5 lb. per cubic foot, +/- 5%. The fuel load calculator will define the total load weight and the range of allowable piece sizes by weight.

11.6.10.3. L3 Operational Parameters:

11.6.10.3.1. Open door upon completion of the L2 phase and load the maintenance-fire fuel charge.

11.6.10.3.2. Air controls

11.6.10.3.2.1. Manually controlled air settings: shall be placed in the fully open position for the first five minutes of the phase, and then returned to the low air setting.

11.6.10.3.2.2. Automatically controlled air settings: shall be placed in the maximum heat output setting for the first five minutes and then shifted to the lowest heat output setting. Air control settings shall not be modified after moving to the lowest heat output setting, and the appliance shall operate as dictated by the automatic controls.

11.6.10.3.3. L3 Load - L3 fuel loaded within 30 seconds of the door opening. Close the loading door immediately.

11.6.10.4. L3 Fuel Adjustments: Fuel Adjustments: If there is a ten-minute period without weight change (0.10 lb.) at any point during the L3-fire phase, a fuel adjustment shall be made to increase the burn rate. The door may be open for up to 30 seconds for fuel adjustments. Only two fuel adjustments may be made during this phase. If after the second fuel adjustment, another ten-minute period of no weight change (0.10 lb.) occurs, the run ends, and it is a failed test run.

11.6.10.5. L3 End of Phase – The L3-fire phase ends when the scale indicates that 90% of the maintenance-fire fuel mass has been consumed.

11.6.10.6. L3 Documentation – Video of the test to clearly show appliance settings, fuel charge placement while loading, changes in appliance settings, coal-bed, and fire when the door is closed sufficient to determine fueling positioning, coal bed conditions, appliance operation, and fuel charge combustion conditions. Photo of the fuel charge prior to loading.

11.6.11. L4: Low burn rate phase – L4 phase commences immediately after the L3-fire ends.

11.6.11.1. L4 Appliance Requirements.

11.6.11.1.1. Record the weight of the stove prior to loading the L4-fire fuel charge, the load of the fuel charge prior to loading, and the scale weight after loading the overnight-fire fuel charge. Alternatively, if the scale was zeroed prior to starting the test, record the scale weight before and after loading the overnight-fire fuel charge.

11.6.11.2. L4 Fuel requirements

11.6.11.2.1. L4 fuel type –a mix of small and large cordwood pieces are used. At least 50% of the fuel charge load, by the number of pieces, must be large pieces.

11.6.11.2.2. L4 Loading structure: fuel will be loaded in one direction.

11.6.11.2.3. L4 loading density: The fuel load calculator specifies a load volume of 12 lb./ft.³ +/-5%. Fuel shall be loaded in a manner to maximize the number of pieces that will fit in the stove without using force. If all pieces cannot be loaded, the stove shall be loaded to the maximum extent possible.

11.6.11.3. L4 Operational Parameters:

11.6.11.3.1. Open the loading door upon completion of the L3 maintenance-fire phase.

11.6.11.3.2. Load the L4 fuel charge within two minutes (120 seconds).

11.6.11.3.3. Keep the door in cracked position (*open up to 1 inch as measured from the opposite of the hinge - largest opening one inch*) for up to five minutes from the beginning of the L4 phase.

11.6.11.3.4. Air controls

11.6.11.3.4.1. Manual air settings: may be placed in the fully open position for the first ten minutes of the phase, and then returned to the low air setting.

11.6.11.3.4.2. Automatically controlled air settings: may be placed in the maximum heat output setting for the first ten minutes and then shifted to the lowest heat output setting. Air control settings shall not be modified after moving to the lowest heat output setting, and the appliance shall operate as dictated by the automatic controls.

11.6.11.4. L4 Fuel Adjustments.

11.6.11.4.1. Unlimited fuel adjustments are allowed within the first ten minutes of the phase. The door may be open for up to 30 seconds for fuel adjustments.

11.6.11.4.2. If there is a ten-minute period without weight change (0.10 lb.) during the first hour of the L4- phase, a fuel adjustment shall be made. The door may be open for up to 30 seconds for fuel adjustments.

11.6.11.4.3. Only two fuel adjustments may be made during the first hour. If after the second fuel adjustment, another period of no weight change (0.10 lb.) is observed, the run ends, and it is a failed test run.

11.6.11.4.4. No fuel adjustments are allowed after the first hour of the phase.

11.6.11.4.5. If there is no weight change (0.10 lb) for a consecutive period of 20 minutes at any point after the first hour of the phase, the test run ends and is an incomplete test run.

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- 11.6.11.5. L4 End of Phase – The L4 phase shall end when the scale indicates that 100% of the total L4 fuel mass has been consumed. If the fuel load does not burn to 90%, it is a failed test run.
- 11.6.11.6. L4 Documentation - Video of the test during active periods to clearly show appliance settings, fuel charge placement while loading, changes in appliance settings, coalbed, and fire when the door is closed sufficient to determine fuel positioning, coal bed conditions, appliance operation, and fuel charge combustion conditions. Photo of the fuel charge prior to loading.
- 11.7. Test Run. A complete test run requires the completion of all four burn phases and loads. For any appliance that will not accommodate the loading arrangement specified in this test method, the test facility personnel shall contact the Agency Administrator to obtain written approval for an alternative loading arrangement.
- 11.8. Test Run Requirements. The following describes the required parameters for each test run. Each emission test run shall include all operational and fueling protocol phases in order as described.
- 11.8.1. Consecutive Test Runs. Consecutive test runs may be conducted, provided that the following requirements are met:
- 11.8.1.1. Run 1 – The appliance shall have an internal and external starting temperature within $\pm 2^{\circ}\text{F}$ (1.1°C) of ambient laboratory temperature at the beginning of Run 1.
- 11.8.1.2. Run 2 – The second test run may commence 24 hours after the start of Run 1. Stove coals and ash can remain in the stove until 1 hour before conducting Run 2. All coals and ash shall be removed at least one hour prior to commencing Run 2.
- 11.8.1.3. Run 3 – The third test run may commence 24 hours after the start of Run 2. Stove coals and ash may remain in the stove until 1 hour before conducting Run 3. All coals and ash shall be removed at least one hour prior to commencing Run 2.
- 11.9. *Failure to Operate at All Test Conditions*
- 11.9.1. If the appliance fails two runs due to incomplete or invalid test runs, it shall be determined that the appliance has failed the certification test and requires a modification to appliance design. All data for incomplete runs shall be reported. Incomplete failed test runs are defined as the following:
- 11.9.1.1. If a wood heater fails to complete all four phases of the test run, the run shall be considered a failed test run.

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- 11.9.1.2. If there is no weight change, defined as 0.10 lb., for a consecutive period of 20 minutes at any point during the test, the unit has failed the test run.
- 11.9.2. If a test run violates any of the test method parameters, the run is invalid.
- 11.9.3. If during certification testing a critical component of the stove is damaged or breaks, the certification test will be stopped and considered invalid.
 - 11.9.3.1. If damage is noted during a test, repairs shall be made by the manufacturer (or by laboratory personnel with written direction from the manufacturer). If the repair involves components that would need aging, the appliance shall then undergo another round of wood heater aging as specified in section 10.6. These components may include but are not limited to catalyst elements, gaskets, and refractory components. The aging process is intended not only to 'cure' the stove but also to cycle parts that may fail with extended use. Alternate aging techniques may be approved by the administrator, depending on the nature of the failure, material, and critical nature.
- 11.10. Test Run Completion. Once three (four for appliances with automatic controls) valid runs have been completed, the testing is complete. No additional runs may be completed.
 - 11.10.1. *Additional Test Runs.*
 - 11.10.1.1. *Invalid/Incomplete Runs.* If there is an invalid run, another additional run may be attempted to complete the test series. If more than three test runs are conducted, the results from all valid test runs shall be used in calculating the average emission rate. The measurement data and results of all test runs shall be reported regardless of which values are used in calculating the emission rate.
 - 11.10.1.2. *No Power Mode for Automatically Controlled Appliances.* For appliances that can only be operated in an automatically controlled mode when power is supplied to the unit, the "no power mode" test run shall not be averaged into the overall test result, but the result from the "no power mode" test run shall be reported separately in the test report. For units where the operator has a choice to operate the appliance in automatic or manual mode, the "no power test" shall be included in the determining the reported results.
 - 11.10.1.3. *Data Elimination.* No test run data can be eliminated from the reporting requirements of this method.
 - 11.10.1.4. A maximum of five runs (six for appliances with automatic controls) attempts can be completed. If a wood heater cannot complete three valid runs after five (six for appliances with automatic controls) attempts, the appliance has failed the certification test.
 - 11.10.2. *Invalid Runs.* When a test run fails to meet one of the QA/QC criteria stipulated in the test method, the data are invalid, and the run must be repeated. Data for the invalidated test run

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must be included in the test report, but the data must not be used in the calculation of average emission values.

- 11.10.3. *Incomplete Runs*: When an appliance cannot successfully complete all operational elements of the protocol specified in Section 11.6.7 through 11.6.10, it is an incomplete run

11.11. Auxiliary Wood Heater Equipment Operation.

- 11.11.1. All test runs should have the fan “ON” at the highest setting except for:

11.11.1.1. The duration of L1;

11.11.1.2. When the door is open in all loads (L1, L2, L3 and L4);

11.11.1.3. From the end of L3 to when the air control is set to the lowest position for L4.

- 11.11.2. An automatic blower can be left energized.

11.12. PM Data Recording.

- 11.12.1. All TEOM data shall be collected and recorded at intervals of 1 minute. TEOM operation shall follow the procedures listed in NYSERDA Standard Operation Procedures for use of a Thermo Scientific 1405-D TEOM™ in a dilution tunnel with wood-fired stoves, hydronic heaters, and furnaces.

- 11.12.2. Tunnel and lab air PM TEOM Data shall be reported using the Excel data analysis spreadsheet templates that are part of the NYSERDA Standard Operation Procedures for Thermo 1405-D TEOM for use in a dilution tunnel. These data analysis spreadsheets shall be submitted as part of the test report.

- 11.12.3. Lab PM measurement – TEOM. A single channel TEOM is used to measure ambient lab air PM during the test, as configured in NYSERDA Standard Operation Procedures for use of a Thermo Scientific 1405-D TEOM™ in a dilution tunnel with wood-fired stoves, hydronic heaters, and furnaces. The sample flow shall be 3 LPM.

12. *Quality Control Measures*

- 12.1. Dilution tunnel - Conduct sampling equipment leak check and calibration pre-and post-test.
- 12.2. TEOM – Flow and Leak checks are done before and after every test run per NYSERDA Standard Operation Procedures for use of a Thermo Scientific 1405-D TEOM™ in a dilution tunnel with wood-fired stoves, hydronic heaters, and furnaces. Additional quality control measures are included in the TEOM Operating Procedure.
- 12.3. Conduct all checks and calibrations per ASTM 2515-11.

13. *Data Analysis and Calculations.*

Proportioning of emission factors and rates per phase according to Appendix A, variables shall have

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subscript added to determine the relevancy of phase, i.e. $E_{T(P1)}$ indicates Total particulate emissions for Phase 1 and $E_{g/hr(P2)}$ indicates emissions factor in grams per hour for Phase 2.

13.1. Emission Calculations. Particulate matter, carbon dioxide, and carbon monoxide shall be calculated using the following methodology and reported in grams per hour, grams per kilogram and pounds per million British Thermal Unit (BTU) heat output.

13.2. Rounding

13.2.1. All calculations shall be conducted using all decimal values provided by the instrumentation or recorded by the operator.

13.2.2. No truncation of data is acceptable until the final result has been calculated.

13.2.3. Only the final calculation of the PM emissions rate shall be rounded to three significant figures.

13.2.4. When rounding off a figure, the following procedure should be used. If the first digit to be discarded is less than five, the last digit retained should not be changed. When the first digit discarded is greater than five, or if it is a five followed by at least one digit other than zero, the last figure retained should be increased by one unit. When the first digit discarded is exactly five, followed only by zeros, the last digit retained should be rounded upward if it is an odd number, but no adjustment made if it is an even number.

13.3. TEOM data shall be reported as follows.

13.3.1. Emissions from each of the 4 phases of the test shall be reported as individual results in grams per hour, grams per kilogram, and lb/MMBtu (heat output). Calculations shall use Section 7 of the NYSERDA Standard Operation Procedures for use of a Thermo Scientific 1405-D TEOM™ in a dilution tunnel with wood-fired stoves, hydronic heaters, and furnaces.

13.3.2. Emissions from the entire test run in grams per hour, grams per kilogram, and lb/MMBtu (heat output) using the TEOM data.

13.4. PM Filter data: Emissions from the entire test run in grams per hour, grams per kilogram, and lb/MMBtu (heat output) using the ASTM 2515-11 filter data.

Nomenclature

BR – average dry fuel burn rate, lb/hour

$BR_{(x)}$ – Burn rate for specific phase, BR_{L1} , BR_{L2} , BR_{L3} , BR_{L4}

CO – Carbon Monoxide

CO₂ – Carbon Dioxide

BT = time of 90% of overnight load consumed – time of overnight loading

C_{steel} – Specific heat of steel (0.1 Btu/ lb)

E_T – Total particulate emissions for the full test run in grams
 $E_{g/MJ}$ – PM emissions rate in grams per megajoule of heat output
 $E_{g/kg}$ – PM emissions factor in grams per kilogram of dry fuel burned
 $E_{g/hr}$ – PM emissions rate in grams per hour
 HHV – Higher heating value of dry fuel (Btu/lb), measured with ASTM E711
 $kJ/kgmol\ K$ - kilojoules per kilogram-mol Kelvin
 $\%M_d$ - Fuel moisture content, dry basis, percent
 $\%M_w$ - Average moisture in test fuel charge, wet basis, percent
 PCTCO₂ – average CO₂ in the dry flue gas (%)
 PPMco – average CO in the dry flue gas (ppm)
 Q_{out} – Total heat output in BTU's (megajoules)
 SC_i – Scale weight at specific time interval, lb.
 T_1 – Surface Temperature 1 °F (°C)
 T_2 – Surface Temperature 2 °F (°C)
 T_3 – Surface Temperature 3 °F (°C)
 T_4 – Surface Temperature 4 °F (°C)
 T_5 – Surface Temperature 5 °F (°C)
 T_6 - Flue Gas Temperature °F (°C)
 T_7 – Room Temperature °F (°C)
 $TS_{avg(i)}$ – Initial Average Surface Temperature °F (°C)
 $TS_{avg(f)}$ – Final Average Surface Temperature °F (°C)
 W_{fuel} – Fuel charge weight in pounds (kg)
 Θ – Total length of test run, hours
 $\Theta_{(x)}$ – Total length of test run in hours per phase, X
 $\%M_w = 100(\%M_d)/100 + \%M_d$

13.5. Average Wood Heater Surface Temperatures. Calculate the average of the wood heater surface temperatures at the start of the phase (L4) and end at the end of the test (L4) of the test run.

$$L4\ TS_{avg(i)} = (T_1 + T_2 + T_3 + T_4 + T_5) / 5$$

$$L4\ TS_{avg(f)} = (T_1 + T_2 + T_3 + T_4 + T_5) / 5$$

Average surface temperatures at the start and end of any phase can be determined by averaging all five sensors at the beginning and end of each phase.

$$L_x\ TS_{avg(i)} = (T_1 + T_2 + T_3 + T_4 + T_5) / 5$$

$$L_x\ TS_{avg(f)} = (T_1 + T_2 + T_3 + T_4 + T_5) / 5$$

13.6. Determine Burn Rates

BR_{L1} = not applicable

$$BR_{L2} = (L2\ Initial\ SC_i - L2\ Final\ SC_i) / \Theta_{(L2)},\ lbs./hr$$

$$BR_{L3} = (L3\ Initial\ SC_i - L3\ Final\ SC_i) / \Theta_{(L3)},\ lbs./hr$$

$$BR_{L4} = (L4\ Initial\ SC_i - L4\ Final\ SC_i) / \Theta_{(L4)},\ lbs./hr$$

13.7. Emissions

13.7.1. Determine emission rates and emission factors, reporting results from both TEOM and filter data, as:

$$E_{g/MJ} = E_T / (Q_{out} \times 0.001055), \text{ g/MJ}$$

$$E_{g/kg} = E_T / (W_{fuel} / (1 + M\%M_d / 100)), \text{ g/dry kg}$$

$$E_{g/hr} = E_T / \Theta, \text{ g/hr}$$

13.8. CO Calculations

$$CO_{PPM} \text{ to } CO_{\%} = CO_{ppm} / 10000 \text{ ppm}/\% = CO_{\%}$$

$$CO_{2(ppm)} \text{ to } CO_{2(\%)} = CO_{2(ppm)} / 10000 \text{ ppm}/\% = CO_{2(\%)}$$

$$CO \text{ factor (g/kg dry wood)} = (CO_{\%} \times 1000 \text{ g/kg} \times 0.508 \times (28 \text{ g/mol} / 12 \text{ g/mol})) / CO_{2(\%)}$$

Where: 0.508 is the assumed carbon fraction of wood

28 is the molecular weight of CO

12 is the molecular weight of Carbon

1000 is a conversion of grams/kg

13.9. Efficiency calculation: As defined in 40 CFR part 60 per subpart AAA, efficiency shall be calculated per CSA B415.10 to be comparable with EPA Method 28R. Efficiency (%HHV), CO emission rate (g/h and g/min) emissions factor (lb/MMBtu, and power output (BTU/h) shall be calculated for all individual loads (L1, L2, L3, and L4) with the following exceptions:

13.9.1. No substitution of data is allowed.

13.9.2. 10-minute average data must be used to calculate efficiency

14. Reporting Requirements. The report shall include the following:

14.1. Introduction

14.1.1. Purpose of test: certification, audit, efficiency,

14.1.2. Name and location of the laboratory conducting the test.

14.1.3. Wood appliance identification – manufacturer, model number/name, design type, description of the appliance tested, stove condition, and date of receipt.

14.1.4. Test information – location of testing, date of tests, sampling methods used, number of test runs, a statement detailing any previous certification testing completed on the wood appliance.

14.1.5. A list of people who conducted research on the appliance, participated in testing preparation, or witnessed the certification testing. This list shall clearly specify their roles in

the testing program for the appliance. The list shall include the participant's name, title, company, contact information and the purpose of their participation.

14.1.6. A statement that the test results apply only to the specific appliance tested.

14.2. Summary and Discussion of Results

14.2.1. Table of results to include test run number, average burn rate for entire run and each phase, carbon monoxide and particulate emission rate for full run, particulate and carbon monoxide emission rate for each load phase (L1, L2, L3, L4), efficiency for the full run and each phase, burn time for total run and each phase.

14.2.2. For each test run and pollutant with real-time data to include: $\Theta_1, \Theta_2, \Theta_3$, CO, CO₂, PM, and efficiency for (1) L1 - the startup phase and (2) L2 - high-, (3) L3-maintenance-, and (4) L4 low burn rate fire phases. Calculated results for PM emissions shall be reported as total emissions in grams, pounds per million Btu output, grams per MJ, grams per kilogram of dry fuel and grams per hour, and pounds per hour. Calculated results for $\Theta_1, \Theta_2, \Theta_3$, CO, and CO₂ emissions shall be reported as grams per kilogram of dry fuel and parts per million for CO and percent for CO and CO₂. Efficiency shall be reported for each load. CO measurements shall be obtained from the dilution tunnel.

14.2.3. A narrative discussion detailing any issues or anomalies that arose during each test run and how those were handled, including comments about the fuel, and loading of the appliance.

14.2.4. TEOM PM Plots

14.2.4.1. A plot of PM emission rate in grams/hour vs. time at 1-minute intervals, for the entire test period, for each run. The report shall include a table reporting the maximum 1-minute, 5-minute, and 60-minute grams per hour on a rolling basis for the test run.

14.2.5. Summary of other data – test facility conditions, surface temperature averages, catalyst temperature averages, pretest fuel weights, test fuel charge weights – total and by phase.

14.3. Discussion. Test run result, specific test run problems, and solutions. Comments on fuel, loading, analysis, and anything that may impact the reported result(s).

14.3.1. Details of deviations from, additions to or exclusions from the test method, and their data quality implications on the test results (if any), as well as information on specific test conditions, such as environmental conditions. An explanation of the deviations, additions, or exclusions shall be provided along with an analysis as to why these elements had no impact.

14.4. Process description:

14.4.1. Data and drawings indicating the firebox size and location of the fuel charge.

14.4.2. Drawings and calculations used to determine firebox volume to include volume, height, width, and lengths, weight, and volume adjustments.

14.4.3. Firebox configuration – At a minimum to include air supply locations and operation, air supply introduction location, refractory location and dimensions, catalyst location, baffle and by-pass location and operation (include line drawings or photographs)

14.4.4. Appliance operation during the test – shall supply details on air supply settings and

adjustments.

14.5. Test fuel properties – the report shall provide information on the species, density, fuel moisture, fuel temperature, and load details from the fuel load calculator to include all measurements including the number of pieces, individual piece weights, piece length, moisture content and weight.

14.6. Sampling

14.6.1. A description of the test procedures and test equipment, including a schematic or other drawing showing the location of all required test equipment. Also, a description of test fuel sourcing, handling and storage practices shall be included.

14.6.2. Describe the sampling location relative to the wood heater, include drawing or photographs.

14.6.3. Provide data on sampling blanks.

14.7. Quality Control and Assurance Procedures

14.7.1. Calibration procedures and results certification procedures, sample and analysis procedures.

14.7.2. Test method quality control procedures to include TEOM leak and flow checks, stratification (velocity) checks, tunnel flow range results, filter temperature range verification and dilution tunnel RH verification.

14.8. Appendices

14.8.1. Results and Example Calculations. Raw data and complete calculations for data included in summary tables.

14.8.2. Raw data. Copies of all files or sheets for sampling measurement, temperature records, and other materials used by lab related to testing.

14.8.3. Calibration Results. Summary of all calibrations, checks, and audits pertinent to the certification.

14.8.4. Sampling and Operation Records. Copies of all uncorrected records of activities not included in raw data sheets (e.g., wood heater door open, times and durations) as well as photographs of fuel loading and airflow settings.

14.8.5. Correspondence. Any correspondence to include written, electronic or verbal communications regarding appliance testing. Items shall include:

14.8.5.1. Request to conduct testing

14.8.5.2. Scheduling of testing

14.8.5.3. Notice to EPA to conduct test and any modifications to that request.

14.8.6. Test Facility Information. Report test facility temperature, air velocity, and humidity information.

14.8.7. Test Equipment Calibration and Audit Information. Report calibration and audit results for the platform scale, test fuel balance, test fuel moisture meter, and sampling equipment, including volume metering systems and gaseous analyzers.

THIS PROTOCOL FOR WOOD STOVES IS THE PROPERTY OF THE NEW YORK STATE ENERGY RESEARCH AND DEVELOPMENT AUTHORITY (NYSERDA) AND CAN BE USED TO TEST TECHNOLOGIES IN A LABORATORY SETTING. ANY DEVIATIONS OR CHANGES TO THIS PROTOCOL FOR WOOD STOVES ARE NOT APPROVED OR SANCTIONED BY NYSERDA. DO NOT CITE, COPY, or DISTRIBUTE THIS PROTOCOL FOR WOOD STOVES WITHOUT THE WRITTEN PERMISSION OF NYSERDA

- 14.8.8. Pretest procedures. Report all pretest procedures conducted at the lab on the appliance to burns, rates, and amounts.
- 14.8.9. All required data for each test run shall be provided in spreadsheet format both in the printed report and in a computer file such that the data can be easily analyzed and calculations easily verified. Formulas used for all calculations shall be accessible for review.
- 14.8.10. For each test run: report TEOM flow and temperature and verification of all TEOM data validation parameters as required in NYSERDA Standard Operation Procedures for use of a Thermo Scientific 1405-D TEOM™ in a dilution tunnel with wood-fired stoves, hydronic heaters, and furnaces.
- 14.8.11. Raw data, calibration records, and other relevant documentation shall be retained by the laboratory for a minimum of 7 years.

Appendix B: Labels & Manuals



Report No. / Rapport n°

14-199 RT

LISTED FACTORY BUILT FIREPLACE
FOYER PRÉFABRIQUE HOMOLOGUE

FIREPLACE, ALSO FOR USE IN MANUFACTURED

HOMES WITH SOLID FUEL ONLY

CE FOYER EST ÉGALEMENT CERTIFIÉ POUR

INSTALLATION DANS LES MAISONS MOBILES

COMBUSTIBLES SOLIDES SEULEMENT

Serial No.

Numéro de série

Model / Modèle: Montecito™-C

EPA certification test emission value 1.5 g/hr using cordwood per NYSEDA IDC ATM dated May 21, 2025 per
Valeur d'émission du test d'homologation 1,5 g/h selon la norme NYSEDA IDC ATM daté du 21 mai 2025

CLEARANCES TO COMBUSTIBLES:

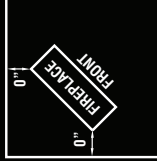
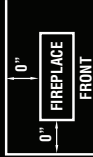
SIDE WALL (FROM FIREBOX OPENING) 24 in. (610 mm)
FRAME HEIGHT OPENING 56 in. (1422 mm)
BACK WALL (FROM STANDOFFS) 0 in. (0 mm)
CEILING HEIGHT (FROM BASE OF FIREPLACE) 6 ft. 8 in. (2032 mm)
CHIMNEY 2 in. (51 mm)

DÉGAGEMENTS AUX COMBUSTIBLES:

MUR LATÉRAL (À PARTIR DE L'OUVERTURE DE LA CHAMBRE DE COMBUSTION) 24 po. (610 mm)
OUVERTURE HAUTEUR DU CADRE 56 po. (1422 mm)
MUR ARRIÈRE (À PARTIR DES ENTRETOISES DE DÉGAGEMENT) 0 po. (0 mm)
AU-DESSUS DU FOYER (À PARTIR DE LA BASE DU FOYER) 6 pi. 8 po. (2032 mm)
CHEMINÉE 2 po. (51 mm)

MINIMUM CLEARANCES TO FINISHED FRAMED OPENING, IN INCHES

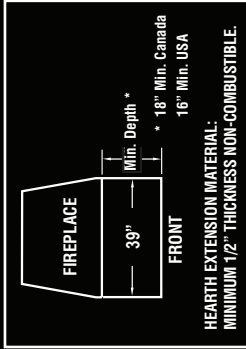
NOTE: Dimensions are to the standards



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

MINIMUM FLOOR PROTECTION FROM OPENING

CENTERED ON FIREPLACE, IN INCHES



HEARTH EXTENSION MATERIAL:
MINIMUM 1/2" THICKNESS NON-COMBUSTIBLE.

Date of Manufacture / Date De Fabrication

P/N 901344-00, REV. 0, 06/2025
2025 JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
JANV FEVR MARS AVR MAI JUIN JUL AOUT SEPT OCT NOV DEC

- USE WOOD FUEL ONLY
- ANON-COMBUSTIBLE HEARTH EXTENSION MUST BE INSTALLED AT FRONT OF UNIT EXTENDING 18" (457 MM) IN CANADA (OR 16" USA) AND 39" (991 MM) WIDE MINIMUM.
- ANY MANTEL MUST BE NON-COMBUSTIBLE.
- WARNING: THIS FIREPLACE HAS NOT BEEN TESTED WITH UN-VENTED GAS LOG SET. TO REDUCE RISK OF FIRE OR INJURY DO NOT INSTALL AN UNVENTED GAS LOG SET INTO THE FIREPLACE.
- ELECTRICAL RATING: 120 VAC, 60 Hz
- CHIMNEY TYPE: USE ONLY WITH 6 IN. DIAMETER.
- USA: IHP SNAP-PAK; CAN: SECURE TEMP ASHT+ OR S2100+, DURATECH CANADA OR DURATECH PREMIUM.
- CAN BE CONNECTED TO A MASONRY CHIMNEY AS DESCRIBED IN THE INSTALLATION INSTRUCTIONS.
- COMPONENTS USED WITH THE FIREPLACES MUST BE LISTED. SEE LIST IN THE INSTALLATION INSTRUCTIONS.
- REPLACE GLASS WITH CERAMIC GLASS 5 mm THICK.
- FOR SAFE OPERATION, INSTALL IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS.
- CAUTION: COMBUSTION AIR OPENING MUST NOT BE OBSTRUCTED.
- DO NOT OVERFIRE THE FIREPLACE.
- OPERATE THE FIREPLACE WITH DOOR FULLY CLOSED ONLY.
- DO NOT USE A FIREPLACE INSERT OR OTHER PRODUCTS NOT SPECIFIED FOR USE WITH THIS PRODUCT.
- CONTACT YOUR LOCAL BUILDING OR FIRE OFFICIALS ABOUT RESTRICTIONS AND INSTALLATION INSPECTIONS IN YOUR AREA.
- SEE IHP INSTALLATION AND OPERATING INSTRUCTIONS FOR THIS MODEL.
- KEEP FURNISHINGS AND OTHER COMBUSTIBLE MATERIALS A CONSIDERABLE DISTANCE AWAY FROM APPLIANCE.
- 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.
- INSTALL AND USE ONLY IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS AND LOCAL BUILDING CODES.
- SPECIAL METHODS ARE REQUIRED WHEN PASSING THROUGH A WALL OR CEILING. SEE INSTRUCTIONS AND BUILDING CODES.
- PREVENT CREOSOTE FIRE: INSPECT CHIMNEY CONNECTOR AND CHIMNEY FLUE MONTHLY AND CLEAN IF NECESSARY.
- DO NOT OVERFIRE. IF DOME OR CHIMNEY CONNECTOR GLOWS YOU ARE OVERFIRING.
- POUR USAGE AVEC LE BOIS SEULEMENT
- UN TABLIER NON COMBUSTIBLE DOIT ÊTRE INSTALLÉ À L'AVANT DE L'APPAREIL S'ÉTENDANT DE 18 PO. (457 MM) À L'AVANT ET AVOIR UNE LARGEUR D'AU MOINS 39 PO. (991 MM).
- LES MANTEAUX DE CHEMINÉE DOIVENT ÊTRE NON COMBUSTIBLES.
- AVERTISSEMENT : CE FOYER N'EST PAS HOMOLOGUÉ POUR ÊTRE UTILISÉ AVEC UN ENSEMBLE DE BûCHES À GAZ SANS CONDUIT D'ÉVACUATION. AFIN DE RÉDUIRE LES RISQUES D'INCENDIE OU DE BLESSURES, N'INSTALLEZ PAS DE BûCHES À GAZ SANS CONDUIT D'ÉVACUATION À L'INTÉRIEUR DE CE FOYER.
- ALIMENTATION ÉLECTRIQUE: 120V, 60 Hz
- TYPE DE CHEMINÉE: UTILISER SEULEMENT AVEC 6 PO. DIAMÈTRE - ÉTATS-UNIS: IHP SNAP-PAK; CAN: SECURE TEMP ASHT+ OU S2100+, DURATECH CANADA OU DURATECH PREMIUM.
- PEUT ÊTRE RACCORDÉ SUR UNE CHEMINÉE DE MACONNERIE TEL QUE DÉCRIT DANS LE MANUEL D'INSTALLATION.
- LES COMPOSANTES UTILISÉES AVEC LE FOYER DOIVENT ÊTRE HOMOLOGUÉES. VOIR LA LISTE DANS LE MANUEL D'INSTALLATION.
- REMPLACEZ LA VITRE AVEC UN VERRE CÉRAMIQUE DE 5mm D'ÉPAISSEUR.
- POUR UNE UTILISATION SÉCURITAIRE, INSTALLEZ CONFORMÉMENT AUX DIRECTIVES DU FABRICANT.
- ATTENTION : NE PAS OBSTRUER LES ARRIVÉES D'AIR COMBURANT.
- NE PAS FAIRE SURCHAUFFER LE FOYER.
- LA PORTE DU FOYER DOIT DEMEURER TOTALEMENT FERMÉE LORSQUE LE FOYER FONCTIONNE.
- NE PAS UTILISER DE POÊLE ENCASTRABLE OU D'AUTRES PRODUITS NON SPÉCIFIÉS COMME ÉTANT UTILISABLES AVEC CE PRODUIT.
- CONTACTEZ LES RESPONSABLES DE VOTRE RÉGION A PROPOS DES RESTRICTIONS ET INSPECTIONS D'INSTALLATION.
- MAINTENIR LES MEUBLES ET AUTRES OBJETS À UNE DISTANCE SÉCURITAIRE DU FOYER.
- CET APPAREIL DE CHAUFFAGE AU BOIS DOIT ÊTRE INSPECTÉ ET ENTRETENU PÉRIODIQUEMENT POUR FONCTIONNER CORRECTEMENT. VOIR LE MANUEL DU PROPRIÉTAIRE POUR PLUS D'INFORMATION.
- L'UTILISATION DE CET APPAREIL DE CHAUFFAGE AU BOIS DE MANIÈRE INCOMPATIBLE AVEC LES INSTRUCTIONS DU MANUEL DU PROPRIÉTAIRE CONSTITUE UNE INFRACTION AUX RÉGULATIONS FÉDÉRALES.



Report No. / Rapport n°
14-199 R1

LISTED FACTORY BUILT FIREPLACE
FOYER PRÉFABRIQUE HOMOLOGUÉ

FIREPLACE, ALSO FOR USE IN MANUFACTURED
HOMES WITH SOLID FUEL ONLY

CE FOYER EST ÉGALEMENT CERTIFIÉ POUR
INSTALLATION DANS LES MAISONS MOBILES.
COMBUSTIBLES SOLIDES SEULEMENT.



Manufactured by / Fabriqué par:
INNOVATIVE HEARTH PRODUCTS
1769 East Lawrence Street
Russellville, AL 35654 USA

Serial No.

Numéro de série

Model / Modèle: WCT6920WSS

Conforms to / Conforme au : UL STD 127
Certified to / Certifié au : UL STD S610

EPA certification test emission value 1.5 g/hr Per NYSERDA IDC ATM dated May 21, 2025

Valeur d'émission du test d'homologation 1.5 g/h selon la norme NYSERDA IDC ATM par May 21, 2025

CLEARANCES TO COMBUSTIBLES:

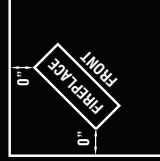
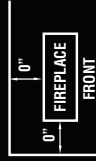
SIDE WALL (FROM FIREBOX OPENING) 24 in. (610 mm)
FRAME HEIGHT OPENING 56 in. (1422 mm)
BACK WALL (FROM STANDOFFS) 0 in. (0 mm)
CEILING HEIGHT (FROM BASE OF FIREPLACE) 6 ft. 8 in. (2032 mm)
CHIMNEY 2 in. (51 mm)

DÉGAGEMENTS AUX COMBUSTIBLES:

MUR LATÉRAL (À PARTIR DE L'OUVERTURE DE LA CHAMBRE DE COMBUSTION) 24 po. (610 mm)
OUVERTURE HAUTEUR DU CADRE 56 po. (1422 mm)
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MINIMUM CLEARANCES TO FINISHED FRAMED OPENING, IN INCHES

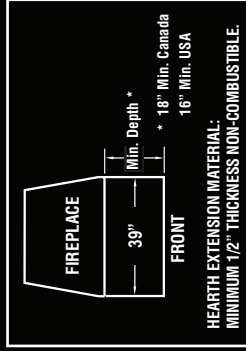
NOTE: Dimensions are to the standards



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

MINIMUM FLOOR PROTECTION FROM OPENING

CENTERED ON FIREPLACE, IN INCHES



HEARTH EXTENSION MATERIAL:
MINIMUM 1/2" THICKNESS NON-COMBUSTIBLE.

