Greentech Manufacturing Inc.

Project # 20-565
Model: Crown Royal Stoves 7200E
Type: Residential Outdoor Wood-Fired Hydronic Heater
July 2, 2020
Revision Dates: June 2, 2022
September 26, 2022

ASTM E2618-13 Measurement of Particulate Emissions and Heating Efficiency of Solid Fuel-Fired Hydronic Heating Appliances

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Revision History

Date: July 2, 2020 – Original Issue

Date: June 2, 2022 – The following changes were made per request from EPA:

- Added weighted average HHV efficiency, see page 8
- B415 Calculations page was included in Appendix A, discussion thereof was added to Page 10
- Technician run notes were added to Appendix A
- Efficiency and PM output based on the 1-hour filter sample were included, see page 8
- Filter train precision in % was added to run results sheets, see Appendix A
- Low burn rate discussion added on page 10
- Fuel loaded direction specified on page 11
- Owners' Manual updated to include guidance on proper draft, establishment of good combustion at the lowest burn rate, and information on smoke and CO detectors, see Appendix B
- Updated dilution tunnel diagram on page 17

Date: September 26, 2022 – The following changes were made per request from EPA:

- Added fuel load density data and discussion on page 10
- Revised discussion of efficiency results on page 10. Added expanded, general discussion of efficiency result discrepancy, see Appendix F.

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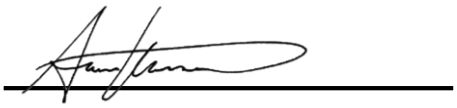
Affidavit

PFS-TECO was contracted by Greentech Manufacturing Inc. to provide testing services for the Crown Royal Stoves 7200E Residential Hydronic Heater per ASTM E2618-13 and 40 CFR Part 60 Subpart QQQQ. All testing and associated procedures were conducted at Greentech's International Falls, MN laboratory beginning on 5/1/2020 and ending on 5/4/2020. Greentech's International Falls laboratory is located at 2716 Crescent Dr, International Falls, MN 56649. Testing procedures followed ASTM E2618, *Standard Test Method for Measurement of Particulate Emissions and Heating Efficiency of Solid Fuel-Fired Hydronic Heating Appliances*. 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 Accreditation Certificate Numbers 4 and 4M (mobile). PFS-TECO is accredited by IAS to ISO 17020:2012 "Criteria for Bodies Performing Inspections", and ISO 17025:2005 "Requirements for Testing Laboratories." PFS-TECO is also accredited by Standards Council of Canada to ISO 17065:2012 "Requirements for Bodies Operating Product Certification Systems."

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



Aaron Kravitz, Testing Supervisor

Introduction

Greentech Manufacturing Inc. of International Falls, MN, contracted with PFS-TECO to perform EPA certification testing on 7200E residential hydronic heater. All testing was performed at Greentech's International Falls, MN laboratory. Testing was performed by Mr. Aaron Kravitz.

Notes

- Prior to start of testing, 50 hours of conditioning was performed per ASTM E2618.
- Prior to start of testing, the dilution tunnel was cleaned with a steel brush.
- Front filters were changed on sample train A at one hour for all 4 test runs.
- In accordance with 40 CFR §60.5476, the burn rate categories specified in Method 28WHH were used in place of those specified by ASTM E2618.
- A total of 4 test runs were performed, 1 at the maximum burn rate category, 1 at the medium high burn rate category, 1 at the medium low burn rate category, and 1 at the low burn rate category.

Wood Heater Identification and Testing

- Appliance Tested: *Crown Royal Stoves 7200E*
- Serial Number: *Un-serialized Prototype – PFS Tracking Number 0069*
- Manufacturer*: Greentech Manufacturing Inc.*
- Catalyst: *No*
- Type: *Wood-Fired Hydronic Heater*
- Style: *Outdoor*
- Usable Firebox Volume: *6.11 ft^3*
- Date Received: *Friday, May 01, 2020*
- Wood Heater Aging: *February – March, 2020*
- Testing Period – Start: *Friday, May 01, 2020* Finish: *Monday, May 04, 2020*
- Test Location: *Greentech's International Falls laboratory, 2716 Crescent Dr, International Falls, MN 56649*
- Elevation: *≈1100 Feet above sea level*
- Test Technician(s): *Aaron Kravitz*
- Observers: *Cody Holmestad and Ryan Horne of Greentech*

Test Procedures and Equipment

All Sampling and analytical procedures were performed by Aaron Kravitz. All procedures used are directly from ASTM E2618 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
VC-GSE350	Floor scale w/digital weight indicator
049	Stopwatch
050	Platform scale
129	APEX XC-50 Digital Emissions Sampling Box A
130	APEX XC-50 Digital Emissions Sampling Box B
145	Omega Handheld Logger w/ RTDs
109A/B	Troemner 100mg/200mg Audit Weights
139	5 lb audit weight
107	Sartorius Analytical Balance
095	Anemometer
141	Microtector
140	Delmhorst J-2000 Wood Moisture Meter
064	Digital Barometer
090	Tape Measure
112	Digital Calipers
N/A*	Electromagnetic Flow Meter
N/A*	CAI Combustion Gas Analyzer

*Client-owned equipment. Calibrations verified prior to each test run.

Results

A total of 4 test runs were performed on the 7200E. The weighted average year-round use emissions rate for the 4 run test series was measured to be **0.08 lb/mmBtu heat output** with a delivered efficiency of **77%.** The average CO emission rate for the 4 tests was **2.8 g/min.** The maximum emissions rate for any one burn was **0.12 lb/mmBtu heat output.** The 7200E Residential Hydronic Heater meets the cord wood alternative compliance option for particulate matter emission limit of ≤ 0.15 lb/mmBtu heat output per CFR 40 part 60, §60.5474 (b).

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

Table 1A. Data Summary Part A

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						Θ	W_{fuel}	MC_{ave}	Q_{in}	Q_{out}
Category	Run No	Load % Capacity	Target Load	Actual Load	Actual Load	Test Duration	Wood Wt	Wood Moisture	Heat Input (HHV)	Heat Output
			BTU/hr	BTU/hr	% of max	hrs	lb	% DB	BTU	BTU
I	2	< 15% of max	< 18487	18,091	14.5%	20.00	66.6	22.3	468,771	361,825
II	3	16-24% of max	19720 - 30812	29,788	23.8%	11.92	67.2	23.9	466,626	354,973
III	4	25-50% of max	30812 - 61624	56,317	45.1%	6.45	66.4	21.1	471,261	363,246
IV	1	Max capacity	125000	123,247	-1.4%	3.63	70.0	22.2	492,443	447,798

Table 1B. Data Summary Part B

			$T2_{Min}$	E_T	E	E	$E_{g/hr}$	$E_{g/kg}$	η_{del}	H_{SLM}
Category	Run No	Load % Capacity	Min Return Temp	Total PM Emissions	PM Output Based	PM Output Based	PM Rate	PM Factor	Delivered Efficiency	Stack Loss Efficiency
			ºF	g	lb/mmBTU Out	g/MJ	g/hr	g/kg	%	%
I	2	< 15% of max	163	10.5	0.064	0.027	0.52	0.42	77.2%	77.1%
II	3	16-24% of max	162	14.0	0.087	0.037	1.17	0.57	76.1%	71.8%
III	4	25-50% of max	160	19.8	0.120	0.052	3.07	0.80	77.1%	83.7%
IV	1	Maximum	147	9.7	0.048	0.020	2.66	0.37	90.9%	91.0%

Table 1C. Hangtag Information

MANUFACTURER:	Greentech Manufacturing, Inc.		
MODEL NUMBER:	7200E		
MAXIMUM OUTPUT RATING:	Q_{max}	125,000	BTU/HR
ANNUAL EFFICIENCY RATING:	η_{avg}	77%	(Using higher heating value)
	ƞSLM	78%	(SLM using HHV)
PARTICLE EMISSIONS:	E_{avg}	1.5	GRAMS/HR (average)
		0.08	LBS/MILLION BTU OUTPUT
CARBON MONOXIDE:	$O_{g/MIN}$	2.8	GRAMS/MINUTE

Table 2A. Heating Season Weighting

Category	Weighting Factor (F_i)	$\eta_{del,\,i} \times F_i$	$E_{g/MJ,\,i} \times F_i$	$E_{g/kg,\,i} \times F_i$	$E_{lb/mmBTU\ Out,\,i} \times F_i$	$E_{g/hr,\,i} \times F_i$	HSLM × F_i
I	0.175	13.5%	0.005	0.074	0.011	0.092	13.5%
II	0.275	20.9%	0.010	0.156	0.024	0.323	19.7%
III	0.450	34.7%	0.023	0.358	0.054	1.382	37.7%
IV	0.100	9.1%	0.002	0.037	0.005	0.266	9.1%
Total	1.000	78.2%	0.040	0.625	**0.094**	2.062	80.0%

Table 2B. Year-Round Use Weighting

Category	Weighting Factor (F_i)	$\eta_{del,\,i} \times F_i$	$E_{g/MJ,\,i} \times F_i$	$E_{g/kg,\,i} \times F_i$	$E_{lb/mmBTU\ Out,\,i} \times F_i$	$E_{g/hr,\,i} \times F_i$	HSLM × F_i
I	0.437	33.7%	0.012	0.185	0.028	0.229	33.7%
II	0.238	18.1%	0.009	0.135	0.021	0.279	17.1%
III	0.275	21.2%	0.014	0.219	0.033	0.844	23.0%
IV	0.050	4.5%	0.001	0.019	0.002	0.133	4.6%
Total	1.000	77.6%	0.036	0.557	**0.084**	1.486	78.3%

Table 3. CO emissions & First Hour PM

Category	CO emissions (g/min)	First Hour Emissions (g/hr)	First Hour Emissions (lb/mmBTU)
I	2.46	2.13	0.196
II	3.85	0.82	0.064
III	2.60	0.91	0.036
IV	2.46	0*	N/A – no filter catch*

*For this run, the unit was off for the entire first hour of the test and near zero catch weight was observed, causing the near-zero results shown above. The results are within measurement uncertainty limits.

Test Run Narrative

Run 1

Run 1 was performed on 5/1/2020 as a category 4 (maximum output) test per EPA Method 28WHH. The unit was operated for one hour at the desired output rate prior to loading the test fuel. The unit did not cycle off during the test and the return water temperature did not drop below 120F, so the test is considered a valid measure of maximum output. Heat output was 123,247 Btu/hr, and emissions rate was 0.048 lb/mmBtu heat output. Delivered efficiency was 90.9%. The Train A front filter was changed at 1 hr to determine 1st hour emissions. All test results were appropriate and valid. There were no anomalies and all test criteria were met.

Run 2

Run 2 was performed on 5/1/2020 as a category 1 test per EPA Method 28WHH. The unit was operated for one hour at the desired output rate prior to loading the test fuel. Output was under 15% of maximum and the return water temperature did not drop below 120F, so the test is considered a valid category 1. Heat output was 18,091 Btu/hr, and emissions rate was 0.064 lb/mmBtu heat output. Delivered efficiency was 77.1%. The Train A front filter was changed at 1 hr to determine 1st hour emissions. All test results were appropriate and valid. There were no anomalies and all test criteria were met.

Run 3

Run 3 was performed on 5/2/2020 as a category 2 test per EPA Method 28WHH. The unit was operated for one hour at the desired output rate prior to loading the test fuel. Heat output was 29,788 Btu/hr, and emissions rate was 0.087 lb/mmBtu heat output. Output was between 15-24% of maximum and the return water temperature did not drop below 120F, so the test is considered a valid category 2. Delivered efficiency was 76.1%. The Train A front filter was changed at 1 hr to determine 1st hour emissions. All test results were appropriate and valid. There were no anomalies and all test criteria were met.

Run 4

Run 4 was performed on 5/3/2020 as a category 3 test per EPA Method 28WHH. The unit was operated for one hour at the desired output rate prior to loading the test fuel. Heat output was 56,317 Btu/hr, and emissions rate was .120 lb/mmBtu heat output. Output was between 25-49% of maximum and the return water temperature did not drop below 120F, so the test is considered a valid category 3. Delivered efficiency was 77.1%. The Train A front filter was changed at 1 hr to determine 1st hour emissions. All test results were appropriate and valid. There were no anomalies and all test criteria were met.

Efficiency Discussion

Two methods were used to determine efficiency for each run: delivered output, which measures energy output at the heat load, and stack loss output, which calculates energy lost through the stack and assumes that all other heat output is useful heat. Theoretically, efficiency calculated from the stack loss output should always be higher than that calculated from delivered output.

However, calculations for two runs performed generated delivered efficiency values higher than stack loss efficiency, see table 1B. The other runs (1 & 4) had delivered efficiency results lower than stack loss.

While the precise cause of this discrepancy cannot be definitively assessed, it does not indicate a source of excessive measurement uncertainty or error, systemic bias, or any deviation from the test method. Several factors related to specific measurement procedures and calculations specified by ASTM E2618 may contribute to this discrepancy. These are explored in detail in Appendix F.

Low Burn Rate Discussion

The 7200E, like all wood-fired hydronic heaters, is functionally a single burn rate appliance. Users have no control of the air settings between “off” and “on;” heat output is varied instead by switching between these two settings. Therefore, all tests conducted on the unit were conducted at a burn rate no higher than that which an end user may achieve.

Test Fuel Loading Density Discussion

Test fuel loading density was determined in compliance with ASTM E2515 section 12.2.3. The manufacturer’s written instructions (see Appendix B) specify loading the firebox 75% full. Filling the firebox to the specified level with fuel as specified in section 12.2.1 resulted in a loading density of 11.45 lb per cubic foot. As this is greater that 10 lb per cubic foot, the manufacturer’s loading instructions were used for determining loading density, and the initial fuel load became the fuel for Run 1. Subsequent fuel loads used the number of pieces most closely corresponding to this density, per the method. The resultant loading densities for each run are shown below:

Run	Loading Density (lb/ft^3)
1	11.45
2	10.90
3	10.99
4	10.87

Test Conditions Summary

Testing conditions for all runs fell within allowable specifications of ASTM E2618 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.)	Preburn Fuel Weight (lbs)	Test Fuel Weight (lbs)	Test Fuel Moisture (%DB)	Test Run Time (Min)
	Pre	Post	Pre	Post					
1	71	74	31.8	42.6	28.47	74	70.0	22.1%	218
2	70	66	46.2	29.8	28.50	78	66.6	22.2%	1200
3	66	64	33.7	36.8	28.64	68	67.2	24.1%	715
4	61	62	39.3	33.7	28.84	69	66.4	21.1%	387

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.

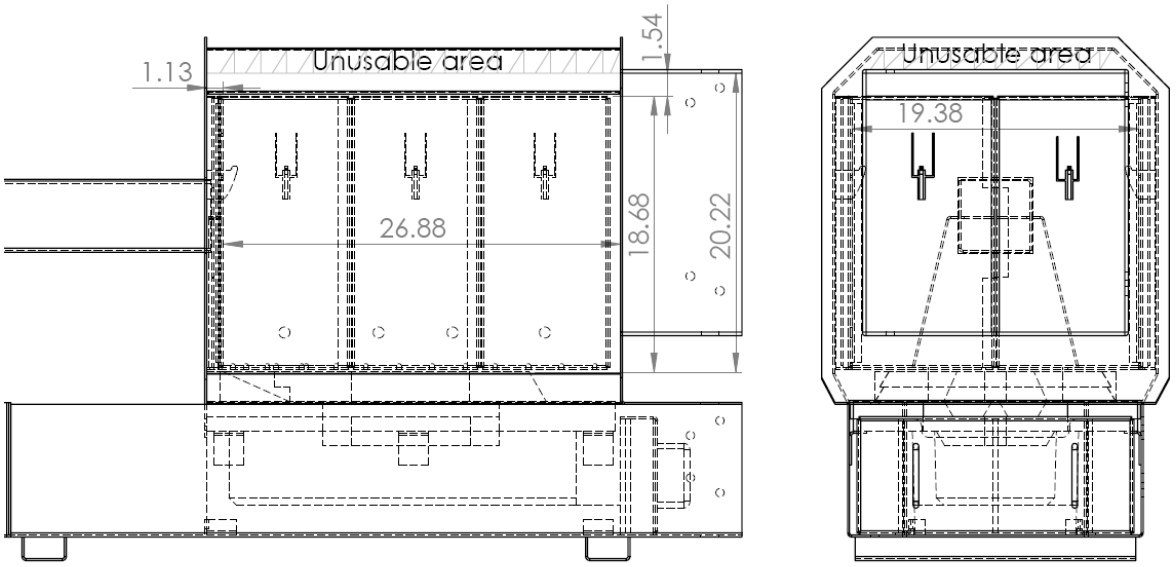
Fuel was loaded in a north/south direction, in parallel with the firebox's longest dimension. See firebox diagram shown below for details.

Appliance Air Flow, Firebox, & Photographs

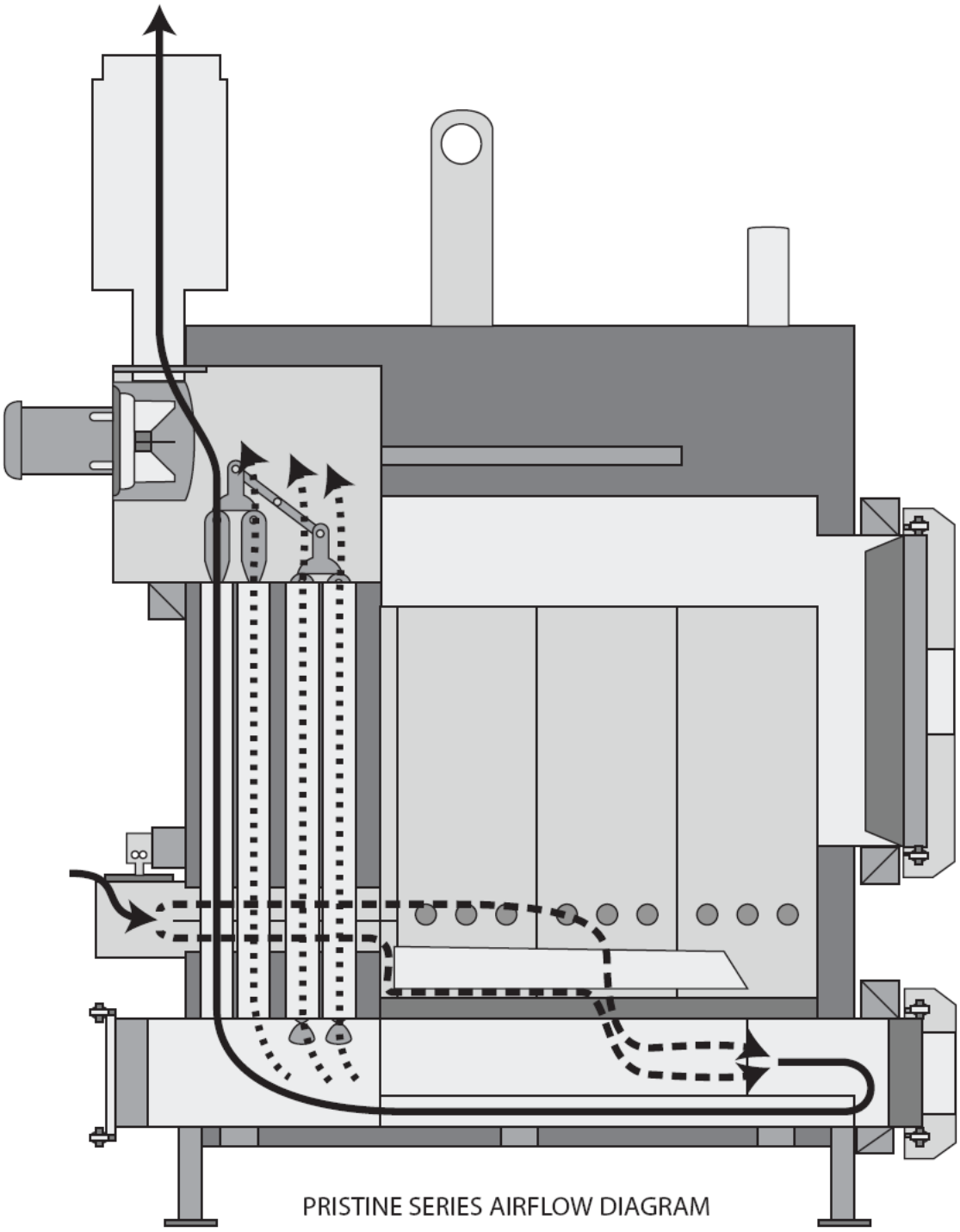
Firebox Volume

7200E
Usable Firebox Volume
From top of Air Panels to bottom
of firebox area: 19.38 x 18.68 x26.88
=5.63 cu. ft.
From top of Air Panels to the highest
usable area: 19.38 x 1.54 x 28
= .48 cu. ft.