Date of Manufacture / Date De Fabrication

P/N 901350-00,	2025	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
REV. 0, 07/2025	■	■	■	■	■	■	■	■	■	■	■	■	■

- USE WOOD FUEL ONLY
- A NON-COMBUSTIBLE HEARTH EXTENSION MUST BE INSTALLED AT FRONT OF UNIT EXTENDING 18" (457 MM) IN CANADA (OR 16" USA) AND 39" (991 MM) WIDE MINIMUM.
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- WARNING: THIS FIREPLACE HAS NOT BEEN TESTED WITH UNVENTED GAS LOG SET. TO REDUCE RISK OF FIRE OR INJURY DO NOT INSTALL AN UNVENTED GAS LOG SET INTO THE FIREPLACE.
- ELECTRICAL RATING: 120 VAC, 60 Hz
- CHIMNEY TYPE: USE ONLY WITH 6 IN. DIAMETER - USA: IHP SNAP-PAK; CAN: SECURE TEMP ASHT+ OR S2100+, DURATECH CANADA OR DURATECH PREMIUM.
- CAN BE CONNECTED TO A MASONRY CHIMNEY AS DESCRIBED IN THE INSTALLATION INSTRUCTIONS.
- COMPONENTS USED WITH THE FIREPLACES MUST BE LISTED. SEE LIST IN THE INSTALLATION INSTRUCTIONS.
- REPLACE GLASS WITH CERAMIC GLASS 5 mm THICK.
- FOR SAFE OPERATION INSTALL IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS.
- CAUTION: COMBUSTION AIR OPENING MUST NOT BE OBSTRUCTED.
- DO NOT OVERFIRE THE FIREPLACE.
- OPERATE THE FIREPLACE WITH DOOR FULLY CLOSED ONLY. DO NOT USE A FIREPLACE INSERT OR OTHER PRODUCTS NOT SPECIFIED FOR USE WITH THIS PRODUCT.
- CONTACT YOUR LOCAL BUILDING OR FIRE OFFICIALS ABOUT RESTRICTIONS AND INSTALLATION INSPECTIONS IN YOUR AREA.
- SEE IHP INSTALLATION AND OPERATING INSTRUCTIONS FOR THIS MODEL.
- KEEP FURNISHINGS AND OTHER COMBUSTIBLE MATERIALS A CONSIDERABLE DISTANCE AWAY FROM APPLIANCE.
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- ALIMENTATION ÉLECTRIQUE: 120V, 60 Hz
- TYPE DE CHEMINÉE: UTILISER SEULEMENT AVEC 6 PO. DIAMÈTRE - ÉTATS-UNIS: IHP SNAP-PAK; CAN: SECURE TEMP ASHT+ OU S2100+, DURATECH CANADA OU DURATECH PREMIUM.
- PEUT ÊTRE RACCORDÉ SUR UNE CHEMINÉE DE MACONNERIE TEL QUE DÉCRIT DANS LE MANUEL D'INSTALLATION.
- LES COMPOSANTES UTILISÉES AVEC LE FOYER DOIVENT ÊTRE HOMOLOGUÉES. VOIR LA LISTE DANS LE MANUEL D'INSTALLATION.
- REMPLACER LA VITRE AVEC UN VERRE CÉRAMIQUE DE 5mm D'ÉPAISSEUR.
- POUR UNE UTILISATION SÉCURITAIRE, INSTALLER CONFORMÉMENT AUX DIRECTIVES DU FABRICANT.
- ATTENTION : NE PAS OBSTRUER LES ARRIVÉES D'AIR COMBURANT.
- NE PAS FAIRE SURCHAUFFER LE FOYER.
- LA PORTE DU FOYER DOIT DEMEURER TOTALEMENT FERMÉE LORSQUE LE FOYER FONCTIONNE.
- NE PAS UTILISER DE POÈLE ENCASTRABLE OU D'AUTRES PRODUITS NON SPÉCIFIÉS COMME ÉTANT UTILISABLES AVEC CE PRODUIT.
- CONTACTEZ LES RESPONSABLES DE VOTRE RÉGION A PROPOS DES RESTRICTIONS ET INSPECTIONS D'INSTALLATION.
- MAINTENIR LES MEUBLES ET AUTRES OBJETS À UNE DISTANCE SÉCURITAIRE DU FOYER.
- CET APPAREIL DE CHAUFFAGE AU BOIS DOIT ÊTRE INSPECTÉ ET ENTRETENU PÉRIODIQUEMENT POUR FONCTIONNER CORRECTEMENT. VOIR LE MANUEL DU PROPRIÉTAIRE POUR PLUS D'INFORMATION.
- L'UTILISATION DE CET APPAREIL DE CHAUFFAGE AU BOIS DE MANIÈRE INCOMPATIBLE AVEC LES INSTRUCTIONS DU MANUEL DU PROPRIÉTAIRE CONSTITUE UNE INFRACTION AUX RÉGULATIONS FÉDÉRALES.



Report No. / Rapport n°
14-199 R1

LISTED FACTORY BUILT FIREPLACE
FOYER PRÉFABRIQUE HOMOLOGUÉ

HOMES WITH SOLID FUEL ONLY

CE FOYER EST ÉGALEMENT CERTIFIÉ POUR
INSTALLATION DANS LES MAISONS MOBILES.
COMBUSTIBLES SOLIDES SEULEMENT.

Serial No.
Numéro de série

Model / Modèle: BAINBRIDGE-B

EPA certification test emission value 1.5 g/hr Per NYSDA IDC ATM dated May 21, 2025
Valeur d'émission du test d'homologation 1,5 g/h selon la norme NYSDA IDC ATM par May 21, 2025

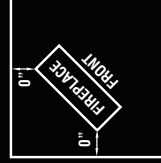
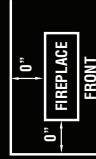
CLEARANCES TO COMBUSTIBLES:

SIDE WALL (FROM FIREBOX OPENING) 24 in. (610 mm)
FRAME HEIGHT OPENING 56 in. (1422 mm)
BACK WALL (FROM STANDOFFS) 0 in. (0 mm)
CEILING HEIGHT (FROM BASE OF FIREPLACE) 6 ft. 8 in. (2032 mm)
CHIMNEY 2 in. (51 mm)

DÉGAGEMENTS AUX COMBUSTIBLES:

MUR LATÉRAL (À PARTIR DE L'OUVERTURE DE LA CHAMBRE DE COMBUSTION) 24 po. (610 mm)
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AU-DESSUS DU FOYER (À PARTIR DE LA BASE DU FOYER) 6 pi. 8 po. (2032 mm)
CHEMINÉE 2 po. (51 mm)

MINIMUM CLEARANCES TO FINISHED FRAMED OPENING, IN INCHES
NOTE: Dimensions are to the standards



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

Date of Manufacture / Date De Fabrication

P/N 901351-00, REV. 0, 07/2025
2025 2026 2027 JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
JANV FEVR MARS AVR MAI JUIN JUL AOUT SEPT OCT NOV DEC

USE WOOD FUEL ONLY

- ANON-COMBUSTIBLE HEARTH EXTENSION MUST BE INSTALLED AT FRONT OF UNIT EXTENDING 18" (457 MM) IN CANADA (OR 16" USA) AND 39" (991 MM) WIDE MINIMUM.
- ANY MANTEL MUST BE NON-COMBUSTIBLE
- WARNING: THIS FIREPLACE HAS NOT BEEN TESTED WITH UN-VENTED GAS LOG SET. TO REDUCE RISK OF FIRE OR INJURY DO NOT INSTALL AN UNVENTED GAS LOG SET INTO THE FIREPLACE.
- ELECTRICAL RATING: 120 VAC, 60 Hz
- CHIMNEY TYPE: USE ONLY WITH 6 IN. DIAMETER.
- USA: IHP SNAP-PAK; CAN: SECURE TEMP ASHT+ OR S2100+, DURATECH CANADA OR DURATECH PREMIUM.
- CAN BE CONNECTED TO A MASONRY CHIMNEY AS DESCRIBED IN THE INSTALLATION INSTRUCTIONS.
- COMPONENTS USED WITH THE FIREPLACE MUST BE LISTED. SEE LIST IN THE INSTALLATION INSTRUCTIONS.
- REPLACE GLASS WITH CERAMIC GLASS 5 mm THICK.
- FOR SAFE OPERATION, INSTALL IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS.
- CAUTION: COMBUSTION AIR OPENING MUST NOT BE OBSTRUCTED.
- DO NOT OVERFIRE THE FIREPLACE.
- OPERATE THE FIREPLACE WITH DOOR FULLY CLOSED ONLY.
- DO NOT USE A FIREPLACE INSERT OR OTHER PRODUCTS NOT SPECIFIED FOR USE WITH THIS PRODUCT.
- CONTACT YOUR LOCAL BUILDING OR FIRE OFFICIALS ABOUT RESTRICTIONS AND INSTALLATION INSPECTIONS IN YOUR AREA.
- SEE IHP INSTALLATION AND OPERATING INSTRUCTIONS FOR THIS MODEL.
- KEEP FURNISHINGS AND OTHER COMBUSTIBLE MATERIALS A CONSIDERABLE DISTANCE AWAY FROM APPLIANCE.
- 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.
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- PREVENT CREOSOTE FIRE: INSPECT CHIMNEY CONNECTOR AND CHIMNEY FLUE MONTHLY AND CLEAN IF NECESSARY.
- DO NOT OVERFIRE. IF DOME OR CHIMNEY CONNECTOR GLOWS YOU ARE OVERFIRING.

- POUR USAGE AVEC LE BOIS SEULEMENT
- UN TABLIER NON COMBUSTIBLE DOIT ÊTRE INSTALLÉ À L'AVANT DE L'APPAREIL S'ÉTENDANT DE 18 PO. (457 MM) À L'AVANT ET AVOIR UNE LARGEUR D'AU MOINS 39 PO. (991 MM).
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- ALIMENTATION ÉLECTRIQUE: 120V, 60 Hz
- TYPE DE CHEMINÉE: UTILISER SEULEMENT AVEC 6 PO. DIAMÈTRE - ÉTATS-UNIS: IHP SNAP-PAK; CAN: SECURE TEMP ASHT+ OU S2100+, DURATECH CANADA OU DURATECH PREMIUM.
- PEUT ÊTRE RACCORDÉ SUR UNE CHEMINÉE DE MACONNERIE TEL QUE DÉCRIT DANS LE MANUEL D'INSTALLATION.
- LES COMPOSANTES UTILISÉES AVEC LE FOYER DOIVENT ÊTRE HOMOLOGUÉES. VOIR LA LISTE DANS LE MANUEL D'INSTALLATION.
- REMPLACEZ LA VITRE AVEC UN VERRE CÉRAMIQUE DE 5mm D'ÉPAISSEUR.
- POUR UNE UTILISATION SÉCURITAIRE, INSTALLEZ CONFORMÉMENT AUX DIRECTIVES DU FABRICANT.
- ATTENTION : NE PAS OBSTRUER LES ARRIVÉES D'AIR COMBURANT.
- NE PAS FAIRE SURCHAUFFER LE FOYER.
- LA PORTE DU FOYER DOIT DEMEURER TOTALEMENT FERMÉE LORSQUE LE FOYER FONCTIONNE.
- NE PAS UTILISER DE POÊLE ENCASTRABLE OU D'AUTRES PRODUITS NON SPÉCIFIÉS COMME ÉTANT UTILISABLES AVEC CE PRODUIT.
- CONTACTEZ LES RESPONSABLES DE VOTRE RÉGION À PROPOS DES RESTRICTIONS ET INSPECTIONS D'INSTALLATION.
- MAINTENIR LES MEUBLES ET AUTRES OBJETS À UNE DISTANCE SÉCURITAIRE DU FOYER.
- CET APPAREIL DE CHAUFFAGE AU BOIS DOIT ÊTRE INSPECTÉ ET ENTRETENU PÉRIODIQUEMENT POUR FONCTIONNER CORRECTEMENT. VOIR LE MANUEL DU PROPRIÉTAIRE POUR PLUS D'INFORMATION.
- L'UTILISATION DE CET APPAREIL DE CHAUFFAGE AU BOIS DE MANIÈRE INCOMPATIBLE AVEC LES INSTRUCTIONS DU MANUEL DU PROPRIÉTAIRE CONSTITUE UNE INFRACTION AUX RÉGULATIONS FÉDÉRALES.



Report No. / Rapport n°
14-199 Rt

LISTED FACTORY BUILT FIREPLACE
FOYER PRÉFABRIQUE HOMOLOGUÉ
FIREPLACE, ALSO FOR USE IN MANUFACTURED
HOMES WITH SOLID FUEL ONLY

CE FOYER EST ÉGALEMENT CERTIFIÉ POUR
INSTALLATION DANS LES MAISONS MOBILES...
COMBUSTIBLES SOLIDES SEULEMENT.

Serial No.
Numéro de série

Model / Modèle: WCT4920WSS

EPA certification test emission value 1,5 g/hr. Per NYSERDA IDC ATM dated May 21, 2025
Valeur d'émission du test d'homologation 1,5 g/h selon la norme NYSERDA IDC ATM par May 21, 2025

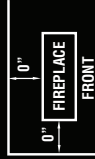
CLEARANCES TO COMBUSTIBLES:

SIDE WALL (FROM FIREBOX OPENING) 24 in. (610 mm)
FRAME HEIGHT OPENING 56 in. (1422 mm)
BACK WALL (FROM STANDOFFS) 0 in. (0 mm)
CEILING HEIGHT (FROM BASE OF FIREPLACE) 6 ft. 8 in. (2032 mm)
CHIMNEY 2 in. (51 mm)

DÉGAGEMENTS AUX COMBUSTIBLES:

MUR LATÉRAL (À PARTIR DE L'OUVERTURE DE LA CHAMBRE DE COMBUSTION) 24 po. (610 mm)
OUVERTURE HAUTEUR DU CADRE 56 po. (1422 mm)
MUR ARRIÈRE (À PARTIR DES ENTRETOISES DE DÉGAGEMENT) 0 PO. (0 MM)
AU-DESSUS DU FOYER (À PARTIR DE LA BASE DU FOYER) 6 pi. 8 po. (2032 mm)
CHEMINÉE 2 po. (51 mm)

MINIMUM CLEARANCES TO FINISHED FRAMED OPENING, IN INCHES
NOTE: Dimensions are to the standards



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

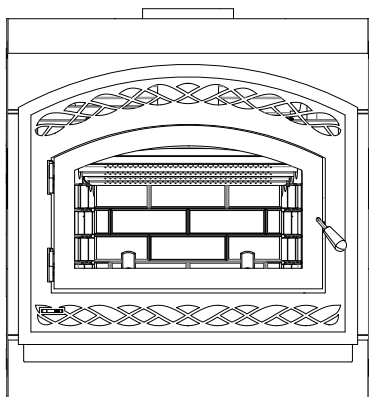
Date of Manufacture / Date De Fabrication

P/N 981377-00, REV. 0, 07/2025
2025 JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
JANV FEVR MARS AVR MAI JUIN JUL AOÛT SEPT OCT NOV DEC

USE WOOD FUEL ONLY

- ANON-COMBUSTIBLE HEARTH EXTENSION MUST BE INSTALLED A L'AVANT DE L'APPAREIL S'ÉTENDANT DE 18 PO. (457 MM) À L'AVANT ET AVOIR UNE LARGEUR D'AU MOINS 39 PO. (991 MM).
- ANY MANTEL MUST BE NON-COMBUSTIBLE
- WARNING: THIS FIREPLACE HAS NOT BEEN TESTED WITH UN-VENTED GAS LOG SET. TO REDUCE RISK OF FIRE OR INJURY DO NOT INSTALL AN UNVENTED GAS LOG SET INTO THE FIREPLACE.
- ELECTRICAL RATING: 120 VAC, 60 Hz
- CHIMNEY TYPE: USE ONLY WITH 6 IN. DIAMETER.
- USA: IHP SNAP-PAK; CAN: SECURE TEMP ASHT+ OR S2100+, DURATECH CANADA OR DURATECH PREMIUM.
- CAN BE CONNECTED TO A MASONRY CHIMNEY AS DESCRIBED IN THE INSTALLATION INSTRUCTIONS.
- COMPONENTS USED WITH THE FIREPLACE MUST BE LISTED. SEE LIST IN THE INSTALLATION INSTRUCTIONS.
- REPLACE GLASS WITH CERAMIC GLASS 5 mm THICK.
- FOR SAFE OPERATION INSTALL IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS.
- CAUTION: COMBUSTION AIR OPENING MUST NOT BE OBSTRUCTED.
- DO NOT OVERFIRE THE FIREPLACE.
- OPERATE THE FIREPLACE WITH DOOR FULLY CLOSED ONLY.
- DO NOT USE A FIREPLACE INSERT OR OTHER PRODUCTS NOT SPECIFIED FOR USE WITH THIS PRODUCT.
- CONTACT YOUR LOCAL BUILDING OR FIRE OFFICIALS ABOUT RESTRICTIONS AND INSTALLATION INSPECTIONS IN YOUR AREA.
- SEE IHP INSTALLATION AND OPERATING INSTRUCTIONS FOR THIS MODEL.
- KEEP FURNISHINGS AND OTHER COMBUSTIBLE MATERIALS A CONSIDERABLE DISTANCE AWAY FROM APPLIANCE.
- 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.
- INSTALL AND USE ONLY IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS AND LOCAL BUILDING CODES.
- SPECIAL METHODS ARE REQUIRED WHEN PASSING THROUGH A WALL OR CEILING. SEE INSTRUCTIONS AND BUILDING CODES.
- PREVENT CREOSOTE FIRE: INSPECT CHIMNEY CONNECTOR AND CHIMNEY FLUE MONTHLY AND CLEAN IF NECESSARY.
- DO NOT OVERFIRE. IF DOME OR CHIMNEY CONNECTOR GLOWS YOU ARE OVERFIRING.

- POUR USAGE AVEC LE BOIS SEULEMENT
- UN TABLIER NON COMBUSTIBLE DOIT ÊTRE INSTALLÉ À L'AVANT DE L'APPAREIL S'ÉTENDANT DE 18 PO. (457 MM) À L'AVANT ET AVOIR UNE LARGEUR D'AU MOINS 39 PO. (991 MM).
- LES MANTEAUX DE CHEMINÉE DOIVENT ÊTRE NON COMBUSTIBLES.
- AVERTISSEMENT : CE FOYER N'EST PAS HOMOLOGUÉ POUR ÊTRE UTILISÉ AVEC UN ENSEMBLE DE BûCHES À GAZ SANS CONDUIT D'ÉVACUATION. AFIN DE RÉDUIRE LES RISQUES D'INCENDIE OU DE BLESSURES, N'INSTALLEZ PAS DE BûCHES À GAZ SANS CONDUIT D'ÉVACUATION À L'INTÉRIEUR DE CE FOYER.
- ALIMENTATION ÉLECTRIQUE: 120V, 60 Hz
- TYPE DE CHEMINÉE: UTILISER SEULEMENT AVEC 6 PO. DIAMÈTRE - ÉTATS-UNIS: IHP SNAP-PAK; CAN: SECURE TEMP ASHT+ OU S2100+, DURATECH CANADA OU DURATECH PREMIUM.
- PEUT ÊTRE RACCORDÉ SUR UNE CHEMINÉE DE MACONNERIE TEL QUE DÉCRIT DANS LE MANUEL D'INSTALLATION.
- LES COMPOSANTES UTILISÉES AVEC LE FOYER DOIVENT ÊTRE HOMOLOGUÉES. VOIR LA LISTE DANS LE MANUEL D'INSTALLATION.
- REMPLACEZ LA VITRE AVEC UN VERRE CÉRAMIQUE DE 5mm D'ÉPAISSEUR.
- POUR UNE UTILISATION SÉCURITAIRE, INSTALLEZ CONFORMÉMENT AUX DIRECTIVES DU FABRICANT.
- ATTENTION : NE PAS OBSTRUER LES ARRIVÉES D'AIR COMBURANT.
- NE PAS FAIRE SURCHAUFFER LE FOYER.
- LA PORTE DU FOYER DOIT DEMEURER TOTALEMENT FERMÉE LORSQUE LE FOYER FONCTIONNE.
- NE PAS UTILISER DE POÊLE ENCASTRABLE OU D'AUTRES PRODUITS NON SPÉCIFIÉS COMME ÉTANT UTILISABLES AVEC CE PRODUIT.
- CONTACTEZ LES RESPONSABLES DE VOTRE RÉGION À PROPOS DES RESTRICTIONS ET INSPECTIONS D'INSTALLATION.
- MAINTENIR LES MEUBLES ET AUTRES OBJETS À UNE DISTANCE SÉCURITAIRE DU FOYER.
- CET APPAREIL DE CHAUFFAGE AU BOIS DOIT ÊTRE INSPECTÉ ET ENTRETENU PÉRIODIQUEMENT POUR FONCTIONNER CORRECTEMENT. VOIR LE MANUEL DU PROPRIÉTAIRE POUR PLUS D'INFORMATION.
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SAVE THESE INSTRUCTIONS FOR FUTURE REFERENCE

A French manual is available upon request. Order P/N 901343-02.

Ce manuel d'installation est disponible en français, simplement en faire la demande. Numéro de la pièce 901343-02.

**Fireplace, also for use in mobile or
manufactured homes with solid fuel only.**



WARNING

- Hot! Do not touch! The glass and surfaces of this appliance will be hot during operation and will retain heat for a while after shutting off the appliance. Severe burns may result.
- Carefully supervise children in the same room as appliance.

- If small children are present in the home, it is recommended that this appliance be fitted with an adjustable safety gate or barrier screen.



Listed to standards:
ULC-S610 and UL-127
Report No. 14-199
EPA Cert. No. TBD

INSTALLATION AND OPERATION INSTRUCTIONS

MONTECITO™-C

EPA Wood-Burning Fireplace
P/N 901343-00 REV. NC 07/2025

MODEL

Montecito-C

This installation manual will enable you to obtain a safe, efficient and dependable installation of your fireplace system. Please read and understand these instructions before beginning your installation.

Do not alter or modify the fireplace or its components under any circumstances. Any modification or alteration of the fireplace system, including but not limited to the fireplace, chimney components and accessories, may void the warranty, listings and approvals of this system and could result in an unsafe and potentially dangerous installation.

IHP wood-burning fireplaces are designed for use as a supplemental heater. They are not intended for continuous use as a primary heat source.

WARNING

- The fireplace cannot be operated without a door. Consult your dealer to select the correct replacement door.
- The fireplace is equipped with a blower, electrical connection must be made prior to fireplace installation
- Important! To assure proper alignment of glass doors: Install this fireplace in a square and plumb condition, using shims as necessary at sides and/or bottom.
- Install the fireplace only as described in these instructions.

WARNING

This product can expose you to chemicals including Carbon Black, which is known to the State of California to cause cancer, and Carbon Monoxide, which is known to the State of California to cause birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov

CONGRATULATIONS!

When you purchased your new fireplace, you joined the ranks of thousands of individuals whose answer to their home heating needs reflects their concern for aesthetics, efficiency and our environment. We extend our continued support to help you achieve the maximum benefit and enjoyment available from your new fireplace.

Thank you for selecting a IHP fireplace as the answer to your home supplemental heating needs.

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THE FIREPLACE INTRODUCTION

The Montecito™-C wood-burning fireplace is an energy efficient, heat circulating, closed combustion fireplace. You will receive a lifetime of comfort and enjoyment from your fireplace provided it is installed, maintained and operated properly.

- Please read these instructions and retain this manual for future reference.
- Before beginning the fireplace installation, consult the local authorities to obtain your building permit and check your local building codes. Install the fireplace only as described in these instructions and using only IHP components.
- These fireplaces are listed by PFS TECO to CAN/ULC S610-M87 and ANSI/UL 127 under report number 14-199. These fireplaces are also compliant with EPA 40 C.F.R Part 60, section 60.532(b). EPA Certificate number xxx-25.
- The fireplace is NOT intended for use with a gas log set. Do not use a fireplace insert or any other product with this fireplace unless it is specified by IHP for use with this appliance. Failure to follow these instructions will void the certification and the warranty of the fireplace and may result in an unsafe installation.
- These appliances are designed to provide supplemental heat to the immediate area only. Therefore, it is advisable to have an alternate heat source when installed in a dwelling.

FIREPLACE PACKAGING LIST (loose parts)

- Literature Kit (bag in bottom compartment containing Installation and Operation Instructions (this manual), Wall Plate, Damper Rod and Handle, Strain Relief, Junction Box, and Rheostat.
- Intake Vent
- 4" Insulation Sleeve
- 4" Outside Air Intake Pipe
- (4) 10-16 x 3/4 Tek Screws
- Safety Metal Strip
- Top standoff assembly (loose on top of unit)

PARTS REQUIRED

Fireplace Model: Montecito-C

- **6" diameter chimney - United States**
Model IHP Snap-Pak, including:
 - Chimney lengths
 - Elbows (*where necessary*)
 - Associated components as per these installation instructions
- **6" diameter chimney - Canada**
Security Chimney: Secure Temp ASHT+ or S2100+, DuraVent: DuraTech Canada or Duratech Premium, including:
 - Chimney lengths

- Elbows (*where necessary*)
- Associated components as per these installation instructions & instructions provided by the venting manufacturer
- **Decorative Door** - Required
(Order Separately - See **Page 26**)
- **Front Facade kit** - Required
(Order Separately - See **Page 26**)
- **UZY6-B Blower Kit** (included in the fireplace).
- **VRUW Blower Speed Control** (included)
- **Outside Air Kit** (Included w/Fireplace)
- **Finishing Guide Plate** (included on Fireplace)

OPTIONAL EQUIPMENT

- **Additional Equipment (optional)**
 - Forced Air Kit
 - HeatFlo Convection Kit

OPERATING THE FIREPLACE

Fuel - USE SOLID NATURAL WOOD FUEL ONLY. This appliance is designed to burn dry seasoned natural wood only (see **Page 7** for a list of prohibited fuels). Failure to burn proper fuels only will void the certification and the warranty of the appliance. Hardwoods are preferred to softwoods since the energy content of wood is relative to its density. Hardwoods will result in a longer burning fire and less frequent refueling. A moisture content of 15% to 20% (seasoned) is recommended. Wood that has been cut and split and let to dry under a cover for a period of one year will usually meet that criteria. The required drying time will vary depending on the climate. Wood that is packed tight together will take longer to dry. Seasoned wood is darker in color than wet wood and will have visible cracks in the grain on the ends. Excessively wet wood will be difficult to burn and will result in lower efficiency, increased creosoting and deposits on the glass and in the chimney. Excessively dry wood will burn well but will also have higher emissions and shorter burning time.

DO NOT OVERFIRE THIS HEATER

Attempts to achieve heat output rates that exceed heater design specifications can result in permanent damage to the heater.

FIRST FIRES

Before using the fireplace make sure to remove any plastic wrapping and any labels taped on the plated door. Remove any glue residue left by the temporary labels using mild soap and glass cleaner.

The first five or six fires should be small fires of short duration (about 30 to 60 minutes). This will help cure the refractory bricks. During the first few fires of this appliance there may be some odor and smoke due to the curing of the paint, dust accumulation and burning off of lubricants used in the manufacturing process. It may set off a smoke alarm located in the same room. For this reason the room should be well ventilated for the first few fires.

IMPORTANT! GENERAL SAFETY PRECAUTIONS. READ AND UNDERSTAND THESE SAFETY RULES BEFORE YOUR FIRST FIRE.

 WARNING

The Montecito™-C fireplace must be installed with an outside air kit intake, which is included with the fireplace

 WARNING

THE FIREPLACE MUST BE OPERATED WITH THE DOORS FULLY CLOSED. IF THE DOORS ARE LEFT PARTLY OPENED, GAS AND FLAME MAY BE DRAWN OUT OF THE FIREPLACE OPENING, CREATING RISKS OF BOTH FIRE AND SMOKE.

 WARNING

NEVER use gasoline, gasoline-type lantern fuel, kerosene, charcoal lighter fluid, naphtha, engine oil or similar liquids to start or “freshen up” a fire in this fireplace. Keep any flammable liquids a safe distance from the fireplace at all times.

 WARNING

THIS FIREPLACE HAS NOT BEEN TESTED WITH AN UNVENTED GAS OR A FIREPLACE INSERT. TO REDUCE RISK OF FIRE OR INJURY, DO NOT INSTALL AN UNVENTED GAS LOG SET OR FIREPLACE INSERT OR OTHER PRODUCTS NOT SPECIFIED FOR USE WITH THIS FIREPLACE.

 WARNING

Use care when selecting window treatments for windows located near the fireplace. Avoid using combustible flowing window treatments such as curtains on nearby windows that are of sufficient length to be blown in front of an open flame when the window is opened. Keep any combustible furniture, materials or decorative pillows at least 48" (1219 mm) from the front fireplace opening.

 WARNING

Never modify or alter your fireplace system in any way. To do so may create a potential fire hazard and void the limited warranty, listings and approvals of this system.

 IMPORTANT

When burning wood, use SOLID NATURAL DRY WELL-SEASONED WOOD ONLY. Hardwoods are recommended (soft woods tend to burn very quickly).

- DO NOT burn treated wood, charcoal, coal, trash, cardboard, driftwood, woods dipped in tar, Christmas tree greens, pitch, pine tar, creosote, chemical chimney cleaners, flame colorants, polystyrene packaging, wood products with synthetic binders (i.e. plywood). Plywood, lumber and other misc. materials can produce abnormally high temperatures, sputtering and smoking fires and may contain hazardous chemicals to treat insects and fungus.
- Burning unapproved fuels can produce excessive temperatures, beyond the design capabilities of the fireplace and may produce excess sparks or may contain hazardous chemicals. Burning unapproved fuels can result in a chimney fire, a house fire, personal injury, death or loss of property.

 WARNING

Always ensure that the air inlet to the fireplace is free from debris and any other obstructions that can block the entrance of air.

 WARNING

Neither the manufacturer nor the seller warrants “smoke free” operation nor are we responsible for inadequate system draft caused by mechanical systems, general construction conditions, inadequate chimney heights, adverse wind conditions and/or unusual environmental factors or conditions beyond our control.

 WARNING

Never leave children unattended when there is a fire burning in the fireplace.

 IMPORTANT

WHEN INSTALLED IN A MOBILE OR MANUFACTURED HOME:

- Mobile or manufactured home installations must be installed in accordance with the requirements of the Department of Housing and Urban Development (HUD) “Mobile Home Construction and Safety standards” for US or Canada Mortgage and Housing Corporation (CMHC) for Canada.
- The fireplace must be fastened to the floor by unfolding and screwing the small tabs on both sides at the bottom of the fireplace.
- It is necessary to have access openings, for inspection purpose only, into built-in enclosures surrounding the fireplace installation. Such openings to require a household tool for access.
- The vapor barrier of the mobile home shall be as close as possible of the location where the chimney assembly penetrates the ceiling and roof structure with no interference to the required clearance to combustible material.
- When the mobile or manufactured home has a flat roof, the Attic Radiation Shield must be installed from below going through the roof (See *Figures 22b and 22d*).
- Warning: Do not install in a sleeping room.
- Caution: The structural integrity of the manufactured home floor, wall, and ceiling/roof must be maintained.

 WARNING

Be careful adding wood fuel to the fire or handling fireplace tools such as shovels, tongs or pokers.

 WARNING

The bottom refractory can be cracked by excessive abuse such as tossing heavy logs onto the grate or gouging with fireplace tools. Exercise caution when adding wood to your fireplace.

COMBUSTION

The overall volume of the Firebox for this appliance is 2.19 ft³. The dimensions used to calculate the Usable Firebox Volume for EPA Certification of this appliance are as detailed below. These dimensions represent the volume constrained by the Andirons and the average height and width of the Firebox up to the Andirons (1.52 ft³). Fuel loading in front of the Andirons is neither permitted during testing, nor advised during operation.

Primary Air and Air Boost Controls

There is no flue damper in this wood burning fireplace. As is common with air tight stoves, the combustion air control sets the flow of air entering the firebox. This allows for a more precise control of the fire. The combustion air control lever is located below the door on the left side of the appliance. The main source of air (primary air) entering the firebox can be reduced by moving the air combustion control lever from left to right. The primary air is fully opened when the lever is completely moved to the left. The air control device can also be used to add an extra boost of air especially during fire start up and reloading of the unit.

Pulling the air combustion control lever out will induce an air boost through the Pilot nozzle located in the front center of the bottom of the Firebox, allowing for an easier fire start up. When the fire is well established, the control lever can be pushed in to shut down the air boost allowing for a longer burn time. The combustion air controls should be in the closed positions when the fireplace is not in use. This will minimize air leakage up the chimney. The combustion air controls should always be opened before opening the door, to minimize the possibility of back draft coming into the room.

Building a Fire

The optimal piece width for this appliance is between 16 and 17 inches (406 mm and 432 mm). For all fuel loads piece loading must ensure that there are no obstructions to the Pilot (nozzle) air flows – clearing is necessary if load pieces block the nozzle; air flow from the nozzle is best supported by avoiding pushing the load deep into the coal bed(s).

To start a fire, the Primary Air and Pilot adjustment lever must both be in the fully open position. Place small pieces of kindling on the bottom of the Firebox, with larger pieces on top, criss-crossing the pieces so that there are air spaces around the wood. Crumpled paper may be applied within the cavities between the wood pieces. Start the fire by igniting the paper, either at the bottom (as was done in testing) or closer to the top as needs be. Individual installations may favor one over the other and can be quickly observed after a few starts. The door should be left slightly open (~1" or 25 mm) until the fire is robustly established, with the flames from ignition heating up the upper combustion tubes as quickly as possible, after which the door may be closed. If the fire dramatically dims when the door is fully closed, re-open it until the fire is properly established again.

Once the start up fire is fully established (10-15 mins) a High Fire can be initiated, optimally with up to 4-5 pieces of small cordwood (1-2 lbs each) placed on top of the remainder of the start-up fuel. This wood must be loaded as quickly as possible, and no adjustments to the coal bed should be necessary. Place the load on top of the coals, and allow for air all around the load pieces. Larger pieces may be added once the initial load has burned down. To maintain a High Fire the Combustion Controls must remain in the fully open positions during which the Heat Output will be up to 81,000 Btu/h.

Accelerated Combustion (High Fire)

The maximum heat output for the fireplace is achieved by burning with the door closed and the combustion air fully opened and boost lever pulled out. By using this method, the fireplace can produce up to 81,000 Btu of heat per hour, however it will be necessary to reload with wood every one or two hours. This is the least efficient method of burning the fireplace.

Always use caution when firing with the combustion air control wide open. Only burn cord wood in this manner. Small dry pieces of softwood and construction scraps will burn very intensely using this method and may damage the firebox.

Medium Fire

This is the recommended mode of operating the fireplace and should be the one normally used since it will deposit the least amount of creosote on the glass and in the chimney. The combustion air control must be approximately 3/4" (19 mm) closed to the right and pushed in to close the air boost. The precise setting will depend on many factors, including chimney length and the moisture content of the wood. For instance, a long chimney will necessitate closing the damper more.

For a medium fire, 3-5 medium sized pieces of wood (2-3 lbs each) should be placed on the bed of hot coals. The heat output will be approximately 30,000 - 40,000 Btu per hour and the loading time will be about every 2-3 hours. Softwoods may be burned using this method but the time will be substantially reduced.

Low Fire

With the air controls settings on High, the coal bed will need to be compressed as much as possible – after which the combination of piece size and load pieces (3-5 pieces, 3-5 lbs each) must ensure that there are spaces between all of the load pieces, and Pilot (nozzle) air flow is unobstructed – it is essential that air flow is able to reach the back of the appliance. Keep the door open until the wood is sufficiently ignited. Shut the door when combustion is cleanly established (up to 10 mins after loading), and then position the air control lever in the fully closed (right and pushed in) position.

When the air combustion control is completely closed, the fireplace is in a slow combustion phase. If the hearth is hot enough, slow combustion will not extinguish the fire, but there will be a noticeable change in the flame pattern. If the wood is too wet (moisture content of 25% and more) creosote may accumulate on the glass door. Do not allow the wood to burn without flame, since this will produce excessive creosote in the unit.

This method of burning should be used only after operating the fireplace with the air control opened to produce a hot fire for about an hour or at medium burn for at least three (3) hours. Slow combustion can be used at night in order to reduce the heat output (as low as 14,500 Btu per hour) and to prolong the burn. The burning time will be between 4-6 hours. Coals may still be present after this period.

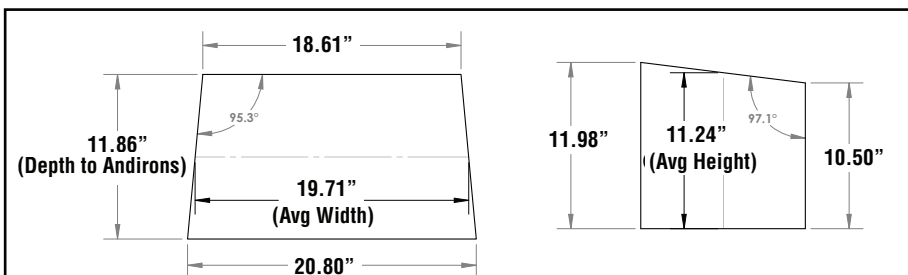


Figure 1a - Usable Firebox Dimensions

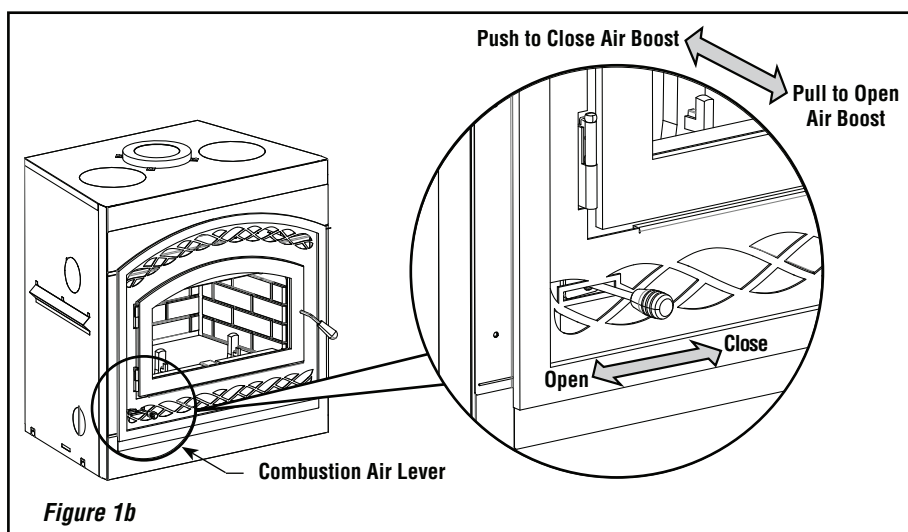


Figure 1b

SMOKING – CAUSES AND TROUBLESHOOTING

To reduce the likelihood of smoking when opening the door, set the combustion air controls to the left (open position) before opening the door. Your fireplace has been designed and tested to provide smoke free operation. Occasionally, there may be a small amount of smoking upon lighting the fire, until the chimney heats up but this should not continue. If the fireplace continues to smoke it is probably for one of the following reasons:

- A. Negative pressure in the house** - As the fire burns, air goes up the chimney. This air must be replaced through leakage into the house or through the outside air duct. When operating the fireplace, open a nearby window temporarily to check if there is adequate replacement air supply.
- B. Fans operating (e.g.: range hood)** - These fans draw air out of the house and may actually cause a negative pressure in the house. Turn off all fans and open a nearby window to determine if this is the cause of the problem.
- C. Wetwood** - Wet or tarred wood will smoulder and smoke instead of burn properly. Your dealer can help you determine if you have properly seasoned wood for burning.
- D. Dirty or blocked chimney** - Check to make sure the chimney is clear and clean. If dirty call a certified chimney sweep or use a properly sized chimney brush to clean.
- E. Chimney not long enough** - The minimum chimney height is twelve 12' (3.7 m) not including the fireplace height. The chimney must extend at least three 3' (915 mm) above its point of contact with the roof and at least two 2' (610 mm) higher than any roof or wall within ten 10' (3 m) of it. When installed with offsets, the minimum chimney height is fifteen 15' (4.6 m). Additional height will increase draft and will decrease the tendency to smoke.
- F. Poor chimney draft** - With no fire, there should be sufficient draft to exhaust cigarette smoke introduced under the baffle. Chimneys installed against an outside wall without protection may generate back draft problems which will cause start-up problems. To prevent this, open a nearby window, roll up a piece of paper and light it. Then, hold it in the upper part of the firebox to warm up the chimney. Wait until the draft is sufficient, then start the fire.

IMPORTANT CAUTIONS

- A. Do not block the hot air vents to the fireplace as this will cause the fireplace to overheat.**
- B. Never use gasoline, gasoline-type lantern fuel, kerosene, charcoal lighter fluid, or similar liquids to start or 'freshen up' a fire in this fireplace. Keep all such liquids well away from the fireplace while it is in use.**
- C. Do not burn coal. The sulphur in coal will corrode the firebox and chimney.**
- D. Keep combustible materials at least 48" (1.2 m) away from the front of the fireplace opening.**
- E. Never leave children unattended when there is a fire burning in the fireplace.**
- F. Do not use the fireplace as an incinerator to burn paper, cardboard or construction material such as pressed wood, plywood or lumber. Use only untreated wood. Wood protectors, metallic paper, coal, plastic, waste, beach wood, Christmas tree, sulphur and/or oil will damage the fireplace.**
- G. Do not burn driftwood which has been in the ocean or salt water. The salt will corrode the firebox and chimney.**
- H. Do not burn wood in the area in front of the andirons.**
- I. Do not allow the wood to smoulder or burn without flame, since this will produce excessive creosote in the unit as well as increased particulate emissions.**
- J. Blower for forced air kit operating** - Make sure that the blower is set to the "off" position when you open the fireplace door for reloading.

Smoke Detectors Recommended

Since there are always several potential sources of fire in any home, we recommend installing smoke detectors. If possible, install the smoke detector in a hallway adjacent to the room (to reduce the possibility of occasional false activation from the heat produced by these appliances). If your local code requires a smoke detector be installed within the same room, you must follow the requirements of your local code. Check with your local building department for requirements in your area.

Carbon Monoxide Monitor Recommended

Carbon Monoxide (CO) Poisoning: Early signs of carbon monoxide poisoning are similar to the flu with headaches, dizziness and/or nausea. If you have these symptoms, obtain fresh air immediately. Some people are more affected by carbon monoxide than others, including pregnant women, people with heart or lung disease or anemia, those under the influence of alcohol, and those at high altitudes.

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.

MAINTENANCE AND CARE

Maintaining Your Fireplace

Have your product inspected at least once a year by a qualified service technician to ensure gaskets, air tubes, baffles, and venting are in good repair to ensure proper performance. Have degraded items replaced by a qualified service technician.

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 in this manual.

Creosote - Formation and Need for Removal

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

The chimney shall be inspected at least twice a year during the heating season to determine when a creosote buildup has occurred.

When creosote has accumulated it shall be removed to reduce the risk of a chimney fire.

When the creosote accumulation is large, a creosote fire in the chimney can damage the chimney and overheat the surrounding wood framing. Creosote formation in a chimney can be minimized by making sure there is always visible flame burning, avoid smouldering fires and by proper refueling techniques.

MAINTENANCE AND CARE

Chimney Maintenance

Regular chimney inspection and maintenance combined with proper operation will prevent chimney fires. Keep your chimney clean. Do not allow more than 1/16" (1.6 mm) creosote build up in your chimney. The amount of creosote will depend on variables such as frequency of use and type of fire. We recommend that you:

- A. Initially inspect the chimney system weekly. From this, you will learn how often it will be necessary to clean your chimney.
- B. Have your chimney cleaned by a qualified chimney sweep. If you wish to clean it yourself, we recommend using a stiff plastic or non-metallic brush. If a metal brush is used, its size should be slightly smaller than the flue to avoid damaging the chimney. Do not use a brush that will scratch the stainless steel interior of the chimney.
- C. Do not expect chemical cleaners to keep your chimney clean. The rain cap can be removed for inspection and/or cleaning of the chimney.

CAUTION: It is necessary to remove the baffle from the top of the firebox before cleaning the chimney. See "Top Baffle Removal Prior To Chimney Sweep."

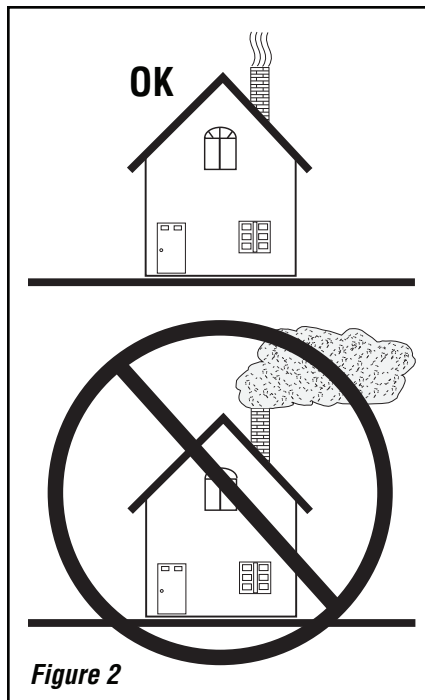
Dealing With a Chimney Fire

Regular chimney maintenance and inspection can prevent chimney fires. If you have a chimney fire, follow these steps:

1. Close the fireplace door and the combustion air controls.
2. Alert your family and household of the possible danger.
3. If you require assistance, alert your fire department.
4. If possible, use a dry chemical fire extinguisher, baking soda or sand to control the fire. Do not use water as it may cause a dangerous steam explosion.
5. Check outside to ensure that sparks and hot embers coming out of the chimney are not igniting the roof or other combustibles.
6. Do not use the fireplace again until your chimney and fireplace have been inspected by a qualified chimney sweep or a Fire Department Inspector.

Achieving Clean Burns

Check the exhaust in about 15 to 20 minutes (see **Figure 2**). Large amounts of smoke indicate an improper burn setting (either too high or too low). Adjust and recheck in 5 to 10 minutes.



FUEL

What does "Well-Seasoned" mean?

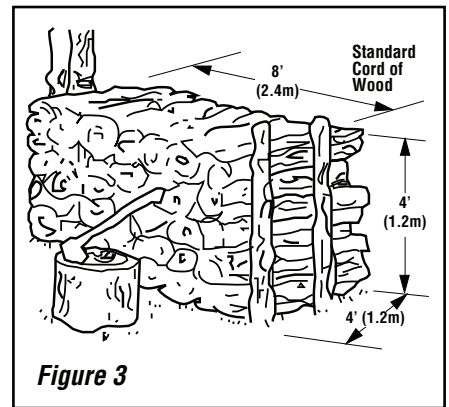
When a tree is cut down, the wood is green, full of sap and moisture. This moisture content can exceed 80%, which must be reduced to less than 20%. Wood properly seasoned is then capable of generating the heat the stove was designed to provide.

Green wood does not burn easily. Attempting to burn green wood often results in a lot of smoke and very little fire. Time is the most important factor in seasoning wood. Ideally the moisture content should be reduced to 11-20%. **NOTE: The use of a firewood moisture meter is recommended to ensure the firewood contains less than 20% moisture.**

Seasoning Guide

Softwoods - 6 months to 18 months
Hardwoods - 12 months to 24 months

Logs that are 5" (127 mm) diameter across or larger should be split in half, three pieces if over 8 inches, and four pieces when over a foot across. If a tree has been dead for 2 - 4 years it still needs to be cut, split, and seasoned for 6 to 24 months depending on the wood.



! WARNING

Disposal of Ashes: Ashes should be placed in a metal container with a tight-fitting lid. The closed container of ashes should be placed on a noncombustible floor or on the ground, well away from all combustible materials, pending final disposal. If the ashes are disposed of by burial in soil or otherwise locally dispersed, they should be retained in the closed container until all cinders have thoroughly cooled.

! WARNING

When processed solid fuel firelogs are used: Do not poke or stir the logs while they are burning. Use only firelogs that have been evaluated for the application in fireplace and refer to firelog warnings and caution markings on packaging prior to use.

MAINTENANCE AND CARE (continued)

Prohibited Fuels

This heater is designed to burn natural wood only. Higher efficiencies and lower emissions generally result when burning air dried seasoned hardwoods, as compared to softwoods or to green or freshly cut hardwoods. **DO NOT BURN:**

- Garbage;
- Lawn clippings or yard waste;
- Materials containing rubber, including tires;
- Materials containing plastic;
- Waste petroleum products, paints or paint thinners, or asphalt products;
- Materials containing asbestos;
- Construction or demolition debris;
- Railroad ties or pressure-treated wood;
- Manure or animal remains;
- Salt water driftwood or other previously salt water saturated materials;
- Unseasoned wood;
- Christmas tree branches;
- Paper products, colored paper, cardboard, plywood, or particleboard;
- gasoline;
- naphtha;
- engine oil;
- flammable liquids;
- solvents;
- grease; or
- coal

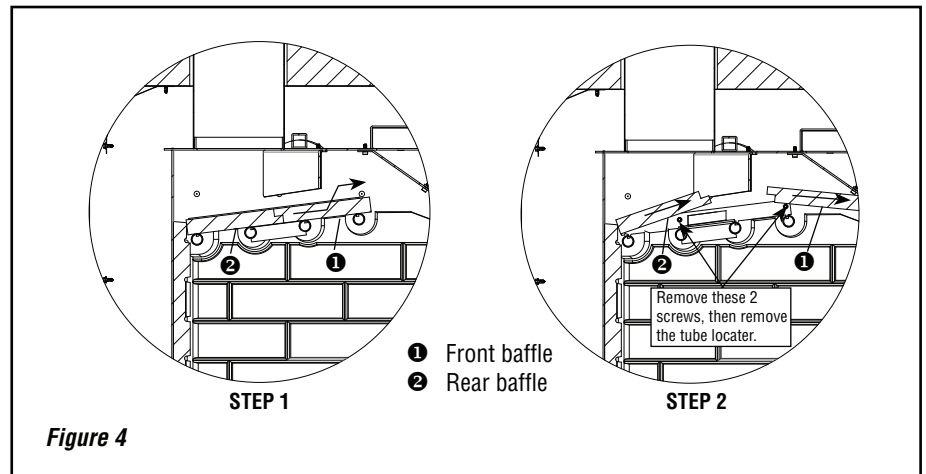
The prohibition against burning these materials does not prohibit the use of fire starters made from paper, cardboard, saw dust, wax and similar substances for the purpose of starting a fire in an affected wood heater.

Burning these materials may result in release of toxic fumes or render the heater ineffective and cause smoke. Intense firing with these materials may overheat the fireplace, causing damage to the unit, a fire or even possibly igniting a chimney fire if the chimney is creosoted. Burning unapproved fuel, resulting in excessive pollutants being emitted, may be prohibited and subject to a fine or other penalty by the authority having jurisdiction in your area.

Top Baffle and Secondary Burn Tube Removal Prior to Cleaning The Chimney, Replacing Baffles, or Replacing Secondary Burn Tubes

Follow these steps to remove the Baffles and/or Secondary Burn Tubes (see **Figure 4**):

1. Remove the side refractory holders. They are located at the top of the refractory.
2. Lift the front baffle and slide forward. Lift the rear baffle and slide up so that both screws holding the tube locator (holding the tubes in place) may be removed.
3. Remove the front tube by sliding it either left or right and dropping it out.
4. Remove the baffle boards.
5. Remove the remaining 3 tubes.
6. Reinstall in reverse order, being sure to position all four tubes in place with the tabs on the tube locator.



Finish Door Casing Care

Use a glass cleaner and a soft cloth to polish the casing. Do not use abrasives such as steel wool, steel pads or an abrasive polish for they may scratch the casing's finish.

DISPOSING OF ASHES

Whenever ashes get 3 to 4 inches deep in your firebox, and when the fire has burned down and cooled, remove excess ashes. Leave an ash bed approximately 1 inch deep on the firebox bottom to help maintain a hot charcoal bed.

Remove ashes only when the fire is out and the ashes are cold (24 to 48 hours after the fire is out).

Do not leave the ashes in the house as they give off carbon monoxide and other toxic gases.

GLASS CARE

Glass Replacement

The glass used for the fireplace is a high temperature ceramic glass (1,400° F/760° C). If the glass breaks, it must be replaced with an identical ceramic glass. Tempered glass or ordinary glass will not withstand the high temperatures of the fireplace. Replacement glass should be purchased from a IHP dealer (see "Replacement Parts", **Page 27**). **DO NOT OPERATE THE UNIT WITH CRACKED OR BROKEN GLASS.**

Glass Cleaning

The fireplace is designed to keep the glass clean under normal operating conditions. If the fireplace is operated continuously with the combustion air controls closed, the glass will tend to get dirty unless the fuel, firebox and glass are maintained at hot temperatures. To clean the glass, there are a number of specially designed cleaners. Your authorized IHP dealer can recommend a suitable cleaner which is available in your area. Regular household glass cleaners will not clean creosote. Do not use abrasives such as steel pads, steel wool or oven cleaner as they will scratch the glass.

DO NOT USE CHEMICAL GLASS CLEANERS

ON PAINTED SURFACES AS IT MAY CAUSE THE PAINT TO PEEL.

CAUTION: DO NOT ALLOW WINDOW CLEANER TO GET IN CONTACT WITH DOOR GASKET OR PAINT ON FACADE OR DOOR. ONCE CLOSED, CONTACT OF GLASS CLEANER WITH THE FIREPLACE FACADE CAN PROVOKE PAINT PEELING OFF.

Gasket Replacement

Remove the door from the unit (see **Page 8**) and lay it on a clean unabrasive surface. To replace the gasket, first remove all of the old gasket and gasket cement. Make sure that the surface is totally clean before applying new cement (a high temperature silicone caulking rated at 500° F [260° C], is suitable) or adhesion problems may result. Apply gasket cement to the gasket channel and install the new gasket. This replacement part is available from your IHP dealer in the following dimensions:

Gasket	Length	Dimensions	Part No.
Steel Door			
Around Glass	69 (1753)	1 x 3/16 (25 x 4.8)	PR-SR1685D
On Door Frame	73 (1854)	5/8 dia. (15.9)	PR-SR1823G
Cast Door			
Around Glass	69 (1753)	1 x 5/16 (25 x 4.8)	PR-SR1823H
On Door Frame	73 (1854)	5/8 dia. (15.9)	PR-SR1823G
Table 1		Inches (millimeters)	

MAINTENANCE AND CARE (continued)

REFRACTORY REPLACEMENT

The intense heat of the fire will normally cause hairline cracks in the refractory. These cracks can be minimized by proper curing as described in "First Fires". They will not normally diminish the effectiveness of the refractory. If large cracks develop, then the refractory should be replaced. To replace the refractory bricks, follow these steps:

1. Remove the front refractories
2. Remove the bottom refractory
3. Remove the left side refractory
4. Remove the right side refractory
5. Remove the back refractory
6. Remove the front ceramic baffle
7. Remove the rear ceramic baffle

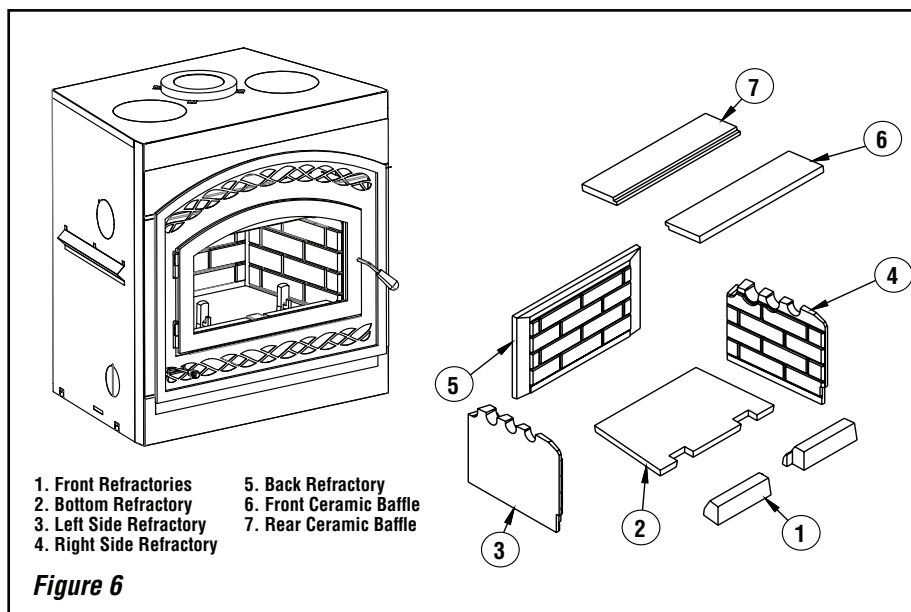
To install the new refractories, follow the above steps in reverse.

DOOR INSTALLATION

The door must be installed only when the installation of the fireplace is completed. All you have to do is fit the male part of the hinge, already on the door, to the female part, which is on the fireplace. To remove the door, simply pull the door up from the hinges (see **Figure 5**). The door adjustment has been set at the factory. If the fit is still not perfect, you can adjust the door using the hinge screws.

DOOR ADJUSTMENT

The door may need to be adjusted to keep the door gasket completely airtight. The door hinges may be loosened using a 3/8" Nut driver and 1/8" Allen Key. The door mount hinges may also be adjusted with a 5/32" Allen Key. Additionally, on the right side of the unit there is a latch adjustment screw (**Figure 5**) which may be used to tighten the door gasket when the door is closed (5/32" Allen Key).



Checking Door Seal - A one-inch strip of paper may be used to perform a test of the integrity of the door seal. Close the door on the paper in at least eight (8) points. It is normal to feel only a slight amount of friction. The door gasket does not need to be "tight" in all areas, since a small amount of leakage is not hazardous or detrimental to the performance of your fireplace.

COLD CLIMATE INSTALLATIONS

Climates where temperatures will fall below 32° F (0° C).

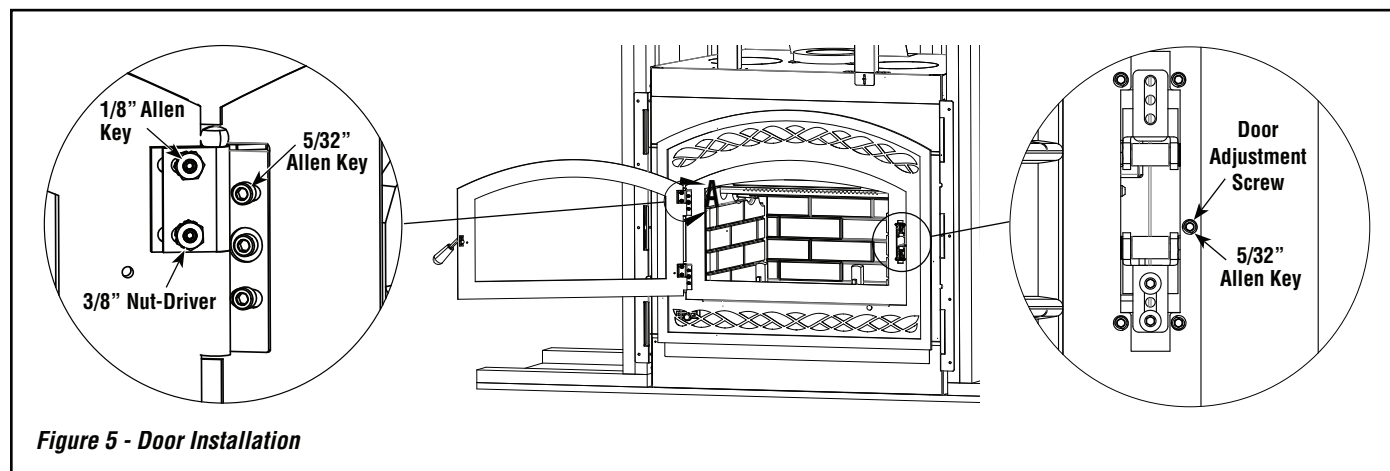
The heating performance of the appliance will vary depending upon the level of insulation, house design, how the appliance is operated, etc.

If this fireplace is being installed in a cold climate, it is especially important to seal all cracks around the fireplace and wherever cold air could enter the room with noncombustible material.

Also, the outside air inlet duct should be wrapped with noncombustible insulation to minimize the formation of condensation. Do not place insulation materials directly against the chimney sections. We recommend that you use the insulated wall radiation shield since it will maintain the home's thermal barrier. AC chimney is NOT recommended in very cold climates (in areas with temperatures below 32°F (0°C)).

**WARNING**

- Use only IHP glass doors, specifically designed for the Montecito-C fireplace.
- The fireplace cannot be operated without a door. Consult your dealer to select the correct replacement door.
- Important! To assure proper alignment of glass doors: Install this fireplace in a square and plumb condition, using shims as necessary at sides and/or bottom.



FACADE INSTALLATION

Install the Facade per instructions provided in Facade Kit (ordered separately - see **Page 26**). After the Facade has been installed attach the adjustment handle by passing it through the lower left slot of the facade, and screwing the threaded end into the threaded faster until snug.

NOTE: install damper handle after facade is installed.

Framing, Facing And Mantel

The construction of the framing, facing, and mantel must be in accordance with the standards and the following illustrations (**Figures 8 and 9**):

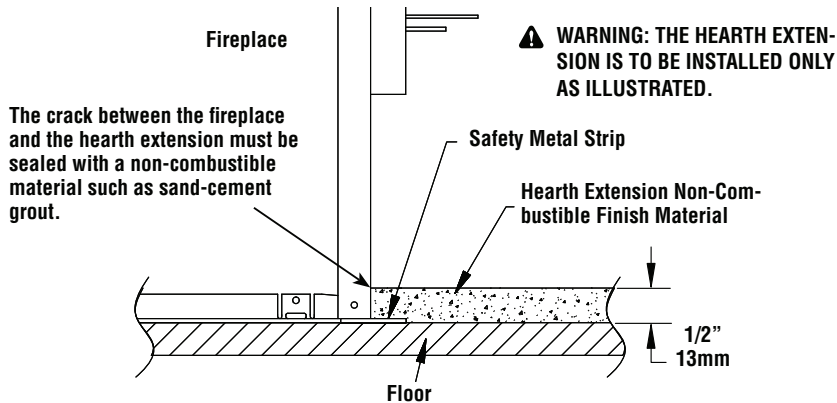
- A. Frame the fireplace using 2" x 3" or heavier lumber.
- B. **WARNING: Combustible materials cannot be used in the space directly above the fireplace, except for the studs above the facade that support the facing and mantel. This area must remain empty for a height of 6'8" (2,032 mm) measured from the base of the appliance.**
- C. Frame the fireplace with vertical studs at the sides of the fireplace running from floor to ceiling (see **Figure 8**). If combustible facing is to be used, position the studs back, from the front edge of the fireplace (a space that is the thickness of the facing material, so that the facing can be installed flush with the fireplace facing). Frame headers between the vertical studs only as follows:
 - Place 2" x 3" or 2" x 4" headers, only along the upper part of the front, side and back faces (some codes may require a 2" x 6" on an outside bearing wall). Do not put wood or any combustible material within the area above the fireplace except on the front facing.
 - Place headers only as required to support the facing and mantel.
- D. **WARNING: The fireplace must not be in contact with any insulation or loose filling material. Cover the insulation with drywall panels around the fireplace.**

HEARTH EXTENSION REQUIREMENTS

The fireplace may be installed directly on a combustible floor. The supplied safety metal strip must be positioned as follows: One half under the front of the fireplace and the other half must extend on the floor over which the hearth extension will be built (see **Figure 8**).

* The safety metal strip must cover the entire width of the fireplace.

The combustible floor in front of the fireplace must be covered with a non-combustible material (tile, marble, stone, etc). See **Figure 9**.



Elevated Fireplaces

- Elevated fireplace installations require a special "Z" Metal Safety Strips (field provided), in place of the safety metal strip shown above. The safety strip should extend the full width of the fireplace. When more than one safety strip is used they must overlap by a minimum of 1" (25 mm). Hearth extension of an elevated fireplace must respect the same minimal dimensions as a fireplace installed directly on the floor (**Figure 9**).

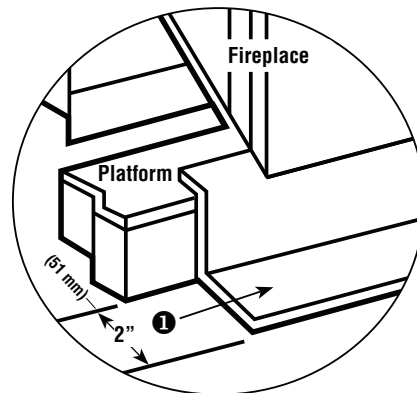


Figure 8 - Hearth Extension Requirements

NOTE: Reference "Clearances to Combustibles" below.

- USA = 16" (407mm) Min.
Canada = 18" (457mm) Min.

NOTE: Hearth extension must extend 8" (204 mm) minimum from each side of the firebox opening

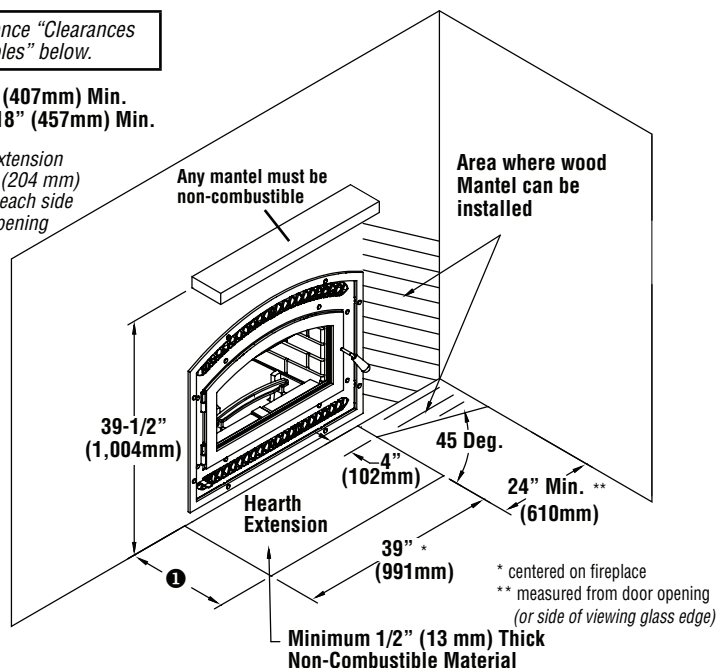


Figure 9

CLEARANCE TO COMBUSTIBLES

The following clearances meet the minimum requirements for a safe installation;

Side wall: 24" (610 mm) (measured from the firebox opening)

Ceiling: 6'-8" (2,032 mm) measured from the base of the fireplace

Fireplace enclosure:

Bottom: 0"

Side: 0" to standoff

Back: 0" to standoff

Top: Do not fill the space above the fireplace with any material (Except the wood framing. See **Page 11, Figure 11**)

Chimney: 2" (51 mm)

Mantel: 39-1/2" (1,004mm) minimum above base of unit. 16" (407mm) maximum depth. **NOTE:** Only non-combustible mantels may be used.

FIREPLACE INSTALLATION

Locating The Montecito-C Fireplace

The best location to install your fireplace is determined by considering the location of windows, doors, and the traffic flow in the room where the fireplace is located, allowing space in front of the unit for the hearth extension and the mantel, and taking into consideration the location of the hot air ducts (optional), outside air kit and chimney.

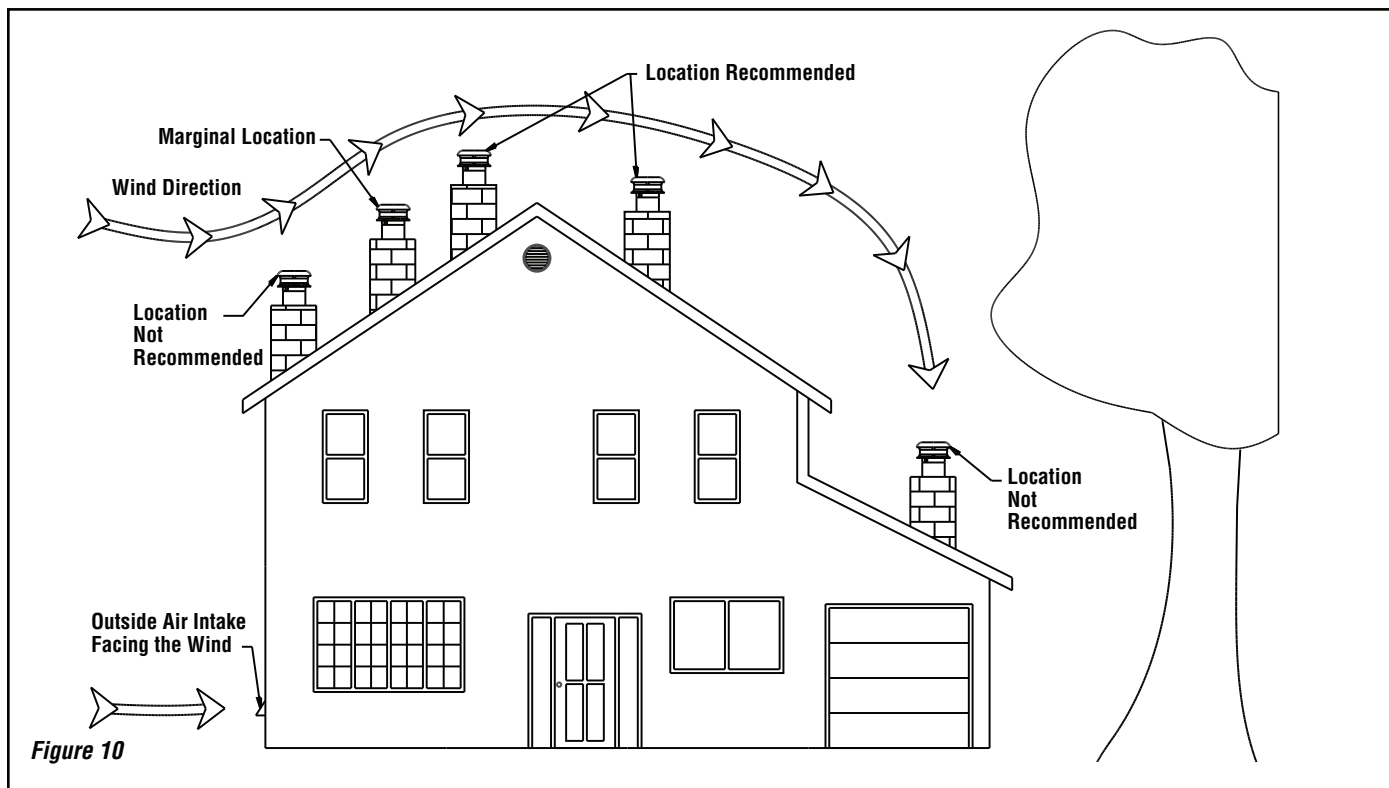
If possible, you should choose a location where the chimney will pass through the house without cutting floor or roof joists (see fireplace dimensions **Page 11**).