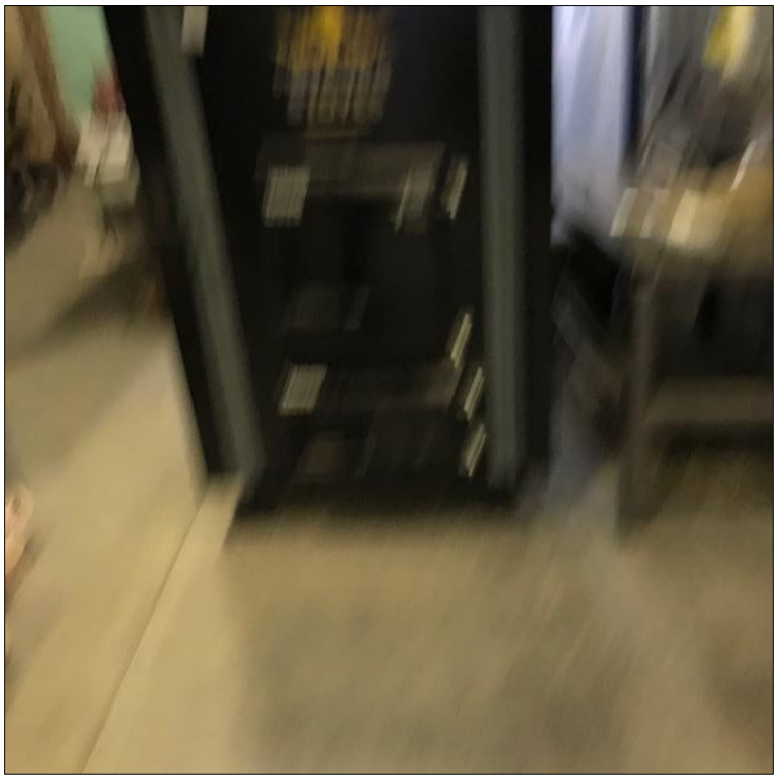
Total Cubic Feel = 6.11



Airflow Diagram



Appliance Front



Appliance Left

Appliance Right

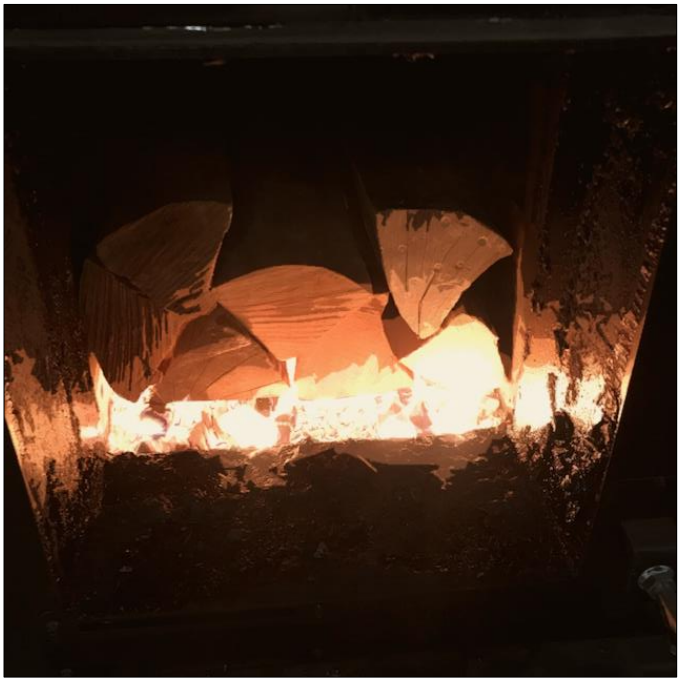
Appliance Rear

Test Fuel Properties

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

Typical Test Fuel Load

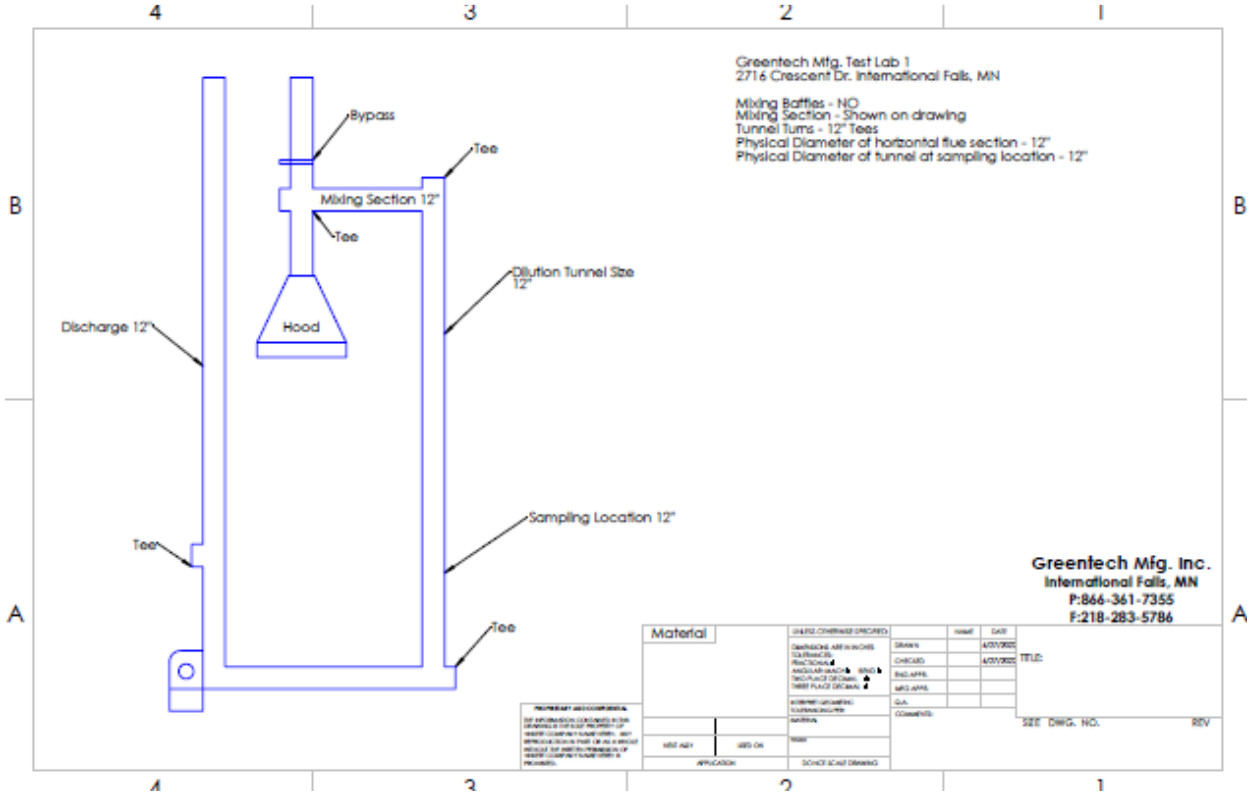
Typical Test Fuel Loaded in Test Unit

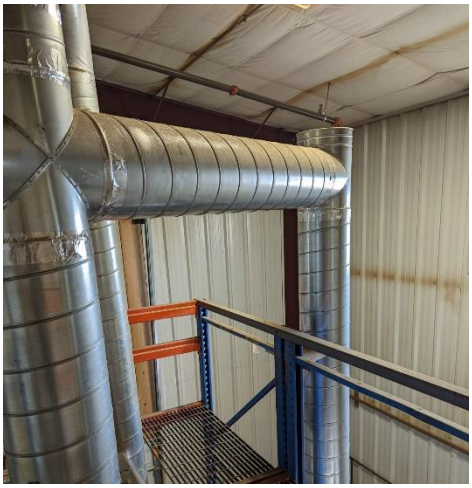


Sampling Locations and Descriptions

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

Tunnel Diagram





Sampling Methods

ASTM E2515 was used in collecting particulate samples. The dilution tunnel is 12 inches in diameter. All sampling conditions per ASTM E2515 were followed. No alternate procedures were used, and no sampling intervals fell outside of proportional rates of +/- 10% when computed on a 10 minute basis.

Analytical Methods Description

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

Calibration, Quality Control and Assurances

Calibration procedures and results were conducted per EPA Method 28WHH, ASTM E2515-11 and ASTM E2618. Test method quality control procedures (leak checks, volume meter checks, stratification checks, proportionality results) followed the procedures outlined.

Appliance Sealing and Storage

Upon completion of testing, the appliance was secured with metal strapping and the seal below was applied, the appliance was then returned to the manufacturer's location at: 2716 Crescent Dr, International Falls, MN 56649, 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

CROWN ROYAL
STOVES
PRISTINE SERIES
WARNING
DOOR MAY BE HOT
USA
WARNING

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 Photos

Appendix B – Labels and Manuals

Appendix C –Equipment Calibration Records

Appendix D – Design Drawings (CBI Report Only)

Appendix E – Manufacturer QAP (CBI Report Only)

HYDRONIC HEATER TES DATA PACKET
ASTM E2618/E2515

Run 1 Data Summary

Client:	Greentech
Model:	RS7200E
Job #:	20-565
Tracking #:	69
Test Date:	5/1/2020

Techician Signature

5/13/2022
Date

TEST RESULTS - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 1

Job #: 20-565
Tracking #: 69
Technician: AK
Date: 5/1/2020

Particulate Data

	Ambient Sample	Sample Train A	Sample Train B	1st Hour Filter
Total Sample Volume (ft^3)	62.639	32.665	35.220	8.930
Average Gas Velocity in Dilution Tunnel (ft/sec)	15.3			
Average Gas Flow Rate in Dilution Tunnel (dscf/hr)	38885.8			
Average Gas Meter Temperature (°F)	70.8	87.4	88.3	77.8
Total Sample Volume (dscf)	59.018	29.796	32.406	8.291
Average Tunnel Temperature (°F)	88.1			
Total Time of Test (min)	218			
Total Particulate Catch (mg)	0.0	2.7	1.5	0.0
Particulate Concentration, dry-standard (g/dscf)	0.0000000	0.0000906	0.0000463	0.0000000
Total PM Emissions (g)	0.00	12.80	6.54	0.00
Particulate Emission Rate (g/hr)	0.00	3.52	1.80	0.00
Emissions Factor (g/kg)	-	0.49	0.25	-
Difference from Average Total Particulate Emissions (%)	-	32.4%	32.4%	-
Difference from Average Emissions Factor (g/kg)	-	0.12	0.12	-

Boiler/ HEX Data

Appliance Average Start Temperature (F)	155.5	
Appliance Average Final Temperature (F)	157.0	**First Hour**
Heat Output (BTU)	447,798	125,282
Heat Output Rate (BTU/hr)	123,247	
Heat Input - HHV (BTU)	492,443	155,471
Heat Input - LHV (BTU)	457,399	

Emissions Rates and Factors

Total Particulate Emissions (g)	9.7	0.0
Emissions Factor (g/MJ)	0.0205	
Emissions Factor (g/kg)	0.3716	
Emissions Rate (g/hr)	2.66	
Emissions Rate (lb/mmbtu output)	0.048	0.000
HHV Delivered Efficiency (%)	90.9%	80.6%
LHV Delivered Efficiency (%)	97.9%	
HHV SLM Efficiency (%)	91.0%	
LHV SLM Efficiency (%)	97.5%	
CO Emissions (g/min)	2.46	

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	78.0	OK
Face Velocity	< 30 ft/min	8.9	OK
Leakage Rate	Less than 4% of average sample rate	0 cfm	OK
Ambient Temp	55-90 °F	Min: 70 / Max: 72	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
Return Temp > 120°F	>120°F	147.0	OK

B415.1 Efficiency Results

Manufacturer: Greentech
Model: RS7200E
Date: 05/01/20
Run: 1
Control #: 20-565
Test Duration: 218
Output Category: 4

Test Results in Accordance with CSA B415.1-09

	HHV Basis	LHV Basis
Overall Efficiency	91.0%	97.5%
Combustion Efficiency	97.8%	97.8%
Heat Transfer Efficiency	93.1%	99.7%

Output Rate (kJ/h)	124,303	117,915	**(Btu/h)**
Burn Rate (kg/h)	6.95	15.31	**(lb/h)**
Input (kJ/h)	136,564	129,545	**(Btu/h)**

Test Load Weight (dry kg)	25.24	55.62	**dry lb**
MC wet (%)	18.20		
MC dry (%)	22.25		
Particulate (g)	9.67		
CO (g)	537		
Test Duration (h)	3.63		

Emissions	Particulate	CO
g/MJ Output	0.02	1.19
g/kg Dry Fuel	0.38	21.26
g/h	2.66	147.69
g/min	0.04	2.46
lb/MM Btu Output	0.05	2.76

Air/Fuel Ratio (A/F)	9.80

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

BOILER CORDWOOD FUEL DATA - ASTM E2618

Client: Greentech
Model: RS7200E
Run #: 1

Job #: 20-565
Tracking #: 69
Technician: AK
Date: 5/1/2020

Firebox Volume (ft^3):	6.11	Minimun Piece Weight (lbs):	4.40
Target Load Weight (lbs):	61.10	Maximun Piece Weight (lbs):	17.60
Number of Fuel Pieces Allowed:	5 - 10	80% of piece of weight range (lbs):	6.6 to 15.4

Pretest Fuel Information

Length (in)	Weight (lbs)	MC (%DB)	Length (in)	Weight (lbs)	MC (%DB)
20.00	74.00	25.0			
20.00		25.0			
20.00		19.0			
20.00		25.0			
20.00		28.0			
20.00		26.0			
20.00		21.0			
20.00		27.0			

Total Preburn Weight (lbs): 74.00
Averge Preburn Moisture (% DB): 24.50

Test Fuel Information

Length (in)	Weight (lbs)	Moisture Content (%DB)					Avg MC (%DB)	Dry Weight (lbs)
20.00	9.00	23.0	22.0	19.0	23.0	23.0	22.00	7.38
20.00	7.00	21.0	20.0	19.0	18.0	20.0	19.60	5.85
20.00	9.00	20.0	19.0	18.0	19.0	20.0	19.20	7.55
20.00	11.00	25.0	25.0	19.0	25.0	25.0	23.80	8.89
20.00	8.00	28.0	26.0	21.0	27.0	27.0	25.80	6.36
20.00	14.00	24.0	22.0	25.0	26.0	26.0	24.60	11.24
20.00	12.00	20.0	18.0	24.0	18.0	20.0	20.00	10.00
Total (lbs):	70.00						Total Dry Weight (lbs):	57.26

Allowable Coal Bed Range (10-20%): 7 - 14

Quality checks

Individual Piece Weights:	OK
80% Piece weight range:	OK
Piece Count:	OK

DILUTION TUNNEL & MISC. DATA - ASTM E2618 / E2515

Client:	Greentech	Job #:	20-565
Model:	RS7200E	Tracking #:	69
Run #:	1	Technician:	AK
Test Start Time:	14:10	Date:	5/1/2020
Manufacturer's Rated Output (BTU/hr):	125,000		

218

Total Sampling Time (min):	218
Recording Interval (min):	1
Meter Box γ Factor:	0.992 (A)
Meter Box γ Factor:	1.002 (B)
Meter Box γ Factor:	0.996 (Ambient)

	Pre-Test	Post Test	Avg.
Barometric Pressure (in. Hg)	28.48	28.45	28.47
Relative Humidity (%)	31.8	42.6	
Room Air Velocity (ft/min)	0	0	
Scale Audit (lbs)	10.0	10.0	
Ambient Sample Volume:		62.639	ft^3

Induced Draft Check (in. H_2O):	0
Smoke Capture Check (%):	100%
Date Flue Pipe Last Cleaned:	4/30/2020
Boiler Dry Weight (lbs):	1964
Supply Side Water Weight (lbs):	1502

Sample Train Post-Test Leak Checks

(A)	0.000	cfm @	-11	in. Hg
(B)	0.000	cfm @	-9	in. Hg
(Ambient)	0.000	cfm @	-15	in. Hg

DILUTION TUNNEL FLOW

Traverse Data

Point	dP (in H_2O)	Temp (°F)
1	0.032	88
2	0.045	88
3	0.045	88
4	0.048	88
5	0.035	88
6	0.026	88
7	0.023	87
8	0.038	87
9	0.040	87
10	0.042	87
11	0.037	87
12	0.029	87
Center	0.042	87

Static Pressure: -0.160 in. H_2O

Dilution Tunnel H_2O:	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	ft^2
V_{strav}:	13.25	ft/sec
V_{scent}:	14.17	ft/sec
F_p:	0.935	[ratio]
Initial Tunnel Flow:	557.9	scf/min

TEST FUEL PROPERTIES

Default Fuel Values

Fuel Type:	D. Fir	Oak
HHV (kJ/kg)	19,810	19,887
%C	48.73	50
%H	6.87	6.9
%O	43.9	42.9
%Ash	0.5	0.5

Actual Fuel Used Properties

Fuel Type:	Maple
HHV (kJ/kg)	19,960
%C	50.64
%H	6.62
%O	41.74
%Ash	1.35
MC (%DB)	22.2%

BOX A TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 1

Job #: 20-565
Tracking #: 69
Technician: AK
Date: 5/1/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
0	0.000		0.056	0.03	72	-5.47		68.0		96	291	73	71
1	0.142	0.142	0.056	1.01	72	-5.47	98	67.8	-0.2	97	293	73	72
2	0.296	0.154	0.056	0.89	72	-5.47	107	67.7	-0.1	96	292	73	72
3	0.447	0.151	0.056	1.00	72	-5.47	105	67.2	-0.5	97	292	73	72
4	0.599	0.152	0.056	1.01	72	-5.47	105	67.0	-0.2	97	294	73	72
5	0.752	0.153	0.056	1.00	72	-5.47	106	66.4	-0.6	97	295	74	72
6	0.905	0.153	0.056	0.97	73	-5.47	106	65.0	-1.4	97	296	74	72
7	1.055	0.150	0.056	1.15	73	-5.47	104	65.1	0.1	97	297	74	72
8	1.206	0.151	0.056	0.95	73	-5.47	104	64.2	-0.9	97	297	74	71
9	1.357	0.151	0.056	0.99	73	-5.47	104	63.9	-0.3	97	298	74	71
10	1.508	0.151	0.056	0.80	73	-5.47	104	63.0	-0.9	97	298	74	71
11	1.660	0.152	0.056	0.96	73	-5.47	105	62.1	-0.9	97	299	74	71
12	1.810	0.150	0.056	0.92	73	-5.47	104	62.8	0.7	97	300	74	72
13	1.957	0.147	0.056	0.94	74	-5.47	101	60.9	-1.9	97	301	74	71
14	2.105	0.148	0.056	0.93	74	-5.47	102	60.0	-0.9	97	301	74	72
15	2.252	0.147	0.056	0.97	74	-5.47	101	61.5	1.5	97	302	75	71
16	2.399	0.147	0.056	0.94	74	-5.47	101	58.8	-2.7	97	303	75	72
17	2.546	0.147	0.056	0.91	74	-5.47	101	58.3	-0.5	97	303	75	72
18	2.693	0.147	0.056	0.95	75	-5.47	101	58.1	-0.2	97	304	75	72
19	2.839	0.146	0.056	0.93	75	-5.47	101	56.9	-1.2	97	305	75	71
20	2.987	0.148	0.056	0.96	75	-5.47	102	56.0	-0.9	97	306	75	71
21	3.135	0.148	0.056	0.92	75	-5.47	102	55.2	-0.8	98	307	75	71
22	3.282	0.147	0.056	0.91	76	-5.47	101	55.0	-0.2	98	308	75	71
23	3.430	0.148	0.056	0.93	76	-5.47	102	53.9	-1.1	98	309	75	72
24	3.577	0.147	0.056	0.92	76	-5.47	101	53.0	-0.9	98	309	75	72
25	3.724	0.147	0.056	0.87	76	-5.47	101	52.4	-0.6	98	310	75	72
26	3.872	0.148	0.056	0.91	77	-5.47	102	50.9	-1.5	98	311	75	71
27	4.019	0.147	0.056	0.96	77	-5.47	101	50.9	0	98	311	75	71
28	4.167	0.148	0.056	0.94	77	-5.47	102	50.1	-0.8	98	312	75	71
29	4.315	0.148	0.056	0.91	77	-5.47	102	49.7	-0.4	98	313	75	72
30	4.462	0.147	0.056	0.90	78	-5.47	101	48.2	-1.5	98	313	75	72
31	4.609	0.147	0.056	0.93	78	-5.47	101	47.9	-0.3	98	313	76	72