Usually, no additional floor support is needed for the fireplace. The adequacy of the floor can be checked by first estimating the weight of the fireplace system. Weights are given on **Page 27**. Note the floor construction and consult your local building code to determine if additional support is needed.

The fireplace may be installed directly on the floor or on a raised base (for proper guidelines, refer to "Hearth Extension Requirements") and a minimum of 6'8" (2 m) measured from the base of the appliance to the ceiling is required.

When selecting the location, the chimney outlet position and the direction of the wind are important factors affecting the chimney performance. To allow a maximum draft and to reduce wind turbulence, the chimney must:

- Penetrate the highest part of the roof.
- Be installed as far as possible of roof offsets, trees or any other obstructions that may cause wind turbulence and back drafts in the chimney.
- The least amount of offsets (elbows) possible. **NOTE:** A maximum of 2 offsets is allowed.





* For flush framing installations

❶ Combustible materials can NOT be used in the space directly above the fireplace. Do not fill the space above the fireplace with any material (Except the wood framing)

NOTES

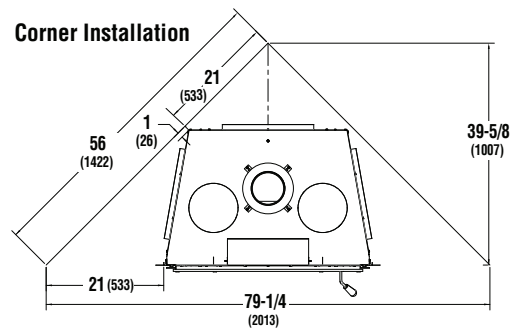
Diagrams, illustrations and photographs are not to scale. Product designs, materials, dimensions, specifications, colors and prices are subject to change or discontinuance without notice.

All framing dimensions include sheathing.

**** The fireplace must not be in contact with any insulation or loose filling material. Cover the insulation with Drywall panels around the fireplace.***

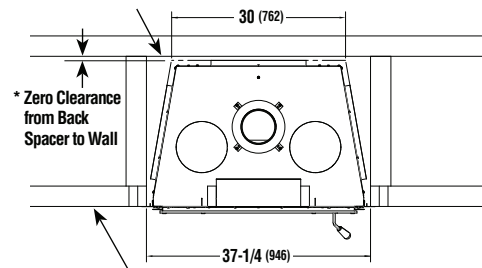
Facing

1. Combustible material must be installed flush with the fireplace. It may not project in front of and on the fireplace (i.e. the steel facade of the fireplace) (**Figure 16A**).
2. Non-combustible materials such as brick, stone or ceramic tile may project in front of and onto the fireplace facing (**Figure 16B**).



Back Wall of Chase / Enclosure
Including Finishing Materials, if any

Outside Chase



* Zero Clearance
from Back
Spacer to Wall

— Rough Framing Face (unfinished shown)

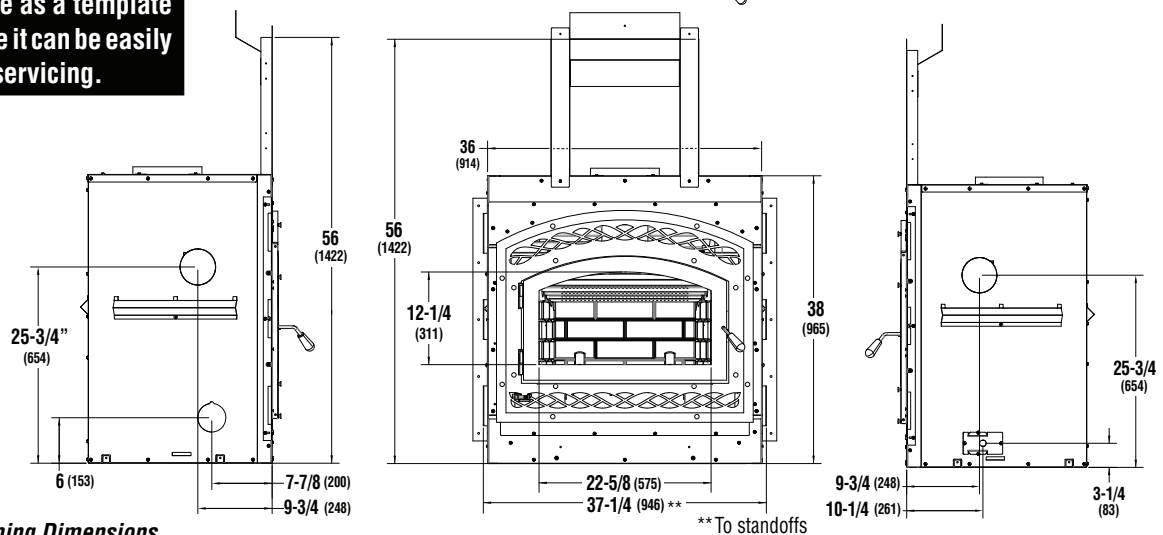
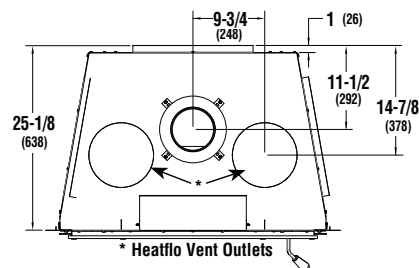
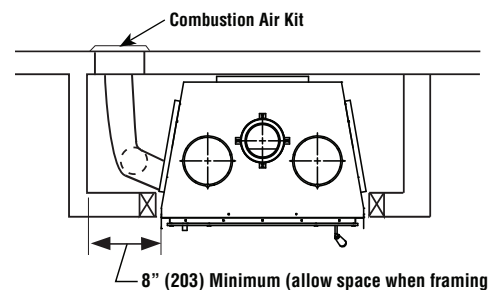


Figure 11 - Framing Dimensions

Inches (millimeters)

NOTE: DIAGRAMS & ILLUSTRATIONS ARE NOT TO SCALE.

INSULATED CHASE CONSTRUCTION

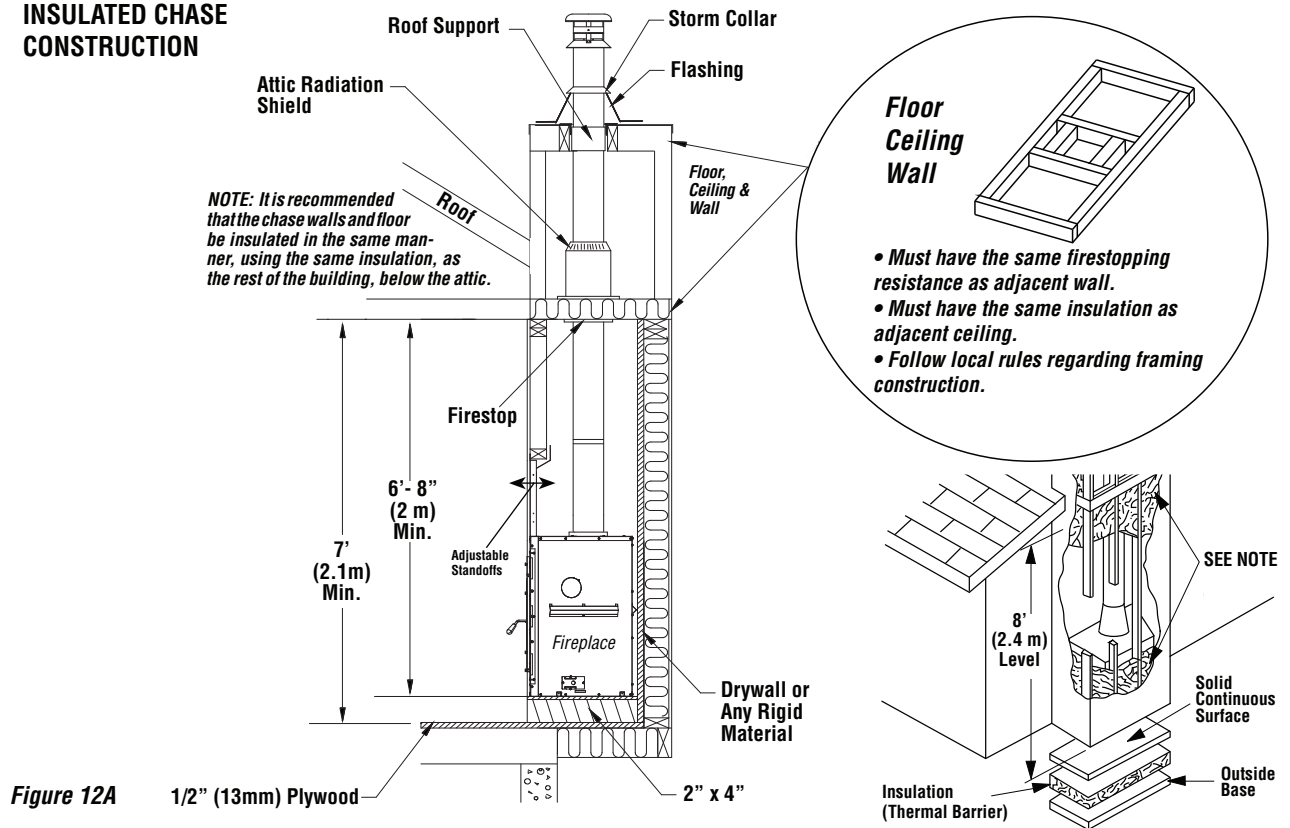


Figure 12A

TOP STAND-OFF ASSEMBLY

NOTES:

- This must be installed during installation.
- Adjustable stand-offs allow for 1" (25mm) of adjustment front to back

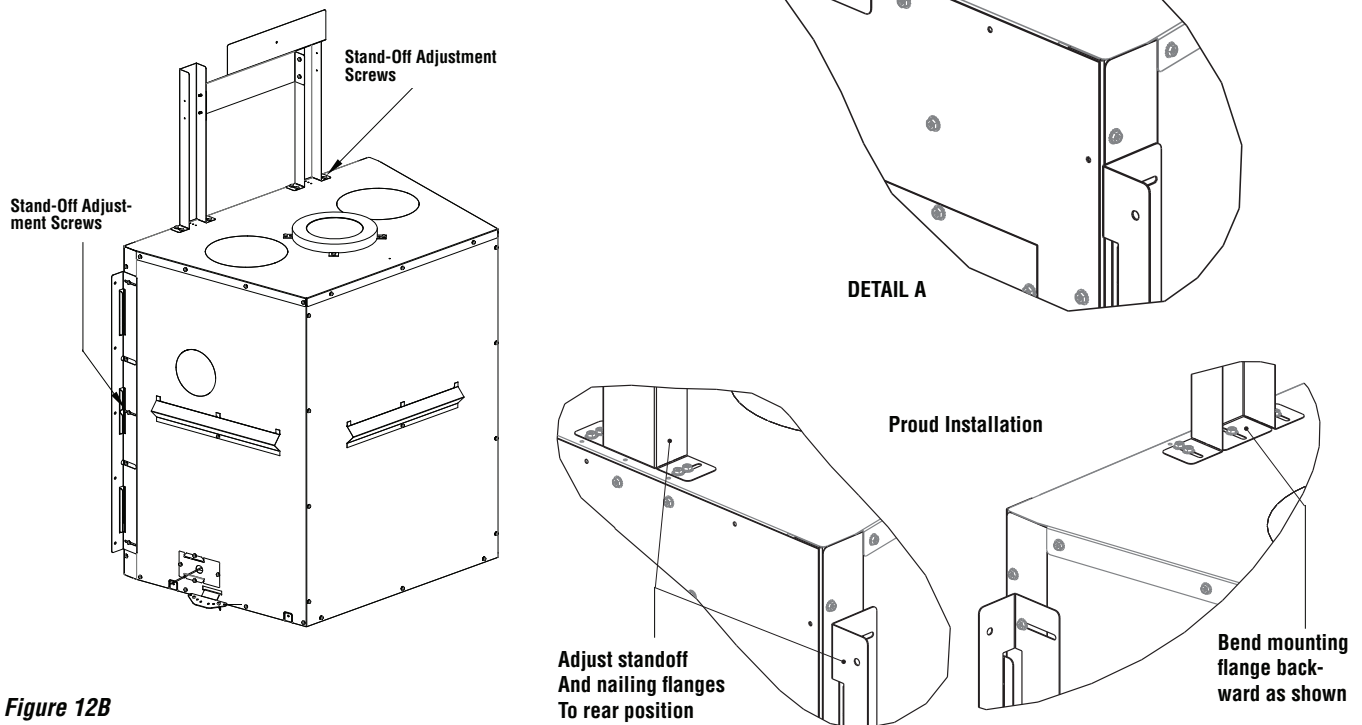


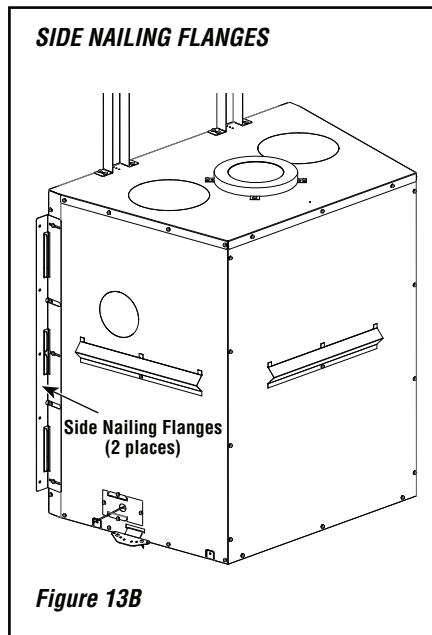
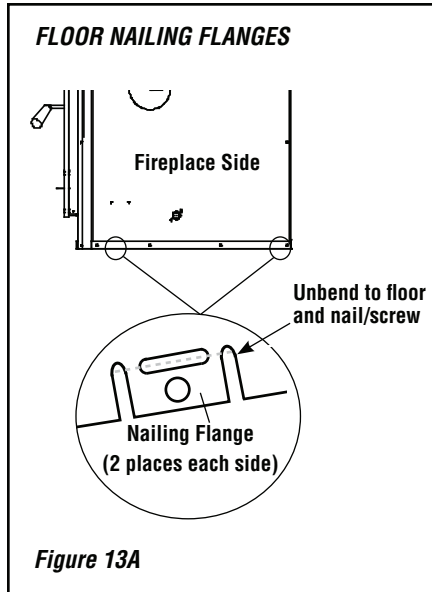
Figure 12B

NOTE: DIAGRAMS & ILLUSTRATIONS ARE NOT TO SCALE.

Nailing Flanges

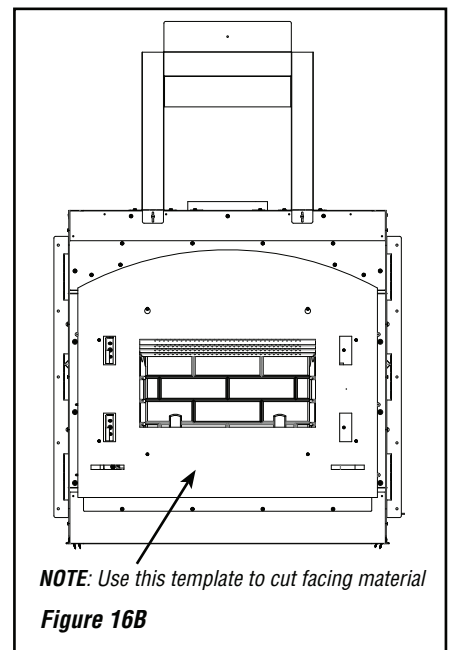
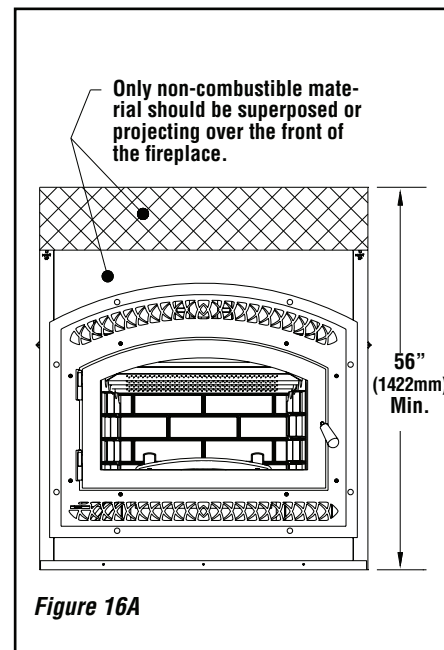
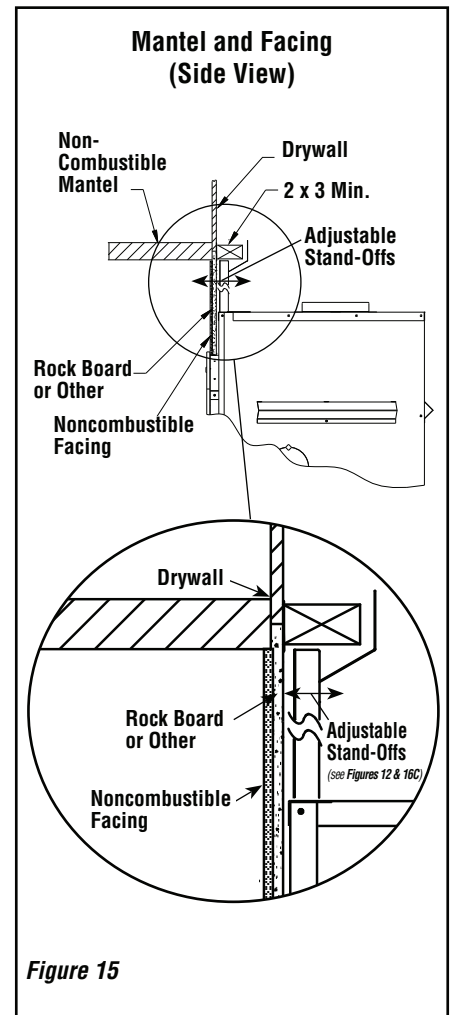
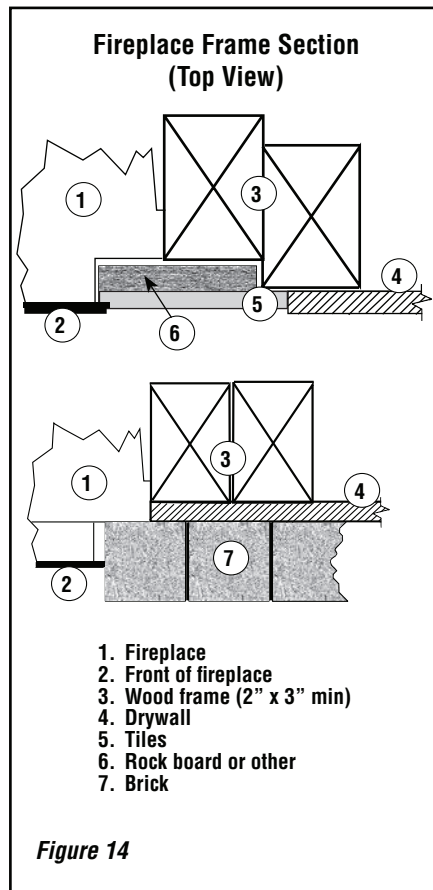
FLOOR: Four floor nailing flanges are provided to secure the fireplace to the floor (see **Figure 13A**). Bend the nailing flanges down so that each flange is flush with the floor, then using nails or screws, secure the fireplace to the floor (2 places each side). The heads of the screws or nails must be large enough to completely cover the holes in the nailing flanges.

SIDES: Secure the sides of the fireplace to the side framing using the side nailing flange assemblies shown in **Figure 13B**.



Mantel and Facing

Any mantel must be constructed of non-combustible material.



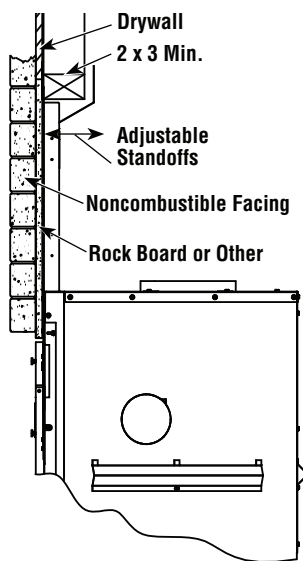


Figure 16C

FIREPLACE BLOWER

The fireplace comes equipped with a heat activated blower. It is located in the bottom of the fireplace, towards the front. It uses 120VAC, 60 Hz and must be connected to the main electrical circuit by a qualified electrician. For connection, use the electrical box supplied with the unit located on the bottom right corner of the fireplace.

If you wish to adjust the blower speed, the variable speed control (VRUW) provided must be installed in line with the wiring (**Figure 18**). Again, use a qualified electrician for installation.

If the blower requires servicing,

1. De-energize the power to the unit at its source.
2. Open the door (**Figure 17A**).
3. Remove both andirons from inside the firebox (**Figure 17A**).
4. Remove the bottom refractory panels (*pieces 1 and 2, Figure 6*). Remove the 14 Cap screws with a 5/32" Allen Key.
5. Unplug the blower.
6. Remove the 5/16" hex head capture screw located at the front of the blower assembly (**Figure 17C**).
7. The blower is located at the front of the unit; magnets on the bottom of the assembly are captured on tabs that extend down through the bottom insulation shield.
8. Rotate the blower forward and remove it from underneath the firebox (**Figure 17B**). Disconnect the insulated quick connects from the motor terminals and attach to the new motor assembly. Re-install in reverse order.

NOTE: The temperature snap disc that is part of the blower assembly may be protruding through the heat shield on the bottom of the unit and partially into the insulation. This is the nominal location for the snap switch.

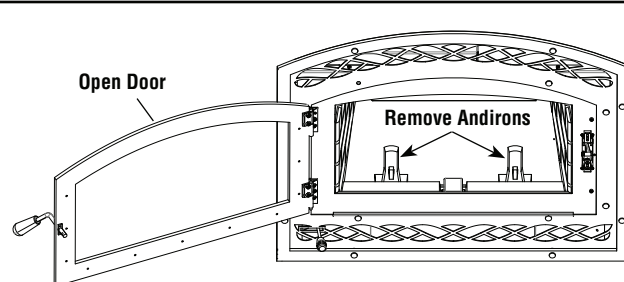


Figure 17A

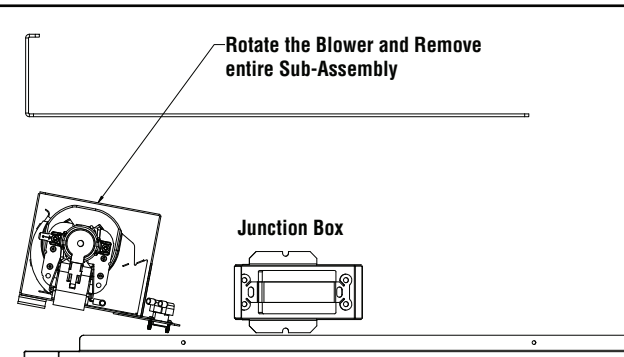


Figure 17B

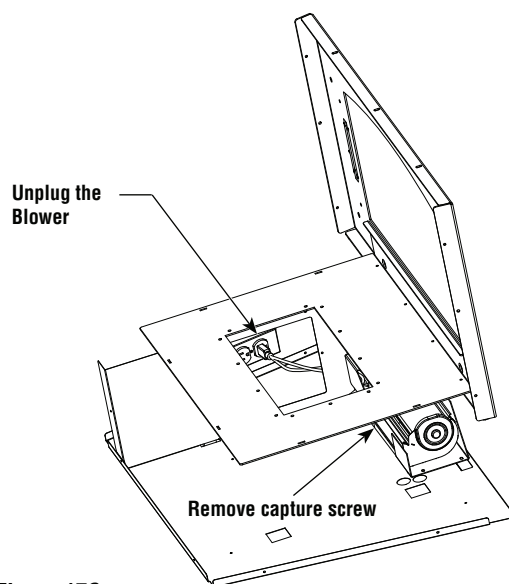


Figure 17C

Complete the Field Wiring

Electrical connections and operation verification must be done prior to installing finishing materials on the fireplace face and right side.

Verify proper operation after servicing.

NOTE: Electrical wiring must be connected to the main electrical circuit.

NOTE: The junction box is located on the right side of the fireplace.

Wire the Fireplace

1. Route a 3-wire, 120 Vac, 60 Hz, single phase unswitched power supply to the fireplace junction box. If using a variable fan speed control, wire main power supply to variable speed control first, then wire from the variable speed control to the fireplace junction box.
2. Remove the electrical inlet cover plate from the outside of the unit by removing the plate securing screws.
3. Feed the power supply wires through the strain relief in the cover plate and into the unit junction box.
4. Connect the black power supply wire and the power outlet black lead wire together. Connect the white power supply wire and the power outlet white lead wire together (**Figure 18**).
5. Connect the ground supply wire to the green lead wire attached to the outlet's green ground screw (**Figure 18**). Restrain the inlet power lead per NEC or local codes.
6. After the wiring is complete, reinstall the cover plate.

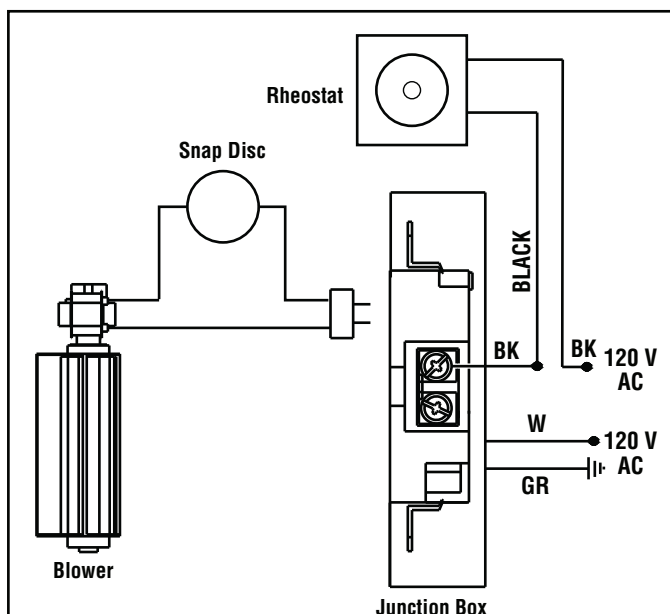


Figure 18 - Junction Box Wiring, 120 VAC, 60 Hz, 1 Phase

OUTSIDE AIR KIT

It is mandatory to install an outside air connection to the wood burning fireplace. The following components are required and are included with the fireplace:

- Outside air kit (includes 4" (102 mm) inside diameter flex that expands up to 10' (3m) feet long.
- 4" (102 mm) Adaptor for fireplace connection.

Outside Air Installation

The outside air assembly may be installed according to the following requirements:

- A) Duct length should be kept to a minimum. The maximum length of a 4" interior diameter (102 mm) insulated flexible duct is 20' (6.1 m). (See note below).
- B) The air intake register must not be installed more than 10' (3.1m) above the base of the fireplace.
- C) The fresh air must come from outside the house. The air intake must not draw air from the attic, basement or garage.
- D) The air intake should be installed where it is not likely to be blocked by snow or exposed to extreme wind and away from automobile exhaust fumes, gas meters and other vents.
- E) The duct and register may be installed above or below floor level.

Make a 4-1/4" (110 mm) hole in the outside wall of the house at the chosen location. From outside, place the outside air register in the hole (open side down) and fasten the register to the wall with screws as shown (see **Figure 19A**). Slip the pipe into the insulated sleeve. Place the insulated pipe over the register tube and over the fireplace's outside air connector (see **Figure 19B**). At each end, carefully pull back the insulation and plastic cover exposing the flexible pipe. Using aluminum foil tape, wrap the tape around the joint between the flexible pipe and the air inlets. Carefully push the insulation and plastic cover back over the pipe. Using aluminum tape, fasten the plastic cover in place.

NOTE: We recommend not to exceed 20' (6.1 m) of 4" (102mm) flexible pipe. If you require a longer length we recommend that you use a 5" (127 mm) diameter flexible pipe for the complete run up to thirty 30' (9.1 m) and a 6" (152 mm) diameter pipe for a run of up to forty 40' (12.2 m).

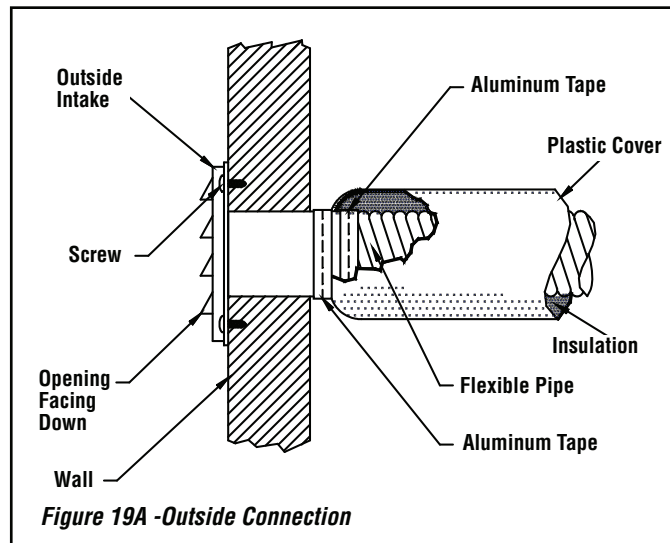


Figure 19A - Outside Connection

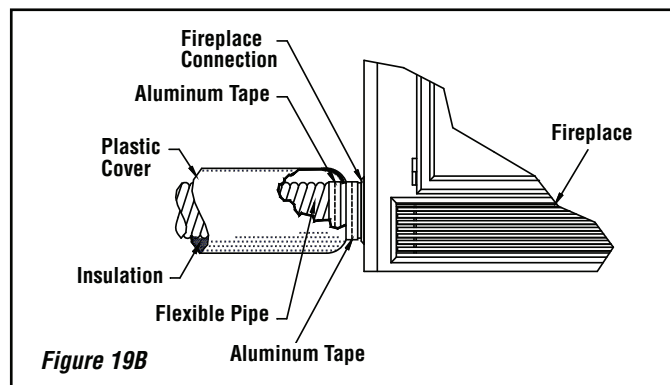


Figure 19B

HEATFLO CONVECTION KIT INSTALLATION

The Montecito™-C wood burning fireplace is approved for use with a HeatFlo Convection Kit (hot air ducting system).

KIT CONTENTS (See Figure 20):

The Ducted Flex Kit must use both hot air outlets and includes:

- 2 ea. Wall Thimble Assembly (item #1)
- 2 ea. Duct Adaptor (item #2)
- 2 ea. Duct Ring (item #3)
- 8 ea. #6-18 X 2 Drywall Screw (item #4)
- 22 ea. #10-16 X 3/4" Hex-Unslotted Drive Zinc Finish Self-Drilling Screw (item #5)
- 2 ea. 2 Ply 8" Dia. X 10' Aluminum Flex with R4 Insulated Sleeve (item #6)
- 2 ea. Grill, White (item #7)
- 4 ea. #6-18 X 1-1/2 White Oval Head Zinc Plated Phillips Screws (item #8)
- 1 ea. Instruction Sheet

TOOLS NEEDED:

5/16" hex driver and no. 2 Phillips screwdriver

EPA Fireplace - HeatFlo Convection Kit

Cat. No.	Model	Description
F3790	EPA-HEATFLO-KIT	EPA Heatflo Conv. Kit

Table 2

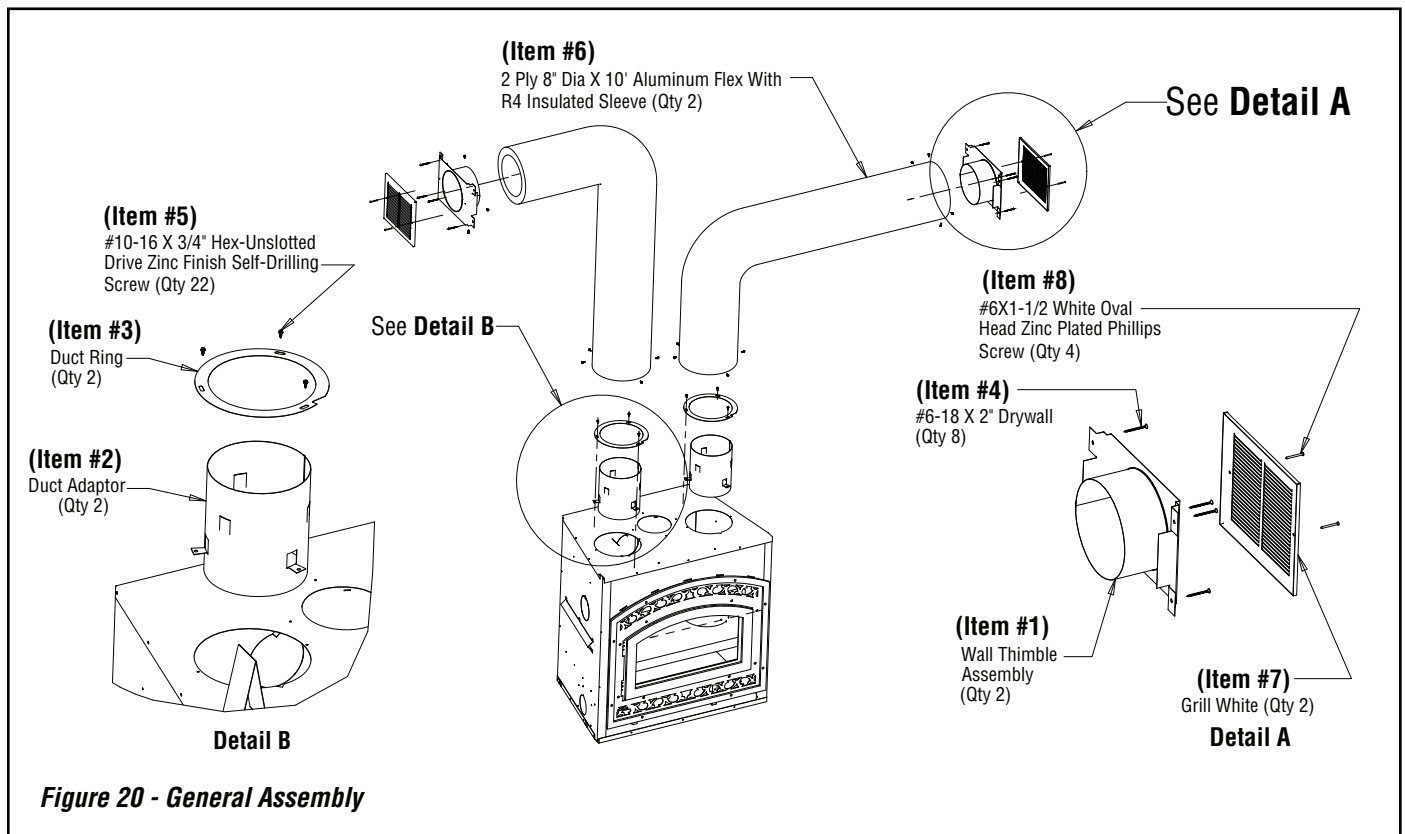
GENERAL INFORMATION

If you encounter any problems, need clarification of these instructions or are not qualified to properly install this kit, contact your local distributor or dealer.

Read this instruction sheet in its entirety before beginning the installation.