BOX A TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 1

Job #: 20-565
Tracking #: 69
Technician: AK
Date: 5/1/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
32	4.757	0.148	0.056	0.94	78	-5.47	101	48.0	0.1	94	311	76	72
33	4.906	0.149	0.056	1.02	78	-5.47	101	46.8	-1.2	81	291	75	72
34	5.054	0.148	0.056	0.91	79	-5.47	99	46.7	-0.1	79	277	75	71
35	5.203	0.149	0.056	0.94	79	-5.47	100	45.8	-0.9	78	266	75	71
36	5.351	0.148	0.056	0.93	79	-5.47	99	45.9	0.1	78	257	75	71
37	5.500	0.149	0.056	0.85	79	-5.47	100	45.9	0	77	250	75	72
38	5.647	0.147	0.056	0.96	80	-5.47	98	45.7	-0.2	77	244	75	71
39	5.795	0.148	0.056	0.97	80	-5.47	99	46.0	0.3	77	238	75	71
40	5.944	0.149	0.056	0.97	80	-5.47	100	45.9	-0.1	77	233	75	71
41	6.093	0.149	0.056	0.93	80	-5.47	100	45.9	0	77	229	75	71
42	6.242	0.149	0.056	0.94	81	-5.47	100	45.9	0	77	224	75	71
43	6.392	0.150	0.056	0.93	81	-5.47	100	45.9	0	76	220	75	71
44	6.541	0.149	0.056	1.00	81	-5.47	99	46.0	0.1	76	217	75	71
45	6.690	0.149	0.056	1.08	81	-5.47	99	45.8	-0.2	76	213	74	71
46	6.840	0.150	0.056	0.94	82	-5.47	100	45.8	0	76	210	74	72
47	6.990	0.150	0.056	0.90	82	-5.47	100	45.7	-0.1	76	207	74	71
48	7.139	0.149	0.056	0.96	82	-5.47	99	44.9	-0.8	76	204	74	71
49	7.287	0.148	0.056	0.86	82	-5.47	99	45.9	1	76	201	74	71
50	7.437	0.150	0.056	0.92	83	-5.47	100	45.8	-0.1	76	198	74	71
51	7.587	0.150	0.056	0.99	83	-5.47	100	45.9	0.1	76	196	74	71
52	7.736	0.149	0.056	0.95	83	-5.47	99	45.8	-0.1	76	193	74	71
53	7.886	0.150	0.056	0.92	83	-5.47	100	45.8	0	76	191	74	71
54	8.036	0.150	0.056	0.95	83	-5.47	100	46.0	0.2	76	189	74	71
55	8.185	0.149	0.056	0.99	84	-5.47	99	45.9	-0.1	76	186	74	71
56	8.335	0.150	0.056	0.93	84	-5.47	100	45.9	0	76	184	74	71
57	8.484	0.149	0.056	0.95	84	-5.47	99	45.9	0	76	182	74	71
58	8.632	0.148	0.056	1.02	84	-5.47	98	45.9	0	76	180	73	71
59	8.782	0.150	0.056	0.92	84	-5.47	100	46.0	0.1	80	188	74	71
60	8.930	0.148	0.056	1.05	85	-5.47	99	45.9	-0.1	87	224	73	71
61	9.079	0.149	0.056	0.94	85	-5.47	100	44.7	-1.2	89	237	74	71
62	9.228	0.149	0.056	0.91	85	-5.47	100	44.6	-0.1	90	246	74	71
63	9.378	0.150	0.056	0.92	85	-5.47	101	44.0	-0.6	91	253	74	71

BOX A TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 1

Job #: 20-565
Tracking #: 69
Technician: AK
Date: 5/1/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
64	9.528	0.150	0.056	0.93	85	-5.47	101	44.3	0.3	92	260	74	71
65	9.676	0.148	0.056	0.83	86	-5.47	99	43.1	-1.2	93	266	74	71
66	9.826	0.150	0.056	1.00	86	-5.47	101	42.3	-0.8	93	271	74	71
67	9.973	0.147	0.056	0.94	86	-5.47	99	41.8	-0.5	94	276	74	71
68	10.121	0.148	0.056	0.89	86	-5.47	100	40.9	-0.9	94	279	74	71
69	10.270	0.149	0.056	0.94	86	-5.47	100	40.5	-0.4	94	282	74	71
70	10.420	0.150	0.056	0.93	86	-5.47	101	38.8	-1.7	95	285	75	71
71	10.576	0.156	0.056	0.93	87	-5.47	105	38.7	-0.1	95	287	76	71
72	10.725	0.149	0.056	0.97	87	-5.47	100	37.7	-1	95	289	76	71
73	10.874	0.149	0.056	0.94	87	-5.47	100	36.7	-1	95	291	76	71
74	11.023	0.149	0.056	0.94	87	-5.47	100	36.5	-0.2	95	293	75	71
75	11.171	0.148	0.056	0.87	87	-5.47	99	35.8	-0.7	95	294	75	71
76	11.321	0.150	0.056	0.66	87	-5.47	101	35.3	-0.5	96	296	75	71
77	11.470	0.149	0.056	0.99	87	-5.47	100	34.5	-0.8	95	297	75	71
78	11.619	0.149	0.056	0.96	88	-5.47	100	33.8	-0.7	96	298	75	71
79	11.768	0.149	0.056	0.92	88	-5.47	100	33.1	-0.7	96	299	75	71
80	11.917	0.149	0.056	0.92	88	-5.47	100	33.1	0	96	301	75	71
81	12.067	0.150	0.056	0.97	88	-5.47	101	31.1	-2	96	302	75	71
82	12.216	0.149	0.056	0.96	88	-5.47	100	30.8	-0.3	96	304	75	71
83	12.365	0.149	0.056	0.92	88	-5.47	100	32.1	1.3	96	305	75	71
84	12.514	0.149	0.056	0.93	88	-5.47	100	28.6	-3.5	97	306	75	71
85	12.662	0.148	0.056	0.92	88	-5.47	99	28.7	0.1	96	307	75	71
86	12.811	0.149	0.056	0.92	89	-5.47	100	27.8	-0.9	97	307	75	71
87	12.960	0.149	0.056	0.92	89	-5.47	100	26.7	-1.1	97	308	75	71
88	13.110	0.150	0.056	0.91	89	-5.47	101	26.7	0	96	308	75	71
89	13.259	0.149	0.056	0.95	89	-5.47	100	25.6	-1.1	97	308	75	71
90	13.409	0.150	0.056	0.95	89	-5.47	101	25.0	-0.6	97	309	75	71
91	13.558	0.149	0.056	0.91	89	-5.47	100	23.9	-1.1	97	310	75	71
92	13.708	0.150	0.056	0.92	89	-5.47	101	23.6	-0.3	97	310	75	71
93	13.856	0.148	0.056	0.79	89	-5.47	99	23.7	0.1	97	310	75	71
94	14.005	0.149	0.056	0.97	89	-5.47	99	24.0	0.3	88	305	75	71
95	14.155	0.150	0.056	1.03	90	-5.47	99	23.2	-0.8	81	285	75	71

BOX A TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 1

Job #: 20-565
Tracking #: 69
Technician: AK
Date: 5/1/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
96	14.305	0.150	0.056	0.92	90	-5.47	99	22.9	-0.3	79	273	75	71
97	14.455	0.150	0.056	0.91	90	-5.47	99	21.9	-1	78	264	75	71
98	14.606	0.151	0.056	0.94	90	-5.47	99	21.7	-0.2	78	257	75	71
99	14.756	0.150	0.056	0.95	90	-5.47	99	21.9	0.2	77	249	75	71
100	14.906	0.150	0.056	0.99	90	-5.47	99	21.9	0	76	242	75	71
101	15.055	0.149	0.056	1.09	90	-5.47	98	21.8	-0.1	76	235	75	71
102	15.205	0.150	0.056	0.94	90	-5.47	99	21.9	0.1	76	230	74	71
103	15.356	0.151	0.056	0.96	90	-5.47	99	21.9	0	76	225	74	71
104	15.506	0.150	0.056	0.92	90	-5.47	99	21.8	-0.1	76	220	74	71
105	15.657	0.151	0.056	0.97	90	-5.47	99	21.8	0	76	216	74	71
106	15.808	0.151	0.056	0.91	90	-5.47	99	22.1	0.3	76	213	74	71
107	15.958	0.150	0.056	0.91	91	-5.47	98	21.8	-0.3	76	209	74	70
108	16.107	0.149	0.056	1.01	91	-5.47	98	21.6	-0.2	76	206	74	71
109	16.258	0.151	0.056	0.95	91	-5.47	99	21.8	0.2	75	203	74	71
110	16.409	0.151	0.056	0.92	91	-5.47	99	21.7	-0.1	75	200	74	71
111	16.560	0.151	0.056	0.89	91	-5.47	99	21.8	0.1	75	197	74	71
112	16.711	0.151	0.056	0.92	91	-5.47	99	21.8	0	75	194	73	71
113	16.861	0.150	0.056	0.97	91	-5.47	98	21.3	-0.5	75	192	73	71
114	17.010	0.149	0.056	0.94	91	-5.47	98	20.7	-0.6	75	189	73	71
115	17.161	0.151	0.056	0.99	91	-5.47	99	22.0	1.3	75	187	73	71
116	17.312	0.151	0.056	0.90	91	-5.47	99	21.0	-1	75	185	73	71
117	17.464	0.152	0.056	0.93	91	-5.47	100	21.8	0.8	75	182	73	71
118	17.615	0.151	0.056	0.93	91	-5.47	99	21.9	0.1	75	180	73	71
119	17.765	0.150	0.056	0.96	91	-5.47	98	22.0	0.1	75	178	73	71
120	17.914	0.149	0.056	0.95	91	-5.47	98	20.9	-1.1	75	176	73	71
121	18.066	0.152	0.056	0.87	91	-5.47	100	21.9	1	75	177	73	71
122	18.216	0.150	0.056	0.94	91	-5.47	99	20.7	-1.2	86	220	73	71
123	18.367	0.151	0.056	0.77	91	-5.47	100	20.4	-0.3	88	235	73	71
124	18.517	0.150	0.056	0.94	91	-5.47	100	19.9	-0.5	89	245	73	71
125	18.668	0.151	0.056	0.93	92	-5.47	100	19.9	0	90	252	73	71
126	18.817	0.149	0.056	0.93	92	-5.47	99	19.8	-0.1	90	258	73	71
127	18.966	0.149	0.056	0.94	92	-5.47	99	18.7	-1.1	91	263	73	71

BOX A TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 1

Job #: 20-565
Tracking #: 69
Technician: AK
Date: 5/1/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
128	19.117	0.151	0.056	0.93	92	-5.47	100	19.0	0.3	92	267	73	71
129	19.268	0.151	0.056	0.93	92	-5.47	100	17.8	-1.2	92	270	73	71
130	19.418	0.150	0.056	0.93	92	-5.47	100	17.9	0.1	92	272	73	71
131	19.569	0.151	0.056	0.94	92	-5.47	100	16.9	-1	93	275	73	71
132	19.719	0.150	0.056	0.96	92	-5.47	100	16.9	0	93	278	73	71
133	19.868	0.149	0.056	0.93	92	-5.47	99	16.4	-0.5	93	280	73	71
134	20.019	0.151	0.056	0.91	92	-5.47	100	15.9	-0.5	93	282	73	71
135	20.169	0.150	0.056	0.98	92	-5.47	100	15.0	-0.9	94	283	73	71
136	20.320	0.151	0.056	0.93	92	-5.47	100	15.1	0.1	94	285	73	71
137	20.470	0.150	0.056	0.93	92	-5.47	100	14.0	-1.1	94	286	73	71
138	20.621	0.151	0.056	0.97	92	-5.47	100	14.0	0	94	287	74	71
139	20.771	0.150	0.056	0.93	92	-5.47	100	14.5	0.5	94	288	74	71
140	20.920	0.149	0.056	0.94	92	-5.47	99	13.0	-1.5	94	289	74	71
141	21.071	0.151	0.056	0.92	92	-5.47	100	12.9	-0.1	94	290	74	71
142	21.222	0.151	0.056	1.01	92	-5.47	100	12.7	-0.2	94	290	74	71
143	21.373	0.151	0.056	0.94	92	-5.47	100	11.9	-0.8	94	291	74	71
144	21.523	0.150	0.056	0.96	92	-5.47	100	11.9	0	95	292	74	71
145	21.673	0.150	0.056	0.94	92	-5.47	100	11.0	-0.9	95	292	74	70
146	21.822	0.149	0.056	0.98	92	-5.47	99	10.8	-0.2	94	293	74	71
147	21.973	0.151	0.056	0.92	92	-5.47	100	10.0	-0.8	94	290	74	70
148	22.123	0.150	0.056	0.95	92	-5.47	100	10.0	0	94	291	74	70
149	22.273	0.150	0.056	0.95	92	-5.47	100	10.0	0	94	291	74	71
150	22.425	0.152	0.056	0.93	92	-5.47	101	8.9	-1.1	94	291	74	71
151	22.576	0.151	0.056	0.93	92	-5.47	100	8.9	0	94	291	74	70
152	22.726	0.150	0.056	0.95	92	-5.47	100	8.0	-0.9	94	292	74	70
153	22.876	0.150	0.056	0.91	92	-5.47	100	7.9	-0.1	94	292	74	70
154	23.026	0.150	0.056	0.97	92	-5.47	100	7.3	-0.6	94	293	74	70
155	23.177	0.151	0.056	0.89	92	-5.47	100	8.0	0.7	94	293	74	70
156	23.328	0.151	0.056	0.97	92	-5.47	100	7.0	-1	93	292	74	70
157	23.479	0.151	0.056	0.98	92	-5.47	100	6.9	-0.1	93	290	74	70
158	23.630	0.151	0.056	0.94	92	-5.47	100	7.1	0.2	93	289	74	70
159	23.779	0.149	0.056	0.94	92	-5.47	99	5.7	-1.4	93	289	74	70

BOX A TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 1

Job #: 20-565
Tracking #: 69
Technician: AK
Date: 5/1/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
160	23.930	0.151	0.056	0.91	92	-5.47	100	6.0	0.3	94	292	74	71
161	24.081	0.151	0.056	1.01	92	-5.47	100	6.0	0	94	294	74	71
162	24.231	0.150	0.056	0.92	93	-5.47	100	6.0	0	94	295	74	71
163	24.383	0.152	0.056	0.98	93	-5.47	101	4.9	-1.1	95	296	74	71
164	24.534	0.151	0.056	0.95	93	-5.47	100	5.2	0.3	95	298	74	70
165	24.683	0.149	0.056	0.97	93	-5.47	98	5.1	-0.1	79	277	74	70
166	24.833	0.150	0.056	0.95	93	-5.47	98	5.0	-0.1	78	263	74	70
167	24.984	0.151	0.056	0.94	93	-5.47	99	5.0	0	77	252	74	70
168	25.135	0.151	0.056	0.97	93	-5.47	99	4.9	-0.1	76	244	74	70
169	25.286	0.151	0.056	0.97	93	-5.47	99	4.5	-0.4	76	237	74	70
170	25.437	0.151	0.056	0.94	93	-5.47	99	5.0	0.5	76	231	74	70
171	25.588	0.151	0.056	0.97	93	-5.47	99	3.4	-1.6	75	226	74	70
172	25.739	0.151	0.056	0.93	93	-5.47	99	5.0	1.6	75	221	74	70
173	25.889	0.150	0.056	0.95	93	-5.47	98	5.0	0	75	217	73	70
174	26.040	0.151	0.056	0.94	93	-5.47	99	5.0	0	75	213	73	70
175	26.192	0.152	0.056	1.15	93	-5.47	99	4.6	-0.4	75	209	73	71
176	26.343	0.151	0.056	0.71	93	-5.47	99	5.1	0.5	75	206	73	70
177	26.492	0.149	0.056	0.91	93	-5.47	97	5.0	-0.1	75	203	73	70
178	26.643	0.151	0.056	0.95	93	-5.47	99	5.0	0	75	200	73	70
179	26.794	0.151	0.056	0.94	93	-5.47	99	5.1	0.1	75	197	73	70
180	26.945	0.151	0.056	0.94	93	-5.47	99	5.1	0	75	194	73	70
181	27.097	0.152	0.056	0.98	93	-5.47	99	5.0	-0.1	75	191	73	70
182	27.247	0.150	0.056	0.95	93	-5.47	98	4.9	-0.1	75	189	73	70
183	27.397	0.150	0.056	0.97	93	-5.47	98	4.9	0	75	186	73	70
184	27.548	0.151	0.056	0.97	93	-5.47	99	5.3	0.4	75	184	73	70
185	27.699	0.151	0.056	0.99	93	-5.47	99	5.1	-0.2	75	182	73	70
186	27.850	0.151	0.056	0.93	93	-5.47	99	5.1	0	75	180	72	70
187	28.001	0.151	0.056	1.02	93	-5.47	99	6.5	1.4	81	191	73	70
188	28.151	0.150	0.056	1.05	93	-5.47	99	5.0	-1.5	87	227	72	70
189	28.301	0.150	0.056	0.98	93	-5.47	99	4.9	-0.1	89	240	73	70
190	28.452	0.151	0.056	1.01	93	-5.47	100	5.0	0.1	90	248	73	70
191	28.603	0.151	0.056	0.95	93	-5.47	100	3.6	-1.4	91	254	73	70

BOX A TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 1

Job #: 20-565
Tracking #: 69
Technician: AK
Date: 5/1/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
192	28.755	0.152	0.056	0.94	93	-5.47	101	4.1	0.5	92	258	73	71
193	28.906	0.151	0.056	1.08	93	-5.47	100	4.0	-0.1	92	261	73	70
194	29.057	0.151	0.056	0.94	93	-5.47	100	4.0	0	93	264	73	70
195	29.206	0.149	0.056	0.94	93	-5.47	99	4.0	0	93	266	73	70
196	29.356	0.150	0.056	0.93	93	-5.47	100	3.2	-0.8	93	267	73	70
197	29.507	0.151	0.056	1.10	93	-5.47	100	3.0	-0.2	93	268	73	70
198	29.658	0.151	0.056	0.99	93	-5.47	100	2.9	-0.1	94	269	73	70
199	29.809	0.151	0.056	0.94	93	-5.47	100	3.1	0.2	94	269	73	70
200	29.959	0.150	0.056	0.97	93	-5.47	100	3.0	-0.1	94	270	73	70
201	30.108	0.149	0.056	0.93	93	-5.47	99	3.1	0.1	94	270	73	70
202	30.258	0.150	0.056	0.95	93	-5.47	100	2.0	-1.1	94	271	73	70
203	30.409	0.151	0.056	0.88	93	-5.47	100	1.2	-0.8	94	271	73	70
204	30.560	0.151	0.056	0.93	93	-5.47	100	2.0	0.8	95	270	73	70
205	30.711	0.151	0.056	1.00	93	-5.47	100	2.0	0	95	270	73	70
206	30.861	0.150	0.056	0.97	93	-5.47	100	2.0	0	95	270	73	70
207	31.011	0.150	0.056	0.93	93	-5.47	100	2.0	0	95	270	73	70
208	31.161	0.150	0.056	0.90	93	-5.47	100	2.0	0	95	269	73	70
209	31.311	0.150	0.056	0.99	93	-5.47	100	2.0	0	95	269	74	70
210	31.461	0.150	0.056	0.84	93	-5.47	100	0.9	-1.1	95	268	74	70
211	31.612	0.151	0.056	0.99	93	-5.47	100	0.9	0	95	268	74	70
212	31.764	0.152	0.056	0.97	93	-5.47	101	0.9	0	95	268	74	70
213	31.914	0.150	0.056	0.99	93	-5.47	100	1.0	0.1	95	267	74	70
214	32.063	0.149	0.056	0.99	93	-5.47	99	1.1	0.1	96	266	74	70
215	32.214	0.151	0.056	0.90	93	-5.47	100	1.0	-0.1	95	266	74	70
216	32.363	0.149	0.056	1.03	93	-5.47	99	1.1	0.1	95	265	74	70
217	32.515	0.152	0.056	0.86	93	-5.47	101	1.0	-0.1	95	265	74	70
218	32.665	0.150	0.056	0.99	93	-5.47	100	0.0	-1	95	264	74	70