ALL WARNINGS AND PRECAUTIONS IN THE INSTALLATION AND OPERATION MANUAL PROVIDED WITH THE APPLIANCE APPLY TO THESE INSTRUCTIONS.

TURN OFF THE APPLIANCE AND ALLOW IT TO COMPLETELY COOL BEFORE PROCEEDING.



HEATFLO CONVECTION KIT INSTALLATION *(continued)*

INSTALLATION INSTRUCTIONS:

For approved installations, the ducted flex kit must meet the following requirements:

Minimum height: 68" (1.7m)

The height of the louver must be measured from the base of the fireplace to the center point of the louver.

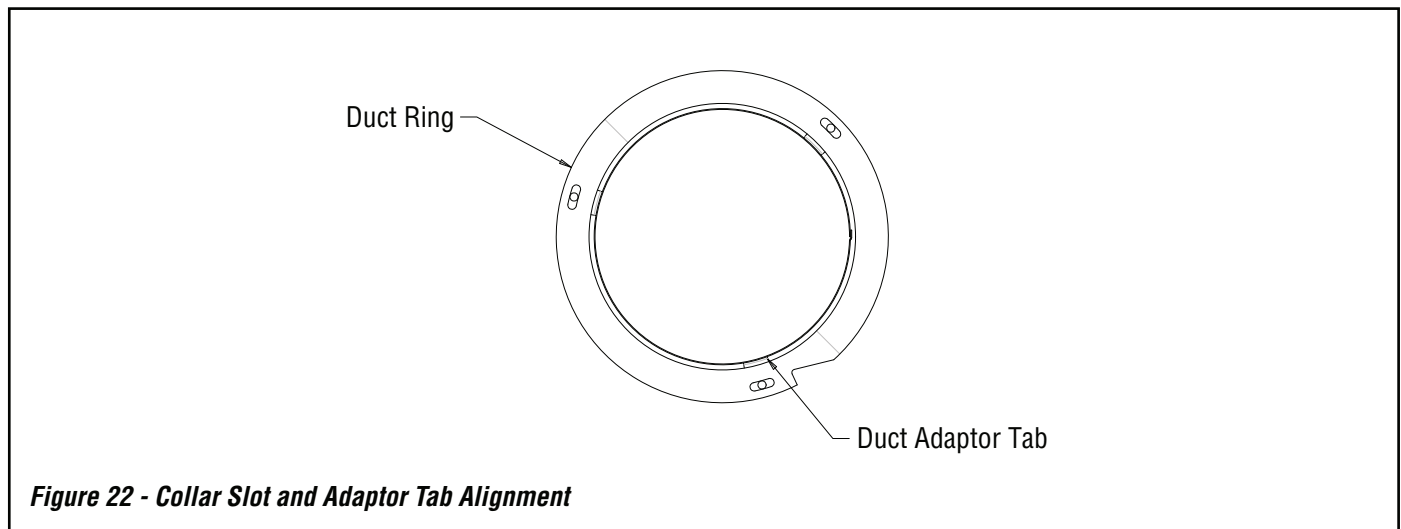
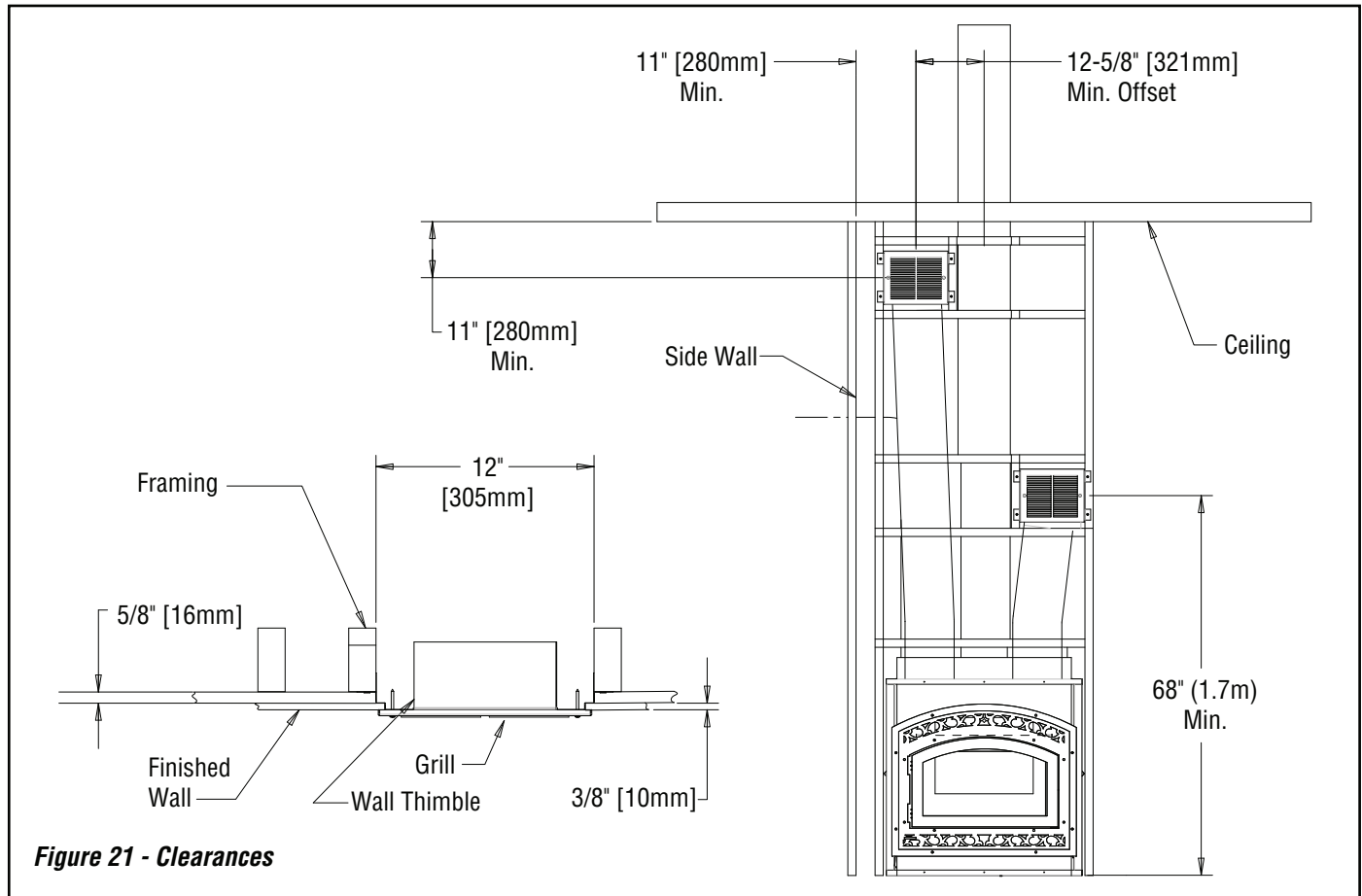
Minimum Ceiling and Side Wall Clearances: 11" (280mm)

Louver ceiling and side wall clearance must be measured from the bottom of the ceiling or from the side wall to middle point of the louver.

Maximum Length: 10' [3.1m] (See **Figure 21**)

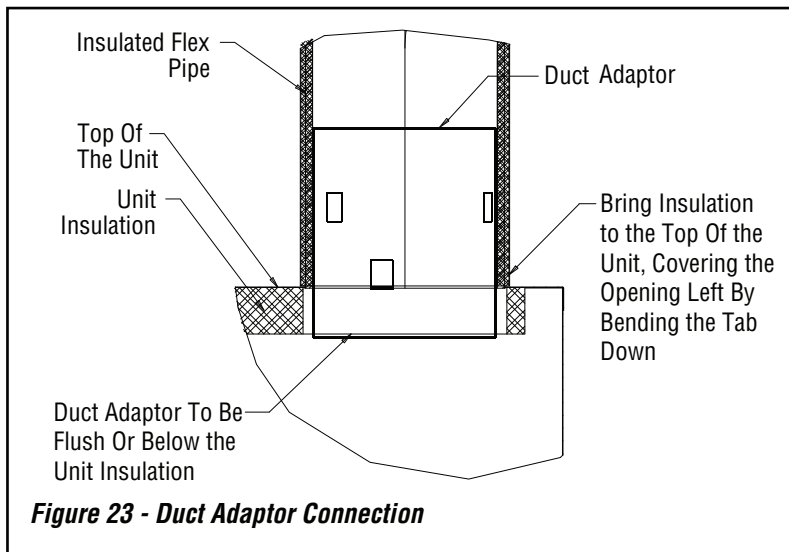
It is recommended that the ducted flex kit duct system be installed in the following order:

1. Plan and frame fireplace and outlet locations prior to ducted flex kit installation.
2. Remove the two 8" (203mm) diameter cutouts on top of the fireplace. Then, cut the insulation in order to obtain two 8" (203mm) diameter openings and remove the insulation.
3. On the duct adaptor, bend the appropriate tabs down so that the bottom of the adaptor is just below the bottom of the insulation.
4. Align the collar slots with the holes in the adaptor; fasten the collar and the adaptor to the top of the fireplace using 3 of the sheet metal screws provided. The collar will fit loosely around the openings (see **Figure 22**).



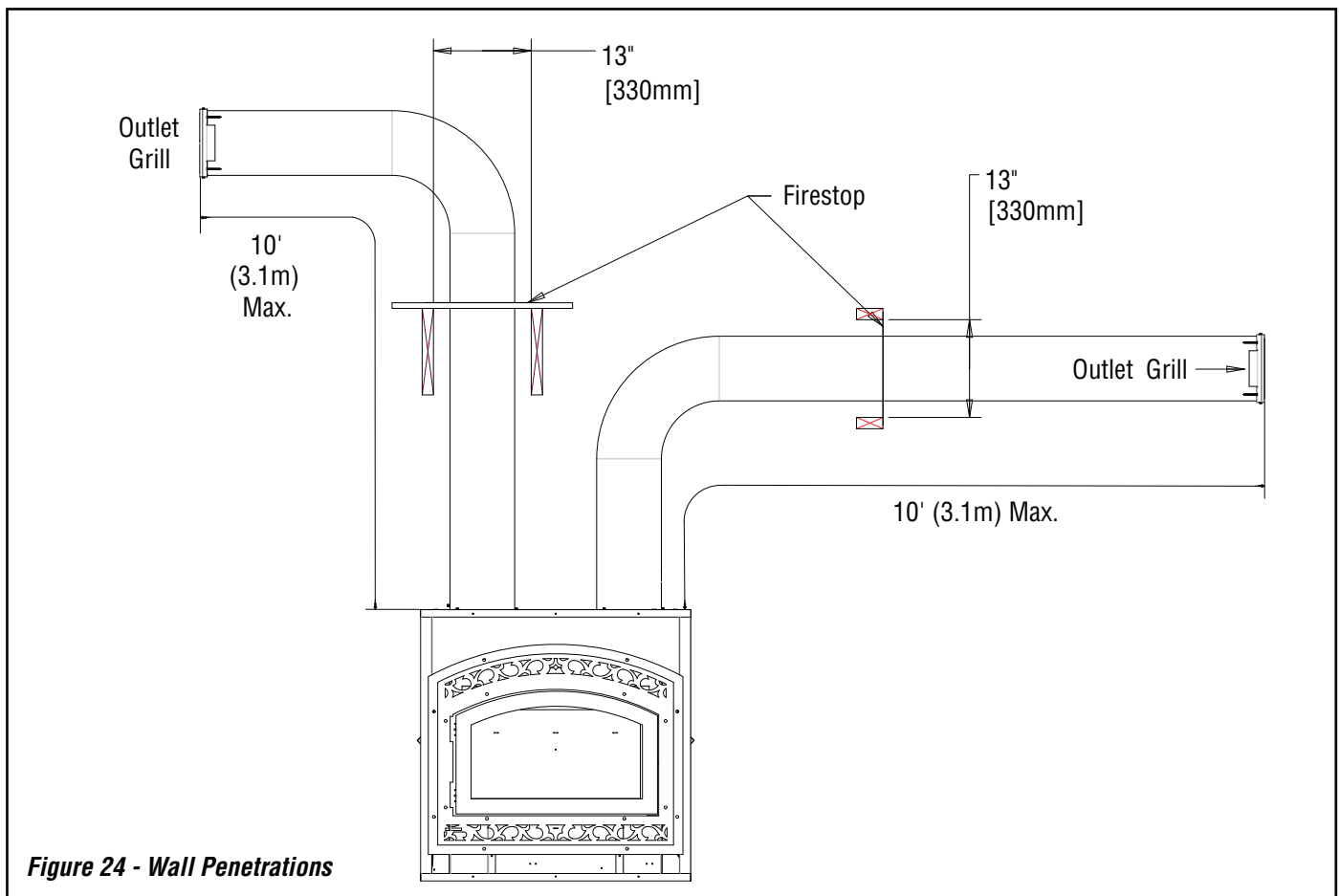
HEATFLO CONVECTION KIT INSTALLATION *(continued)*

5. Fit the wall thimble onto the flex-pipe, prior to the wall thimble installation, and fasten together using 4 sheet metal screws. Measure from top of fireplace to planned outlet location and trim the flex-pipe if necessary.
6. Install the wall thimble to the outlet framing using 4 of the supplied wood screws and run the flex pipe to fireplace.
7. Attach the bottom of the flex-pipe to the duct adaptor on the unit and secure using 4 of the supplied sheet metal screws. Bring the outside insulation and sleeve down to the top of the unit, ensuring that the openings in the duct adaptor, (left by bending the adaptor tabs down) are fully covered (see **Figure 23**).



INSTALLATION NOTES:

- When framing for the outlet grill: The minimum height from the bottom of the unit to the center of the outlet is 68" (1.7m) with the minimum distance from the center of outlet to the ceiling and for the center of the outlet to a side wall of 11" (279mm).
- Do not connect the hot air ducts to a central heating system.
- Use only IHP grills and components as described in this manual.
- Ensure that the flex insulation and sheathing do not touch the flue pipe.
- Never allow the pipe to pitch downwards. Never route the piping downwards.
- The hot air outlet grills must be installed with the louvers pointing downwards.
- The hot air outlets can be installed in the same room as the fireplace, or one or both of the outlets can be installed in adjacent or upper rooms. Installing the ducts at different elevations will tend to exhaust more heat out of the higher outlet.
- When traversing a combustible wall or floor, a firestop (not provided) must be installed at the wall or floor penetration. Maintaining a minimum 1" (25mm) clearance between the ducts and any combustible material, the hole size must be 13" X 13" (330mm X 330mm) (see **Figure 24**).
- Install to local codes and regulations.



NOTE: DIAGRAMS & ILLUSTRATIONS ARE NOT TO SCALE.

THE CHIMNEY SYSTEM (UNITED STATES & CANADA)

Chimney Installation Notes

1. The IHP fireplace model Montecito™-C may be installed only with IHP 6" Snap-Pak chimney in the United States or Security Chimney models ASHT & S2100 or DuraVent model DuraTech Canada (DTC) in Canada. The 6" & 7" Security systems are approved in Canada with the use of an adaptor.
2. If possible, install an interior chimney as it will provide better performance. In areas with continuous temperatures below -18° C (0° F), the use of an exterior chimney increases the likelihood of operating problems such as low draft, high rate of creosoting, and poor start-up characteristics. Exterior chimneys are also prone to down-draft with dry and flow reversal. Installations-which are located on lower floors in the house-such as in a basement, in combination with an outside chimney, are especially prone to flow reversal.
3. A chimney venting a fireplace shall not vent any other appliance.
4. The minimum chimney height is twelve 12' (3.7 m). To compensate for altitude, add 18" (450 mm) to the chimney for every 2,000 feet (600 m) above sea level.
5. **All chimney installations must include at least one support.** Reducing the amount of chimney weight on the fireplace will help avoid the noise created when the fireplace expands. This can be achieved by having the chimney supported by the supports. The maximum chimney length that can be supported by the fireplace is nine 9' (2.75 m).
6. The chimney must extend at least three 3' (915 mm) above its point of contact with the roof and at least two 2' (610 mm) higher than any wall, roof or building within ten 10' (3m) of it.
7. If the chimney extends higher than five 5' (1,500 mm) above its point of contact with the roof, it must be secured using a roof brace.
8. A rain cap must be installed on top of the chimney. Failure to install a rain cap may cause corrosion problems.
9. Cut and frame square holes in all floors, ceilings, and roof that the chimney will go through to provide a 2" (51 mm) clearance between the chimney and any combustible materials. Do not fill this 2" space with insulation or any other combustible material.
10. Portions of the chimney which may extend through accessible spaces must be enclosed to avoid contact with combustible materials or damage to the chimney.
11. When offsets are used, the pipe may not penetrate a ceiling or floor unless it is running vertical (no 30° offsets).

NOTE: 2" (51 mm) clearance to combustibles around chimney components required.

NOTE: Blown or fill type insulation materials must not be in contact with the fireplace or in the enclosure frame as described in "Enclosure" section.

NOTE: Local codes may not require firestopping at the ceiling levels for outside chase installations. However, it is recommended for safety and the reduction of heat loss.

UNITED STATES ONLY CHIMNEY INSTALLATION INSTRUCTIONS USING IHP SNAP PAK (SP)

UNITED STATES APPROVED VENTING SYSTEMS:

6" diameter chimney: Model IHP Snap-Pak, including:

- Chimney lengths
- Elbows (*where necessary*)
- Associated components as per these installation instructions

INSTALLATION THROUGH FLAT CEILING(S)

1. Using framing lumber equal to ceiling joist size, frame ceiling opening as shown in **Figure 25** and **Table 3**.

Chimney Flue Diameter - 6"	
A	12-7/16"
B	12-7/16"

Table 3

If the area above the ceiling is an attic, go to step 5.

2. Install SNAP-PAK chimney sections starting at the top of the appliance. Leave the first section loose until the installation is complete to allow the chimney to be rotated, easing the installation of any offsets if they are used. Secure subsequent sections by pushing together until stop-locked (see **Figure 26**).

3. If IHP Elbows are to be used because the chimney is to be offset, refer to "Installation of Elbows" section. Directly above the Center of the flue in the ceiling support, mark the ceiling. A plumb bob is normally used to find the center. Cut an opening in the ceiling using **Figure 25** and **Table 3**.

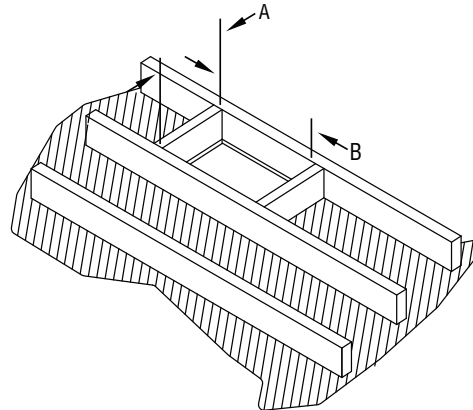
4. At each ceiling penetration, a firestop (6SPFS) is required. Insert the 6SPFS into the joist area prepared in **Figure 25**.

NOTE: When the chimney extends between floors-which can be occupied-the chimney must be enclosed to prevent contact. As previously noted, 2" minimum clearance to combustibles is to be maintained at all times.

5. The first chimney section through the joist area into attic is to be approximately 2'. If the pipe sections in the attic are not enclosed, an insulation shield (6SPIS) must be installed. Lower the insulation shield (6SPIS) over the SP pipe until the SPIS flange is resting on the joist. Secure the SPIS in place by nailing the flange to the joist. See **Figure 27**. If the section within the attic area is to be chase enclosed, the SPIS is not required.

WARNING: Do not place any type of insulation in the required clearance spaces surrounding the chimney.

6. Continue the chimney to the roof. See "Flashing Installation" and "Termination" sections.



Framing lumber of equal size to the joist should be used.

Figure 25

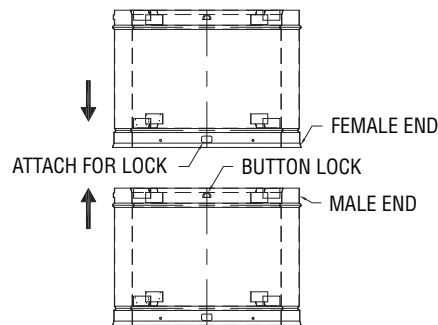


Figure 26

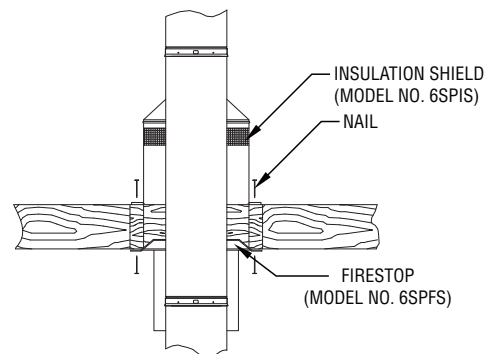


Figure 27

INSTALLATION THROUGH A SIDE WALL

1. It is recommended that exterior mounted chimneys be enclosed below the roof line in geographical areas experiencing sustained low ambient temperatures to help reduce or limit condensation, creosote buildup and poor draft.
2. Locate the area where the chimney section is to penetrate the vertical wall studs. Cut and frame an opening so that the flue is centered between the vertical wall studs. Frame opening per **Figure 28** and **Table 4**.

Chimney Flue Diameter - 6"	
A	12-7/16"
B	13"

Table 4

3. A 2-piece wall firestop (6SPWF) must be installed in the framed opening from outside. The stainless portion is first installed from the outside of the opening. Push the remaining half through the opening from the inside until the plate is flush with stud. Use four (4) # 10 x 2-1/2" wood screws to attach opening (see **Figure 29**). Seal the outside plate with RTV sealant or similar.

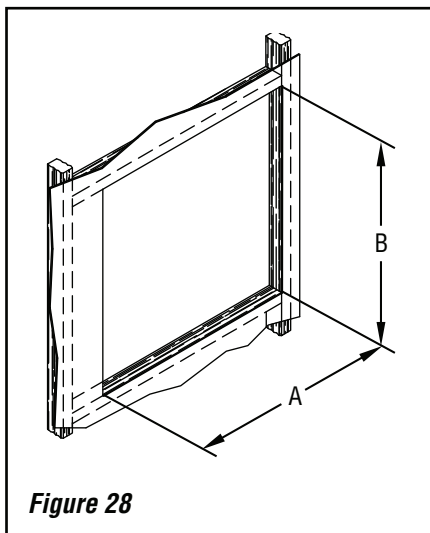


Figure 28

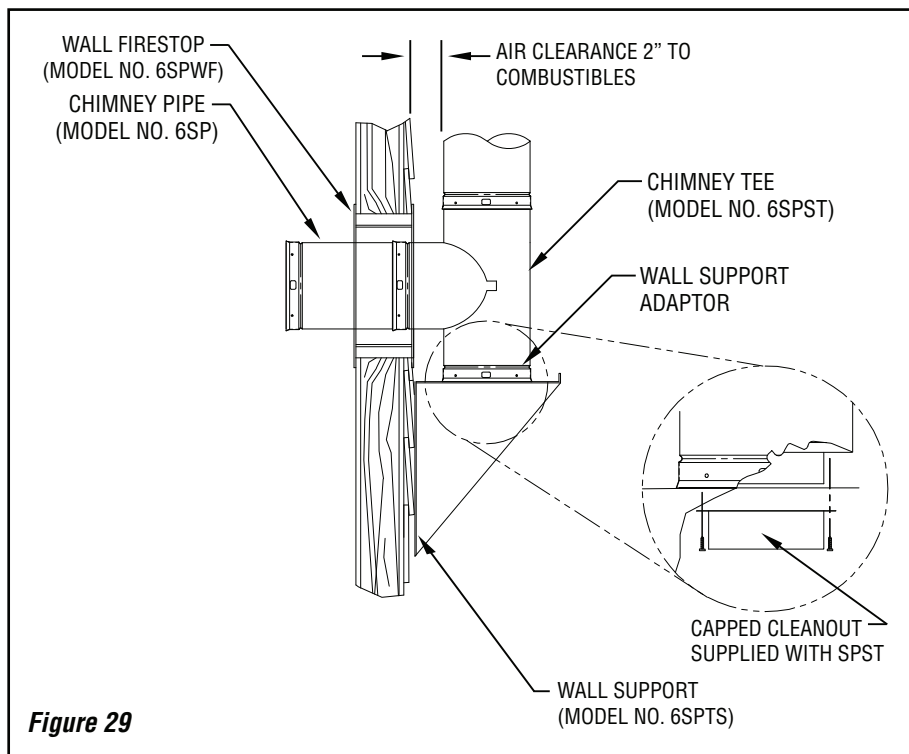


Figure 29

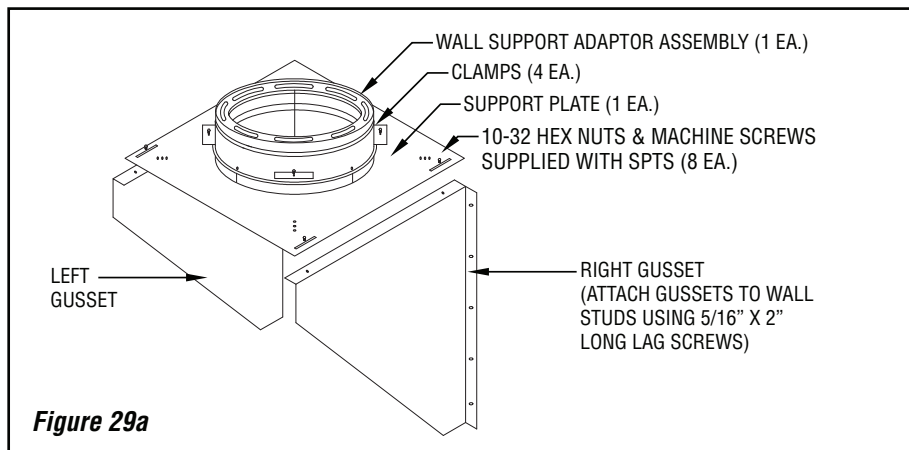


Figure 29a

4. Remove the wall support adaptor pieces from the SPSTs box and attach the adaptor to the bottom of the tee by inserting it into the bottom of the tee and push to lock.
5. Push the side portion of the tee into the opening in the wall firestop.
6. Assemble the right and left gussets to the support plate using the hardware provided.
7. Attach wall support plate to wall support adaptor using 4 clamps provided. Do not tighten. (See **Figure 29a**).
8. Align the wall support with the wall and secure it to the wall studs using 5/16" x 2" lag screws (not provided). **DO NOT SECURE TO SIDING**. For masonry walls, use 5/16" x 2" masonry lag bolts.
9. Install the tee cap to the bottom of the wall support adaptor with a minimum of two (2) #10 x 1/2" sheet metal screws.
10. Position the tee and the adaptor on wall support to maintain 2" (51 mm) clearance to combustibles. AT THIS POINT TIGHTEN CLAMPS.
11. Slide IHP chimney pipe into top of tee. Align male and female ends. Push down on pipe sections until locked. As sections are added, it will be necessary to secure them to the outside wall with bands (6SPWB) at eight foot intervals and 2" from combustibles. Wall Bands (6SPWB) are secured to the chimney by placing band around the chimney and tightening clamping bolt. The assembly is anchored to the wall studs (not the siding) with 5/8" x 2" lag bolts. To complete the chimney installation, see "Flashing Installation" and "Termination" sections.

NOTE: DIAGRAMS & ILLUSTRATIONS ARE NOT TO SCALE.

ELBOW INSTALLATION

1. IHP provides 15° (6SPSE15) and 30° (6SPSE30) elbows to allow chimneys to avoid framing members or roof peaks. A maximum of 30° from the vertical is allowed, and a total of four elbows (two pair) for each chimney installation. Maintain 2" (51 mm) clearance to combustibles.
2. Attach the elbow(s) to the chimney pipe or other support part and push to lock. Using the offset chart (see **Table 5**), add chimney sections between the elbows. A support band (6SPSB) is required at the upper elbow of the pair to support the load, as shown in **Figure 30**. Attach the upper elbow to bring the chimney back to vertical.

Offset combinations: see **Table 5** and illustration, **Figure 31**.

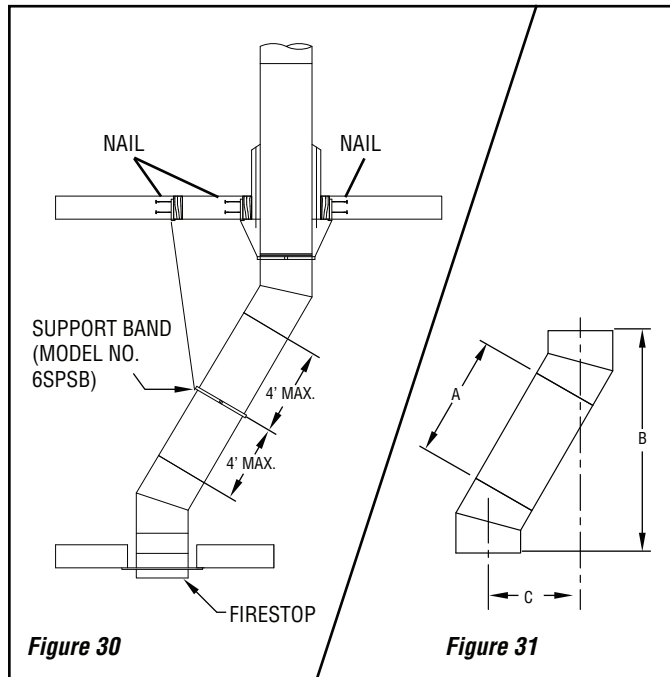


Figure 30

Figure 31

6" DIAMETER CENTER LINE OFFSET TABLE					
A		15° Angle		30° Angle	
Length	No. Pcs.	B	C	B	C
0	0	18-7/16"	2-1/4"	20-3/16"	5"
6"	1	22-13/16"	3-3/8"	24-1/16"	7-1/4"
12"	1	28-5/8"	4-15/16"	29-1/4"	10-1/4"
18"	1	34-3/8"	6-1/2"	34-7/16"	13-1/4"
24"	1	40-3/16"	8-1/16"	39-5/8"	16-1/4"
30"	2	44-1/2"	9-1/4"	43-1/2"	18-1/2"
36"	1	51-3/4"	11-3/16"	50-1/16"	22-1/4"
42"	2	56-1/8"	12-3/8"	53-15/16"	24-1/2"
48"*	1	63-3/8"	14-1/4"	60-7/16"	28-1/4"
54"*	2	67-3/4"	15-7/16"	64-3/8"	30-1/2"
60"*	2	73-1/2"	17"	69-1/2"	33-1/2"
66"*	2	79-11/16"	18-1/2"	74-3/4"	36-1/2"
72"*	2	85-1/2"	20-1/16"	79-15/16"	39-1/2"
78"*	3	89-7/16"	21-1/4"	83-13/16"	41-3/4"
84"*	2	96-11/16"	23-3/16"	90-5/16"	45-1/2"
90"*	3	102-3/8"	24-3/8"	94-3/16"	47-1/2"
96"*	2	108-1/4"	26-5/16"	100-11/16"	51-1/2"

Table 5

FLASHING INSTALLATION

1. Continue the SP chimney to the roof. Cut the roof opening, centered over the chimney. A 2 inch-airspace around the chimney is required as it penetrates the roof. The size of hole in the roof will vary depending on the roof pitch.
 2. Install the next SP chimney section through the roof. See **Figure 32**.
- NOTE:** If your roof is already shingled, be sure to slide the upper edge under the shingles to prevent leakage.
3. Install a bead of caulk around the pipe at the top edge of the flashing. Wrap the storm collar around the pipe and imbed the edge in the caulk to prevent leakage around the pipe.
 4. Continue to install pipe sections until the proper termination height is reached. See termination section.

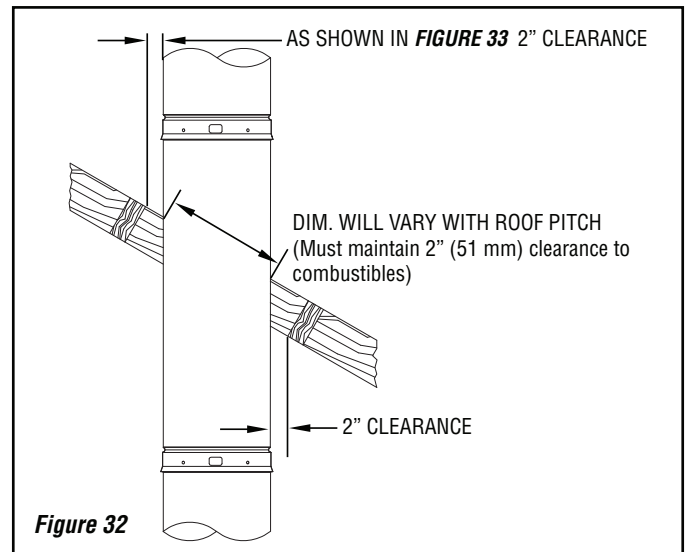


Figure 32

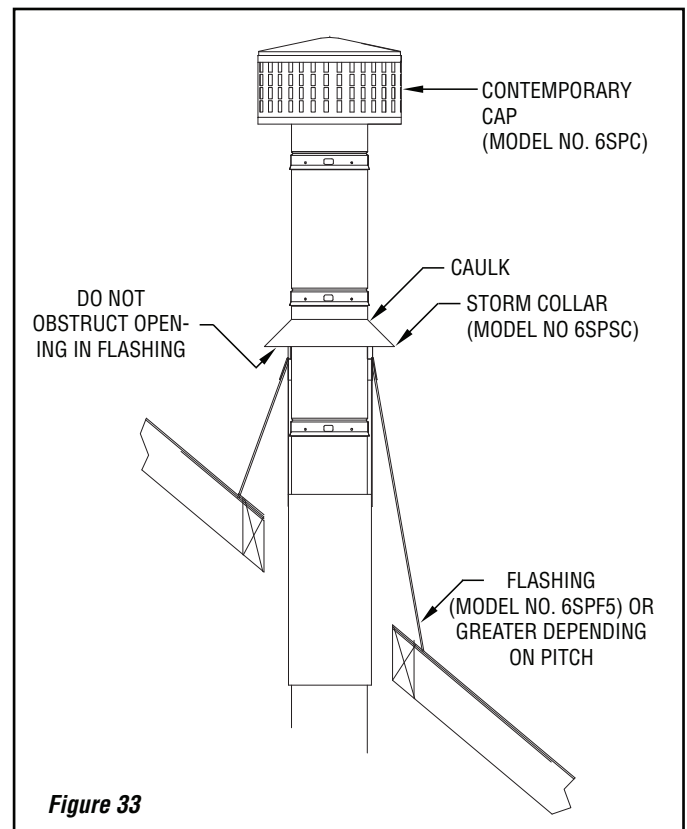


Figure 33

NOTE: DIAGRAMS & ILLUSTRATIONS ARE NOT TO SCALE.

TERMINATION

Many building codes specify a minimum chimney heights above the roof top. These specifications are summarized in what is known as the "Ten Foot Rule". This rule states:

If the horizontal distance from the side of the chimney to the peak of the roof is 10 feet or less, the top of the chimney must be at least 2 feet above the peak of the roof, but never less than 3 feet in overall height above the highest point where it passes through the roof (**Figure 34**).

If the horizontal distance from the side of the chimney to the peak of the roof is more than 10 feet, a chimney height reference point is established on the surface of the roof a distance of 10 feet from the side of the chimney in a horizontal plane. The top of the chimney must be at least 2 feet above this reference point, but never less than 3 feet in height above the highest point where it passes through the roof (**Figure 35**).

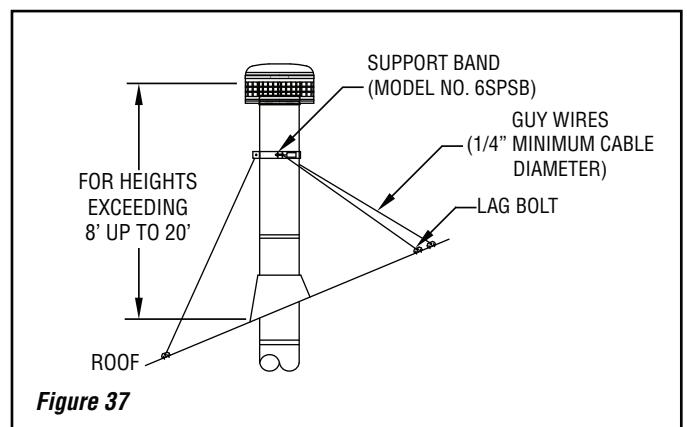
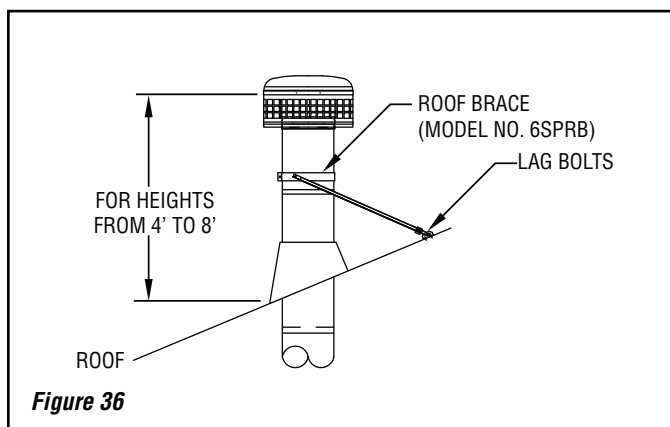
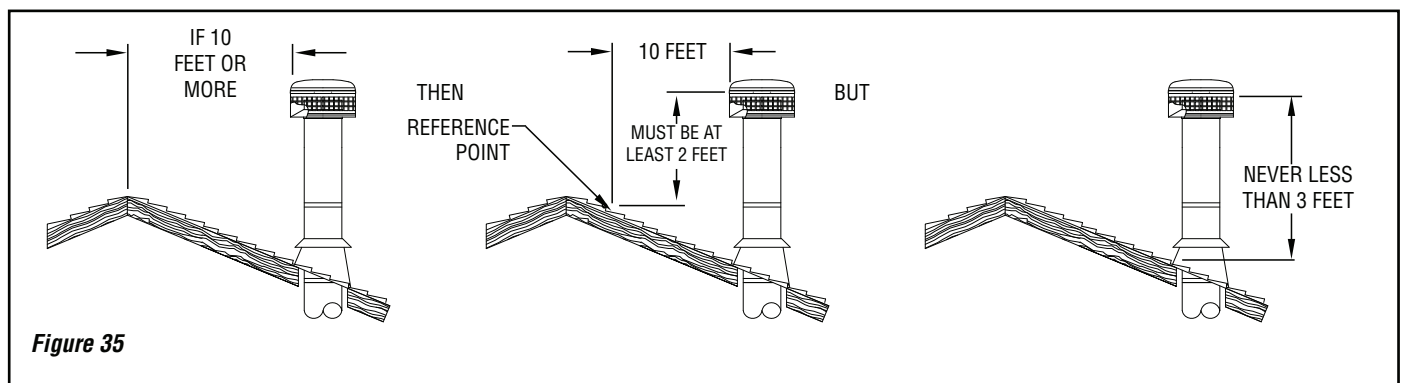
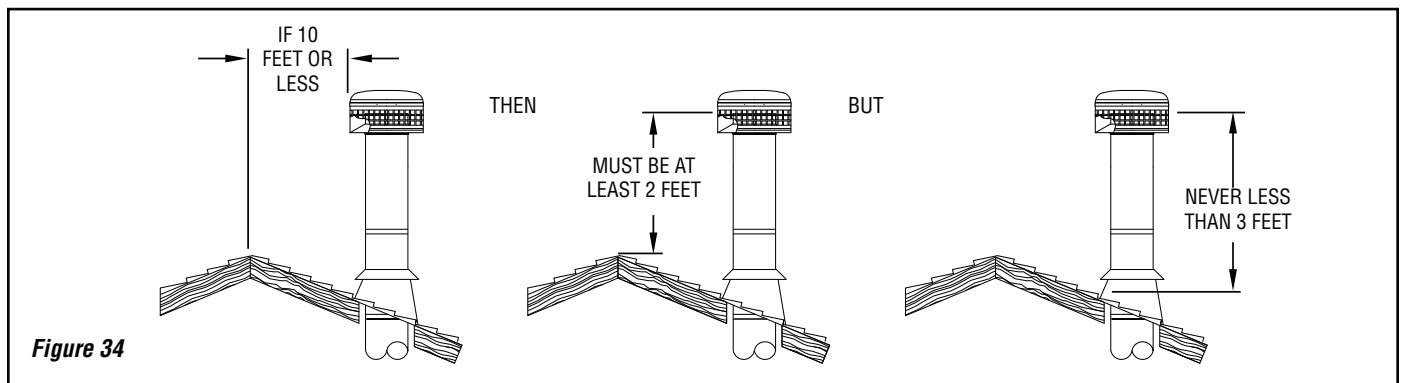
These chimney heights are necessary in the interest of safety and do not ensure smoke free operation. Trees, buildings, adjoining roof lines, adverse wind conditions-etc., may create a need for a taller chimney, should smoking occur.

Additional support is required above the roof if the chimney height exceeds four (4) feet.

Select the proper support for your application-using either a roof brace (**Figure 36**), or a support band with guy wires (**Figure 37**)

SP ROOF BRACE INSTALLATION

1. Assemble the attachment support band (6SPSB) around the chimney, and clamp it in place at the desired height using the nut and bolt provided.
2. Loosely attach the support legs to the bolts on the attachment band using hardware provided.
3. Position the support legs as shown in **Figure 36**. The length of the support legs can be adjusted by loosening the bolt on the leg clamp.
4. Secure legs to roof using screws provided. Seal screw holes to prevent roof leaks.
5. Tighten all hardware.



CANADA ONLY CHIMNEY INSTALLATION INSTRUCTIONS

CANADA APPROVED VENTING SYSTEMS:

6" diameter chimney - Canada

Security Chimney: Secure Temp ASHT+ or S2100+, DuraVent: DuraTech Canada or Duratech Premium, including:

- Chimney lengths
- Elbows (*where necessary*)
- Associated components as per these installation instructions and instructions provided by the venting Manufacturer

Reference the installation instructions provided by venting manufacturer.

CHIMNEY ADAPTOR-CANADA ONLY

The fireplace is normally supplied with a chimney adaptor suitable for use with IHP SnapPak venting. In Canada, the use of Security Chimneys ASHT adaptor is required (Security part number 6IHP1* or 6IHP2**).

* One inch wall

** Two inch wall

Chimney Adaptor - Canada only

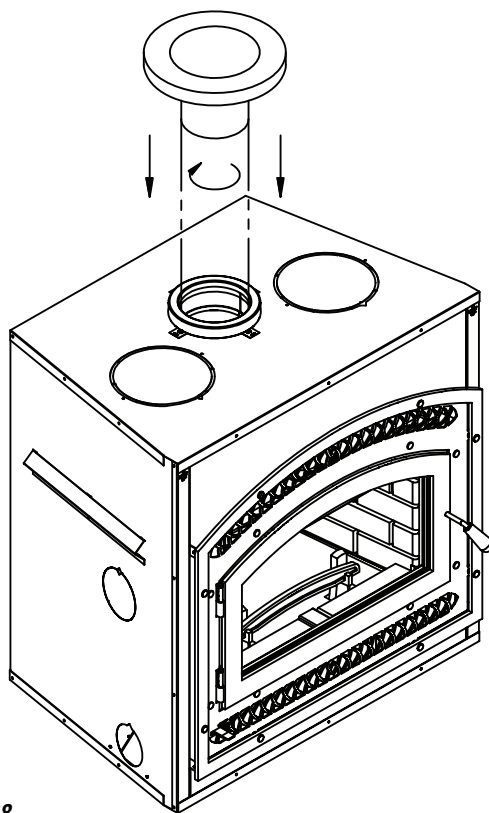


Figure 38

CHIMNEY CHASE AND MULTIPLE TERMINATIONS

For the purpose of this manual, a chimney chase is considered a part of the chimney system rather than part of a building. The termination must be placed a minimum of 18" (460 mm) above the chase.

For installations where more than one chimney is located in the same chase or within the same area, we suggest that their terminations be separated by at least 16" (410 mm) horizontally, and 18" (460 mm) vertically. This separation is to prevent smoke migrating from one chimney to another (see **Figure 39**).

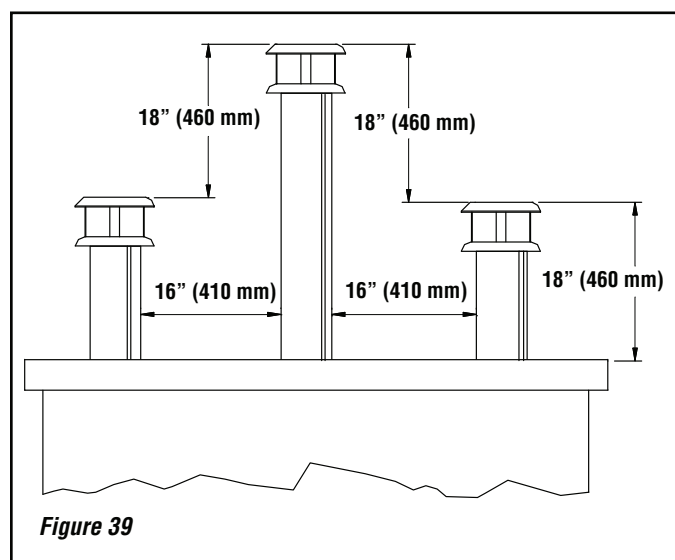


Figure 39

INSTALLATION INSTRUCTIONS FOR MASONRY APPLICATIONS FOR BOTH UNITED STATES AND CANADA

WARNING: Before starting the installation, the masonry chimney must be inspected by a qualified chimney sweep.

The following requirements must be followed:

1. The chimney must be absolutely clear of any soot residue or creosote. Check for cracks, loose or missing bricks that could inhibit correct installation of the liner.
2. The clearance to combustibles must be a minimum of 1" (25 mm) between the outside of the masonry and any wood framing or loose insulation.
3. The chimney must be built in accordance with the current building code.
4. No other appliance can be connected to the same chimney.
5. The clearances to combustibles for these fireplace connectors are 2" (51 mm) on the side and bottom and 16" (406 mm) at the top.
6. The connector parts are not necessary if the connection between the insulated length and the stainless steel liner is done within the masonry chimney.

Installation:

Rigid stainless liner or stainless flex must be used and listed to UL-1777 for US applications and ULC-S635 for existing masonry or ULC-S640M for new masonry applications in Canada. The steel rigid or flex liner must be rated at 2100° F (1100° C).

Follow these steps:

1. Position the fireplace in its location. Temporarily install the 30° insulated elbow on the top of the fireplace and, using a level, mark with an oval the location where the flue liner will enter the masonry chimney.
2. In the middle of the oval, drill a hole in the masonry chimney at 30°.
3. Increase the size of the hole until a 30° liner elbow can be easily slipped through.
4. Slide the liner down from the top of the masonry chimney until you reach the hole level.
5. Slip through the hole a 30° liner elbow and connect it to the liner.
6. Add a small liner section to the other end of the liner elbow which will allow the liner to extend at least 12" (305 mm, measured at the top of the liner) from the masonry chimney.
7. Seal the opening around the liner with high temperature refractory cement.
8. The next steps must be done in the following order:

See typical installation illustrated below (Figure 40).

- A. Select the insulated pipe length that will fit between the 30° insulated elbow on top of the appliance and the exposed liner so that it will slide at least 2" (51 mm) over the liner section (You may need to cut the liner for a better fit).
- B. Take that section and attach the pipe to the insulated liner connector and slide it over the liner. Make sure you have enough opening to be able to install the elbow without difficulty.
- C. Install the 30° elbow on the fireplace.
- D. Slide the length section back down on the elbow and twist lock the two together.
- E. Pull the cover down over the length and install the insulation pad over the liner; be careful to cover the liner completely.
- F. Slide back the cover over the insulation and fix it in place using the 3 metal screws supplied.

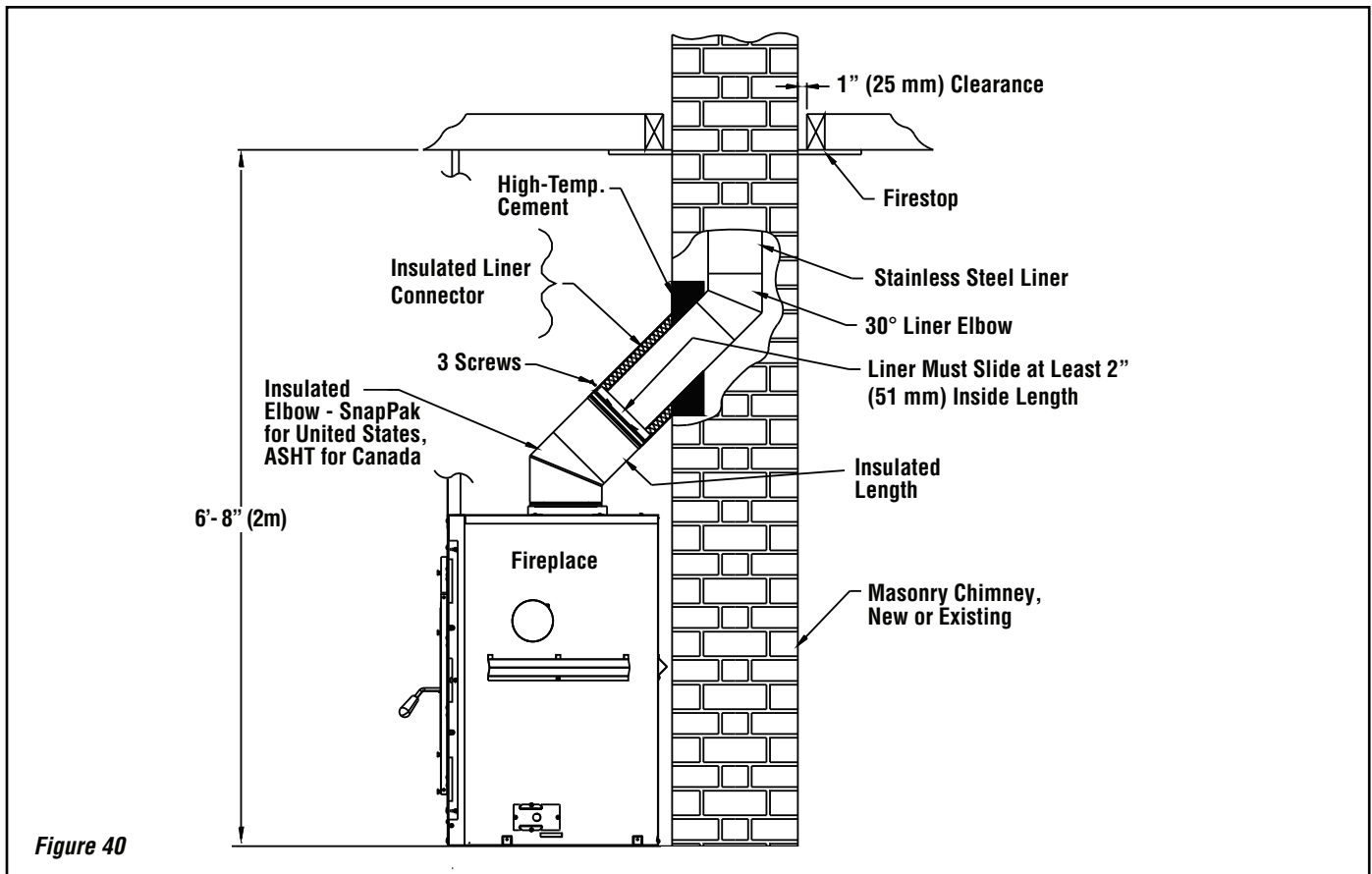


Figure 40

NOTE: DIAGRAMS & ILLUSTRATIONS ARE NOT TO SCALE.

OPTIONAL INSTALLATION ACCESSORIES

Installation Accessories	
Description	Cat./ Part No.
Facades (Required - Order Separately)	
Montecito™-C Facade Black, MFBK	F2320
Doors (Required - Order Separately)	
Montecito-C Door, Black, MCBK	F1857
Cast Iron Door, Black, BWBK	F1859
Outside Air Kit (included with fireplace)	
Outside Air Coupler To Connect Outside Air (UZI) To Fire-place, UZIAD	UZIAD
Outside Air Ducting - includes 4" insulated flex x 10' long, UZI	UZI
EPA Fireplace - HeatFlo Convection Kit	
EPA Heatflo Conv. Kit, EPA-HEATFLO-KIT	F3790

Fireplace Kits	
Description	Cat./ Part No.
Central Forced Air Kit Accessories	
Central Forced Air Kit, Central forced air kit including: blower (BISZY), flex adaptor (BISAF), 2 clamps, variable speed control (VRUW), thermo-disk (VTU), fan to flexible pipe adaptor (BISAVF), back draft damper (BISBD), aluminum tape, BISFWK-1	BISFWK-1
Flexible pipe 5" I.D. x 15 ft. Long, 5FLEX15	5FLEX15
Flexible pipe 5" I.D. x 30 ft. Long, 5FLEX25	5FLEX25
Heating and cooling thermostat, 24V, HCTW	HCTW

REPLACEMENT PARTS LIST

Montecito™-C Replacement Parts	
Description	Cat. No.
Blower Assembly, Single	F3866
Blower Wiring Harness	F4801
Blower motor speed control (wall mount)	VRUW
Snap Switch, 110°-20°	H8682
Baffle refractory (2 pieces)	PR-IS02205
Back refractory	PR-SR2618
Right side refractory	PR-SR2619D
Left side refractory	PR-SR2619G
Bottom refractory	PR-SR2201
Front refractory, right side	PR-SR2202D
Front refractory, left side	PR-SR2202G
Door handle	PR-SR1787
Door rod and lock	PR-SR2118
Hinge Assembly, Fireplace and Door	PR-SR2395TCE
Decorative Screw Caps, Black (2)	PR-SACMEFBK
Ceramic glass panel	PR-SR2222-1
Secondary air tube	PR-SR2271
Secondary Air Tube Retaining Bracket	PR-SR2214
Cast iron Log Retainer Supports - Andirons (2)	PR-SR2324
Cast Iron Log Retainer Bar	PR-SR2323
Gasket Kit, Glass, 69" (1 x 5/16") (steel and cast doors)	PR-SR1823H
Gasket Kit, Steel Door Frame, 73" (5/8" dia.)	PR-SR1685D
Gasket Kit, Cast Door Frame, 73" (5/8" dia.)	PR-SR1823G
Touch-up Paint, Aerosol, Satin Black	F5035
Coupler, Outside Air (connects UZI to fireplace)	UZIAD
Blower 250 CFM for central forced air kit	BISZY
Blower to flexible pipe adaptor	BISAVF
Backdraft damper	BISBD
Fireplace to Flex adaptor and 2 clamps	BISAF
Metal Fab Collar and Sleeve	F4189
Top Standoff Header Shield Assy	F4713
Damper Rod	H8393
HeatFlo Cover Plate Kit	F5083

Contact an IHP dealer to obtain any of these parts. Never use substitute materials not approved by IHP. Use of non-approved parts can result in poor performance and safety hazards.

SPECIFICATIONS

Cat. No.	Model No.
F5117	Montecito-C

Model	Emission Rate	Heat Output	EPA Estimated Efficiency *
Montecito-C	1.5 g/hr	14,500-81,000 btu/hr	63% HHV

* Efficiency determined per CSA B415.1.

Product Reference Information	
Weight	330 lbs
Height	38"
Width	37-1/4"
Depth	25-1/8"

IHP SNAP-PAK CHIMNEY (USA) - PARTS AND COMPONENTS LISTS

The components listed below must be ordered from IHP. Contact your IHP Distributor or Dealer for ordering information.

6" Snap-Pak Chimney		
Snap-Pak 6" Wood-Burning Chimney Lengths and Fittings (6" Inner Diam. - 9" Outer Diameter). Listed to UL103HT (2100° Intermittent, 1000° Continuous)		
Cat. No.	Model	Description
F3966	6SPS6-2	6" SS Chimney Length (2pk)
F3967	6SPS12-2	12" SS Chimney Length (2pk)
F3968	6SPS18-2	18" SS Chimney Length (2pk)
F3969	6SPS24	24" SS Chimney Length
F3970	6SPS36	36" SS Chimney Length
F3971	6SPS48	48" SS Chimney Length
F3972	6SPSE15-2	15° SS Elbow (2pk)
F3973	6SPE30-2	30° SS Elbow (2pk)
F3974	6SPFS	Firestop Spacer
F3975	6SPIS	Insulation Shield
F3976	6SPFF	Flat Flashing
F3977	6SPF5	2/12-5/12 Flashing
F3978	6SPF10	6/12-10/12 Flashing
F3980	6SPRB	Roof Brace
F3981	6SPSC	Storm Collar
F3982	6SPC	Round Cap with Spark Arrester
F3983	6SPWF	Non-Insulated Wall Firestop
F3984	6SPAS	Adjustable Support
F3985	6SPWB	Wall Band
F3986	6SPSB	Support Band
F3991	6SPST	Tee SS (Tee Cap Included)
F3992	6SPTS	Tee Support
F3993	6SPATS	Adjustable Tee Support

CANADA: Security Chimney: Secure Temp ASHT+ or S2100+, DuraVent: DuraTech Canada or Duratech Premium

Contact your Security Chimneys or DuraVent Distributor or Dealer for ordering information.

Security Chimneys® 2125 Monterey, Laval, Quebec Canada, H7L 3T6 securitychimneys.com	450-973-9999 1-800-361-4909 (USA) 1-800-667-3387 (Canada)
--	---

M&G DuraVent 877 Cotting Court, Vacaville, California, 95688 duravent.com	1-800-835-4429
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Report No. / Rapport n°
14-199 R1

LISTED FACTORY BUILT FIREPLACE
FOYER PRÉFABRIQUE HOMOLOGUÉ

FIREPLACE, ALSO FOR USE IN MANUFACTURED

HOMES WITH SOLID FUEL ONLY

CE FOYER EST ÉGALEMENT CERTIFIÉ POUR
INSTALLATION DANS LES MAISONS MOBILES.
COMBUSTIBLES SOLIDES SEULEMENT.



Manufactured by / Fabriqué par:
INNOVATIVE HEARTH PRODUCTS
1769 East Lawrence Street
Russellville, AL 35654 USA

Serial No.
Numéro de série
Model / Modèle: Montecito™-C

Conforms to / Conforme au : UL STD 127
Certified to / Certifié au : ULC STD S610

EPA certification test emission value 1.5 g/hr Per NYSEDA IDC ATM dated May 21, 2025
Valeur d'émission du test d'homologation 1,5 g/h selon la norme NYSEDA IDC ATM par May 21, 2025

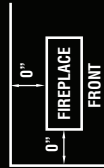
CLEARANCES TO COMBUSTIBLES:

SIDE WALL (FROM FIREBOX OPENING) 24 in. (610 mm)
FRAME HEIGHT OPENING 56 in. (1422 mm)
BACK WALL (FROM STANDOFFS) 0 in. (0 mm)
CEILING HEIGHT (FROM BASE OF FIREPLACE) 6 ft. 8 in. (2032 mm)
CHIMNEY 2 in. (51 mm)

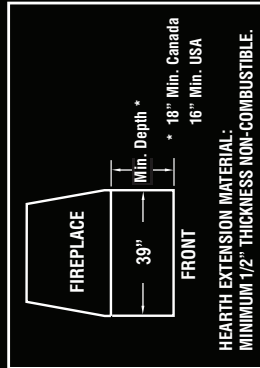
DÉGAGEMENTS AUX COMBUSTIBLES:

MUR LATÉRAL (À PARTIR DE L'OUVERTURE DE LA CHAMBRE DE COMBUSTION) 24 po. (610 mm)
OUVERTURE HAUTEUR DU CADRE 56 po. (1422 mm)
MUR ARRIÈRE (À PARTIR DES ENTRETOISES DE DÉGAGEMENT) 0 po. (0 mm)
AU-DESSUS DU FOYER (À PARTIR DE LA BASE DU FOYER) 6 pi. 8 po. (2032 mm)
CHEMINÉE 2 po. (51 mm)

MINIMUM CLEARANCES TO FINISHED FRAMED OPENING, IN INCHES
NOTE: Dimensions are to the standards



MINIMUM FLOOR PROTECTION FROM OPENING
CENTERED ON FIREPLACE, IN INCHES



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

Date of Manufacture / Date De Fabrication
2025 JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
REV. 0, 07/2025

- USE WOOD FUEL ONLY
- A NON-COMBUSTIBLE HEARTH EXTENSION MUST BE INSTALLED AT FRONT OF UNIT EXTENDING 18" (457 mm) IN CANADA (OR 16" USA) AND 39" (991 mm) WIDE MINIMUM.
- ANY MANTEL MUST BE NON-COMBUSTIBLE.
- WARNING: THIS FIREPLACE HAS NOT BEEN TESTED WITH UNVENTED GAS LOG SET. TO REDUCE RISK OF FIRE OR INJURY DO NOT INSTALL AN UNVENTED GAS LOG SET INTO THE FIREPLACE.
- ELECTRICAL RATING: 120 VAC, 60 Hz
- CHIMNEY TYPE: USE ONLY WITH 6 IN. DIAMETER - USA: IHP SNAP-PAK CAN; SECURE TEMP ASHT+ OR S2100+, DURATECH CANADA OR DURATECH PREMIUM.
- CAN BE CONNECTED TO A MASONRY CHIMNEY AS DESCRIBED IN THE INSTALLATION INSTRUCTIONS.
- COMPONENTS USED WITH THE FIREPLACE MUST BE LISTED. SEE LIST IN THE INSTALLATION INSTRUCTIONS.
- REPLACE GLASS WITH CERAMIC GLASS 5 mm THICK.
- FOR SAFE OPERATION INSTALL IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS.
- CAUTION: COMBUSTION AIR OPENING MUST NOT BE OBSTRUCTED.
- DO NOT OVERFIRE THE FIREPLACE.
- OPERATE THE FIREPLACE WITH DOOR FULLY CLOSED ONLY.
- DO NOT USE A FIREPLACE INSERT OR OTHER PRODUCTS NOT SPECIFIED FOR USE WITH THIS PRODUCT.
- CONTACT YOUR LOCAL BUILDING OR FIRE OFFICIALS ABOUT RESTRICTIONS AND INSTALLATION INSPECTIONS IN YOUR AREA.
- SEE IHP INSTALLATION AND OPERATING INSTRUCTIONS FOR THIS MODEL.
- KEEP FURNISHINGS AND OTHER COMBUSTIBLE MATERIALS A CONSIDERABLE DISTANCE AWAY FROM APPLIANCE.
- 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.
- INSTALL AND USE ONLY IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS AND LOCAL BUILDING CODES.
- SPECIAL METHODS ARE REQUIRED WHEN PASSING THROUGH A WALL OR CEILING. SEE INSTRUCTIONS AND BUILDING CODES.
- PREVENT CREOSOTE FIRE: INSPECT CHIMNEY CONNECTOR AND CHIMNEY FLUE MONTHLY AND CLEAN IF NECESSARY.
- DO NOT OVERFIRE. IF DOME OR CHIMNEY CONNECTOR GLOWS YOU ARE OVERFIRING.

- POUR USAGE AVEC LE BOIS SEULEMENT
- UN TABLIER NON COMBUSTIBLE DOIT ÊTRE INSTALLÉ À L'AVANT DE L'APPAREIL S'ÉTENDANT DE 18 PO. (457 MM) À L'AVANT ET AVOIR UNE LARGEUR D'AU MOINS 39 PO. (991 MM).
- LES MANTEAUX DE CHEMINÉE DOIVENT ÊTRE NON COMBUSTIBLES.
- AVERTISSEMENT : CE FOYER N'EST PAS HOMOLOGUÉ POUR ÊTRE UTILISÉ AVEC UN ENSEMBLE DE BûCHES À GAZ SANS CONDUIT D'ÉVACUATION. AFIN DE RÉDUIRE LES RISQUES D'INCENDIE OU DE BLESSURES, N'INSTALLEZ PAS DE BûCHES À GAZ SANS CONDUIT D'ÉVACUATION À L'INTÉRIEUR DE CE FOYER.
- ALIMENTATION ÉLECTRIQUE: 120V, 60 Hz
- TYPE DE CHEMINÉE: UTILISER SEULEMENT AVEC 6 PO. DIAMÈTRE - ÉTATS-UNIS: IHP SNAP-PAK CAN; SECURE TEMP ASHT + OU S2100 +, DURATECH CANADA OU DURATECH PREMIUM.
- PEUT ÊTRE RACCORDÉ SUR UNE CHEMINÉE DE MACONNERIE TEL QUE DÉCRIT DANS LE MANUEL D'INSTALLATION.
- LES COMPOSANTES UTILISÉES AVEC LE FOYER DOIVENT ÊTRE HOMOLOGUÉES. VOIR LA LISTE DANS LE MANUEL D'INSTALLATION.
- REMPLACER LA VITRE AVEC UN VERRE CÉRAMIQUE DE 5mm D'ÉPAISSEUR.
- POUR UNE UTILISATION SÉCURITAIRE, INSTALLER CONFORMÉMENT AUX DIRECTIVES DU FABRICANT.
- ATTENTION - NE PAS OBSTRUER LES ARRIVÉES D'AIR COMBURANT.
- NE PAS FAIRE SURCHAUFFER LE FOYER.
- LA PORTE DU FOYER DOIT DEMEURER TOTALEMENT FERMÉE LORSQUE LE FOYER FONCTIONNE.
- NE PAS UTILISER DE POÈLE ENCASTRABLE OU D'AUTRES PRODUITS NON SPÉCIFIÉS COMME ÉTANT UTILISABLES AVEC CE PRODUIT.
- CONTACTEZ LES RESPONSABLES DE VOTRE RÉGION À PROPOS DES RESTRICTIONS ET INSPECTIONS D'INSTALLATION.
- MAINTENIR LES MEUBLES ET AUTRES OBJETS À UNE DISTANCE SÉCURITAIRE DU FOYER.
- CET APPAREIL DE CHAUFFAGE AU BOIS DOIT ÊTRE INSPECTÉ ET ENTRETENU PÉRIODIQUEMENT POUR FONCTIONNER CORRECTEMENT. VOIR LE MANUEL DU PROPRIÉTAIRE POUR PLUS D'INFORMATION.
- L'UTILISATION DE CET APPAREIL DE CHAUFFAGE AU BOIS DE MANIÈRE INCOMPATIBLE AVEC LES INSTRUCTIONS DU MANUEL DU PROPRIÉTAIRE CONSTITUE UNE INFRACTION AUX RÉGLEMENTS FÉDÉRAUX.

[illegible]

Innovative Hearth Products Astria® Brand EPA Wood Burning Fireplace Limited Lifetime Warranty

THE WARRANTY

Innovative Hearth Products ("IHP") Limited Lifetime Warranty warrants your Astria® Brand EPA Wood Burning Fireplace ("Product") to be free from defects in materials and workmanship at the time of manufacture. The Product body, firebox and ceramic glass carry the Limited Lifetime Warranty. Ceramic glass carries the Limited Lifetime Warranty against thermal breakage only. After installation, if covered components manufactured by IHP are found to be defective in materials or workmanship during the Limited Lifetime Warranty period and while the Product remains at the site of the original installation, IHP will, at its option, repair or replace the covered components. If repair or replacement is not commercially practical, IHP will, at its option, refund the purchase price or wholesale price of the IHP product, whichever is applicable. IHP will also pay IHP prevailing labor rates, as determined in its sole discretion, incurred in repairing or replacing such components for up to five years. THERE ARE EXCLUSIONS AND LIMITATIONS to this Limited Lifetime Warranty as described herein.

COVERAGE COMMENCEMENT DATE

Warranty coverage begins on the date of purchase. In the case of new home construction, warranty coverage begins on the date of first occupancy of the dwelling or six months after the sale of the Product by an independent IHP dealer/distributor, whichever occurs earlier. The warranty shall commence no later than 24 months following the date of product shipment from IHP, regardless of the installation or occupancy date.

EXCLUSIONS AND LIMITATIONS

This Limited Lifetime Warranty applies only if the Product is installed in the United States or Canada and only if operated and maintained in accordance with the printed instructions accompanying the Product and in compliance with all applicable installation and building codes and good trade practices.

This warranty is non-transferable and extends to the original owner only. The Product must be purchased through a listed supplier of IHP and proof of purchase must be provided. The Product body and firebox carry the Limited Lifetime Warranty from the date of installation. Vent components, trim components and paint are excluded from this Limited Lifetime Warranty. The following do not carry a Limited Lifetime Warranty but are warranted as follows:

Cast Iron Heat Exchanger – Replacement for five years from the date of installation

Cast iron parts – Replacement for one year from the date of installation

Catalyst – Carries a separate warranty. Refer to the warranty certificate provided for that part

Electrical components – Repair or replacement for one year from date of installation

Gaskets – Replacement for one year from the date of installation.

Gold & nickel plating – Replacement for two years from date of installation. Excludes tarnishing

Refractory & screens – Replacement for two years from date of installation. Excludes hairline cracks

Removable air tubes – Repair or replacement for seven years from date of installation. IHP prevailing labor rates for years one through five.

Labor coverage – Prevailing IHP labor rates apply for the warranty period of the component, unless otherwise noted

Parts not otherwise listed carry a 90 day warranty from the date of installation.

Whenever practicable, IHP will provide replacement parts, if available, for a period of 10 years from the last date of manufacture of the Product.

IHP will not be responsible for: (a) damages caused by normal wear and tear, accident, riot, fire, flood or acts of God; (b) damages caused by abuse, negligence, misuse, or unauthorized alteration or repair of the Product affecting its stability or performance. (The Product must be subject to normal use with approved fuels listed in the Operation Manual provided with the product. Fuel products with abnormal burning characteristics, including but not limited to fuel such as driftwood, coal or plywood and wood products using a binder may burn at excessive temperatures and may cause damage to the Product or may cause it to function improperly; IHP stoves, inserts and high efficiency EPA fireplaces are approved for burning dry seasoned wood only.); (c) damages caused by failing to provide proper maintenance and service in accordance with the instructions provided with the Product; (d) damages, repairs or inefficiency resulting from faulty installation or application of the Product.

Coverage of this Limited Lifetime Warranty is conditional upon the appliance being operated without the use of grates, irons or any other method to elevate the fire.

IHP is not responsible for inadequate system draft caused by air conditioning and heating systems, mechanical ventilation systems, or general construction conditions which may generate negative air pressure in the room in which the appliance is installed. Additionally IHP assumes no responsibility for smoking conditions caused by inadequate chimney height, adjoining trees or buildings, adverse wind conditions or unusual environmental factors and conditions. Certain IHP Products are listed for use with Security Chimneys International, Ltd. chimney systems only. Use of chimney components other than that specified in the Product manual will void the Product warranty.