BOX B TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 1

Job #: 20-565
Tracking #: 69
Technician: AK
Date: 5/1/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
0	0.000		0.00	72	-1		74	2.000	6.01	0.54
1	0.158	0.158	0.84	72	-1.21	102	74	2.210	12.00	0.19
2	0.323	0.165	0.50	72	-1.31	106	75	2.200	16.98	0.14
3	0.484	0.161	1.50	72	-0.91	104	75	2.200	14.42	0.08
4	0.647	0.163	1.66	72	-0.94	105	75	2.200	13.70	0.10
5	0.808	0.161	0.96	72	-1.17	104	75	2.200	13.60	0.07
6	0.972	0.164	1.66	72	-0.93	105	75	2.200	13.52	0.05
7	1.134	0.162	1.51	73	-1	104	75	2.200	13.67	0.11
8	1.297	0.163	1.23	73	-1.08	105	75	2.210	13.41	0.09
9	1.458	0.161	1.34	73	-1.04	103	76	2.200	13.88	0.06
10	1.621	0.163	0.75	73	-1.21	105	76	2.210	14.00	0.07
11	1.785	0.164	1.69	73	-0.92	105	76	2.200	14.11	0.09
12	1.947	0.162	0.57	73	-1.32	104	76	2.200	14.37	0.07
13	2.108	0.161	1.57	74	-0.95	103	76	2.210	14.42	0.06
14	2.269	0.161	0.38	74	-1.33	103	76	2.210	14.58	0.11
15	2.430	0.161	0.75	74	-1.13	103	76	2.200	14.95	0.14
16	2.592	0.162	1.68	74	-0.91	104	76	2.210	14.98	0.08
17	2.753	0.161	1.67	74	-0.93	103	77	2.200	14.93	0.05
18	2.915	0.162	1.65	75	-1.01	104	77	2.200	15.01	0.08
19	3.075	0.160	1.33	75	-1.15	102	77	2.200	15.65	0.13
20	3.240	0.165	0.48	75	-1.41	106	77	2.200	15.73	0.06
21	3.400	0.160	1.68	75	-1.02	102	77	2.200	15.65	0.10
22	3.564	0.164	1.57	76	-1.03	105	77	2.200	15.78	0.01
23	3.725	0.161	0.51	76	-1.38	103	77	2.200	15.86	0.07
24	3.887	0.162	1.66	76	-0.93	103	77	2.200	15.88	0.07
25	4.047	0.160	1.65	76	-0.93	102	77	2.200	15.86	0.05
26	4.209	0.162	0.42	77	-1.31	103	77	2.200	15.95	0.02
27	4.369	0.160	0.35	77	-1.32	102	77	2.200	15.90	0.08
28	4.530	0.161	1.69	77	-0.92	103	77	2.200	15.55	0.05
29	4.692	0.162	0.44	78	-1.3	103	78	2.200	15.45	0.07
30	4.851	0.159	0.87	78	-1.18	101	78	2.200	15.30	0.03
31	5.014	0.163	0.55	78	-1.26	104	78	2.210	15.34	0.04

BOX B TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 1

Job #: 20-565
Tracking #: 69
Technician: AK
Date: 5/1/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
32	5.173	0.159	1.52	78	-0.98	101	78	2.210	15.14	0.02
33	5.335	0.162	1.67	79	-0.96	101	78	2.210	10.78	0.77
34	5.495	0.160	0.88	79	-1.17	100	77	2.210	3.49	0.42
35	5.658	0.163	1.51	79	-0.98	102	77	2.220	2.19	0.44
36	5.819	0.161	0.60	80	-1.25	100	77	2.230	1.63	0.41
37	5.980	0.161	0.90	80	-1.17	100	77	2.210	1.00	0.25
38	6.142	0.162	1.89	80	-0.92	101	77	2.220	0.91	0.25
39	6.302	0.160	0.57	80	-1.26	100	77	2.220	0.76	0.20
40	6.465	0.163	1.53	81	-0.97	101	77	2.220	0.69	0.19
41	6.626	0.161	0.86	81	-1.17	100	77	2.220	0.48	0.11
42	6.790	0.164	1.54	81	-0.97	102	77	2.230	0.39	0.09
43	6.950	0.160	1.43	81	-1.01	99	77	2.220	0.38	0.09
44	7.111	0.161	1.49	82	-0.98	100	77	2.220	0.36	0.08
45	7.273	0.162	0.74	82	-1.23	100	77	2.220	0.27	0.09
46	7.434	0.161	1.41	82	-1	100	77	2.220	0.33	0.07
47	7.597	0.163	0.92	83	-1.16	101	76	2.220	0.35	0.10
48	7.758	0.161	1.43	83	-1	100	76	2.220	0.32	0.07
49	7.921	0.163	1.63	83	-0.94	101	76	2.220	0.31	0.06
50	8.081	0.160	0.57	83	-1.26	99	76	2.220	0.31	0.05
51	8.242	0.161	0.45	83	-1.3	100	76	2.220	0.34	0.05
52	8.403	0.161	1.52	84	-0.97	99	76	2.220	0.26	(0.05)
53	8.567	0.164	0.59	84	-1.26	101	76	2.220	0.14	0.04
54	8.727	0.160	0.43	84	-1.3	99	76	2.220	0.30	0.04
55	8.890	0.163	1.67	84	-0.92	101	76	2.230	0.27	0.04
56	9.051	0.161	0.85	85	-1.16	99	76	2.230	0.15	0.09
57	9.211	0.160	1.24	85	-1.05	99	76	2.230	0.26	0.04
58	9.374	0.163	0.78	85	-1.2	100	76	2.220	0.17	0.00
59	9.534	0.160	1.67	85	-0.92	99	76	2.180	0.33	0.05
60	9.695	0.161	0.80	86	-1.19	100	76	2.170	4.82	0.72
61	9.854	0.159	1.66	86	-0.93	99	76	2.210	7.28	0.27
62	10.016	0.162	1.43	86	-1	101	76	2.210	9.17	0.08
63	10.178	0.162	1.73	86	-0.93	101	76	2.210	10.61	0.05

BOX B TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 1

Job #: 20-565
Tracking #: 69
Technician: AK
Date: 5/1/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
64	10.339	0.161	1.58	86	-0.99	100	76	2.210	11.69	0.00
65	10.501	0.162	0.37	87	-1.32	101	76	2.210	13.12	0.05
66	10.660	0.159	1.04	87	-1.13	99	76	2.210	14.17	0.05
67	10.821	0.161	0.43	87	-1.29	100	76	2.200	14.71	0.04
68	10.980	0.159	0.45	87	-1.3	99	76	2.210	14.99	0.13
69	11.143	0.163	0.92	87	-1.16	102	76	2.200	15.00	0.08
70	11.306	0.163	0.65	87	-1.23	102	76	2.200	15.00	0.01
71	11.466	0.160	0.91	88	-1.16	100	76	2.210	15.06	0.03
72	11.628	0.162	1.52	88	-0.98	101	76	2.200	14.93	0.00
73	11.786	0.158	0.66	88	-1.24	98	76	2.210	15.32	0.05
74	11.947	0.161	1.65	88	-0.95	100	76	2.210	15.66	0.06
75	12.109	0.162	0.63	88	-1.24	101	76	2.200	15.31	0.12
76	12.271	0.162	0.69	88	-1.22	101	76	2.220	15.41	0.07
77	12.434	0.163	1.72	89	-0.92	101	76	2.210	15.59	0.11
78	12.594	0.160	0.71	89	-1.2	100	77	2.200	15.76	0.07
79	12.754	0.160	1.49	89	-1	100	77	2.210	15.79	0.05
80	12.914	0.160	0.93	89	-1.15	100	77	2.200	15.89	0.07
81	13.077	0.163	0.82	89	-1.18	101	77	2.210	16.33	0.11
82	13.238	0.161	0.84	89	-1.18	100	77	2.200	16.90	0.16
83	13.400	0.162	1.68	89	-0.92	101	77	2.210	16.52	0.15
84	13.559	0.159	0.76	89	-1.2	99	77	2.200	16.05	0.14
85	13.720	0.161	0.42	90	-1.26	100	77	2.200	15.56	0.09
86	13.881	0.161	1.68	90	-0.91	100	77	2.260	14.98	0.07
87	14.041	0.160	0.61	90	-1.25	100	77	2.170	14.68	0.02
88	14.203	0.162	1.68	90	-0.92	101	77	2.210	14.81	0.09
89	14.363	0.160	1.45	90	-1	100	77	2.210	14.82	0.05
90	14.525	0.162	1.51	90	-0.97	101	77	2.200	14.32	0.10
91	14.685	0.160	1.51	90	-0.96	100	77	2.210	14.06	0.02
92	14.845	0.160	1.53	90	-0.96	100	77	2.200	13.53	0.03
93	15.005	0.160	1.11	91	-1.07	99	77	2.210	13.46	0.13
94	15.167	0.162	0.77	91	-1.19	100	77	2.210	13.16	0.09
95	15.328	0.161	1.47	91	-0.99	99	77	2.210	16.39	4.74

BOX B TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 1

Job #: 20-565
Tracking #: 69
Technician: AK
Date: 5/1/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
96	15.491	0.163	1.63	91	-0.93	100	77	2.210	20.09	5.47
97	15.654	0.163	1.34	91	-1.03	99	77	2.200	20.84	5.47
98	15.814	0.160	0.90	91	-1.15	98	77	2.200	20.56	5.47
99	15.978	0.164	0.64	91	-1.25	100	77	2.220	19.26	5.47
100	16.137	0.159	0.44	91	-1.3	97	76	2.220	1.80	0.78
101	16.301	0.164	0.46	91	-1.3	100	76	2.220	1.45	0.62
102	16.461	0.160	1.49	91	-0.98	97	76	2.220	1.31	0.58
103	16.626	0.165	1.63	91	-0.93	101	76	2.220	1.05	0.44
104	16.788	0.162	0.46	91	-1.29	99	76	2.220	1.28	0.45
105	16.950	0.162	1.58	92	-0.95	98	76	2.210	0.96	0.38
106	17.112	0.162	1.61	92	-0.94	98	76	2.200	0.89	0.34
107	17.275	0.163	0.71	92	-1.22	99	76	2.220	0.77	0.33
108	17.436	0.161	1.37	92	-0.97	98	76	2.220	0.62	0.29
109	17.598	0.162	0.65	92	-1.24	98	75	2.230	0.66	0.24
110	17.761	0.163	0.86	92	-1.18	99	75	2.220	0.73	0.19
111	17.924	0.163	1.21	92	-1.07	99	75	2.220	0.47	0.12
112	18.086	0.162	1.57	92	-0.96	98	75	2.230	0.44	0.11
113	18.248	0.162	0.44	92	-1.29	98	75	2.220	0.48	0.05
114	18.414	0.166	0.64	92	-1.24	101	75	2.230	0.51	0.16
115	18.572	0.158	0.72	92	-1.22	96	75	2.220	0.44	0.14
116	18.736	0.164	1.09	92	-1.16	100	75	2.220	0.36	0.10
117	18.898	0.162	0.41	92	-1.3	98	75	2.230	0.36	0.16
118	19.060	0.162	0.67	92	-1.23	98	75	2.220	0.28	0.06
119	19.220	0.160	0.38	92	-1.29	97	75	2.210	0.29	0.15
120	19.384	0.164	1.46	93	-0.99	99	74	2.230	0.30	0.05
121	19.544	0.160	1.58	93	-0.93	97	74	2.180	0.33	0.06
122	19.708	0.164	1.67	93	-0.92	100	75	2.210	5.64	0.85
123	19.867	0.159	0.60	93	-1.26	98	75	2.210	8.08	0.30
124	20.030	0.163	1.21	93	-1.08	100	75	2.210	9.58	0.13
125	20.192	0.162	0.45	93	-1.3	100	75	2.210	10.22	0.10
126	20.355	0.163	1.66	93	-0.92	100	75	2.210	11.03	0.07
127	20.516	0.161	0.39	93	-1.31	99	75	2.210	11.65	0.09

BOX B TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 1

Job #: 20-565
Tracking #: 69
Technician: AK
Date: 5/1/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
128	20.677	0.161	1.34	93	-1.03	99	75	2.210	12.00	0.05
129	20.839	0.162	1.12	93	-1.04	100	75	2.210	12.37	0.06
130	21.000	0.161	0.49	93	-1.3	99	75	2.210	12.79	0.09
131	21.162	0.162	1.05	93	-1.13	100	75	2.210	12.78	0.06
132	21.321	0.159	0.78	93	-1.2	98	75	2.210	12.30	0.05
133	21.484	0.163	0.71	93	-1.22	100	75	2.210	12.13	0.07
134	21.645	0.161	0.82	93	-1.19	99	75	2.210	12.06	0.08
135	21.808	0.163	1.42	93	-0.97	101	75	2.210	12.00	0.07
136	21.966	0.158	0.67	93	-1.19	97	75	2.210	11.84	0.05
137	22.131	0.165	1.50	93	-0.98	102	76	2.180	11.67	0.02
138	22.292	0.161	0.80	93	-1.18	99	76	2.210	11.66	0.03
139	22.456	0.164	0.56	93	-1.26	101	76	2.210	11.55	0.05
140	22.617	0.161	0.59	93	-1.25	99	76	2.210	11.38	0.06
141	22.780	0.163	1.76	93	-0.92	101	76	2.220	11.39	0.03
142	22.943	0.163	1.63	93	-0.92	101	76	2.210	11.50	0.00
143	23.102	0.159	1.36	93	-1.02	98	76	2.210	11.51	0.07
144	23.265	0.163	0.97	93	-1.18	101	76	2.210	11.16	0.02
145	23.425	0.160	0.40	93	-1.31	99	76	2.210	11.08	0.04
146	23.588	0.163	0.66	93	-1.23	101	76	2.210	10.77	0.08
147	23.748	0.160	0.40	93	-1.31	99	76	2.180	11.25	0.06
148	23.912	0.164	0.53	94	-1.27	101	76	2.210	11.78	0.03
149	24.073	0.161	1.51	94	-0.97	99	76	2.210	11.27	0.04
150	24.236	0.163	1.42	94	-1	100	76	2.210	11.05	0.07
151	24.397	0.161	1.63	94	-0.93	99	76	2.210	11.05	0.08
152	24.560	0.163	0.54	94	-1.24	100	76	2.210	10.66	0.07
153	24.721	0.161	1.32	94	-1.03	99	76	2.210	10.49	0.12
154	24.884	0.163	1.60	94	-0.95	100	76	2.200	10.63	0.09
155	25.046	0.162	1.45	94	-1	100	77	2.210	10.54	0.09
156	25.208	0.162	0.39	94	-1.31	100	77	2.210	10.61	0.09
157	25.373	0.165	0.92	94	-1.17	102	77	2.210	10.58	0.05
158	25.533	0.160	0.44	94	-1.29	98	77	2.210	10.11	0.10
159	25.697	0.164	0.79	94	-1.2	101	77	2.230	9.85	0.08

BOX B TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 1

Job #: 20-565
Tracking #: 69
Technician: AK
Date: 5/1/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
160	25.858	0.161	1.44	94	-1	99	77	2.210	9.61	0.10
161	26.020	0.162	0.35	94	-1.29	100	77	2.210	9.96	0.11
162	26.182	0.162	1.67	94	-0.92	100	77	2.210	10.22	0.08
163	26.346	0.164	1.36	94	-1.02	101	77	2.210	9.99	0.11
164	26.505	0.159	1.35	94	-1.02	98	77	2.210	9.31	0.30
165	26.670	0.165	1.47	94	-0.99	100	77	2.220	6.84	0.07
166	26.833	0.163	1.25	94	-1.05	99	76	2.220	2.21	0.02
167	26.995	0.162	0.82	94	-1.21	98	76	2.220	1.18	0.13
168	27.157	0.162	1.79	94	-0.93	98	76	2.220	0.62	0.04
169	27.320	0.163	1.69	94	-0.92	99	76	2.220	0.53	0.04
170	27.482	0.162	1.65	94	-0.93	98	76	2.220	0.35	0.01
171	27.643	0.161	0.38	94	-1.31	97	76	2.210	0.27	0.00
172	27.806	0.163	0.57	94	-1.27	99	76	2.220	0.28	0.05
173	27.967	0.161	1.03	94	-1.13	97	76	2.220	0.28	(0.04)
174	28.129	0.162	1.46	94	-1	98	76	2.220	0.15	0.00
175	28.291	0.162	0.57	94	-1.28	98	76	2.220	0.16	0.02
176	28.454	0.163	1.35	94	-1.03	99	76	2.220	0.27	0.01
177	28.614	0.160	1.68	94	-0.92	97	75	2.220	0.14	0.03
178	28.777	0.163	1.54	94	-0.93	99	75	2.220	0.21	0.04
179	28.938	0.161	1.04	94	-1.12	97	75	2.180	0.10	0.02
180	29.103	0.165	0.37	94	-1.32	100	75	2.220	0.22	0.03
181	29.262	0.159	0.42	94	-1.3	96	75	2.270	0.13	(0.02)
182	29.424	0.162	0.61	94	-1.25	98	75	2.230	0.14	0.03
183	29.584	0.160	1.62	94	-0.93	97	75	2.260	0.09	(0.02)
184	29.747	0.163	0.66	94	-1.3	99	75	2.230	0.07	0.03
185	29.908	0.161	0.53	94	-1.27	97	75	2.210	0.10	(0.01)
186	30.069	0.161	0.88	94	-1.16	97	75	2.230	0.15	0.02
187	30.231	0.162	0.51	94	-1.28	99	75	2.210	0.10	0.03
188	30.391	0.160	0.68	94	-1.23	98	75	2.240	5.47	1.16
189	30.555	0.164	0.64	94	-1.23	101	75	2.210	6.29	1.10
190	30.714	0.159	1.58	94	-0.95	98	75	2.210	6.78	1.15
191	30.878	0.164	1.34	94	-1.03	101	75	2.210	6.54	1.12

BOX B TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 1

Job #: 20-565
Tracking #: 69
Technician: AK
Date: 5/1/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
192	31.038	0.160	1.31	94	-1.02	98	75	2.210	6.52	1.05
193	31.199	0.161	1.41	94	-1.01	99	75	2.210	6.40	0.97
194	31.361	0.162	0.77	94	-1.2	100	75	2.210	6.24	0.87
195	31.522	0.161	0.38	94	-1.32	99	75	2.210	6.05	0.75
196	31.683	0.161	1.44	94	-1	99	75	2.210	5.91	0.77
197	31.842	0.159	1.31	94	-1.03	98	75	2.210	5.75	0.74
198	32.003	0.161	1.37	94	-1.01	99	75	2.210	5.63	0.61
199	32.164	0.161	0.41	94	-1.29	99	75	2.210	5.71	0.70
200	32.324	0.160	1.02	94	-1.15	99	75	2.210	5.32	0.72
201	32.485	0.161	1.61	94	-0.93	99	75	2.210	5.37	0.69
202	32.645	0.160	0.42	94	-1.3	99	75	2.210	4.95	0.58
203	32.807	0.162	0.43	94	-1.3	100	76	2.210	4.90	0.63
204	32.965	0.158	1.44	94	-0.99	97	76	2.210	4.67	0.56
205	33.128	0.163	1.64	94	-0.93	100	76	2.210	4.53	0.55
206	33.288	0.160	0.70	94	-1.22	99	76	2.210	4.39	0.51
207	33.447	0.159	0.36	94	-1.31	98	76	2.210	4.39	0.61
208	33.611	0.164	0.41	94	-1.31	101	76	2.210	4.27	0.51
209	33.768	0.157	1.42	94	-0.99	97	76	2.240	4.13	0.51
210	33.928	0.160	0.63	94	-1.24	99	76	2.210	3.90	0.51
211	34.089	0.161	0.82	94	-1.18	99	76	2.200	3.87	0.51
212	34.250	0.161	1.15	94	-1.09	99	76	2.210	3.63	0.55
213	34.412	0.162	1.26	94	-1.04	100	76	2.190	3.52	0.58
214	34.574	0.162	1.65	94	-0.92	100	76	2.200	3.73	0.55
215	34.735	0.161	0.53	94	-1.27	99	76	2.210	3.56	0.62
216	34.897	0.162	0.51	94	-1.27	100	76	2.210	3.55	0.60
217	35.058	0.161	0.98	94	-1.13	99	76	2.200	3.34	0.51
218	35.220	0.162	1.87	94	-0.94	100	76	2.210	3.30	0.53