This Limited Lifetime Warranty covers only parts and labor as provided herein. In no case shall IHP be responsible for materials, components or construction which are not manufactured or supplied by IHP or for the labor necessary to install, repair or remove such materials, components or construction. Additional utility bills incurred due to any malfunction or defect in equipment are not covered by this Limited Lifetime Warranty. All replacement or repair components will be shipped F.O.B. from the nearest stocking IHP factory.

LIMITATION ON LIABILITY

It is expressly agreed and understood that IHP's sole obligation and the purchaser's exclusive remedy under this warranty, under any other warranty, expressed or implied, or in contract, tort or otherwise, shall be limited to replacement, repair, or refund, as specified herein.

In no event shall IHP be liable for any incidental or consequential damages caused by defects in the Product, whether such damage occurs or is discovered before or after replacement or repair, and whether such damage is caused by IHP's negligence. IHP has not made and does not make any representation or warranty of fitness for a particular use or purpose, and there is no implied condition of fitness for a particular use or purpose.

IHP makes no expressed warranties except as stated in this Limited Lifetime Warranty. The duration of any implied warranty is limited to the duration of this expressed warranty.

No one is authorized to change this Limited Lifetime Warranty or to create for IHP any other obligation or liability in connection with the Product. Some states and provinces do not allow the exclusion or limitation of incidental or consequential damages, so the above limitations or exclusions may not apply to you. The provisions of this Limited Lifetime Warranty are in addition to and not a modification of or subtraction from any statutory warranties and other rights and remedies provided by law.

INVESTIGATION OF CLAIMS AGAINST WARRANTY

IHP reserves the right to investigate any and all claims against this Limited Lifetime Warranty and to decide, in its sole discretion, upon the method of settlement.

To receive the benefits and advantages described in this Limited Lifetime Warranty, the appliance must be installed and repaired by a licensed contractor approved by IHP.

Contact IHP at the address provided herein to obtain a listing of approved dealers/distributors. **IHP shall in no event be responsible for any warranty work done by a contractor that is not approved without first obtaining IHP's prior written consent.**

HOW TO REGISTER A CLAIM AGAINST WARRANTY

In order for any claim under this warranty to be valid, you must contact the IHP dealer/distributor from which you purchased the product. If you cannot locate the dealer/distributor, then you must notify IHP in writing. IHP must be notified of the claimed defect in writing within 90 days of the date of failure. Notices should be directed to the IHP Warranty Department at 1769 East Lawrence Street; Russellville, AL 35654 or visit our website at WWW.ASTRIA.US.COM.

WARRANTY

Your fireplace is covered by a limited warranty. Please read the warranty to be familiar with its coverage.

Retain this manual. File it with your other documents for future reference.

PRODUCT REFERENCE INFORMATION

We recommend that you record the following important information about your fireplace. Please contact your IHP dealer for any questions or concerns.

REPLACEMENT PARTS

See **Page 27** for a complete replacement parts list. Use only parts supplied from the manufacturer.

Normally, all parts should be ordered through your IHP distributor or dealer. Parts will be shipped at prevailing prices at time of order.

When ordering repair parts, always give the following information:

1. The model number of the appliance.
2. The serial number of the appliance.
3. The part number.
4. The description of the part.
5. The quantity required.
6. The installation date of the appliance.

If you encounter any problems or have any questions concerning the installation or application of this system, please contact your dealer.

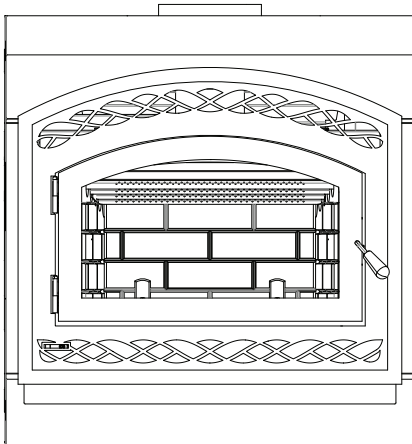
IHP
1769 East Lawrence Street
Russellville, AL 35654
Visit us at Astria.us.com

Model Number _____
Serial Number _____
Date Installed _____
Dealer's Name _____
Dealer's Phone Number _____



Innovative Hearth Products (IHP) reserves the right to make changes at any time, without notice, in design, materials, specifications, and prices, and also to discontinue colors, styles, and products. Consult your local distributor for fireplace code information.





SAVE THESE INSTRUCTIONS FOR FUTURE REFERENCE

A French manual is available upon request. Order P/N 901348-02.

Ce manuel d'installation est disponible en français, simplement en faire la demande. Numéro de la pièce 901348-02.

**Fireplace, also for use in mobile or
manufactured homes with solid fuel only.**



WARNING

- Hot! Do not touch! The glass and surfaces of this appliance will be hot during operation and will retain heat for a while after shutting off the appliance. Severe burns may result.
- Carefully supervise children in the same room as appliance.
- If small children are present in the home, it is recommended that this appliance be fitted with an adjustable safety gate or barrier screen.



Listed to standards:
ULC-S610 and UL-127
Report No. 14-199
EPA Cert. No. TBD

INSTALLATION AND OPERATION INSTRUCTIONS

WCT6920WSS

EPA Wood-Burning Fireplace
P/N 901348-00 REV. NC 07/2025

MODEL

WCT6920WSS

This installation manual will enable you to obtain a safe, efficient and dependable installation of your fireplace system. Please read and understand these instructions before beginning your installation.

Do not alter or modify the fireplace or its components under any circumstances. Any modification or alteration of the fireplace system, including but not limited to the fireplace, chimney components and accessories, may void the warranty, listings and approvals of this system and could result in an unsafe and potentially dangerous installation.

IHP wood-burning fireplaces are designed for use as a supplemental heater. They are not intended for continuous use as a primary heat source.



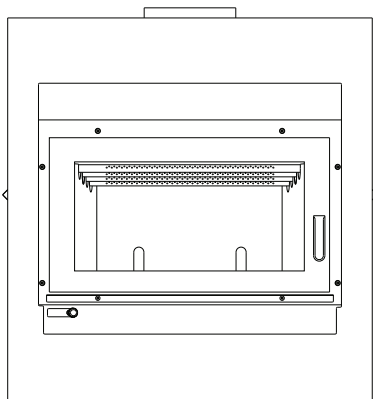
WARNING

- The fireplace cannot be operated without a door. Consult your dealer to select the correct replacement door.
- The fireplace is equipped with a blower, electrical connection must be made prior to fireplace installation
- Important! To assure proper alignment of glass doors: Install this fireplace in a square and plumb condition, using shims as necessary at sides and/or bottom.
- Install the fireplace only as described in these instructions.



WARNING

This product can expose you to chemicals including Carbon Black, which is known to the State of California to cause cancer, and Carbon Monoxide, which is known to the State of California to cause birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov



SAVE THESE INSTRUCTIONS FOR FUTURE REFERENCE

A French manual is available upon request. Order P/N 901349-02.

Ce manuel d'installation est disponible en français, simplement en faire la demande. Numéro de la pièce 901349-02.

**Fireplace, also for use in mobile or
manufactured homes with solid fuel only.**



WARNING

- **Hot! Do not touch!** The glass and surfaces of this appliance will be hot during operation and will retain heat for a while after shutting off the appliance. Severe burns may result.
- **Carefully supervise children** in the same room as appliance.
- If small children are present in the home, it is recommended that this appliance be fitted with an adjustable safety gate or barrier screen.



Listed to standards:
ULC-S610 and UL-127
Report No. 14-199
EPA Cert. No. TBD

INSTALLATION AND OPERATION INSTRUCTIONS

BAINBRIDGE-B

EPA Wood-Burning Fireplace
P/N 901349-00 REV. NC 07/2025

MODEL

Bainbridge-B

This installation manual will enable you to obtain a safe, efficient and dependable installation of your fireplace system. Please read and understand these instructions before beginning your installation.

Do not alter or modify the fireplace or its components under any circumstances. Any modification or alteration of the fireplace system, including but not limited to the fireplace, chimney components and accessories, may void the warranty, listings and approvals of this system and could result in an unsafe and potentially dangerous installation.

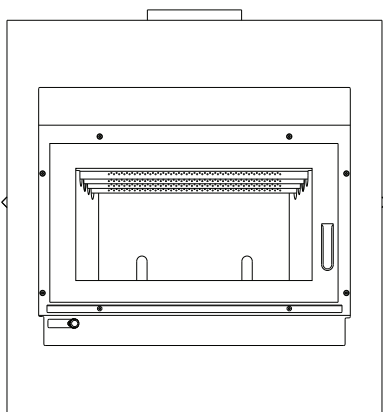
IHP wood-burning fireplaces are designed for use as a supplemental heater. They are not intended for continuous use as a primary heat source.

WARNING

- The fireplace cannot be operated without a door. Consult your dealer to select the correct replacement door.
- The fireplace is equipped with a blower, electrical connection must be made prior to fireplace installation
- Important! To assure proper alignment of glass doors: Install this fireplace in a square and plumb condition, using shims as necessary at sides and/or bottom.
- Install the fireplace only as described in these instructions.

WARNING

This product can expose you to chemicals including Carbon Black, which is known to the State of California to cause cancer, and Carbon Monoxide, which is known to the State of California to cause birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov



SAVE THESE INSTRUCTIONS FOR FUTURE REFERENCE

A French manual is available upon request. Order P/N 901376-02.

Ce manuel d'installation est disponible en français, simplement en faire la demande. Numéro de la pièce 901376-02.

**Fireplace, also for use in mobile or
manufactured homes with solid fuel only.**



WARNING

- Hot! Do not touch! The glass and surfaces of this appliance will be hot during operation and will retain heat for a while after shutting off the appliance. Severe burns may result.
- Carefully supervise children in the same room as appliance.
- If small children are present in the home, it is recommended that this appliance be fitted with an adjustable safety gate or barrier screen.



Listed to standards:
ULC-S610 and UL-127
Report No. 14-199
EPA Cert. No. TBD

INSTALLATION AND OPERATION INSTRUCTIONS

WCT4920WSS

EPA Wood-Burning Fireplace
P/N 901376-00 REV. NC 07/2025

MODEL

WCT4920WSS

This installation manual will enable you to obtain a safe, efficient and dependable installation of your fireplace system. Please read and understand these instructions before beginning your installation.

Do not alter or modify the fireplace or its components under any circumstances. Any modification or alteration of the fireplace system, including but not limited to the fireplace, chimney components and accessories, may void the warranty, listings and approvals of this system and could result in an unsafe and potentially dangerous installation.

IHP wood-burning fireplaces are designed for use as a supplemental heater. They are not intended for continuous use as a primary heat source.



WARNING

- The fireplace cannot be operated without a door. Consult your dealer to select the correct replacement door.
- The fireplace is equipped with a blower, electrical connection must be made prior to fireplace installation
- Important! To assure proper alignment of glass doors: Install this fireplace in a square and plumb condition, using shims as necessary at sides and/or bottom.
- Install the fireplace only as described in these instructions.



WARNING

This product can expose you to chemicals including Carbon Black, which is known to the State of California to cause cancer, and Carbon Monoxide, which is known to the State of California to cause birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov

Appendix C: Calibrations



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



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

Report Number: DIRI0182484A0912013i241204

A2LA ACCREDITED **CERTIFICATE OF CALIBRATION WITH DATA**

INSTRUMENT INFORMATION

Item	Make	Model	Serial Number	Customer ID	Location
Scale	Digiweigh	DWP12i 300kg x 0.	82484A0912013i	#050	Lab
Units	Readability	SOP	Cal Date	Last Cal Date	Cal Due Date
kg	0.01	QC033	12/4/24	12/28/23	12/2025

FUNCTIONAL CHECKS

FUNCTIONAL CHECKS						
SHIFT TEST		LINEARITY		REPEATABILITY		ENVIRONMENTAL CONDITIONS
Test Wt:	Tol:	Test Wt:	Tol:	Test Wt:	Tol:	
100	0.05	HB44	HB44	100	0.01	
As-Found:		As-Found:		As-Found:		
Pass: ☒	Fail: ☐	Pass: ☒	Fail: ☐	Pass: ☒	Fail: ☐	
As-Left:		As-Left:		As-Left:		
Pass: ☒	Fail: ☐	Pass: ☒	Fail: ☐	Pass: ☒	Fail: ☐	
						☐ ☒ ☐ Good Fair Poor
						Temperature: 17.2°C

CALIBRATION DATA

Standard	As-Found	As-Left	Expanded Uncertainty
400	399.98	399.98	0.006
200	200.00	200.00	0.005
100	100.00	100.00	0.005
75	75.00	75.00	0.005
50	50.00	50.00	0.005
25	25.00	25.00	0.005

CALIBRATION STANDARDS

Item	Make	Model	Serial Number	Cal Date	Cal Due Date	NIST ID
Avoirdupois Cast W	Rice Lake	25 and 50lb	PWO990-CA	7/26/24	7/2026	20221688

Permanent Information Concerning this Equipment:

12 month calibration cycle. Scale calibrates in kg only.

Comments/Information Concerning this Calibration

12/04/2024: RH-37%

Report prepared/reviewed by: TLP

Date: 12.04.2024

Technician: T. Peterson

Signature: [Signature]

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. Calibrations comply with ISO/IEC 17025 and ANSI/Z540-1-1994 quality standards.

Member: National Conference of Standards Laboratories and Weights & Measures

Dry Gas Meter Calibration

DUT

Manufacturer: Apex
 Model: Xc-50-DIR
 Lab ID #: 129
 Serial #:
 Calibration Date: 12/12/2024
 Calibration Expiration: 6/12/2025
 Barometric Pressure: 29.67 in. Hg



Equipment Used:	Ref. Std. DGM	Thermometer	Barometer	Manometer
Manufacturer: Apex		Fluke	Aquatech	
Model: SK25DA			DBX2	
Lab ID#: 47		196	202	
Calibration Expiration Date: 6/4/2024		1/3/2025	6/17/2025	
Calibration γ Factor: 0.99801214				

Use in accordance with EPA Method 5, sections 10.3 and 16.1. Use only calibrated, NIST traceable reference standard DGM. Calibrate over expected operating flow range of DUT.

Calibration Data	Run 1	Run 2	Run 3
Standard DGM Initial Volume (L)	0.000	0.000	0.000
Standard DGM Final Volume (L)	147.396	140.784	139.749
Standard DGM Temperature (°F)	64.0	65.4	66.0
Standard DGM Pressure (in H ₂ O)	0.00	0.00	0.0
DGM Initial Volume (ft ³)	0.000	0.000	0.000
DGM Final Volume (ft ³)	5.171	5.002	5.030
DGM Temperature (°F)	65.8	75.0	80.8
DGM Pressure (in H ₂ O)	1.86	1.50	1.0
Net Volume for Standard DGM (ft ³)	5.205	4.972	4.935
Net Volume for DGM (ft ³)	5.171	5.002	5.030
Dry Gas Meter γ Factor	1.003	1.006	1.004
γ Factor Deviation From Average	1.003	1.006	1.004

Average Gas Meter γ Factor

1.005

Measurement Uncertainty: Total measurement uncertainty +/- 0.748% RD, K=2

Calculations:

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

Report and Certificate of Calibration



www.Cal-Cert.com

Toll Free
800-356-4662

Address
5777 SE International Way
Milwaukie, OR 97222

Local
503-654-9620



Report #: 33086-203315-4525 **Customer PO#:** 1109
Customer Name: PFS TECO
Customer Address: 1507 Matt Pass
City: Cottage Grove **State:** WI **Zip:** 53527
Contact: Ethan Frederick
Service Address: 11785 SE Highway 212, Suite 305 Clackamas, OR 97015

Calibration Standards

10-01442 Compound Gauge Fluke SN: 4582643 Cal: 01/26/2024 Due: 01/31/2025 Vendor: Fluke Report #: EVL943251
LP-01782 Thermo-Hygrometer Comark SN: 06247790052 Cal: 01/24/2024 Due: 01/31/2025 Range: 122 °F 95 %RH Report #: 32568-205513-3646

Instrument Data

Calibration Date:	February 28, 2024	Reference:	ASME B40.100
Recommended Due Date:	February 28, 2025	Cal-Cert Procedure:	CP-003
Calibration Frequency:	12 Months	Indicating System:	Digital
Manufacturer:	Red Lion	Temperature:	70 °F
Type:	Pressure Transducer	Humidity:	40% RH
Model Number:	Unknown	Cal Factor:	None
Serial #:	Unknown	Asset #:	129B
Capacity:	1 In H2O	Service Location:	Service Address
Tolerance:	± 1.00% of Span	As Found:	Pass
Gauge Class:	A	As Left:	Pass

Instrument Range:		Range Resolution:		Mode Verified:		Pressure		
UUT Reading	Standard As Found	Standard Verification Reading #1	Error	Standard Verification Reading #2	Error	Tolerance	Expanded Uncertainty ±	
In H2O	In H2O	In H2O	In H2O	In H2O	In H2O	In H2O	In H2O	
0.000	0.000	0.000	0.00	0.000	0.00	0.01	0.0005	
0.100	0.100	0.100	0.00	0.097	0.00	0.01	0.0067	
0.250	0.247	0.247	0.00	0.247	0.00	0.01	0.0006	
0.500	0.496	0.496	0.00	0.495	0.00	0.01	0.0011	
0.750	0.743	0.743	-0.01	0.743	-0.01	0.01	0.001	
1.000	0.992	0.992	-0.01	0.992	-0.01	0.01	0.0022	
0.750	0.745	0.745	-0.01	0.743	-0.01	0.01	0.006	
0.500	0.496	0.496	0.00	0.496	0.00	0.01	0.0009	
0.250	0.248	0.248	0.00	0.249	0.00	0.01	0.0031	
0.100	0.101	0.101	0.00	0.099	0.00	0.01	0.0049	
0.000	0.009	0.009	0.01	-0.004	0.00	0.01	0.0005	

Manufacturer: Red Lion

Type: Pressure Transducer

Serial #: Unknown

Remarks:

**We sincerely thank you for your business. Please call us at 503-654-9620 for all your sales and calibration needs.
Cleaning and preventative maintenance were performed as part of this service.**

**Cal-Cert is accredited by A2LA under Calibration Laboratory Code #4986.01.
A2LA is recognized under the ILAC mutual recognition agreement (MRA).**

This certificate is hereby issued that the above instrument was tested for accuracy with calibrated standards traceable to the National Institute of Standards and Technology (NIST). The information provided on this form complies with the data gathering and reporting requirements of ISO/IEC 17025 and ANSI/NCSL Z540.1, and meets the requirements of all applicable references and Cal-Cert procedures listed above. Any stated measurement uncertainty includes the uncertainty of the Calibration standards used, combined with the uncertainty of the measurement process using the RSS method with a k=2 for an approximate 95% level of confidence. The calibration process meets or exceeds a ratio of 4:1 unless otherwise stated.

All tolerances were derived from the applicable standards and pass/fail determination is based on those tolerances. The customer determined any recommended due dates indicated on the certificate.

This report shall not be reproduced except in full, without written approval from Cal-Cert.

Service Engineer: Steven White

Date: February 28, 2024

Technical Manager: Marshall Doyle

Signature:



Report and Certificate of Calibration



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Toll Free
800-356-4662

Address
5777 SE International Way
Milwaukie, OR 97222

Local
503-654-9620



Report #: 33086-203316-4525 **Customer PO#:** 1109
Customer Name: PFS TECO
Customer Address: 1507 Matt Pass
City: Cottage Grove **State:** WI **Zip:** 53527
Contact: Ethan Frederick
Service Address: 11785 SE Highway 212, Suite 305 Clackamas, OR 97015

Calibration Standards

10-01442 Compound Gauge Fluke SN: 4582643 Cal: 01/26/2024 Due: 01/31/2025 Vendor: Fluke Report #: EVL943251
LP-01782 Thermo-Hygrometer Comark SN: 06247790052 Cal: 01/24/2024 Due: 01/31/2025 Range: 122 °F 95 %RH Report #: 32568-205513-3646

Instrument Data

Calibration Date:	February 28, 2024	Reference:	ASME B40.100
Recommended Due Date:	February 28, 2025	Cal-Cert Procedure:	CP-003
Calibration Frequency:	12 Months	Indicating System:	Digital
Manufacturer:	Red Lion	Temperature:	70 °F
Type:	Pressure Transducer	Humidity:	40% RH
Model Number:	Unknown	Cal Factor:	None
Serial #:	Unknown	Asset #:	129C
Capacity:	5 In H2O	Service Location:	Service Address
Tolerance:	± 1.00% of Span	As Found:	Pass
Gauge Class:	A	As Left:	Pass

Instrument Range:		Range Resolution:		Mode Verified:		Pressure		
UUT Reading	Standard As Found	Standard Verification Reading #1	Error	Standard Verification Reading #2	Error	Tolerance	Expanded Uncertainty ±	
In H2O	In H2O	In H2O	In H2O	In H2O	In H2O	In H2O	In H2O	
0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.005	
0.50	0.50	0.50	0.00	0.49	-0.01	0.05	0.024	
1.25	1.23	1.23	-0.02	1.24	-0.01	0.05	0.014	
2.50	2.47	2.47	-0.03	2.47	-0.03	0.05	0.017	
3.75	3.71	3.71	-0.04	3.71	-0.04	0.05	0.007	
5.00	4.96	4.96	-0.04	4.95	-0.05	0.05	0.023	
3.75	3.71	3.71	-0.04	3.72	-0.03	0.05	0.041	
2.50	2.47	2.47	-0.03	2.47	-0.03	0.05	0.006	
1.25	1.24	1.24	-0.01	1.24	-0.01	0.05	0.01	
0.50	0.51	0.51	0.01	0.50	0.00	0.05	0.027	
0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.005	

Manufacturer: Red Lion

Type: Pressure Transducer

Serial #: Unknown

Remarks:

--

**We sincerely thank you for your business. Please call us at 503-654-9620 for all your sales and calibration needs.
Cleaning and preventative maintenance were performed as part of this service.**

Cal-Cert is accredited by A2LA under Calibration Laboratory Code #4986.01. A2LA is recognized under the ILAC mutual recognition agreement (MRA).
--

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All tolerances were derived from the applicable standards and pass/fail determination is based on those tolerances. The customer determined any recommended due dates indicated on the certificate.

This report shall not be reproduced except in full, without written approval from Cal-Cert.

Service Engineer: Steven White

Date: February 28, 2024

Technical Manager: Marshall Doyle

Signature:



Dry Gas Meter Calibration

DUT

Manufacturer: Apex
 Model: Xc-50-DIR
 Lab ID #: 130
 Serial #:
 Calibration Date: 12/12/2024
 Calibration Expiration: 6/12/2025
 Barometric Pressure: 29.67 in. Hg



Equipment Used:	Ref. Std. DGM	Thermometer	Barometer	Manometer
Manufacturer: Apex		Fluke	Aquatech	
Model: SK25DA			DBX2	
Lab ID#: 47		196	202	
Calibration Expiration Date: 6/4/2024		1/3/2025	6/17/2025	
Calibration γ Factor: 0.99801214				

Use in accordance with EPA Method 5, sections 10.3 and 16.1. Use only calibrated, NIST traceable reference standard DGM. Calibrate over expected operating flow range of DUT.

Calibration Data	Run 1	Run 2	Run 3
Standard DGM Initial Volume (L)	0.000	0.000	0.000
Standard DGM Final Volume (L)	146.253	143.931	140.414
Standard DGM Temperature (°F)	67.1	67.1	68.9
Standard DGM Pressure (in H ₂ O)	0.00	0.00	0.0
DGM Initial Volume (ft ³)	0.000	0.000	0.000
DGM Final Volume (ft ³)	5.090	5.091	5.039
DGM Temperature (°F)	70.0	77.5	83.5
DGM Pressure (in H ₂ O)	1.79	1.47	1.0
Net Volume for Standard DGM (ft ³)	5.165	5.083	4.959
Net Volume for DGM (ft ³)	5.090	5.091	5.039
Dry Gas Meter γ Factor	1.014	1.012	1.007
γ Factor Deviation From Average	1.014	1.012	1.007

Average Gas Meter γ Factor

1.011

Measurement Uncertainty: Total measurement uncertainty +/- 0.748% RD, K=2

Calculations:

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

Report and Certificate of Calibration



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Toll Free
800-356-4662

Address
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Milwaukie, OR 97222

Local
503-654-9620



Report #: 33086-203317-4525 **Customer PO#:** 1109
Customer Name: PFS TECO
Customer Address: 1507 Matt Pass
City: Cottage Grove **State:** WI **Zip:** 53527
Contact: Ethan Frederick
Service Address: 11785 SE Highway 212, Suite 305 Clackamas, OR 97015

Calibration Standards

10-01442 Compound Gauge Fluke SN: 4582643 Cal: 01/26/2024 Due: 01/31/2025 Vendor: Fluke Report #: EVL943251
LP-01782 Thermo-Hygrometer Comark SN: 06247790052 Cal: 01/24/2024 Due: 01/31/2025 Range: 122 °F 95 %RH Report #: 32568-205513-3646

Instrument Data

Calibration Date:	February 28, 2024	Reference:	ASME B40.100
Recommended Due Date:	February 28, 2025	Cal-Cert Procedure:	CP-003
Calibration Frequency:	12 Months	Indicating System:	Digital
Manufacturer:	Red Lion	Temperature:	70 °F
Type:	Pressure Transducer	Humidity:	39% RH
Model Number:	Unknown	Cal Factor:	None
Serial #:	Unknown	Asset #:	130B
Capacity:	1 In H2O	Service Location:	Service Address
Tolerance:	± 1.00% of Span	As Found:	Pass
Gauge Class:	A	As Left:	Pass

Instrument Range: 1.00		Range Resolution: 0.001		Mode Verified: Pressure				
UUT Reading	Standard As Found	Standard Verification Reading #1	Error	Standard Verification Reading #2	Error	Tolerance	Expanded Uncertainty ±	
In H2O	In H2O	In H2O	In H2O	In H2O	In H2O	In H2O	In H2O	
0.000	0.000	0.000	0.00	0.000	0.00	0.01	0.0005	
0.100	0.099	0.099	0.00	0.098	0.00	0.01	0.0021	
0.250	0.246	0.246	0.00	0.246	0.00	0.01	0.001	
0.500	0.493	0.493	-0.01	0.493	-0.01	0.01	0.0009	
0.750	0.748	0.748	0.00	0.741	-0.01	0.01	0.0185	
1.000	0.991	0.991	-0.01	0.991	-0.01	0.01	0.0026	
0.750	0.743	0.743	-0.01	0.742	-0.01	0.01	0.0025	
0.500	0.494	0.494	-0.01	0.494	-0.01	0.01	0.0009	
0.250	0.247	0.247	0.00	0.248	0.00	0.01	0.0026	
0.100	0.098	0.098	0.00	0.100	0.00	0.01	0.0052	
0.000	0.000	0.000	0.00	0.000	0.00	0.01	0.0005	

Manufacturer: Red Lion

Type: Pressure Transducer

Serial #: Unknown

Remarks:

**We sincerely thank you for your business. Please call us at 503-654-9620 for all your sales and calibration needs.
Cleaning and preventative maintenance were performed as part of this service.**

**Cal-Cert is accredited by A2LA under Calibration Laboratory Code #4986.01.
A2LA is recognized under the ILAC mutual recognition agreement (MRA).**

This certificate is hereby issued that the above instrument was tested for accuracy with calibrated standards traceable to the National Institute of Standards and Technology (NIST). The information provided on this form complies with the data gathering and reporting requirements of ISO/IEC 17025 and ANSI/NCSL Z540.1, and meets the requirements of all applicable references and Cal-Cert procedures listed above. Any stated measurement uncertainty includes the uncertainty of the Calibration standards used, combined with the uncertainty of the measurement process using the RSS method with a k=2 for an approximate 95% level of confidence. The calibration process meets or exceeds a ratio of 4:1 unless otherwise stated.

All tolerances were derived from the applicable standards and pass/fail determination is based on those tolerances. The customer determined any recommended due dates indicated on the certificate.

This report shall not be reproduced except in full, without written approval from Cal-Cert.

Service Engineer: Steven White

Date: February 28, 2024

Technical Manager: Marshall Doyle

Signature:

McDoyle

Report and Certificate of Calibration



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800-356-4662

Address
5777 SE International Way
Milwaukie, OR 97222

Local
503-654-9620



Report #: 33086-203318-4525 **Customer PO#:** 1109
Customer Name: PFS TECO
Customer Address: 1507 Matt Pass
City: Cottage Grove **State:** WI **Zip:** 53527
Contact: Ethan Frederick
Service Address: 11785 SE Highway 212, Suite 305 Clackamas, OR 97015

Calibration Standards

10-01442 Compound Gauge Fluke SN: 4582643 Cal: 01/26/2024 Due: 01/31/2025 Vendor: Fluke Report #: EVL943251
LP-01782 Thermo-Hygrometer Comark SN: 06247790052 Cal: 01/24/2024 Due: 01/31/2025 Range: 122 °F 95 %RH Report #: 32568-205513-3646

Instrument Data

Calibration Date:	February 28, 2024	Reference:	ASME B40.100
Recommended Due Date:	February 28, 2025	Cal-Cert Procedure:	CP-003
Calibration Frequency:	12 Months	Indicating System:	Digital
Manufacturer:	Red Lion	Temperature:	70 °F
Type:	Pressure Transducer	Humidity:	39% RH
Model Number:	Unknown	Cal Factor:	None
Serial #:	Unknown	Asset #:	130C
Capacity:	5 In H2O	Service Location:	Service Address
Tolerance:	± 1.00% of Span	As Found:	Pass
Gauge Class:	A	As Left:	Pass

Instrument Range:		Range Resolution:		Mode Verified:		Pressure		
UUT Reading	Standard As Found	Standard Verification Reading #1	Error	Standard Verification Reading #2	Error	Tolerance	Expanded Uncertainty ±	
In H2O	In H2O	In H2O	In H2O	In H2O	In H2O	In H2O	In H2O	
0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.005	
0.50	0.51	0.51	0.01	0.49	-0.01	0.05	0.034	
1.25	1.20	1.20	-0.05	1.24	-0.01	0.05	0.083	
2.50	2.53	2.53	0.03	2.48	-0.02	0.05	0.127	
3.75	3.70	3.70	-0.05	3.73	-0.02	0.05	0.056	
5.00	4.97	4.97	-0.03	4.98	-0.02	0.05	0.049	
3.75	3.71	3.71	-0.04	3.73	-0.02	0.05	0.061	
2.50	2.46	2.46	-0.04	2.49	-0.01	0.05	0.06	
1.25	1.21	1.21	-0.04	1.24	-0.01	0.05	0.062	
0.50	0.50	0.50	0.00	0.50	0.00	0.05	0.005	
0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.005	

Manufacturer: Red Lion

Type: Pressure Transducer

Serial #: Unknown

Remarks:

**We sincerely thank you for your business. Please call us at 503-654-9620 for all your sales and calibration needs.
Cleaning and preventative maintenance were performed as part of this service.**

**Cal-Cert is accredited by A2LA under Calibration Laboratory Code #4986.01.
A2LA is recognized under the ILAC mutual recognition agreement (MRA).**

This certificate is hereby issued that the above instrument was tested for accuracy with calibrated standards traceable to the National Institute of Standards and Technology (NIST). The information provided on this form complies with the data gathering and reporting requirements of ISO/IEC 17025 and ANSI/NCSL Z540.1, and meets the requirements of all applicable references and Cal-Cert procedures listed above. Any stated measurement uncertainty includes the uncertainty of the Calibration standards used, combined with the uncertainty of the measurement process using the RSS method with a k=2 for an approximate 95% level of confidence. The calibration process meets or exceeds a ratio of 4:1 unless otherwise stated.

All tolerances were derived from the applicable standards and pass/fail determination is based on those tolerances. The customer determined any recommended due dates indicated on the certificate.

This report shall not be reproduced except in full, without written approval from Cal-Cert.

Service Engineer: Steven White

Date: February 28, 2024

Technical Manager: Marshall Doyle

Signature:

Mr Doyle

Dry Gas Meter Calibration

DUT

Manufacturer: Apex
 Model: XC-60
 Lab ID #: 55
 Serial #: 810016
 Calibration Date: 2/1/2025
 Calibration Expiration: 8/1/2025
 Barometric Pressure: 30.02 in. Hg



Equipment Used:	Ref. Std. DGM	Thermometer	Barometer	Manometer
Manufacturer: Apex		NI	Aquatech	Dwyer
Model: SK25DA		9213	DBX2	W17AE
Lab ID#: 47		215	202	124
Calibration Expiration Date: 5/1/2025		2/26/2025	6/17/2025	6/16/2025
Calibration γ Factor: 0.998				

Use in accordance with EPA Method 5, sections 10.3 and 16.1. Use only calibrated, NIST traceable reference standard DGM. Calibrate over expected operating flow range of DUT.

Calibration Data	Run 1	Run 2	Run 3
Standard DGM Initial Volume (L)	0.000	0.000	0.000
Standard DGM Final Volume (L)	148.998	157.125	207.888
Standard DGM Temperature (°F)	70.2	71.1	69.8
Standard DGM Pressure (in H ₂ O)	0.00	0.00	0.0
DGM Initial Volume (ft ³)	0.000	0.000	0.000
DGM Final Volume (ft ³)	5.249	5.608	7.444
DGM Temperature (°F)	80.0	82.2	83.8
DGM Pressure (in H ₂ O)	0.00	0.00	0.00
Net Volume for Standard DGM (ft ³)	5.262	5.549	7.341
Net Volume for DGM (ft ³)	5.249	5.608	7.444
Dry Gas Meter γ Factor	1.019	1.008	1.010
γ Factor Deviation From Average	1.019	1.008	1.010

Average Gas Meter γ Factor

1.012

Measurement Uncertainty: Total measurement uncertainty +/- 0.748% RD, K=2

Calculations:

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

Report and Certificate of Calibration



Portland Laboratory
5777 SE International Way
Milwaukie, OR 97222
800-356-4662
503-654-9620

Anaheim Laboratory
120 S. Chaparral Ct Suite 110
Anaheim Hills, CA 92808
888-700-4100
714-696-5300

www.Cal-Cert.com

Report #: 36866-28785-3646 **Customer PO#:** 1122
Customer Name: PFS TECO
Customer Address: 11785 SE Highway 212, Suite 305
City: Clackamas **State:** OR **Zip:** 97015
Contact: Ethan Frederick
Service Address: 5777 SE International Way Milwaukie, OR 97222

Calibration Standards

10-00391 | Thermo-Hygrometer | Comark | SN: 6217150001 | Cal: 05/02/2024 | Due: 04/30/2025 | Vendor: Cal-Cert | Range: 122 °F 95 %RH | Report #: 34722-30759-4525
LP-01158 | Electrical Meter | Keithley | SN: 1388607 | Cal: 07/24/2023 | Due: 07/31/2025 | Vendor: Techmaster Electronics | Report #: TSV-0-545118

Instrument Data

Calibration Date:	September 25, 2024	Reference:	Manufactures Tolerances
Recommended Due Date:	September 25, 2025	Cal-Cert Procedure:	CP-080
Calibration Frequency:	12 Months	Indicating System:	Digital
Manufacturer:	Delmhorst	Temperature:	72 °F
Type:	Resistivity Meter	Humidity:	49% RH
Model Number:	MCS-1	Asset #:	#094
Serial #:	#094	Service Location:	Cal-Cert Lab
Capacity:	120 Megaohms	As Found:	Pass
Tolerance:	1.00 % of indication	As Left:	Pass

Instrument Range:		120 Megaohms		Resolution:	0.001	Mode Verified:	Resistance
Standard Reading	UUT	UUT	Error	UUT	Error	OUT OF TOLERANCE	
	As Found	Reading #1		Reading #2			
0.000	0.000	0.000	0.000	0.000	0.000		
1,100,000	1,095,000	1,095,000	-5,000.000	1,095,000	-5,000.000		
120,000,000	120,830,000	120,830,000	830,000.000	120,830,000	830,000.000	OUT OF TOLERANCE	

Expanded Uncertainty± 2.50 Megaohms

Remarks:

We sincerely thank you for your business. Please call us at 503-654-9620 for all your sales and calibration needs.
Cleaning and preventative maintenance were performed as part of this service.