WATER FLOW AND TEMPERATURE DATA - ASTM E2618

Client: Greentech
Model: RS7200E
Run #: 1

Job #: 20-565
Tracking #: 69
Technician: AK
Date: 5/1/2020

	Flow (GPM)		Temperature Data (°F)						
Elapsed Time (min)	Load Side Flow	Appliance Flow (optional)	HEX Load In	HEX Load Out	HEX Supply In	HEX Supply Out	Specific Heat of Inlet Water (BTU/lb-°F)	Mass Flow Rate of Inlet Water (lb/min)	Heat Output (Btu)
0	1.88		43.22	165.63	164	147	1.00	15.67	
1	1.94		43.40	166.01	164	148	1.00	16.15	1983
2	1.92		43.49	166.29	164	148	1.00	15.99	1966
3	1.87		43.58	166.67	164	148	1.00	15.64	1928
4	1.86		43.68	167.24	165	149	1.00	15.51	1919
5	1.99		43.77	167.80	166	149	1.00	16.63	2065
6	1.93		43.91	168.18	166	150	1.00	16.12	2006
7	1.92		44.00	168.84	167	150	1.00	16.01	2001
8	1.88		44.09	169.36	167	150	1.00	15.67	1965
9	1.87		44.23	169.64	168	151	1.00	15.64	1964
10	1.92		44.32	170.53	168	151	1.00	15.99	2021
11	1.96		44.37	171.01	169	152	1.00	16.32	2069
12	1.89		44.46	171.43	169	153	1.00	15.81	2010
13	1.92		44.55	172.04	170	153	1.00	15.99	2041
14	1.99		44.65	172.56	170	153	1.00	16.64	2131
15	1.92		44.65	173.08	171	154	1.00	15.98	2055
16	1.90		44.65	173.88	171	154	1.00	15.82	2047
17	1.90		44.65	174.44	172	155	1.00	15.81	2055
18	1.94		44.69	174.82	173	156	1.00	16.16	2105
19	1.97		44.69	175.53	173	156	1.00	16.47	2157
20	1.90		44.65	176.19	173	156	1.00	15.83	2085
21	1.94		44.69	176.62	174	157	1.00	16.15	2133
22	1.95		44.69	177.42	175	157	1.00	16.31	2167
23	1.94		44.69	178.13	175	158	1.00	16.16	2159
24	1.99		44.74	178.65	176	159	1.00	16.62	2229
25	1.94		44.79	179.46	177	159	1.00	16.16	2179
26	1.94		44.74	180.17	177	160	1.00	16.16	2191
27	1.93		44.79	180.60	178	160	1.00	16.12	2192
28	1.94		44.79	181.40	179	161	1.00	16.15	2209
29	1.94		44.74	182.06	179	161	1.00	16.19	2226
30	1.93		44.79	182.68	180	162	1.00	16.12	2225
31	1.91		44.74	183.34	181	162	1.00	15.97	2217
32	1.90		44.74	183.58	181	163	1.00	15.82	2200
33	1.94		44.74	183.44	182	164	1.00	16.15	2243
34	1.88		44.65	183.06	182	163	1.00	15.67	2172
35	1.82		44.69	182.68	181	163	1.00	15.17	2096
36	1.93		44.69	182.25	181	163	1.00	16.13	2222
37	1.92		44.69	181.78	181	163	1.00	15.99	2195
38	1.92		44.65	181.35	180	162	1.00	15.98	2187
39	1.84		44.65	180.74	180	162	1.00	15.34	2090
40	1.88		44.65	180.26	179	162	1.00	15.66	2126
41	1.90		44.69	179.79	179	161	1.00	15.81	2139
42	1.92		44.74	179.13	178	160	1.00	16.01	2154
43	1.84		44.74	178.56	178	160	1.00	15.32	2053
44	1.94		44.74	177.90	177	159	1.00	16.15	2153
45	1.90		44.74	177.23	177	159	1.00	15.82	2099
46	1.89		44.79	176.52	176	158	1.00	15.81	2085
47	1.90		44.79	175.91	176	158	1.00	15.84	2080

WATER FLOW AND TEMPERATURE DATA - ASTM E2618

Client: Greentech
Model: RS7200E
Run #: 1

Job #: 20-565
Tracking #: 69
Technician: AK
Date: 5/1/2020

	Flow (GPM)		Temperature Data (°F)						
Elapsed Time (min)	Load Side Flow	Appliance Flow (optional)	HEX Load In	HEX Load Out	HEX Supply In	HEX Supply Out	Specific Heat of Inlet Water (BTU/lb-°F)	Mass Flow Rate of Inlet Water (lb/min)	Heat Output (Btu)
48	1.92		44.79	175.20	175	157	1.00	16.01	2090
49	1.97		44.79	174.49	174	157	1.00	16.46	2137
50	1.94		44.79	173.83	174	156	1.00	16.18	2091
51	1.93		44.79	173.22	173	156	1.00	16.12	2072
52	1.86		44.79	172.51	172	155	1.00	15.51	1984
53	1.94		44.83	171.71	172	154	1.00	16.16	2053
54	1.90		44.79	171.05	171	154	1.00	15.83	2001
55	1.92		44.79	170.39	170	153	1.00	15.99	2011
56	1.93		44.79	169.69	170	152	1.00	16.14	2018
57	1.88		44.79	168.93	169	152	1.00	15.68	1949
58	1.86		44.74	168.27	168	151	1.00	15.51	1918
59	1.98		44.79	167.52	167	151	1.00	16.49	2026
60	1.90		44.79	167.09	166	150	1.00	15.84	1940
61	1.86		44.74	166.81	166	149	1.00	15.51	1895
62	1.94		44.79	166.62	166	149	1.00	16.17	1972
63	1.90		44.79	166.58	166	149	1.00	15.81	1928
64	1.84		44.79	166.58	166	149	1.00	15.35	1871
65	1.94		44.79	166.67	165	149	1.00	16.16	1972
66	1.93		44.79	166.86	165	149	1.00	16.14	1973
67	1.86		44.79	167.14	165	149	1.00	15.52	1902
68	1.98		44.83	167.33	166	149	1.00	16.49	2023
69	1.92		44.83	167.75	166	150	1.00	16.01	1970
70	1.92		44.79	168.13	166	150	1.00	16.01	1977
71	1.84		44.79	168.65	166	150	1.00	15.35	1903
72	1.84		44.83	169.21	167	151	1.00	15.32	1908
73	1.92		44.79	169.59	167	151	1.00	16.00	1999
74	1.94		44.79	170.20	168	151	1.00	16.15	2028
75	1.96		44.83	170.77	168	152	1.00	16.35	2062
76	1.88		44.83	171.38	169	153	1.00	15.67	1986
77	1.88		44.83	172.04	169	153	1.00	15.68	1997
78	1.92		44.83	172.75	170	153	1.00	16.01	2050
79	1.94		44.83	173.36	171	154	1.00	16.17	2080
80	1.96		44.79	174.07	171	155	1.00	16.32	2113
81	1.82		44.88	174.87	172	155	1.00	15.16	1974
82	1.90		44.83	175.67	173	156	1.00	15.83	2074
83	1.97		44.83	176.52	173	156	1.00	16.47	2172
84	1.84		44.83	177.33	174	158	1.00	15.35	2036
85	1.88		44.83	177.85	175	158	1.00	15.66	2086
86	1.86		44.79	178.65	176	159	1.00	15.51	2079
87	1.84		44.79	179.36	177	159	1.00	15.35	2068
88	1.92		44.83	180.26	177	160	1.00	15.99	2168
89	1.94		44.83	180.93	178	161	1.00	16.15	2201
90	1.86		44.83	181.40	179	161	1.00	15.51	2121
91	1.91		44.83	182.30	179	162	1.00	15.90	2188
92	1.87		44.83	182.96	180	162	1.00	15.62	2161
93	1.92		44.79	183.77	181	163	1.00	16.00	2226
94	1.92		44.83	183.72	182	164	1.00	15.98	2222
95	1.92		44.83	183.48	182	164	1.00	16.02	2223

WATER FLOW AND TEMPERATURE DATA - ASTM E2618

Client: Greentech
Model: RS7200E
Run #: 1

Job #: 20-565
Tracking #: 69
Technician: AK
Date: 5/1/2020

	Flow (GPM)		Temperature Data (°F)						
Elapsed Time (min)	Load Side Flow	Appliance Flow (optional)	HEX Load In	HEX Load Out	HEX Supply In	HEX Supply Out	Specific Heat of Inlet Water (BTU/lb-°F)	Mass Flow Rate of Inlet Water (lb/min)	Heat Output (Btu)
96	1.92		44.83	183.34	182	164	1.00	16.00	2219
97	1.92		44.83	183.06	181	164	1.00	16.01	2215
98	1.86		44.83	182.54	181	163	1.00	15.51	2138
99	1.93		44.83	182.20	181	163	1.00	16.14	2220
100	1.86		44.83	181.78	180	162	1.00	15.51	2126
101	1.92		44.83	181.16	180	162	1.00	15.99	2183
102	1.88		44.79	180.69	180	162	1.00	15.66	2131
103	1.90		44.83	180.03	179	161	1.00	15.81	2141
104	1.92		44.83	179.50	178	161	1.00	15.99	2156
105	1.95		44.83	178.89	178	160	1.00	16.31	2189
106	1.94		44.79	178.18	178	160	1.00	16.17	2159
107	1.86		44.79	177.56	177	159	1.00	15.50	2060
108	1.90		44.83	176.85	176	159	1.00	15.81	2090
109	1.87		44.83	176.24	176	158	1.00	15.59	2051
110	1.95		44.83	175.58	175	158	1.00	16.29	2133
111	1.85		44.79	174.82	175	157	1.00	15.41	2006
112	1.94		44.79	174.12	174	156	1.00	16.19	2097
113	1.90		44.74	173.45	173	156	1.00	15.82	2039
114	1.86		44.74	172.75	173	155	1.00	15.51	1987
115	1.82		44.74	171.99	172	155	1.00	15.17	1933
116	1.92		44.74	171.24	171	154	1.00	15.99	2025
117	1.88		44.69	170.63	170	153	1.00	15.67	1976
118	1.92		44.74	169.92	170	153	1.00	15.98	2003
119	1.90		44.74	169.07	169	152	1.00	15.86	1974
120	1.88		44.74	168.41	168	151	1.00	15.68	1942
121	1.94		44.74	167.66	168	151	1.00	16.16	1988
122	1.84		44.74	167.28	166	150	1.00	15.34	1882
123	1.94		44.74	167.00	166	150	1.00	16.16	1978
124	1.94		44.69	166.86	166	149	1.00	16.17	1977
125	1.90		44.74	166.86	166	149	1.00	15.83	1936
126	1.82		44.74	166.91	166	149	1.00	15.20	1859
127	1.91		44.74	166.95	166	149	1.00	15.97	1955
128	1.88		44.74	167.14	166	149	1.00	15.69	1923
129	1.85		44.69	167.38	166	149	1.00	15.42	1895
130	1.95		44.74	167.66	166	150	1.00	16.27	2002
131	1.87		44.74	168.23	166	150	1.00	15.57	1925
132	1.88		44.69	168.32	166	150	1.00	15.72	1946
133	1.92		44.74	168.88	166	150	1.00	15.98	1986
134	1.88		44.74	169.26	167	151	1.00	15.68	1955
135	1.88		44.69	169.64	167	151	1.00	15.66	1960
136	1.84		44.69	170.20	168	151	1.00	15.35	1929
137	1.88		44.74	170.68	168	152	1.00	15.66	1974
138	1.96		44.74	171.10	169	152	1.00	16.33	2066
139	1.88		44.69	171.76	169	153	1.00	15.68	1995
140	1.90		44.69	172.28	170	153	1.00	15.82	2021
141	1.92		44.69	172.70	170	154	1.00	16.01	2052
142	1.86		44.69	173.22	171	154	1.00	15.50	1994
143	1.88		44.74	173.79	171	155	1.00	15.69	2027

WATER FLOW AND TEMPERATURE DATA - ASTM E2618

Client: Greentech
Model: RS7200E
Run #: 1

Job #: 20-565
Tracking #: 69
Technician: AK
Date: 5/1/2020

	Flow (GPM)		Temperature Data (°F)						
Elapsed Time (min)	Load Side Flow	Appliance Flow (optional)	HEX Load In	HEX Load Out	HEX Supply In	HEX Supply Out	Specific Heat of Inlet Water (BTU/lb-°F)	Mass Flow Rate of Inlet Water (lb/min)	Heat Output (Btu)
144	1.92		44.74	174.21	172	155	1.00	16.00	2074
145	1.90		44.74	174.82	172	156	1.00	15.83	2062
146	1.84		44.69	175.29	173	156	1.00	15.37	2010
147	1.88		44.69	175.81	173	157	1.00	15.69	2060
148	1.93		44.69	176.19	174	157	1.00	16.13	2124
149	1.87		44.69	176.57	174	157	1.00	15.58	2057
150	1.88		44.69	177.14	174	158	1.00	15.69	2081
151	1.96		44.69	177.52	175	158	1.00	16.35	2174
152	1.82		44.69	178.04	176	158	1.00	15.19	2028
153	1.91		44.69	178.56	176	159	1.00	15.93	2135
154	1.93		44.69	178.94	176	159	1.00	16.14	2170
155	1.84		44.74	179.36	177	160	1.00	15.35	2069
156	1.94		44.74	179.70	177	160	1.00	16.16	2183
157	1.94		44.69	180.26	178	160	1.00	16.18	2197
158	1.84		44.69	180.60	178	161	1.00	15.35	2088
159	1.94		44.69	180.83	179	161	1.00	16.17	2204
160	1.88		44.69	181.21	179	161	1.00	15.68	2143
161	1.92		44.69	181.54	179	161	1.00	15.99	2191
162	1.86		44.69	182.02	180	162	1.00	15.51	2133
163	1.86		44.74	182.63	180	162	1.00	15.50	2140
164	1.92		44.69	182.63	181	163	1.00	16.01	2211
165	1.90		44.69	182.44	181	163	1.00	15.83	2184
166	1.94		44.74	182.06	180	163	1.00	16.17	2224
167	1.92		44.74	181.64	180	163	1.00	16.00	2193
168	1.82		44.74	180.97	180	162	1.00	15.17	2069
169	1.83		44.69	180.50	179	162	1.00	15.25	2073
170	1.91		44.69	179.88	179	161	1.00	15.97	2162
171	1.88		44.69	179.32	178	161	1.00	15.71	2118
172	1.85		44.69	178.60	178	160	1.00	15.40	2064
173	1.86		44.69	177.94	177	160	1.00	15.50	2068
174	1.82		44.69	177.23	176	159	1.00	15.20	2017
175	1.92		44.69	176.57	176	158	1.00	16.00	2113
176	1.88		44.65	175.86	175	158	1.00	15.70	2062
177	1.88		44.65	175.06	175	157	1.00	15.66	2045
178	1.82		44.65	174.40	174	157	1.00	15.21	1975
179	1.90		44.69	173.64	173	156	1.00	15.86	2047
180	1.96		44.65	172.84	173	155	1.00	16.34	2097
181	1.84		44.65	172.18	172	155	1.00	15.36	1961
182	1.82		44.65	171.48	171	154	1.00	15.20	1930
183	1.92		44.69	170.58	170	153	1.00	16.01	2018
184	1.84		44.65	169.87	170	153	1.00	15.35	1924
185	1.88		44.65	169.12	169	152	1.00	15.68	1954
186	1.88		44.65	168.37	168	151	1.00	15.66	1940
187	1.86		44.65	167.85	167	151	1.00	15.54	1917
188	1.86		44.65	167.52	167	150	1.00	15.54	1912
189	1.95		44.65	167.33	167	150	1.00	16.27	1999
190	1.87		44.69	167.14	166	150	1.00	15.58	1910
191	1.87		44.69	167.05	166	150	1.00	15.60	1911

WATER FLOW AND TEMPERATURE DATA - ASTM E2618

Client: Greentech
Model: RS7200E
Run #: 1

Job #: 20-565
Tracking #: 69
Technician: AK
Date: 5/1/2020

	Flow (GPM)		Temperature Data (°F)						
Elapsed Time (min)	Load Side Flow	Appliance Flow (optional)	HEX Load In	HEX Load Out	HEX Supply In	HEX Supply Out	Specific Heat of Inlet Water (BTU/lb-°F)	Mass Flow Rate of Inlet Water (lb/min)	Heat Output (Btu)
192	1.86		44.65	167.00	166	149	1.00	15.53	1903
193	1.94		44.69	166.95	166	149	1.00	16.17	1980
194	1.86		44.65	166.95	165	149	1.00	15.51	1900
195	1.90		44.69	166.95	166	149	1.00	15.85	1940
196	1.88		44.65	166.95	165	149	1.00	15.68	1920
197	1.86		44.69	167.09	165	150	1.00	15.52	1902
198	1.90		44.69	167.19	165	150	1.00	15.84	1943
199	1.88		44.65	167.24	165	150	1.00	15.69	1926
200	1.84		44.60	167.33	165	149	1.00	15.36	1887
201	1.98		44.65	167.38	165	150	1.00	16.51	2029
202	1.84		44.65	167.33	165	150	1.00	15.36	1886
203	1.98		44.65	167.33	165	150	1.00	16.50	2027
204	1.84		44.65	167.52	165	150	1.00	15.36	1890
205	1.92		44.69	167.52	166	150	1.00	16.01	1969
206	1.90		44.69	167.47	166	150	1.00	15.82	1945
207	1.84		44.69	167.38	165	150	1.00	15.35	1885
208	1.82		44.65	167.38	165	150	1.00	15.20	1867
209	1.82		44.60	167.47	166	150	1.00	15.19	1869
210	1.94		44.65	167.47	165	150	1.00	16.18	1990
211	1.86		44.60	167.33	165	150	1.00	15.52	1908
212	1.88		44.65	167.14	165	150	1.00	15.69	1924
213	1.86		44.65	167.00	165	150	1.00	15.52	1902
214	1.86		44.65	167.00	165	150	1.00	15.52	1902
215	1.88		44.69	166.81	165	149	1.00	15.67	1916
216	1.86		44.65	166.67	165	149	1.00	15.52	1896
217	3.35		44.60	166.53	165	149	1.00	27.94	3411
218					165	149			

WATER FLOW AND TEMPERATURE DATA - ASTM E2618

Client: Greentech
Model: RS7200E
Run #: 1

Job #: 20-565
Tracking #: 69
Technician: AK
Date: 5/1/2020

	Flow (GPM)		Temperature Data (°F)						
Elapsed Time (min)	Load Side Flow	Appliance Flow (optional)	HEX Load In	HEX Load Out	HEX Supply In	HEX Supply Out	Specific Heat of Inlet Water (BTU/lb-°F)	Mass Flow Rate of Inlet Water (lb/min)	Heat Output (Btu)
Average	2	#DIV/0!	45	174	172	155	1	16	2052
								TOTAL:	**445249**

LAB SAMPLE DATA - ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 1

Job #: 20-565
Tracking #: 69
Technician: AK
Date: 5/1/2020

	Sample ID	Tare, mg	Total, mg	Final, mg	Catch, mg
Train A Filters - First Hour	3772	119.7	119.7	119.7	0.0
Train A Filters - Remainder	A001	118.1	237.4	239.8	2.4
	3773	119.3			
Train A Probe	18A	117496.5	117496.5	117496.8	0.3
Train A O-Rings	18A	3396.1	3396.1	3394.9	0.0*
Train B Filters	3774	118.9	237.1	238.6	1.5
	3775	118.2			
Train B Probe	18B	117329.5	117329.5	117329.5	0.0
Train B O-Rings	18B	3367.7	3367.7	3366.5	0.0*
Background Filter	A002	119.1	119.1	118.5	0.0

**Negative value corrected to zero*

Placed in Dessicator on:	5/7/2020

Train A Filters - First Hour	119.9		119.7					
Train A Filters - Remainder	239.6		240.0		239.8			
Train A Probe	117497.0				117496.8			
Train A O-Rings	3394.4		3395.0		3394.9			
Train B Filters	238.3		238.6		238.6			
Train B Probe	117329.6				117329.5			
Train B O-Rings	3365.8		3366.6		3366.5			
Background Filter	118.6		118.5					

1st hour Sub-Total, mg:	0.0
Remainder Sub-Total, mg:	2.7
Train 1 Aggregate, mg:	**2.7**
Train 2 Aggregate, mg:	**1.5**
Ambient Aggregate, mg:	0.0

ASTM E2618 Hydronic Heater Run Sheets

Client: Greentech Job Number: 20-565 Tracking #: 69
Model: RS7200E Run Number: 1 Test Date: 5/1/2020

Wood Heater Run Notes

Pre-Test Notes
Pre-Test Start Time: 13:10
Target Load (BTU/hr): 125,000

Time	Notes
0 min	Began preburn
115 min	Stirred remaining fuel load to ensure uniform charcoal bed
148 min	End PB

Test Notes
Test Burn Start Time: 14:10
Target Load (BTU/hr): 125,000 (Category 4)

Time	Notes
0 min	Loaded test fuel within 60 seconds, door closed immediately
60 min	Changed 1st hour filter
218 min	End of Test

Test Burn End Time: 17:48

Flue Gas Concentration Measurement

Calibration Gas Values: Span Gas CO_2 (%): 15.30 CO (%): 4.98

Calibration Results:

	Pre Test			Post Test		
	Zero		Span	Zero		Span
Time	13:15		13:17	5/2 14:32		5/2 14:36
CO_2	0.00		15.30	-0.15		15.18
CO	0.000		4.981	0.008		4.915

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

Technician Signature: Date: 5/10/2020

HYDRONIC HEATER TES DATA PACKET
ASTM E2618/E2515

Run 2 Data Summary

Client:	Greentech
Model:	RS7200E
Job #:	20-565
Tracking #:	0069
Test Date:	5/1/2020

Technician Signature

5/13/2022
Date

TEST RESULTS - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 2

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/1/2020

Particulate Data

	Ambient Sample	Sample Train A	Sample Train B	1st Hour Filter
Total Sample Volume (ft^3)	344.807	179.499	189.387	9.006
Average Gas Velocity in Dilution Tunnel (ft/sec)	14.4			
Average Gas Flow Rate in Dilution Tunnel (dscf/hr)	37751.8			
Average Gas Meter Temperature (°F)	67.3	91.2	92.2	87.5
Total Sample Volume (dscf)	327.413	162.789	173.236	8.223
Average Tunnel Temperature (°F)	72.4			
Total Time of Test (min)	1200			
Total Particulate Catch (mg)	1.4	2.9	3.2	0.5
Particulate Concentration, dry-standard (g/dscf)	0.0000043	0.0000178	0.0000185	0.0000608
Total PM Emissions (g)	3.23	10.22	10.72	2.13
Particulate Emission Rate (g/hr)	0.16	0.51	0.54	2.13
Emissions Factor (g/kg)	-	0.41	0.43	-
Difference from Average Total Particulate Emissions (%)	-	2.4%	2.4%	-
Difference from Average Emissions Factor (g/kg)	-	0.01	0.01	-

Boiler/ HEX Data

Appliance Average Start Temperature (F)	163.5	
Appliance Average Final Temperature (F)	166.5	**First Hour**
Heat Output (BTU)	361,825	23,971
Heat Output Rate (BTU/hr)	18,091	
Heat Input - HHV (BTU)	468,771	88,211
Heat Input - LHV (BTU)	435,412	

Emissions Rates and Factors

Total Particulate Emissions (g)	10.5	2.1
Emissions Factor (g/MJ)	0.0274	
Emissions Factor (g/kg)	0.4226	
Emissions Rate (g/hr)	0.52	
Emissions Rate (lb/mmbtu output)	0.064	0.196
HHV Delivered Efficiency (%)	77.2%	27.2%
LHV Delivered Efficiency (%)	83.1%	
HHV SLM Efficiency (%)	77.1%	
LHV SLM Efficiency (%)	82.6%	
CO Emissions (g/min)	2.46	

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	77.0	OK
Face Velocity	< 30 ft/min	9.1	OK
Leakage Rate	Less than 4% of average sample rate	0 cfm	OK
Ambient Temp	55-90 °F	Min: 67 / Max: 71	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
Return Temp > 120°F	>120°F	163.0	OK

B415.1 Efficiency Results

Manufacturer: Greentech
Model: RS7200E
Date: 05/01/20
Run: 2
Control #: 20-565
Test Duration: 1200
Output Category: 1

Test Results in Accordance with CSA B415.1-09

	HHV Basis	LHV Basis
Overall Efficiency	77.1%	82.6%
Combustion Efficiency	94.0%	94.0%
Heat Transfer Efficiency	82.0%	87.8%

Output Rate (kJ/h)	18,751	17,787	**(Btu/h)**
Burn Rate (kg/h)	1.24	2.73	**(lb/h)**
Input (kJ/h)	24,311	23,062	**(Btu/h)**

Test Load Weight (dry kg)	24.73	54.51	**dry lb**
MC wet (%)	18.20		
MC dry (%)	22.26		
Particulate (g)	10.47		
CO (g)	2,950		
Test Duration (h)	20.00		

Emissions	**Particulate**	**CO**
g/MJ Output	0.03	7.87
g/kg Dry Fuel	0.42	119.28
g/h	0.52	147.50
g/min	0.01	2.46
lb/MM Btu Output	0.06	18.28

Air/Fuel Ratio (A/F)	50.02

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

BOILER CORDWOOD FUEL DATA - ASTM E2618

Client: Greentech
Model: RS7200E
Run #: 2

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/1/2020

Firebox Volume (ft^3):	6.11	Minimun Piece Weight (lbs):	4.40
Target Load Weight (lbs):	61.10	Maximun Piece Weight (lbs):	17.60
Number of Fuel Pieces Allowed:	5 - 10	80% of piece of weight range (lbs):	6.6 to 15.4

Pretest Fuel Information

Length (in)	Weight (lbs)	MC (%DB)	Length (in)	Weight (lbs)	MC (%DB)
20.00	78.00	24.0			
20.00		24.0			
20.00		24.0			
20.00		22.0			
20.00		27.0			
20.00		18.0			
20.00		18.0			
20.00		20.0			

Total Preburn Weight (lbs): 78.00
Averge Preburn Moisture (% DB): 22.13

Test Fuel Information

Length (in)	Weight (lbs)	Moisture Content (%DB)					Avg MC (%DB)	Dry Weight (lbs)
20.00	8.23	20.0	18.0	19.0	23.0	23.0	20.60	6.82
20.00	7.28	21.0	27.0	18.0	18.0	20.0	20.80	6.03
20.00	8.40	18.0	22.0	19.0	19.0	20.0	19.60	7.02
20.00	9.03	19.0	21.0	18.0	25.0	25.0	21.60	7.43
20.00	8.10	18.0	22.0	19.0	27.0	27.0	22.60	6.61
20.00	7.95	26.0	26.0	19.0	26.0	26.0	24.60	6.38
20.00	9.23	28.0	24.0	24.0	24.0	22.0	24.40	7.42
20.00	8.42	28.0	25.0	27.0	20.0	19.0	23.80	6.80
Total (lbs):	66.64						Total Dry Weight (lbs):	54.51

Allowable Coal Bed Range (10-20%): 6.7 - 13.3

Quality checks

Individual Piece Weights:	OK
80% Piece weight range:	OK
Piece Count:	OK

DILUTION TUNNEL & MISC. DATA - ASTM E2618 / E2515

Client:	Greentech	Job #:	20-565
Model:	RS7200E	Tracking #:	0069
Run #:	2	Technician:	AK
Test Start Time:	18:24	Date:	5/1/2020
Manufacturer's Rated Output (BTU/hr):	125,000		

Total Sampling Time (min):	1200
Recording Interval (min):	1

1200

	Pre-Test	**Post Test**	**Avg.**
Barometric Pressure (in. Hg)	28.47	28.53	28.50
Relative Humidity (%)	46.2	29.8	
Room Air Velocity (ft/min)	0	0	
Scale Audit (lbs)	10.0	10.0	
Ambient Sample Volume:		344.807	ft^3

Meter Box γ Factor:	0.992	(A)
Meter Box γ Factor:	1.002	(B)
Meter Box γ Factor:	0.996	(Ambient)

Induced Draft Check (in. H_2O):	0
Smoke Capture Check (%):	100%
Date Flue Pipe Last Cleaned:	4/30/2020
Boiler Dry Weight (lbs):	1964
Supply Side Water Weight (lbs):	1502

Sample Train Post-Test Leak Checks

(A)	0.000	cfm @	-10	in. Hg
(B)	0.000	cfm @	-12	in. Hg
(Ambient)	0.000	cfm @	-15	in. Hg

DILUTION TUNNEL FLOW

Traverse Data

Point	dP (in H_2O)	Temp (°F)
1	0.034	68
2	0.046	68
3	0.052	68
4	0.050	68
5	0.042	68
6	0.032	68
7	0.038	68
8	0.046	68
9	0.052	68
10	0.054	68
11	0.046	68
12	0.038	68
Center	0.056	68

Static Pressure: -0.160 in. H_2O

Dilution Tunnel H_2O:	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	ft^2
V_{strav}:	14.38	ft/sec
V_{scent}:	16.08	ft/sec
F_p:	0.894	[ratio]
Initial Tunnel Flow:	625.6	scf/min

TEST FUEL PROPERTIES

Default Fuel Values

Fuel Type:	D. Fir	Oak
HHV (kJ/kg)	19,810	19,887
%C	48.73	50
%H	6.87	6.9
%O	43.9	42.9
%Ash	0.5	0.5

Actual Fuel Used Properties

Fuel Type:	Maple
HHV (kJ/kg)	19,960
%C	50.64
%H	6.62
%O	41.74
%Ash	1.35
MC (%DB)	22.3%

BOX A TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 2

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/1/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
0	0.000		0.056	0.09	89	-5.47		66.6		95	284	74	70
1	0.126	0.126	0.056	0.99	88	-5.47	87	66.3	-0.34	95	286	74	71
2	0.276	0.150	0.056	0.93	88	-5.47	103	66.0	-0.3	95	287	74	70
3	0.427	0.151	0.056	0.96	87	-5.47	104	65.6	-0.4	96	290	74	70
4	0.578	0.151	0.056	0.83	87	-5.47	104	65.5	-0.1	96	293	74	71
5	0.728	0.150	0.056	0.89	87	-5.47	103	64.0	-1.5	96	295	75	70
6	0.880	0.152	0.056	0.94	87	-5.47	105	63.0	-1	97	298	75	70
7	1.030	0.150	0.056	0.99	87	-5.47	103	62.9	-0.1	96	300	75	70
8	1.179	0.149	0.056	0.93	87	-5.47	103	62.0	-0.9	96	302	75	70
9	1.328	0.149	0.056	0.92	87	-5.47	103	60.9	-1.1	97	304	75	70
10	1.478	0.150	0.056	0.95	86	-5.47	104	60.9	0	97	305	75	70
11	1.629	0.151	0.056	0.96	86	-5.47	104	59.2	-1.7	97	307	75	70
12	1.779	0.150	0.056	0.93	86	-5.47	104	57.9	-1.3	97	308	75	70
13	1.929	0.150	0.056	0.94	86	-5.47	104	57.8	-0.1	97	310	75	70
14	2.079	0.150	0.056	0.99	86	-5.47	102	57.6	-0.2	84	299	74	70
15	2.229	0.150	0.056	0.96	86	-5.47	102	56.9	-0.7	79	282	74	70
16	2.392	0.163	0.056	0.93	86	-5.47	111	55.8	-1.1	78	268	74	70
17	2.542	0.150	0.056	0.98	86	-5.47	102	56.1	0.3	77	258	74	70
18	2.692	0.150	0.056	0.96	86	-5.47	102	56.4	0.3	76	249	74	70
19	2.842	0.150	0.056	0.92	86	-5.47	102	55.9	-0.5	76	242	74	70
20	2.994	0.152	0.056	0.95	86	-5.47	103	58.0	2.1	75	236	74	70
21	3.144	0.150	0.056	0.94	87	-5.47	101	56.0	-2	75	230	74	70
22	3.294	0.150	0.056	0.95	87	-5.47	101	55.8	-0.2	75	225	74	70
23	3.443	0.149	0.056	0.97	87	-5.47	101	55.0	-0.8	75	221	73	70
24	3.592	0.149	0.056	0.93	87	-5.47	101	55.3	0.3	75	217	73	70
25	3.742	0.150	0.056	0.88	87	-5.47	101	55.0	-0.3	75	213	73	70
26	3.892	0.150	0.056	0.94	87	-5.47	101	53.9	-1.1	75	210	73	70
27	4.042	0.150	0.056	0.89	87	-5.47	101	55.6	1.7	75	206	73	70
28	4.192	0.150	0.056	0.97	87	-5.47	101	55.0	-0.6	75	203	73	70
29	4.341	0.149	0.056	0.94	87	-5.47	101	55.0	0	75	200	73	70
30	4.500	0.159	0.056	0.94	87	-5.47	107	55.2	0.2	74	197	73	70
31	4.649	0.149	0.056	0.89	87	-5.47	101	54.9	-0.3	74	194	73	70

BOX A TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 2

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/1/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
32	4.800	0.151	0.056	0.94	87	-5.47	102	54.9	0	75	192	73	70
33	4.950	0.150	0.056	0.91	87	-5.47	101	55.0	0.1	74	189	72	70
34	5.100	0.150	0.056	0.94	87	-5.47	101	55.0	0	74	187	72	70
35	5.251	0.151	0.056	0.94	87	-5.47	102	55.0	0	74	184	72	70
36	5.402	0.151	0.056	0.97	88	-5.47	102	54.9	-0.1	74	182	72	70
37	5.552	0.150	0.056	0.95	88	-5.47	101	55.0	0.1	74	180	72	70
38	5.702	0.150	0.056	0.97	88	-5.47	101	55.0	0	74	178	72	70
39	5.851	0.149	0.056	0.99	88	-5.47	100	54.6	-0.4	74	176	72	70
40	6.001	0.150	0.056	0.91	88	-5.47	101	54.5	-0.1	74	174	72	70
41	6.151	0.150	0.056	0.93	88	-5.47	101	54.1	-0.4	74	172	72	70
42	6.302	0.151	0.056	0.97	88	-5.47	102	54.9	0.8	74	170	72	70
43	6.453	0.151	0.056	1.12	88	-5.47	102	54.2	-0.7	74	169	72	70
44	6.603	0.150	0.056	0.95	88	-5.47	101	54.7	0.5	74	167	72	70
45	6.753	0.150	0.056	0.93	88	-5.47	101	54.0	-0.7	74	165	72	70
46	6.902	0.149	0.056	0.93	88	-5.47	100	55.5	1.5	74	164	72	70
47	7.052	0.150	0.056	0.91	88	-5.47	101	54.0	-1.5	74	162	72	70
48	7.202	0.150	0.056	0.93	89	-5.47	101	55.0	1	74	161	72	70
49	7.353	0.151	0.056	0.96	89	-5.47	102	53.2	-1.8	74	159	72	70
50	7.503	0.150	0.056	0.95	89	-5.47	101	53.2	0	74	157	72	70
51	7.653	0.150	0.056	0.94	89	-5.47	101	54.4	1.2	74	156	71	70
52	7.803	0.150	0.056	0.89	89	-5.47	101	54.1	-0.3	74	154	71	70
53	7.951	0.148	0.056	1.01	89	-5.47	99	55.1	1	74	153	71	70
54	8.102	0.151	0.056	0.95	89	-5.47	102	53.9	-1.2	74	152	71	70
55	8.252	0.150	0.056	0.91	89	-5.47	101	54.0	0.1	74	150	71	70
56	8.402	0.150	0.056	0.91	89	-5.47	101	54.0	0	74	150	71	70
57	8.553	0.151	0.056	1.00	89	-5.47	102	54.0	0	74	148	71	70
58	8.703	0.150	0.056	0.93	89	-5.47	101	54.1	0.1	74	147	71	70
59	8.856	0.153	0.056	0.69	89	-5.47	103	54.0	-0.1	74	146	74	70
60	9.006	0.150	0.056	0.97	89	-5.47	101	54.1	0.1	74	145	74	70
61	9.156	0.150	0.056	0.87	90	-5.47	101	54.2	0.1	74	144	73	70
62	9.307	0.151	0.056	0.90	90	-5.47	101	54.0	-0.2	74	143	73	70
63	9.458	0.151	0.056	0.97	90	-5.47	101	53.5	-0.5	74	142	73	70

BOX A TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 2

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/1/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
64	9.609	0.151	0.056	0.96	90	-5.47	101	53.9	0.4	74	140	72	70
65	9.759	0.150	0.056	0.97	90	-5.47	101	54.0	0.1	74	139	72	70
66	9.908	0.149	0.056	1.01	90	-5.47	100	54.4	0.4	74	139	72	70
67	10.060	0.152	0.056	0.91	90	-5.47	102	54.3	-0.1	74	138	72	70
68	10.210	0.150	0.056	0.90	90	-5.47	101	54.2	-0.1	74	137	72	70
69	10.361	0.151	0.056	0.92	90	-5.47	101	53.9	-0.3	74	136	72	70
70	10.511	0.150	0.056	0.93	90	-5.47	101	54.0	0.1	74	135	72	70
71	10.661	0.150	0.056	0.86	90	-5.47	101	54.4	0.4	74	135	72	70
72	10.810	0.149	0.056	0.92	90	-5.47	100	53.9	-0.5	74	133	72	70
73	10.960	0.150	0.056	0.98	90	-5.47	101	54.0	0.1	74	132	72	70
74	11.111	0.151	0.056	0.99	90	-5.47	101	54.0	0	74	131	72	70
75	11.261	0.150	0.056	0.94	90	-5.47	101	53.9	-0.1	74	130	71	70
76	11.413	0.152	0.056	0.81	90	-5.47	102	54.0	0.1	74	129	71	70
77	11.564	0.151	0.056	0.97	91	-5.47	101	53.1	-0.9	74	129	71	70
78	11.714	0.150	0.056	0.97	91	-5.47	100	54.0	0.9	74	128	71	70
79	11.863	0.149	0.056	0.93	91	-5.47	100	53.9	-0.1	73	128	71	70
80	12.014	0.151	0.056	0.92	91	-5.47	101	53.9	0	73	127	71	70
81	12.164	0.150	0.056	0.95	91	-5.47	100	54.4	0.5	73	127	71	70
82	12.315	0.151	0.056	0.90	91	-5.47	101	53.9	-0.5	73	125	71	70
83	12.466	0.151	0.056	0.86	91	-5.47	101	54.3	0.4	73	125	71	70
84	12.617	0.151	0.056	0.94	91	-5.47	101	53.4	-0.9	73	125	71	70
85	12.765	0.148	0.056	0.92	91	-5.47	99	53.9	0.5	73	124	71	69
86	12.916	0.151	0.056	0.93	91	-5.47	101	54.2	0.3	73	123	71	69
87	13.066	0.150	0.056	0.88	91	-5.47	100	53.9	-0.3	73	123	71	70
88	13.217	0.151	0.056	0.97	91	-5.47	101	54.1	0.2	73	122	71	70
89	13.368	0.151	0.056	0.97	91	-5.47	101	54.0	-0.1	73	122	71	70
90	13.519	0.151	0.056	0.93	91	-5.47	101	54.1	0.1	73	121	71	70
91	13.669	0.150	0.056	0.93	91	-5.47	100	54.0	-0.1	73	121	71	70
92	13.819	0.150	0.056	0.92	91	-5.47	100	53.9	-0.1	73	120	71	70
93	13.969	0.150	0.056	0.90	91	-5.47	100	54.0	0.1	73	120	71	70
94	14.120	0.151	0.056	1.01	91	-5.47	101	54.0	0	73	118	71	69
95	14.271	0.151	0.056	0.95	91	-5.47	101	55.0	1	73	118	71	69

BOX A TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 2

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/1/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
96	14.422	0.151	0.056	1.03	91	-5.47	101	54.3	-0.7	73	118	71	70
97	14.572	0.150	0.056	0.92	91	-5.47	100	55.0	0.7	73	118	71	69
98	14.721	0.149	0.056	0.85	91	-5.47	100	54.2	-0.8	73	117	71	69
99	14.871	0.150	0.056	0.97	91	-5.47	100	54.0	-0.2	73	116	71	70
100	15.022	0.151	0.056	0.96	92	-5.47	101	54.1	0.1	73	116	71	70
101	15.173	0.151	0.056	0.96	92	-5.47	101	54.8	0.7	73	115	71	70
102	15.324	0.151	0.056	0.93	92	-5.47	101	54.1	-0.7	73	115	71	69
103	15.475	0.151	0.056	0.96	92	-5.47	101	53.9	-0.2	73	114	71	69
104	15.624	0.149	0.056	0.95	92	-5.47	100	54.0	0.1	73	114	71	70
105	15.774	0.150	0.056	0.95	92	-5.47	100	53.6	-0.4	73	114	71	69
106	15.925	0.151	0.056	0.94	92	-5.47	101	54.0	0.4	73	114	71	69
107	16.076	0.151	0.056	0.91	92	-5.47	101	53.8	-0.2	73	114	71	70
108	16.227	0.151	0.056	0.91	92	-5.47	101	54.0	0.2	73	113	71	69
109	16.378	0.151	0.056	0.98	92	-5.47	101	54.0	0	73	112	71	69
110	16.528	0.150	0.056	0.98	92	-5.47	100	53.9	-0.1	73	112	71	69
111	16.678	0.150	0.056	0.92	92	-5.47	100	54.0	0.1	73	112	71	69
112	16.828	0.150	0.056	0.97	92	-5.47	100	54.6	0.6	73	112	71	69
113	16.979	0.151	0.056	1.00	92	-5.47	101	53.9	-0.7	73	112	71	69
114	17.131	0.152	0.056	0.95	92	-5.47	102	53.8	-0.1	73	111	71	69
115	17.282	0.151	0.056	0.89	92	-5.47	101	54.0	0.2	73	110	71	69
116	17.432	0.150	0.056	0.96	92	-5.47	100	53.9	-0.1	73	110	71	69
117	17.582	0.150	0.056	0.96	92	-5.47	100	53.7	-0.2	73	110	71	69
118	17.733	0.151	0.056	0.93	92	-5.47	101	53.9	0.2	73	110	71	69
119	17.885	0.152	0.056	0.92	92	-5.47	102	54.7	0.8	73	109	71	69
120	18.036	0.151	0.056	0.96	92	-5.47	101	54.0	-0.7	73	109	71	69
121	18.187	0.151	0.056	0.79	92	-5.47	101	54.0	0	73	109	71	69
122	18.337	0.150	0.056	0.93	92	-5.47	100	54.0	0	73	108	71	69
123	18.488	0.151	0.056	0.91	92	-5.47	101	53.9	-0.1	73	108	71	69
124	18.639	0.151	0.056	0.93	92	-5.47	101	54.0	0.1	73	108	71	69
125	18.790	0.151	0.056	1.06	92	-5.47	101	54.0	0	73	108	71	69
126	18.942	0.152	0.056	0.74	92	-5.47	102	54.3	0.3	73	108	71	69
127	19.093	0.151	0.056	0.93	92	-5.47	101	54.0	-0.3	73	108	71	69