This certificate is hereby issued that the above instrument was tested for accuracy with calibrated standards traceable to the National Institute of Standards and Technology (NIST). The information provided on this form complies with the data gathering and reporting requirements of ANSI/NCSL Z540.1, and meets the requirements of all applicable references and Cal-Cert procedures listed above.

Any stated measurement uncertainty includes the uncertainty of the Calibration standards used, combined with the uncertainty of the measurement process using the RSS method with a k=2 for an approximate 95% level of confidence. The calibration process meets or exceeds a ratio of 4:1 unless otherwise stated.

All tolerances were derived from the applicable standards and pass/fail determination is based on those tolerances. The customer determined any recommended due dates indicated on the certificate.

This report shall not be reproduced except in full, without written approval from Cal-Cert.

Service Engineer: Brent Enbysk

Date: September 25, 2024

Quality Manager: Jason Wimmer

Signature:

Resistivity Meter CF-080-01

Revision 7

7/24/2017



CERTIFICATE OF CALIBRATION

CUSTOMER:	PFS-TECO : CLACKAMAS, OR	CALIBRATION DATE:	06/17/2024
PO NUMBER:	1120	CALIBRATION DUE:	06/17/2025
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 53% RH 70°F
UNCERTAINTY GIVEN:	± 0.43% RD ; k=2	CERTIFICATE FILE #:	490265.2024
NOTES:	± 3.0% FS (0-500 / 0-1500) ** ± 4.0% F.S. (0-5000) **± 5.0% F.S. (0-15000) ** ± 2 °F		

Q.MANUAL IM 2.0 REV 2020.2 DATED 7-27-2020

DECISION RULE: SIMPLE ACCEPTANCE. MEASUREMENT UNCERTAINTIES NOT TAKEN INTO CONSIDERATION WHEN DETERMINING PASS/FAIL

UUT INDICATED FT/MIN	DM.STD. ACTUAL FT/MIN	UUT INDICATED DEG. F	DM STD. ACTUAL DEG. F
70	73	0 TO 200°F	0 TO 200°F
126	130	44.7	44.1
242	249	71.8	71.0
495	508	99.9	99.3
521	533		
1039	1066		
1490	1530		
507	522		
3214	3311		
4998	5156		
6975	7182		
14853	15322		

STANDARDS USED:

A312 ± .02% RD -140 TO 1372 DEG °C TRACE# 2023004415	DUE	11/13/24
A800 flow nozzles +/- .2% RD (.2-5, 5-100, 100-1650 SCFM)TRACE# 144613547,1424683640,1583314714	DUE	02/14/25

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:

Approved By:

Cal. Technician:

Calibrated at: ☒ Lab

☐ On-Site (Customer's)

Page 1 of 1

06/17/2024

[Signature]

A.W.

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 = ✓
Mass								
Raw Data		g	4535.92370000	0.0000000	0.0000000	0.1785299	4536.1022299 g	3.5E-01 ✓

This instrument has been calibrated in accordance with the JJ Calibrations Quality Assurance Manual and is traceable to either the SI or to National Institute of Standards and Technology (NIST). The quality system and this certificate are in compliance with ANSI/NCSL Z540-1-1994, ISO/IEC 17025-2017, ISO 10012-1, the ISO 9000 family and QS 9000. The expanded uncertainties of measurements for this calibration are based upon 95% (2 sigma) confidence limits. Unless stated in the comments, certificates reflect the "Simple Acceptance Rule" as specified by JCGM 106:2012. Unless otherwise stated, a test accuracy 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



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

Report Number: DIRI0134307497241204

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	12/4/24	6/12/24	6/2025

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. 100.0000	5. 99.9999	9. 99.9999	Temperature: 20.8°C		
Pass: ☒	Fail: ☐	Pass: ☒	Fail: ☐	2. 100.0000	6. 100.0000	10. 100.0000			
As-Left:		As-Left:		3. 100.0000	7. 100.0000	Result			
Pass: ☒	Fail: ☐	Pass: ☒	Fail: ☐	4. 99.9999	8. 99.9999	0.00005			

A2LA ACCREDITED SECTION OF REPORT

Standard	As-Found	As-Left	Expanded Uncertainty
200	200.0007	199.9999	0.00017
100	100.0006	99.9999	0.00016
50	50.0004	50.0000	0.00015
20	20.0003	20.0000	0.00015
0.1	0.0999	0.0999	0.00015
0.05	0.0498	0.0499	0.00015

CALIBRATION STANDARDS

Item	Make	Model	Serial Number	Cal Date	Cal Due Date	NIST ID
Weight Set	Rice Lake	20 kg to 1mg	2831W	3/31/24	3/2025	20240774

Permanent Information Concerning this Equipment:

6 month calibration cycle

Comments/Info Concerning this Calibration:

12/04/2024: Adjusted span. RH=36%

Report prepared/reviewed by: TLP

Date: 12-04-2024

Technician: E.J. Yasko

Signature: [Signature]

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. Results relate only to the item(s) tested. Unless otherwise noted, statements of conformity do not include measurement

Member: National Conference of Standards Laboratories and Weights & Measures

PT ID: DIRI01



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

Report Number: DIRI0134307497250605

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	6/5/25	12/4/24	12/2025

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		
As-Found:		As-Found:		1. 100.0000	5. 100.0000	9. 99.9999	
Pass: ☒	Fail: ☐	Pass: ☒	Fail: ☐	2. 99.9999	6. 100.0000	10. 99.9999	☐ Good ☒ Fair ☐ Poor
As-Left:		As-Left:		3. 99.9999	7. 99.9999	<u>Result</u>	Temperature: 22.6°C
Pass: ☒	Fail: ☐	Pass: ☒	Fail: ☐	4. 100.0000	8. 99.9999	0.00005	

A2LA ACCREDITED SECTION OF REPORT

Standard	As-Found	As-Left	Expanded Uncertainty
200	199.9994	200.0000	0.00017
100	99.9998	100.0000	0.00016
50	49.9999	50.0001	0.00015
20	19.9999	19.9999	0.00015
0.1	0.1000	0.0999	0.00015
0.05	0.0500	0.0499	0.00015

CALIBRATION STANDARDS

Item	Make	Model	Serial Number	Cal Date	Cal Due Date	NIST ID
Weight Set	Rice Lake	10 kg to 1 mg	D123	7/1/24	7/2025	20241353

Permanent Information Concerning this Equipment:
6 month calibration cycle

Comments/Info Concerning this Calibration:
6/25 - Cleaned, leveled, & adjusted span. RH = 49%

Report prepared/reviewed by: 

Date: 6.5.25

Technician: D. Oudeans

Signature: 

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. Results relate only to the item(s) tested. Unless otherwise noted, statements of conformity do not include measurement

Member: National Conference of Standards Laboratories and Weights & Measures

PT ID: DIRI01



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Report of Calibration

Firm: PFS-TECO
Address: 11785 SE Hwy 212, Ste 305
City/State/Zip: Clackamas, OR 97015

Test Completed: 05/09/22
Purchase Order: 1067
Traceable Number: 20220682

Test Item: 200 mg and 100 mg Individual Weights
Serial No.: Listed in Table

Manufacturer: Troemner
Customer ID: Listed in Table

<u>Material</u>	<u>Assumed Density</u>	<u>Range</u>	<u>Tolerance Class</u>
Stainless Steel	7.95 g/cm ³	200 mg & 100 mg	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:

100 g to 1 mg Working Standards Were Calibrated: 07/02/21 Due: 07/31/22 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. 8.0 g/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: 05/09/22


Signature David S. Thompson

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Report of Calibration

Firm: PFS-TECO
Address: 11785 SE Hwy 212, Ste 305
City/State/Zip: Clackamas, OR 97015

Test Completed: 05/09/22
Purchase Order: 1067
Traceable Number: 20220682

Test Item: 200 mg and 100 mg Individual Weights
Serial No.: Listed in Table

Manufacturer: Troemner
Customer ID: Listed in Table

Laboratory Environment at time of test

Temperature °C	Pressure mmHg	Humidity %RH
21.93 to 21.94	760.7 to 760.8	47.8 to 47.9

Conventional Mass Value

Nominal Value	As Found Value (g)	As Found Correction* (mg)	As Left Value (g)	As Left Correction* (mg)	Uncertainty (mg)	Tolerance (mg)
200 mg, 1000101395, #109-B	0.2000082	0.0082	0.2000082	0.0082	0.0014	0.010
100 mg, 1000126267, #109-A	0.1000065	0.0065	0.1000065	0.0065	0.0014	0.010

*Correction is the difference between the conventional mass value of a weight and its nominal value.

Comments: These weights were received in good condition and were within ASTM Class 1 tolerances As Found.

Recalibration Due: The customer has requested a 5-year calibration cycle. The calibration due date for these weights is 05/09/27. The values listed above were found at the time of calibration. Any number of factors may cause these items to drift out of calibration before the calibration interval has expired.

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 17025:2017 *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 to 2

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

Date: 05/09/22

Signature David S. Thompson

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

Report Number: DIRI01C101887029241204

A2LA ACCREDITED CERTIFICATE OF CALIBRATION WITH DATA

INSTRUMENT INFORMATION

Item	Make	Model	Serial Number	Customer ID	Location
Scale	Mettler	IND570 - 1000lbx0.	C101887029	#190	Lab
Units	Readability	SOP	Cal Date	Last Cal Date	Cal Due Date
lbs	0.02	QC033	12/4/24	12/28/23	12/2025

FUNCTIONAL CHECKS

SHIFT TEST		LINEARITY		REPEATABILITY		ENVIRONMENTAL CONDITIONS
Test Wt:	Tol:	Test Wt:	Tol:	Test Wt:	Tol:	
400	0.10	HB44	HB44	200	0.04	
As-Found:		As-Found:		As-Found:		
Pass: ☒	Fail: ☐	Pass: ☒	Fail: ☐	Pass: ☒	Fail: ☐	
As-Left:		As-Left:		As-Left:		☐ ☒ ☐ Good Fair Poor Temperature: 18.7°C
Pass: ☒	Fail: ☐	Pass: ☒	Fail: ☐	Pass: ☒	Fail: ☐	

CALIBRATION DATA

Standard	As-Found	As-Left	Expanded Uncertainty
1000	N/A	N/A	0.012
600	600.00	600.00	0.011
400	399.98	399.98	0.011
200	199.98	199.98	0.011
100	99.98	99.98	0.011
50	49.98	49.98	0.011

CALIBRATION STANDARDS

Item	Make	Model	Serial Number	Cal Date	Cal Due Date	NIST ID
Avoirdupois Cast W	Rice Lake	25 and 50lb	PWO990-CA	7/26/24	7/2026	20221688

Permanent Information Concerning this Equipment:

Comments/Information Concerning this Calibration

12/04/2024: N/A due to overload at 1000lb. RH=35%

Report prepared/reviewed by: TLP

Date: 12-04-2024

Technician: E.J. Vasko

Signature: [Signature]

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. Calibrations comply with ISO/IEC 17025 and ANSI/Z540-1-1994 quality standards.

Member: National Conference of Standards Laboratories and Weights & Measures

Report and Certificate of Calibration



www.Cal-Cert.com

Toll Free
800-356-4662

Address
5777 SE International Way
Milwaukie, OR 97222

Local
503-654-9620



Report #: 39356-1216144-4847 **Customer PO#:** 1128
Customer Name: PFS TECO
Customer Address: 11785 SE Highway 212, Suite 305
City: Clackamas **State:** OR **Zip:** 97015
Contact: Ethan Frederick
Service Address: 5777 SE International Way Milwaukie, OR 97222

Calibration Standards

10-00027 Gage Block Set Mitutoyo SN: 975536 Cal: 03/28/2023 Due: 03/31/2025 Vendor: Cal-Cert Report #: 28026-56355-5
10-00954 Gage Block Set Shars SN: 120018 Cal: 05/26/2023 Due: 05/26/2025 Vendor: American Gage Report #: 109141
LP-01346 Thermo-Hygrometer Comark SN: 06210350198 Cal: 03/08/2024 Due: 03/31/2025 Vendor: Cal-Cert Range: 122 °F 95 %RH Report #: 33563-67215-3616

Instrument Data

Calibration Date:	March 5, 2025	Reference:	Manufacturer's Spec
Calibration Due Date:	March 5, 2026	Cal-Cert Procedure:	CP-115
Calibration Frequency:	12 Months	Indicating System:	Scaling
Manufacturer:	Craftsman	Temperature:	66 °F
Type:	Tape Measure	Humidity:	40% RH
Model Number:	CMHT37365	Asset #:	209
Serial #:	Unknown	Service Location:	Cal-Cert Lab
Capacity:	25.00 Feet	As Found:	Pass
		As Left:	Pass

Instrument Range:	25.000 Feet	Range Resolution:	0.06250 Feet
	Calibration Standard	As Found Reading	Verification Reading #1
			Verification Reading #2
	0.0000	0.0000	0.0000
	0.5000	0.5000	0.5000
	0.1000	0.1000	0.1000
	12.0000	12.0000	12.0000
	48.0000	48.0000	48.0000
	96.0000	96.0000	96.0000
	192.0000	192.0000	192.0000

Expanded Uncertainty ± 0.07217 Feet

Remarks:

We sincerely thank you for your business. Please call us at 503-654-9620 for all your sales and calibration needs.
Cleaning and preventative maintenance were performed as part of this service.

Cal-Cert is accredited by A2LA under Calibration Laboratory Code #4986.01.
A2LA is recognized under the ILAC mutual recognition agreement (MRA).

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All tolerances were derived from the applicable standards and pass/fail determination is based on those tolerances. The customer determined any recommended due dates indicated on the certificate.

This report shall not be reproduced except in full, without written approval from Cal-Cert.

Service Engineer: Justin Royce

Date: March 5, 2025

Quality Manager: Tony Lewandowski

Signature:

Report and Certificate of Calibration



www.Cal-Cert.com

Toll Free
800-356-4662

Address
5777 SE International Way
Milwaukie, OR 97222

Local
503-654-9620



Report #: 38860-206392-21 **Customer PO#:** 1126
Customer Name: PFS TECO
Customer Address: 11785 SE Highway 212, Suite 305
City: Clackamas **State:** OR **Zip:** 97015
Contact: Ethan Frederick
Service Address: 11785 SE Highway 212, Suite 305 Clackamas, OR 97015

Calibration Standards

14-00235 Thermocouple Meter Tegan SN: T-276988 Cal: 08/23/2024 Due: 08/31/2025 Vendor: Cal-Cert Range: 2400 °F Report #: 36408-30865-3646
14-01349 Thermo-Hygrometer Comark SN: 06210350162 Cal: 08/23/2024 Due: 08/31/2025 Vendor: Cal-Cert Range: 122 °F 95 %RH Report #: 36408-71148-5

Instrument Data

Calibration Date:	February 26, 2025	Reference:	Navair 17-20ST-95
Recommended Due Date:	February 26, 2026	Cal-Cert Procedure:	CP-013
Calibration Frequency:	12 Months	Indicating System:	Computer
Manufacturer:	National Instruments	Temperature:	70 °F
Type:	Data Logger	Humidity:	32% RH
Model Number:	NI 9213	Asset #:	216 Booth 2
Serial #:	1E286FA	Service Location:	Service Address
Resolution:	0.1 °F	As Found:	Pass
Capacity:	2,500 °F	As Left:	Pass
Tolerance:	± 2.0 °F		
Thermocouple Type:	K		

Thermocouple LOGGING FUNCTION

Channel	Calibration Standard	UUT As Found	UUT As Left Reading 1	UUT As Left Reading 2	As Left Error	Expanded Uncertainty±
Tunnel	0.00	0.00	0.00	0.00	0.00	0.436
	500.00	500.00	500.00	500.00	0.00	
	1000.00	999.90	999.90	999.90	-0.10	
	1500.00	1499.80	1499.80	1499.90	-0.15	
	2000.00	1999.70	1999.70	1999.80	-0.25	
	2400.00	2399.60	2399.60	2399.70	-0.35	

Thermocouple LOGGING FUNCTION

Channel	Calibration Standard	UUT As Found	UUT As Left Reading 1	UUT As Left Reading 2	As Left Error	Expanded Uncertainty±
Flue	0.00	-0.20	-0.20	-0.20	0.20	0.436
	500.00	499.80	499.80	499.90	-0.15	
	1000.00	999.80	999.80	999.80	-0.20	
	1500.00	1499.80	1499.80	1499.80	-0.20	
	2000.00	1999.50	1999.50	1999.50	-0.50	
	2400.00	2399.50	2399.50	2399.50	-0.50	

Thermocouple LOGGING FUNCTION						
Channel	Calibration Standard	UUT As Found	UUT As Left Reading 1	UUT As Left Reading 2	As Left Error	Expanded Uncertainty±
Filter A	0.00	0.00	0.00	0.00	0.00	0.436
	500.00	499.90	499.90	499.90	-0.10	
	1000.00	999.90	999.90	999.90	-0.10	
	1500.00	1499.80	1499.80	1499.80	-0.20	
	2000.00	1999.80	1999.80	1999.80	-0.20	
	2400.00	2399.60	2399.60	2399.70	-0.35	

Thermocouple LOGGING FUNCTION						
Channel	Calibration Standard	UUT As Found	UUT As Left Reading 1	UUT As Left Reading 2	As Left Error	Expanded Uncertainty±
Back	0.00	-0.40	-0.40	-0.40	0.40	0.436
	500.00	499.50	499.50	499.50	-0.50	
	1000.00	999.60	999.60	999.50	-0.45	
	1500.00	1499.50	1499.50	1499.40	-0.55	
	2000.00	1999.20	1999.20	1999.30	-0.75	
	2400.00	2399.20	2399.20	2399.20	-0.80	

Thermocouple LOGGING FUNCTION						
Channel	Calibration Standard	UUT As Found	UUT As Left Reading 1	UUT As Left Reading 2	As Left Error	Expanded Uncertainty±
Catalyst	0.00	(0.60)	(0.60)	(0.60)	0.60	0.436
	500.00	499.40	499.40	499.40	-0.60	
	1000.00	999.40	999.40	999.40	-0.60	
	1500.00	1499.30	1499.30	1499.20	-0.75	
	2000.00	1999.10	1999.10	1999.10	-0.90	
	2400.00	2398.80	2398.80	2398.90	-1.15	

Thermocouple LOGGING FUNCTION						
Channel	Calibration Standard	UUT As Found	UUT As Left Reading 1	UUT As Left Reading 2	As Left Error	Expanded Uncertainty±
Meter A	0.00	-0.70	-0.70	-0.90	0.80	0.511
	500.00	499.20	499.20	499.10	-0.85	
	1000.00	999.20	999.20	999.20	-0.80	
	1500.00	1499.00	1499.00	1499.10	-0.95	
	2000.00	1999.00	1999.00	1998.90	-1.05	
	2400.00	2398.80	2398.80	2398.70	-1.25	

Thermocouple LOGGING FUNCTION						
Channel	Calibration Standard	UUT As Found	UUT As Left Reading 1	UUT As Left Reading 2	As Left Error	Expanded Uncertainty±
Left	0.00	-0.80	-0.80	-0.80	0.80	0.436
	500.00	499.10	499.10	499.10	-0.90	
	1000.00	999.20	999.20	999.10	-0.85	
	1500.00	1499.00	1499.00	1499.10	-0.95	
	2000.00	1998.90	1998.90	1998.90	-1.10	
	2400.00	2398.60	2398.60	2398.70	-1.35	

Thermocouple LOGGING FUNCTION						
Channel	Calibration Standard	UUT As Found	UUT As Left Reading 1	UUT As Left Reading 2	As Left Error	Expanded Uncertainty±
Right	0.00	-1.00	-1.00	-1.00	1.00	0.436
	500.00	499.00	499.00	498.90	-1.05	
	1000.00	999.00	999.00	999.00	-1.00	
	1500.00	1498.80	1498.80	1498.90	-1.15	
	2000.00	1998.70	1998.70	1998.80	-1.25	
	2400.00	2398.50	2398.50	2398.60	-1.45	

Thermocouple LOGGING FUNCTION						
Channel	Calibration Standard	UUT As Found	UUT As Left Reading 1	UUT As Left Reading 2	As Left Error	Expanded Uncertainty±
Filter B	0.00	0.00	0.00	0.00	0.00	0.511
	500.00	500.40	500.40	500.50	0.45	
	1000.00	1000.10	1000.10	1000.20	0.15	
	1500.00	1499.80	1499.80	1499.60	-0.30	
	2000.00	1999.30	1999.30	1999.20	-0.75	
	2400.00	2398.60	2398.60	2398.80	-1.30	

Thermocouple LOGGING FUNCTION						
Channel	Calibration Standard	UUT As Found	UUT As Left Reading 1	UUT As Left Reading 2	As Left Error	Expanded Uncertainty±
Top	0.00	-1.20	-1.20	-1.20	1.20	0.511
	500.00	498.80	498.80	498.70	-1.25	
	1000.00	998.80	998.80	998.80	-1.20	
	1500.00	1498.70	1498.70	1498.60	-1.35	
	2000.00	1998.60	1998.60	1998.40	-1.50	
	2400.00	2398.30	2398.30	2398.30	-1.70	

Remarks:

We sincerely thank you for your business. Please call us at 503-654-9620 for all your sales and calibration needs.
Cleaning and preventative maintenance were performed as part of this service.

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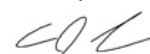
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Service Engineer: Samuel Owens

Date: February 26, 2025

Quality Manager: Tony Lewandowski

Signature:



Report #: 38860-206392-21

Report and Certificate of Calibration



www.Cal-Cert.com

Toll Free
800-356-1662

Address
5777 SE International Way
Milwaukie, OR 97222

Local
503-654-9620



Report #: 38860-206392-21-B **Customer PO#:** 1126
Customer Name: PFS TECO
Customer Address: 11785 SE Highway 212, Suite 305
City: Clackamas **State:** OR **Zip:** 97015
Contact: Ethan Frederick
Service Address: 11785 SE Highway 212, Suite 305 Clackamas, OR 97015

Calibration Standards

14-00235 Thermocouple Meter Tegan SN: T-276988 Cal: 08/23/2024 Due: 08/31/2025 Vendor: Cal-Cert Range: 2400 °F Report #: 36408-30865-3646
14-01349 Thermo-Hygrometer Comark SN: 06210350162 Cal: 08/23/2024 Due: 08/31/2025 Vendor: Cal-Cert Range: 122 °F 95 %RH Report #: 36408-71148-5

Instrument Data

Calibration Date:	February 27, 2025	Reference:	Navair 17-20ST-95
Recommended Due Date:	February 27, 2026	Cal-Cert Procedure:	CP-013
Calibration Frequency:	12 Months	Indicating System:	Computer
Manufacturer:	National Instruments	Temperature:	65 °F
Type:	Data Logger	Humidity:	40% RH
Model Number:	NI 9213	Asset #:	216 Booth 2
Serial #:	1E286FA	Service Location:	Service Address
Resolution:	0.1 °F	As Found:	Pass
Capacity:	2,400 °F	As Left:	Pass
Tolerance:	± 3.0 °F		
Thermocouple Type:	K		

Thermocouple LOGGING FUNCTION

Channel	Calibration Standard	UUT As Found	UUT As Left Reading 1	UUT As Left Reading 2	As Left Error	Expanded Uncertainty±
Bottom	0.00	-1.50	-1.50	-1.50	1.50	0.511
	500.00	498.50	498.50	498.60	-1.45	
	1000.00	998.50	998.50	998.60	-1.45	
	1500.00	1498.40	1498.40	1498.40	-1.60	
	2000.00	1998.20	1998.20	1998.00	-1.90	
	2400.00	2397.90	2397.90	2397.80	-2.15	
	0.00	-1.50	-1.50	-1.50	1.50	

Thermocouple LOGGING FUNCTION

Channel	Calibration Standard	UUT As Found	UUT As Left Reading 1	UUT As Left Reading 2	As Left Error	Expanded Uncertainty±
Meter B	0.00	-1.60	-1.60	-1.60	1.60	0.436
	500.00	498.50	498.50	498.50	-1.50	
	1000.00	998.60	998.60	998.50	-1.45	
	1500.00	1498.40	1498.40	1498.30	-1.65	
	2000.00	1998.10	1998.10	1998.00	-1.95	
	2400.00	2397.70	2397.70	2397.70	-2.30	
	0.00	-1.50	-1.50	-1.60	1.55	

Thermocouple LOGGING FUNCTION						
Channel	Calibration Standard	UUT As Found	UUT As Left Reading 1	UUT As Left Reading 2	As Left Error	Expanded Uncertainty±
Meter C	0.00	-1.70	-1.70	-1.70	1.70	0.436
	500.00	498.20	498.20	498.30	-1.75	
	1000.00	998.30	998.30	998.30	-1.70	
	1500.00	1498.20	1498.20	1498.10	-1.85	
	2000.00	1997.90	1997.90	1997.90	-2.10	
	2400.00	2397.50	2397.50	2397.60	-2.45	
	0.00	-1.70	-1.70	-1.70	1.70	

Thermocouple LOGGING FUNCTION						
Channel	Calibration Standard	UUT As Found	UUT As Left Reading 1	UUT As Left Reading 2	As Left Error	Expanded Uncertainty±
Filter C	0.00	-1.50	-1.50	-1.50	1.50	0.436
	500.80	498.50	498.50	498.50	-2.30	
	1000.40	998.50	998.50	998.40	-1.95	
	1500.00	1498.30	1498.30	1498.20	-1.75	
	1999.40	1998.00	1998.00	1998.00	-1.40	
	2399.10	2397.70	2397.70	2397.60	-1.45	
	0.00	-1.50	-1.50	-1.60	1.55	

Thermocouple LOGGING FUNCTION						
Channel	Calibration Standard	UUT As Found	UUT As Left Reading 1	UUT As Left Reading 2	As Left Error	Expanded Uncertainty±
Ambient	0.00	(1.90)	(1.90)	(1.80)	1.85	0.576
	20.00	18.30	18.30	18.50	-1.60	
	40.00	38.40	38.40	38.60	-1.50	
	60.00	58.40	58.40	58.40	-1.60	
	80.00	78.50	78.50	78.60	-1.45	
	100.00	98.50	98.50	98.60	-1.45	
	0.00	(1.80)	(1.80)	(1.50)	1.65	

Remarks:

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Service Engineer: Samuel Owens

Date: February 27, 2025

Quality Manager: Tony Lewandowski

Signature:



Report #: 38860-206392-21-B

IN CASE OF EMERGENCY: CALL 1-800-645-4633

SDS ID: P-18-0301-H

DO NOT REMOVE THIS LABEL

Lot No. 70086426104
Cylinder No. DT0042934
Part No. NI CD17CO8E-AS
Volume: 99 ft³
Fill Date: 09/17/2024
Expiration Date: 09/26/2032



ProSpec

By Linde



Linde Gas P. Equipment Inc.

5760 S. Alameda Ave.

Los Angeles, CA 90008

UN1956

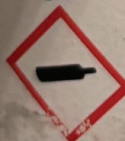
Compressed gas, n.o.s. (Nitrogen,
Oxygen)



EPA Protocol

Molar Concentration	Component	CAS
17.32 %	Carbon dioxide	124-38-9
4.35 %	Carbon monoxide	630-08-0
16.96 %	Oxygen	7782-44-7
Balance	Nitrogen	7727-37-9

Danger



CONTAINS GAS UNDER PRESSURE; MAY EXPLODE IF HEATED. MAY DAMAGE FERTILITY OR THE UNBORN CHILD. CAUSES DAMAGE TO ORGANS THROUGH PROLONGED OR REPEATED EXPOSURE. MAY INCREASE RESPIRATION AND HEART RATE. ASPHYXIATING EVEN WITH ADEQUATE OXYGEN.

TLV:

Carbon monoxide 25 ppm

Obtain special instructions before use; Do not handle until all safety precautions have been read and understood; Do not breathe gas vapors; If exposed skin thoroughly after handling; Do not eat, drink or smoke when using this product; Wear protective gloves/protective clothing/eye protection/face protection; IF EXPOSED OR CONCERNED: Get medical advice/attention; Get medical advice/attention if you feel unwell; Store locked up; Dispose of contents/container in accordance with local/regional/national/international regulations; Contact supplier for any special requirements; Use and store only outdoors or in a well-ventilated place; Use a back flow preventive device in the piping; Use only with equipment rated for cylinder pressure; Do not open valve until connected to equipment prepared for use; Close valve after each use and when empty; Protect from sunlight when ambient temperature exceeds 52°C (125°F); Avoid breathing gas, vapors; IF INHALED: Remove person to fresh air and rest; Comfortable for breathing; Call a POISON CENTER or doctor/physician.

FIRST AID

IF INHALED: Remove to fresh air and keep at rest in a position comfortable for breathing. If not breathing, give artificial respiration. If breathing is difficult, trained personnel should give oxygen. Call a physician.
IF IN EYES: Immediately flush eyes with plenty of water. Hold the eyelids open and away from the eyeballs as much as possible. Call a physician.
IF ON SKIN: Wash with plenty of water. Call a physician.



Compressed gas, n.o.s.
(Carbon Monoxide, Carbon Dioxide, Oxygen,
Nitrogen)

UN1956

SPG 5P10162.5VM2
Part Number

Primary Standard, +/- 0.02% Absolute

2.500 % Carbon Monoxide
10.00 % Carbon Dioxide
10.00 % Oxygen
Balance Nitrogen

CAS: 630-08-0
CAS: 124-38-9
CAS: 7782-44-7
CAS: 7727-37-9

DANGER: CAUSES DAMAGE TO ORGANS THROUGH PROLONGED OR REPEATED EXPOSURE. CONTAINS GAS UNDER PRESSURE; MAY EXPLODE WHEN HEATED. MAY DAMAGE FERTILITY OR THE UNBORN CHILD. MAY INCREASE RESPIRATION AND HEARTRATE. Use only with equipment of compatible materials of construction and rated for cylinder pressure. Protect from sunlight when ambient temperature exceeds 52C (125F). Use a back flow preventive device in the piping. Close valve after each use and when empty. Do not open valve until connected to equipment prepared for use. Obtain special instructions before use. Protect from sunlight. Store in a well-ventilated place. IF exposed or concerned: Get medical advice. Store locked up. Dispose of contents/container in accordance with container/supplier owner instructions. Do not handle until all safety precautions have been read and understood. Do not breathe gas. Wash hands thoroughly after handling. Do not eat, drink, or smoke when using this product. Wear protective gloves, protective clothing, eye protection, and/or face protection. Read and follow the Safety Data Sheet (SDS) before use.

FIRST AID: IF ON SKIN: wash with plenty of water. IF INHALED: Remove person to fresh air and keep comfortable for breathing. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do - continue rinsing. IF exposed or concerned: Get medical advice.



WARNING: This product can expose you to Carbon Monoxide which is known to the State of California to cause birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

Lot No: 1-053-122
Serial Number: CC341544
SPG 5P10162.5VM2
Part Number
PO # 208483
Expires: 2-2024

NorLAB

To Order Call: 800-657-6672

In Emergency Call: 1-800-424-6300
Norlab, Inc.
888 W. Gower Road
Boling, Idaho 83703

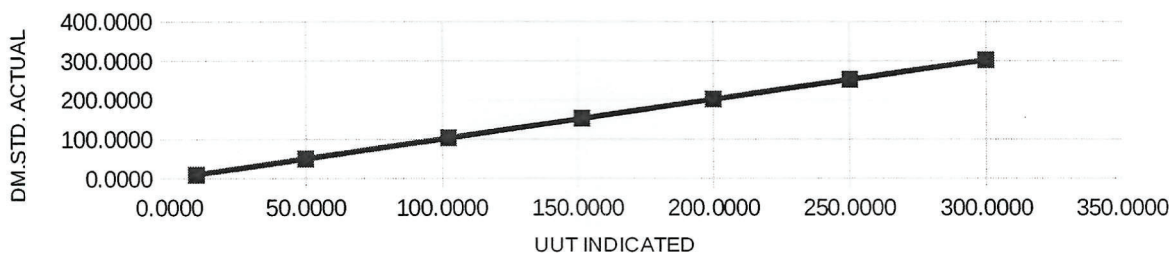


CERTIFICATE OF CALIBRATION

CUSTOMER: PFS-TECO CLACKAMAS OR
PO NUMBER: 1126
INST. MANUFACTURER: KELLY PNEUMATICS
INST. DESCRIPTION: DIGITAL FLOW METER
MODEL NUMBER: KPI-MFS-1
SERIAL NUMBER: 05167; ID# 134
RATED ACCURACY: +/- 2 % RD. or 0.05 SLPM (the greater)
UNCERTAINTY GIVEN: TOTAL measurement uncertainty: +/- .221 % RD. K = 2
NOTES: REFERENCE CONDITIONS: 760mmHGA & 70 DEG. F QM.IM 2.0 REV. DATED 7-27-2020
DECISION RULE: SIMPLE ACCEPTANCE. MEASUREMENT UNCERTAINTIES NOT TAKEN INTO CONSIDERATION WHEN DETERMINING PASS/FAIL

CALIBRATION DATE: 02/07/25
CALIBRATION DUE: 02/07/26
PROCEDURE: NAVAIR-17-20MG-02
CALIBRATION FLUID: AIR @ 14.7 PSIA, 70 F
AS RECEIVED: WITHIN SPECS.
AS RETURNED: WITHIN SPECS.
AMBIENT CONDITIONS: 765 mm HGA 52 % RH 70 F
CERTIFICATE FILE #: 492852.2025

TEST POINT NUMBER	UUT INDICATED SLPM	DM.STD. ACTUAL SLPM	ERROR % RD.	TEST RESULTS
4	10.03	10.130	0.997	PASS
5	49.96	50.432	0.945	PASS
6	102.33	103.091	0.744	PASS
7	151.45	152.508	0.699	PASS
8	199.90	201.723	0.912	PASS
9	250.12	252.256	0.854	PASS
10	299.95	302.312	0.787	PASS



STANDARDS USED:

A24 TEMP.STD.:HART SCIENTIFIC +/- .19 F (+/- .04 C) TRACE# 1683031933	DUE	05/02/25
A5 VOLUME PROVER +/- .049% BY VOLUME + TRACE NUMBERS. 2-1200 ACFM TRACE# 1649766843,06290041521	DUE	02/14/25

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:

Approved By:

Cal. Technician:

Calibrated at: ☒ Lab

☐ On-Site (Customer's)

Page 1 of 1

02/07/2025

[Signature]

[Signature]

Thermo Fisher Scientific Inc.

Serial # CVK 7037

Weight One	Weight Two	Weight Three	Average Weight
0.094101 grams	0.094103 grams	0.094102 grams	0.09410 grams

Technician: Ying-Dunn
Name

2-18-21
Date

Q.A.: [Signature]

Name

Date

This filter has been weighed on a laboratory balance that is calibrated and certified traceable to NIST test standards.