BOX A TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 2

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/1/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
128	19.243	0.150	0.056	0.93	92	-5.47	100	54.3	0.3	72	107	71	69
129	19.393	0.150	0.056	0.95	92	-5.47	100	54.0	-0.3	72	107	71	69
130	19.543	0.150	0.056	0.93	92	-5.47	100	54.1	0.1	72	107	71	69
131	19.694	0.151	0.056	0.91	92	-5.47	101	54.1	0	72	106	71	69
132	19.845	0.151	0.056	1.00	92	-5.47	101	54.1	0	72	106	71	69
133	19.996	0.151	0.056	0.96	92	-5.47	101	53.9	-0.2	72	106	71	69
134	20.146	0.150	0.056	0.97	92	-5.47	100	53.7	-0.2	72	105	71	69
135	20.296	0.150	0.056	0.95	92	-5.47	100	54.1	0.4	72	105	71	69
136	20.447	0.151	0.056	0.97	92	-5.47	101	54.0	-0.1	72	105	70	69
137	20.597	0.150	0.056	0.94	92	-5.47	100	54.0	0	72	106	70	69
138	20.748	0.151	0.056	0.95	92	-5.47	101	52.5	-1.5	72	105	70	69
139	20.900	0.152	0.056	0.95	92	-5.47	101	53.6	1.1	72	105	70	69
140	21.049	0.149	0.056	0.92	92	-5.47	99	53.9	0.3	72	105	70	69
141	21.200	0.151	0.056	0.97	92	-5.47	101	54.2	0.3	72	104	70	69
142	21.351	0.151	0.056	0.94	92	-5.47	101	54.1	-0.1	72	104	70	69
143	21.502	0.151	0.056	0.98	92	-5.47	101	53.0	-1.1	72	104	70	69
144	21.654	0.152	0.056	0.91	92	-5.47	101	54.0	1	72	104	70	69
145	21.804	0.150	0.056	0.94	92	-5.47	100	53.9	-0.1	72	103	70	69
146	21.953	0.149	0.056	0.93	92	-5.47	99	53.9	0	72	104	70	69
147	22.104	0.151	0.056	0.94	92	-5.47	101	54.0	0.1	72	103	70	69
148	22.256	0.152	0.056	1.25	92	-5.47	101	53.4	-0.6	72	103	70	69
149	22.407	0.151	0.056	0.96	92	-5.47	101	54.2	0.8	72	103	70	69
150	22.558	0.151	0.056	0.98	92	-5.47	101	53.0	-1.2	72	102	70	69
151	22.709	0.151	0.056	1.04	92	-5.47	101	54.5	1.5	72	103	70	69
152	22.858	0.149	0.056	0.92	92	-5.47	99	54.7	0.2	72	103	70	69
153	23.010	0.152	0.056	0.91	92	-5.47	101	54.1	-0.6	72	103	70	69
154	23.161	0.151	0.056	0.94	92	-5.47	101	53.3	-0.8	72	103	70	69
155	23.312	0.151	0.056	0.96	92	-5.47	101	53.9	0.6	72	102	70	69
156	23.463	0.151	0.056	0.94	92	-5.47	101	54.0	0.1	72	101	70	69
157	23.613	0.150	0.056	0.93	92	-5.47	100	54.0	0	72	101	70	69
158	23.763	0.150	0.056	0.96	92	-5.47	100	53.8	-0.2	72	101	70	69
159	23.915	0.152	0.056	0.94	93	-5.47	101	53.9	0.1	72	102	70	69

BOX A TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 2

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/1/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
160	24.066	0.151	0.056	0.86	92	-5.47	101	53.9	0	72	102	70	69
161	24.217	0.151	0.056	0.98	92	-5.47	101	53.7	-0.2	72	102	70	69
162	24.369	0.152	0.056	0.97	93	-5.47	101	53.9	0.2	72	101	70	69
163	24.518	0.149	0.056	0.95	93	-5.47	99	53.9	0	72	101	70	69
164	24.669	0.151	0.056	0.93	93	-5.47	101	54.4	0.5	72	102	70	69
165	24.821	0.152	0.056	0.91	93	-5.47	101	53.9	-0.5	72	102	70	69
166	24.973	0.152	0.056	0.96	93	-5.47	101	54.0	0.1	72	101	70	69
167	25.124	0.151	0.056	1.03	93	-5.47	101	54.0	0	72	99	70	69
168	25.275	0.151	0.056	0.92	93	-5.47	101	54.1	0.1	72	100	70	69
169	25.425	0.150	0.056	0.90	93	-5.47	100	53.8	-0.3	72	100	70	69
170	25.577	0.152	0.056	0.93	93	-5.47	101	53.9	0.1	72	100	70	69
171	25.728	0.151	0.056	0.98	93	-5.47	101	54.0	0.1	72	100	70	69
172	25.880	0.152	0.056	0.91	93	-5.47	101	54.0	0	72	100	70	69
173	26.031	0.151	0.056	0.97	93	-5.47	101	53.9	-0.1	72	100	70	69
174	26.182	0.151	0.056	0.99	93	-5.47	101	54.4	0.5	72	100	70	69
175	26.332	0.150	0.056	0.95	93	-5.47	100	54.3	-0.1	72	100	70	69
176	26.483	0.151	0.056	0.98	93	-5.47	101	54.7	0.4	72	99	70	69
177	26.634	0.151	0.056	0.95	93	-5.47	101	53.9	-0.8	72	99	70	69
178	26.786	0.152	0.056	0.95	93	-5.47	101	53.9	0	72	98	70	69
179	26.937	0.151	0.056	0.91	93	-5.47	101	53.5	-0.4	72	99	70	69
180	27.086	0.149	0.056	0.96	93	-5.47	99	54.0	0.5	72	99	70	69
181	27.238	0.152	0.056	0.96	93	-5.47	101	54.0	0	72	100	70	69
182	27.389	0.151	0.056	1.06	93	-5.47	101	54.4	0.4	72	99	70	69
183	27.541	0.152	0.056	0.97	93	-5.47	101	53.9	-0.5	72	98	70	69
184	27.692	0.151	0.056	0.91	93	-5.47	101	53.7	-0.2	72	98	70	69
185	27.842	0.150	0.056	1.08	93	-5.47	100	54.1	0.4	72	98	70	69
186	27.993	0.151	0.056	0.98	93	-5.47	101	53.9	-0.2	72	98	70	69
187	28.145	0.152	0.056	0.99	93	-5.47	101	53.9	0	72	98	70	69
188	28.296	0.151	0.056	0.99	93	-5.47	101	54.2	0.3	72	98	70	69
189	28.447	0.151	0.056	0.91	93	-5.47	101	54.0	-0.2	72	98	70	69
190	28.599	0.152	0.056	0.95	93	-5.47	101	53.7	-0.3	72	98	70	69
191	28.748	0.149	0.056	1.05	93	-5.47	99	54.1	0.4	72	98	70	69

BOX A TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 2

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/1/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
192	28.899	0.151	0.056	0.94	93	-5.47	101	54.0	-0.1	72	98	70	69
193	29.051	0.152	0.056	0.91	93	-5.47	101	54.2	0.2	71	98	70	68
194	29.203	0.152	0.056	0.94	93	-5.47	101	54.0	-0.2	71	97	70	69
195	29.354	0.151	0.056	0.91	93	-5.47	100	54.1	0.1	71	98	70	68
196	29.504	0.150	0.056	0.97	93	-5.47	100	53.9	-0.2	71	97	70	69
197	29.654	0.150	0.056	0.96	93	-5.47	100	54.2	0.3	71	97	70	69
198	29.806	0.152	0.056	0.92	93	-5.47	101	53.9	-0.3	71	97	70	69
199	29.957	0.151	0.056	0.95	93	-5.47	100	54.0	0.1	71	97	70	68
200	30.108	0.151	0.056	0.97	93	-5.47	100	53.9	-0.1	71	97	70	68
201	30.259	0.151	0.056	0.97	93	-5.47	100	53.7	-0.2	71	97	70	69
202	30.409	0.150	0.056	0.96	93	-5.47	100	54.0	0.3	71	97	70	68
203	30.561	0.152	0.056	0.96	93	-5.47	101	53.9	-0.1	71	98	70	68
204	30.712	0.151	0.056	0.99	93	-5.47	100	54.5	0.6	71	97	70	69
205	30.864	0.152	0.056	0.96	93	-5.47	101	53.3	-1.2	71	96	70	68
206	31.015	0.151	0.056	0.94	93	-5.47	100	54.5	1.2	71	97	70	68
207	31.165	0.150	0.056	0.99	93	-5.47	100	54.0	-0.5	71	97	70	68
208	31.316	0.151	0.056	1.00	93	-5.47	100	53.9	-0.1	71	96	70	69
209	31.467	0.151	0.056	0.88	93	-5.47	100	53.8	-0.1	71	97	70	68
210	31.618	0.151	0.056	0.90	93	-5.47	100	54.0	0.2	71	96	70	68
211	31.770	0.152	0.056	0.99	93	-5.47	101	54.3	0.3	71	96	70	68
212	31.921	0.151	0.056	0.98	93	-5.47	100	54.0	-0.3	71	97	70	68
213	32.070	0.149	0.056	0.94	93	-5.47	99	54.0	0	71	97	70	68
214	32.222	0.152	0.056	0.96	93	-5.47	101	54.0	0	71	96	70	68
215	32.373	0.151	0.056	0.96	93	-5.47	100	53.8	-0.2	71	97	70	68
216	32.524	0.151	0.056	1.00	93	-5.47	100	53.8	0	71	96	70	68
217	32.676	0.152	0.056	0.94	93	-5.47	101	53.8	0	71	97	70	68
218	32.826	0.150	0.056	0.95	93	-5.47	100	53.9	0.1	71	97	70	68
219	32.976	0.150	0.056	0.96	93	-5.47	100	53.9	0	71	96	70	68
220	33.127	0.151	0.056	0.93	93	-5.47	100	54.1	0.2	71	96	70	68
221	33.278	0.151	0.056	0.94	93	-5.47	100	53.7	-0.4	71	95	70	68
222	33.429	0.151	0.056	0.97	93	-5.47	100	54.0	0.3	71	96	70	68
223	33.580	0.151	0.056	1.01	93	-5.47	100	53.8	-0.2	71	96	70	68

BOX A TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 2

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/1/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
224	33.730	0.150	0.056	0.96	93	-5.47	100	54.1	0.3	71	96	70	68
225	33.881	0.151	0.056	0.87	93	-5.47	100	53.9	-0.2	71	96	70	68
226	34.032	0.151	0.056	0.78	93	-5.47	100	54.0	0.1	71	95	69	68
227	34.183	0.151	0.056	0.94	93	-5.47	100	53.9	-0.1	71	95	69	68
228	34.335	0.152	0.056	0.98	93	-5.47	101	54.1	0.2	71	95	69	68
229	34.485	0.150	0.056	0.88	93	-5.47	100	54.1	0	71	94	69	68
230	34.635	0.150	0.056	0.95	93	-5.47	100	54.0	-0.1	71	94	69	68
231	34.786	0.151	0.056	0.89	92	-5.47	101	54.2	0.2	71	95	69	68
232	34.936	0.150	0.056	0.95	92	-5.47	100	53.9	-0.3	71	95	69	68
233	35.088	0.152	0.056	0.98	93	-5.47	101	53.9	0	71	95	69	68
234	35.239	0.151	0.056	0.96	92	-5.47	101	53.9	0	71	95	69	68
235	35.390	0.151	0.056	0.94	92	-5.47	101	53.8	-0.1	71	94	69	68
236	35.539	0.149	0.056	0.95	92	-5.47	99	54.5	0.7	71	94	69	68
237	35.690	0.151	0.056	0.96	92	-5.47	101	54.0	-0.5	71	94	69	68
238	35.841	0.151	0.056	0.98	92	-5.47	101	54.1	0.1	71	95	69	68
239	35.992	0.151	0.056	0.92	92	-5.47	101	54.0	-0.1	71	95	69	68
240	36.144	0.152	0.056	0.98	92	-5.47	101	53.8	-0.2	71	94	69	68
241	36.294	0.150	0.056	0.93	92	-5.47	100	54.1	0.3	71	94	69	68
242	36.444	0.150	0.056	1.00	92	-5.47	100	54.1	0	71	94	69	68
243	36.595	0.151	0.056	0.92	92	-5.47	101	53.7	-0.4	71	94	69	68
244	36.746	0.151	0.056	0.94	92	-5.47	101	54.1	0.4	71	94	69	68
245	36.897	0.151	0.056	0.96	92	-5.47	101	54.2	0.1	71	94	69	68
246	37.048	0.151	0.056	0.90	92	-5.47	101	54.1	-0.1	71	94	69	68
247	37.199	0.151	0.056	0.92	92	-5.47	101	54.2	0.1	71	94	69	68
248	37.348	0.149	0.056	0.95	92	-5.47	99	53.9	-0.3	71	94	69	68
249	37.500	0.152	0.056	1.07	92	-5.47	101	54.2	0.3	71	95	69	68
250	37.650	0.150	0.056	0.94	92	-5.47	100	53.9	-0.3	71	94	69	68
251	37.802	0.152	0.056	0.95	92	-5.47	101	53.9	0	71	94	69	68
252	37.953	0.151	0.056	0.95	92	-5.47	101	54.6	0.7	71	94	69	68
253	38.103	0.150	0.056	0.97	92	-5.47	100	53.9	-0.7	71	94	69	68
254	38.253	0.150	0.056	0.75	92	-5.47	100	54.3	0.4	71	94	69	68
255	38.404	0.151	0.056	0.95	92	-5.47	101	53.6	-0.7	71	94	69	68

BOX A TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 2

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/1/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
256	38.555	0.151	0.056	0.79	92	-5.47	101	54.0	0.4	71	94	69	68
257	38.707	0.152	0.056	0.90	92	-5.47	101	53.9	-0.1	71	94	69	68
258	38.857	0.150	0.056	0.94	92	-5.47	100	53.8	-0.1	71	94	69	68
259	39.007	0.150	0.056	0.81	92	-5.47	100	53.4	-0.4	71	94	69	68
260	39.157	0.150	0.056	0.96	92	-5.47	100	54.1	0.7	71	94	69	68
261	39.308	0.151	0.056	0.90	92	-5.47	101	54.0	-0.1	71	94	69	68
262	39.460	0.152	0.056	0.93	92	-5.47	101	54.0	0	71	93	69	68
263	39.611	0.151	0.056	0.94	92	-5.47	101	53.9	-0.1	71	93	69	68
264	39.763	0.152	0.056	0.95	92	-5.47	101	54.1	0.2	71	94	69	68
265	39.912	0.149	0.056	1.06	92	-5.47	99	54.5	0.4	71	94	69	68
266	40.062	0.150	0.056	0.99	92	-5.47	100	53.8	-0.7	71	93	69	68
267	40.214	0.152	0.056	0.99	92	-5.47	101	54.0	0.2	71	93	69	68
268	40.365	0.151	0.056	0.97	92	-5.47	101	54.4	0.4	71	94	69	68
269	40.516	0.151	0.056	0.93	92	-5.47	101	54.1	-0.3	71	92	69	68
270	40.667	0.151	0.056	0.92	92	-5.47	101	54.1	0	71	92	69	68
271	40.816	0.149	0.056	0.96	92	-5.47	99	54.8	0.7	71	93	69	68
272	40.967	0.151	0.056	0.92	92	-5.47	101	54.0	-0.8	71	92	69	68
273	41.118	0.151	0.056	0.95	92	-5.47	101	54.1	0.1	71	93	69	68
274	41.269	0.151	0.056	0.94	92	-5.47	101	52.6	-1.5	71	93	69	68
275	41.420	0.151	0.056	0.97	92	-5.47	101	54.0	1.4	71	93	69	68
276	41.572	0.152	0.056	0.96	92	-5.47	101	54.0	0	71	93	69	68
277	41.721	0.149	0.056	0.98	92	-5.47	99	54.1	0.1	71	93	69	68
278	41.872	0.151	0.056	0.97	92	-5.47	101	53.9	-0.2	71	92	69	68
279	42.023	0.151	0.056	0.97	92	-5.47	101	54.0	0.1	71	93	69	68
280	42.174	0.151	0.056	0.93	92	-5.47	101	53.9	-0.1	71	93	69	68
281	42.326	0.152	0.056	0.78	92	-5.47	101	54.0	0.1	71	93	69	68
282	42.477	0.151	0.056	0.96	92	-5.47	101	53.9	-0.1	71	94	69	68
283	42.626	0.149	0.056	1.04	92	-5.47	99	53.8	-0.1	71	93	69	68
284	42.778	0.152	0.056	0.96	92	-5.47	101	53.6	-0.2	71	93	69	68
285	42.930	0.152	0.056	0.84	92	-5.47	101	54.0	0.4	70	92	69	68
286	43.082	0.152	0.056	0.96	92	-5.47	101	54.0	0	71	92	69	68
287	43.233	0.151	0.056	0.98	92	-5.47	101	54.2	0.2	70	93	69	68

BOX A TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 2

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/1/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
288	43.383	0.150	0.056	0.92	92	-5.47	100	54.1	-0.1	71	93	69	68
289	43.534	0.151	0.056	0.98	92	-5.47	101	54.5	0.4	70	92	69	68
290	43.684	0.150	0.056	1.03	92	-5.47	100	53.8	-0.7	71	93	69	68
291	43.835	0.151	0.056	0.91	92	-5.47	102	52.8	-1	81	138	69	68
292	43.985	0.150	0.056	0.96	92	-5.47	101	52.9	0.1	80	163	69	68
293	44.136	0.151	0.056	0.93	92	-5.47	102	53.5	0.6	81	169	69	68
294	44.287	0.151	0.056	0.97	92	-5.47	102	52.2	-1.3	82	174	69	68
295	44.436	0.149	0.056	0.97	92	-5.47	100	53.0	0.8	83	178	69	68
296	44.586	0.150	0.056	0.95	92	-5.47	101	51.9	-1.1	83	184	70	68
297	44.736	0.150	0.056	0.96	92	-5.47	101	52.0	0.1	84	193	70	68
298	44.886	0.150	0.056	0.95	92	-5.47	101	50.9	-1.1	85	202	70	68
299	45.037	0.151	0.056	0.93	92	-5.47	102	49.9	-1	86	210	70	68
300	45.186	0.149	0.056	0.95	92	-5.47	101	49.9	0	87	217	70	68
301	45.336	0.150	0.056	0.90	92	-5.47	102	48.9	-1	87	223	70	68
302	45.485	0.149	0.056	0.91	92	-5.47	101	47.8	-1.1	88	230	70	68
303	45.634	0.149	0.056	0.92	92	-5.47	101	47.7	-0.1	88	236	70	68
304	45.784	0.150	0.056	0.93	92	-5.47	102	47.1	-0.6	89	241	70	68
305	45.934	0.150	0.056	0.76	92	-5.47	102	45.9	-1.2	89	246	71	68
306	46.083	0.149	0.056	0.92	92	-5.47	101	45.2	-0.7	90	251	71	68
307	46.233	0.150	0.056	0.92	92	-5.47	102	44.4	-0.8	90	255	71	68
308	46.382	0.149	0.056	0.91	92	-5.47	101	42.9	-1.5	91	259	71	68
309	46.532	0.150	0.056	0.93	92	-5.47	102	42.7	-0.2	91	262	71	68
310	46.680	0.148	0.056	0.91	92	-5.47	101	41.9	-0.8	91	265	71	68
311	46.828	0.148	0.056	0.95	92	-5.47	101	40.9	-1	91	268	71	68
312	46.976	0.148	0.056	0.78	92	-5.47	101	39.9	-1	92	271	71	68
313	47.125	0.149	0.056	1.03	92	-5.47	101	38.8	-1.1	92	273	71	68
314	47.273	0.148	0.056	0.89	92	-5.47	101	37.8	-1	92	276	71	68
315	47.421	0.148	0.056	0.94	92	-5.47	101	36.9	-0.9	92	279	71	68
316	47.569	0.148	0.056	0.92	92	-5.47	101	36.8	-0.1	93	281	71	68
317	47.717	0.148	0.056	0.93	92	-5.47	100	36.1	-0.7	83	276	71	68
318	47.866	0.149	0.056	0.90	92	-5.47	100	34.8	-1.3	75	255	71	68
319	48.014	0.148	0.056	0.96	92	-5.47	99	34.9	0.1	74	240	71	68

BOX A TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 2

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/1/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
320	48.163	0.149	0.056	0.95	92	-5.47	100	33.5	-1.4	73	229	71	68
321	48.311	0.148	0.056	0.91	92	-5.47	99	33.7	0.2	72	220	71	68
322	48.459	0.148	0.056	1.12	92	-5.47	99	33.9	0.2	72	212	71	68
323	48.607	0.148	0.056	0.91	92	-5.47	99	33.9	0	72	206	71	68
324	48.755	0.148	0.056	0.95	92	-5.47	99	33.7	-0.2	72	201	71	68
325	48.903	0.148	0.056	1.06	92	-5.47	99	34.3	0.6	72	196	71	68
326	49.050	0.147	0.056	0.92	92	-5.47	98	33.2	-1.1	71	192	71	68
327	49.199	0.149	0.056	0.95	92	-5.47	99	32.9	-0.3	71	188	71	68
328	49.348	0.149	0.056	0.95	92	-5.47	99	32.8	-0.1	71	184	71	68
329	49.496	0.148	0.056	0.92	92	-5.47	99	33.4	0.6	71	181	70	68
330	49.645	0.149	0.056	0.91	92	-5.47	99	32.7	-0.7	71	178	70	68
331	49.794	0.149	0.056	0.83	92	-5.47	99	32.6	-0.1	71	175	70	68
332	49.942	0.148	0.056	0.94	92	-5.47	99	33.2	0.6	71	173	70	68
333	50.091	0.149	0.056	0.90	92	-5.47	99	32.9	-0.3	71	170	70	68
334	50.239	0.148	0.056	0.86	92	-5.47	99	33.4	0.5	71	168	70	68
335	50.387	0.148	0.056	1.05	92	-5.47	99	32.8	-0.6	71	165	70	68
336	50.536	0.149	0.056	1.16	92	-5.47	99	32.8	0	71	163	70	68
337	50.684	0.148	0.056	0.90	92	-5.47	99	32.8	0	71	162	70	68
338	50.832	0.148	0.056	0.88	92	-5.47	99	32.7	-0.1	71	160	70	68
339	50.979	0.147	0.056	1.01	92	-5.47	98	32.7	0	71	158	70	68
340	51.128	0.149	0.056	0.90	92	-5.47	99	33.3	0.6	71	156	70	68
341	51.277	0.149	0.056	1.13	92	-5.47	99	32.6	-0.7	71	154	70	68
342	51.426	0.149	0.056	0.90	92	-5.47	99	32.7	0.1	71	152	70	68
343	51.574	0.148	0.056	0.91	92	-5.47	99	32.8	0.1	71	151	70	68
344	51.724	0.150	0.056	0.93	92	-5.47	100	32.9	0.1	71	149	70	68
345	51.873	0.149	0.056	0.96	92	-5.47	99	32.7	-0.2	71	148	70	68
346	52.021	0.148	0.056	0.96	92	-5.47	99	32.7	0	71	146	69	68
347	52.170	0.149	0.056	0.90	92	-5.47	99	32.6	-0.1	71	145	69	68
348	52.318	0.148	0.056	0.96	92	-5.47	99	32.7	0.1	71	144	69	68
349	52.467	0.149	0.056	0.93	92	-5.47	99	32.6	-0.1	71	143	69	68
350	52.615	0.148	0.056	0.97	92	-5.47	99	32.8	0.2	71	142	69	68
351	52.763	0.148	0.056	1.02	92	-5.47	99	32.2	-0.6	71	140	69	68

BOX A TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 2

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/1/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
352	52.911	0.148	0.056	0.94	92	-5.47	99	32.8	0.6	71	139	69	68
353	53.060	0.149	0.056	0.88	92	-5.47	99	33.0	0.2	71	138	69	68
354	53.208	0.148	0.056	0.97	92	-5.47	99	32.8	-0.2	71	137	69	68
355	53.357	0.149	0.056	0.92	92	-5.47	99	32.6	-0.2	71	136	69	68
356	53.506	0.149	0.056	0.94	92	-5.47	99	32.7	0.1	71	134	69	68
357	53.654	0.148	0.056	0.95	92	-5.47	99	32.8	0.1	71	134	69	68
358	53.803	0.149	0.056	0.91	92	-5.47	99	32.9	0.1	71	133	69	68
359	53.952	0.149	0.056	0.91	92	-5.47	99	32.9	0	71	132	69	68
360	54.100	0.148	0.056	0.87	92	-5.47	99	32.9	0	71	131	69	68
361	54.249	0.149	0.056	0.90	92	-5.47	99	32.7	-0.2	71	130	69	68
362	54.398	0.149	0.056	0.98	92	-5.47	99	33.1	0.4	71	129	69	68
363	54.545	0.147	0.056	0.90	92	-5.47	98	32.7	-0.4	71	129	69	68
364	54.693	0.148	0.056	0.96	92	-5.47	99	32.7	0	71	128	69	68
365	54.841	0.148	0.056	0.89	92	-5.47	99	32.7	0	71	127	69	68
366	54.991	0.150	0.056	0.88	92	-5.47	100	32.7	0	71	127	69	68
367	55.139	0.148	0.056	0.93	92	-5.47	99	32.8	0.1	71	126	69	68
368	55.288	0.149	0.056	0.90	92	-5.47	99	32.8	0	71	125	69	68
369	55.437	0.149	0.056	0.96	92	-5.47	99	33.0	0.2	71	124	69	68
370	55.585	0.148	0.056	0.92	92	-5.47	99	32.9	-0.1	71	123	69	68
371	55.734	0.149	0.056	0.93	92	-5.47	99	32.8	-0.1	71	123	69	68
372	55.883	0.149	0.056	0.91	92	-5.47	99	33.0	0.2	71	122	69	68
373	56.031	0.148	0.056	1.11	92	-5.47	99	32.8	-0.2	71	122	69	68
374	56.180	0.149	0.056	0.93	92	-5.47	99	32.9	0.1	71	121	69	68
375	56.328	0.148	0.056	0.90	92	-5.47	99	33.4	0.5	71	121	69	68
376	56.476	0.148	0.056	0.92	92	-5.47	99	32.9	-0.5	71	120	69	68
377	56.624	0.148	0.056	0.94	92	-5.47	99	32.8	-0.1	71	119	69	68
378	56.773	0.149	0.056	0.89	92	-5.47	99	32.9	0.1	71	119	69	68
379	56.921	0.148	0.056	0.88	92	-5.47	99	32.8	-0.1	71	118	69	68
380	57.069	0.148	0.056	0.95	92	-5.47	99	32.8	0	71	117	69	68
381	57.218	0.149	0.056	0.91	92	-5.47	99	32.8	0	71	118	69	68
382	57.366	0.148	0.056	0.91	92	-5.47	99	32.9	0.1	71	117	69	68
383	57.515	0.149	0.056	0.95	92	-5.47	99	32.7	-0.2	71	116	69	68

BOX A TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 2

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/1/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
384	57.665	0.150	0.056	0.89	92	-5.47	100	32.7	0	71	116	69	68
385	57.813	0.148	0.056	0.90	92	-5.47	99	31.6	-1.1	70	115	69	68
386	57.962	0.149	0.056	0.93	92	-5.47	99	32.6	1	70	114	69	68
387	58.111	0.149	0.056	0.82	92	-5.47	99	32.9	0.3	70	113	69	68
388	58.258	0.147	0.056	0.87	92	-5.47	98	32.8	-0.1	70	113	69	68
389	58.407	0.149	0.056	0.92	92	-5.47	99	32.8	0	70	113	69	68
390	58.555	0.148	0.056	0.92	92	-5.47	99	32.7	-0.1	70	113	69	68
391	58.703	0.148	0.056	0.89	92	-5.47	99	32.8	0.1	70	112	69	68
392	58.852	0.149	0.056	0.92	92	-5.47	99	32.5	-0.3	70	112	69	68
393	59.001	0.149	0.056	0.97	92	-5.47	99	32.8	0.3	70	111	68	68
394	59.149	0.148	0.056	0.95	92	-5.47	99	33.0	0.2	70	111	68	68
395	59.299	0.150	0.056	0.95	92	-5.47	100	32.9	-0.1	70	110	68	68
396	59.448	0.149	0.056	0.94	92	-5.47	99	32.8	-0.1	70	110	68	68
397	59.596	0.148	0.056	1.04	92	-5.47	99	31.8	-1	70	110	68	68
398	59.745	0.149	0.056	0.96	92	-5.47	99	33.1	1.3	70	110	68	68
399	59.893	0.148	0.056	0.93	92	-5.47	99	32.7	-0.4	70	109	68	68
400	60.041	0.148	0.056	0.92	92	-5.47	99	32.9	0.2	70	109	68	68
401	60.190	0.149	0.056	0.96	92	-5.47	99	32.7	-0.2	70	108	68	68
402	60.338	0.148	0.056	0.82	92	-5.47	99	32.7	0	70	108	68	68
403	60.487	0.149	0.056	0.96	92	-5.47	99	32.5	-0.2	70	107	68	68
404	60.635	0.148	0.056	0.95	92	-5.47	99	33.0	0.5	70	107	68	68
405	60.785	0.150	0.056	0.97	92	-5.47	100	32.7	-0.3	70	108	68	68
406	60.933	0.148	0.056	0.89	92	-5.47	99	32.8	0.1	70	107	68	67
407	61.082	0.149	0.056	0.94	92	-5.47	99	32.8	0	70	107	68	68
408	61.231	0.149	0.056	0.82	92	-5.47	99	32.8	0	70	106	68	68
409	61.380	0.149	0.056	1.06	92	-5.47	99	33.3	0.5	70	106	68	68
410	61.529	0.149	0.056	0.94	92	-5.47	99	32.8	-0.5	70	106	68	68
411	61.678	0.149	0.056	0.85	92	-5.47	99	32.8	0	70	106	68	68
412	61.826	0.148	0.056	0.94	92	-5.47	99	32.7	-0.1	70	106	68	68
413	61.974	0.148	0.056	0.93	92	-5.47	99	32.9	0.2	70	105	68	68
414	62.123	0.149	0.056	0.90	92	-5.47	99	32.6	-0.3	70	104	68	68
415	62.272	0.149	0.056	0.89	92	-5.47	99	32.5	-0.1	70	104	68	68

BOX A TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 2

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/1/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
416	62.421	0.149	0.056	0.95	92	-5.47	99	32.9	0.4	70	104	68	67
417	62.570	0.149	0.056	0.89	92	-5.47	99	32.8	-0.1	70	104	68	67
418	62.718	0.148	0.056	0.94	92	-5.47	99	32.8	0	70	104	68	67
419	62.868	0.150	0.056	0.91	92	-5.47	100	32.6	-0.2	70	104	68	67
420	63.017	0.149	0.056	0.95	92	-5.47	99	32.7	0.1	70	103	68	68
421	63.166	0.149	0.056	0.90	92	-5.47	99	32.9	0.2	70	103	68	68
422	63.315	0.149	0.056	0.94	92	-5.47	99	33.0	0.1	70	103	68	68
423	63.463	0.148	0.056	0.90	92	-5.47	99	32.5	-0.5	70	103	68	67
424	63.611	0.148	0.056	0.93	92	-5.47	99	32.5	0	70	102	68	67
425	63.759	0.148	0.056	0.90	92	-5.47	99	32.9	0.4	70	102	68	67
426	63.908	0.149	0.056	0.63	92	-5.47	99	32.6	-0.3	70	102	68	67
427	64.056	0.148	0.056	0.91	92	-5.47	99	32.7	0.1	70	102	68	67
428	64.205	0.149	0.056	0.93	92	-5.47	99	33.2	0.5	70	102	68	67
429	64.354	0.149	0.056	0.97	92	-5.47	99	31.9	-1.3	70	102	68	67
430	64.503	0.149	0.056	0.92	92	-5.47	99	32.9	1	70	101	68	67
431	64.652	0.149	0.056	0.92	92	-5.47	99	32.7	-0.2	70	101	68	67
432	64.801	0.149	0.056	0.93	92	-5.47	99	35.0	2.3	70	101	68	67
433	64.950	0.149	0.056	1.00	92	-5.47	99	33.3	-1.7	70	102	68	67
434	65.098	0.148	0.056	0.91	92	-5.47	99	32.6	-0.7	70	101	68	67
435	65.247	0.149	0.056	0.95	92	-5.47	99	32.8	0.2	70	101	68	67
436	65.396	0.149	0.056	0.94	92	-5.47	99	32.8	0	70	101	68	67
437	65.544	0.148	0.056	0.92	92	-5.47	99	33.0	0.2	70	100	68	67
438	65.693	0.149	0.056	0.94	92	-5.47	99	32.7	-0.3	70	100	68	67
439	65.842	0.149	0.056	0.89	92	-5.47	99	32.8	0.1	70	99	68	67
440	65.991	0.149	0.056	0.95	92	-5.47	99	33.0	0.2	70	100	68	67
441	66.140	0.149	0.056	0.98	92	-5.47	99	32.1	-0.9	70	100	68	67
442	66.289	0.149	0.056	0.92	92	-5.47	99	32.7	0.6	70	99	68	67
443	66.437	0.148	0.056	0.93	92	-5.47	99	32.7	0	70	99	68	67
444	66.587	0.150	0.056	0.79	92	-5.47	100	32.8	0.1	70	99	68	67
445	66.735	0.148	0.056	0.99	92	-5.47	99	32.7	-0.1	70	98	68	67
446	66.883	0.148	0.056	0.92	92	-5.47	99	32.7	0	70	98	68	67
447	67.031	0.148	0.056	0.92	92	-5.47	99	32.8	0.1	70	98	68	67

BOX A TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 2

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/1/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
448	67.180	0.149	0.056	0.95	92	-5.47	99	32.8	0	70	98	68	67
449	67.328	0.148	0.056	0.92	92	-5.47	99	32.7	-0.1	70	98	68	67
450	67.477	0.149	0.056	0.98	92	-5.47	99	33.2	0.5	70	98	68	67
451	67.626	0.149	0.056	0.91	92	-5.47	99	32.7	-0.5	70	98	68	67
452	67.775	0.149	0.056	0.90	92	-5.47	99	32.7	0	70	98	68	67
453	67.925	0.150	0.056	0.91	92	-5.47	100	32.8	0.1	70	97	68	67
454	68.074	0.149	0.056	0.94	92	-5.47	99	32.8	0	70	97	68	67
455	68.223	0.149	0.056	0.93	92	-5.47	99	32.6	-0.2	70	97	68	67
456	68.372	0.149	0.056	0.92	92	-5.47	99	32.9	0.3	70	97	68	67
457	68.520	0.148	0.056	0.93	92	-5.47	99	32.5	-0.4	70	97	68	67
458	68.668	0.148	0.056	0.94	92	-5.47	99	32.6	0.1	70	97	68	67
459	68.817	0.149	0.056	0.92	92	-5.47	99	32.6	0	70	97	68	67
460	68.966	0.149	0.056	0.92	92	-5.47	99	33.0	0.4	70	98	68	67
461	69.114	0.148	0.056	0.93	92	-5.47	99	32.7	-0.3	70	97	68	67
462	69.263	0.149	0.056	1.06	92	-5.47	99	33.0	0.3	70	96	68	67
463	69.412	0.149	0.056	0.94	92	-5.47	99	32.7	-0.3	70	97	68	67
464	69.561	0.149	0.056	0.96	92	-5.47	99	32.6	-0.1	70	96	68	67
465	69.710	0.149	0.056	0.96	92	-5.47	99	32.3	-0.3	70	97	68	67
466	69.859	0.149	0.056	0.91	92	-5.47	99	32.8	0.5	70	96	68	67
467	70.008	0.149	0.056	0.92	92	-5.47	99	32.7	-0.1	70	96	68	67
468	70.156	0.148	0.056	0.89	92	-5.47	99	32.7	0	70	96	68	67
469	70.303	0.147	0.056	0.96	92	-5.47	98	32.9	0.2	70	96	68	67
470	70.452	0.149	0.056	0.93	92	-5.47	99	32.6	-0.3	70	96	68	67
471	70.601	0.149	0.056	0.84	92	-5.47	99	33.0	0.4	70	96	68	67
472	70.750	0.149	0.056	0.95	92	-5.47	99	32.8	-0.2	70	96	68	67
473	70.899	0.149	0.056	0.95	92	-5.47	99	32.7	-0.1	70	96	68	67
474	71.047	0.148	0.056	0.93	92	-5.47	99	32.7	0	70	96	68	67
475	71.197	0.150	0.056	1.08	92	-5.47	100	32.9	0.2	70	96	68	67
476	71.346	0.149	0.056	0.95	92	-5.47	99	32.6	-0.3	70	95	68	67
477	71.494	0.148	0.056	0.94	92	-5.47	99	32.7	0.1	70	95	68	67
478	71.644	0.150	0.056	0.93	92	-5.47	100	32.8	0.1	70	95	68	67
479	71.791	0.147	0.056	1.02	92	-5.47	98	32.7	-0.1	69	95	68	67

BOX A TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 2

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/1/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
480	71.940	0.149	0.056	0.99	92	-5.47	99	32.7	0	69	94	68	67
481	72.089	0.149	0.056	0.94	92	-5.47	99	32.8	0.1	69	95	68	67
482	72.238	0.149	0.056	0.93	92	-5.47	99	32.5	-0.3	69	95	68	67
483	72.386	0.148	0.056	0.88	92	-5.47	98	32.7	0.2	69	95	68	67
484	72.536	0.150	0.056	0.94	92	-5.47	100	32.7	0	69	94	68	67
485	72.685	0.149	0.056	0.94	92	-5.47	99	32.7	0	69	94	68	67
486	72.834	0.149	0.056	0.93	92	-5.47	99	32.9	0.2	69	94	68	67
487	72.983	0.149	0.056	0.95	92	-5.47	99	32.9	0	69	94	68	67
488	73.132	0.149	0.056	1.08	92	-5.47	99	32.9	0	69	94	68	67
489	73.281	0.149	0.056	0.90	92	-5.47	99	32.8	-0.1	69	94	68	67
490	73.429	0.148	0.056	0.71	92	-5.47	98	35.1	2.3	69	93	68	67
491	73.577	0.148	0.056	1.00	92	-5.47	98	32.8	-2.3	69	93	68	67
492	73.726	0.149	0.056	0.92	92	-5.47	99	32.8	0	69	93	68	67
493	73.874	0.148	0.056	0.95	92	-5.47	98	32.8	0	69	93	68	67
494	74.023	0.149	0.056	0.73	92	-5.47	99	32.7	-0.1	69	93	68	67
495	74.172	0.149	0.056	0.93	92	-5.47	99	33.0	0.3	69	94	68	67
496	74.321	0.149	0.056	0.93	92	-5.47	99	32.3	-0.7	69	94	68	67
497	74.471	0.150	0.056	0.97	92	-5.47	100	33.2	0.9	69	93	68	67
498	74.619	0.148	0.056	0.96	92	-5.47	98	32.8	-0.4	69	93	68	67
499	74.768	0.149	0.056	0.96	92	-5.47	99	32.7	-0.1	69	94	68	67
500	74.917	0.149	0.056	0.92	92	-5.47	99	32.0	-0.7	69	93	68	67
501	75.065	0.148	0.056	0.91	92	-5.47	98	32.9	0.9	69	93	68	67
502	75.214	0.149	0.056	0.96	92	-5.47	99	32.8	-0.1	69	94	68	67
503	75.363	0.149	0.056	0.92	92	-5.47	99	32.7	-0.1	69	92	68	67
504	75.511	0.148	0.056	0.91	92	-5.47	98	32.7	0	69	93	68	67
505	75.660	0.149	0.056	0.74	92	-5.47	99	32.6	-0.1	69	93	68	67
506	75.809	0.149	0.056	0.91	92	-5.47	99	32.9	0.3	69	93	68	67
507	75.958	0.149	0.056	0.97	92	-5.47	99	32.8	-0.1	69	92	68	67
508	76.107	0.149	0.056	0.97	92	-5.47	99	32.8	0	69	92	68	67
509	76.256	0.149	0.056	0.96	92	-5.47	99	32.6	-0.2	69	93	68	67
510	76.405	0.149	0.056	0.94	92	-5.47	99	32.8	0.2	69	92	68	67
511	76.553	0.148	0.056	0.93	92	-5.47	98	32.7	-0.1	69	92	68	67

BOX A TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 2

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/1/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
512	76.701	0.148	0.056	0.92	92	-5.47	98	32.8	0.1	69	92	68	67
513	76.850	0.149	0.056	0.95	92	-5.47	99	32.7	-0.1	69	92	68	67
514	76.999	0.149	0.056	0.91	92	-5.47	99	32.9	0.2	69	92	68	67
515	77.148	0.149	0.056	0.90	92	-5.47	99	32.7	-0.2	69	93	68	67
516	77.297	0.149	0.056	0.96	92	-5.47	99	32.7	0	69	92	68	67
517	77.446	0.149	0.056	1.06	92	-5.47	99	32.8	0.1	69	92	68	67
518	77.595	0.149	0.056	0.95	92	-5.47	99	33.2	0.4	69	92	68	67
519	77.745	0.150	0.056	0.77	92	-5.47	100	32.6	-0.6	69	92	68	67
520	77.894	0.149	0.056	0.95	92	-5.47	99	32.3	-0.3	69	92	68	67
521	78.043	0.149	0.056	0.96	92	-5.47	99	32.7	0.4	69	92	68	67
522	78.191	0.148	0.056	0.97	92	-5.47	98	32.9	0.2	69	92	68	67
523	78.339	0.148	0.056	0.97	92	-5.47	98	32.9	0	69	92	68	67
524	78.488	0.149	0.056	0.87	92	-5.47	99	32.8	-0.1	69	92	68	67
525	78.636	0.148	0.056	0.98	92	-5.47	100	32.7	-0.1	80	137	68	67
526	78.785	0.149	0.056	1.10	92	-5.47	100	31.9	-0.8	78	161	68	67
527	78.934	0.149	0.056	0.92	92	-5.47	100	31.7	-0.2	79	170	68	67
528	79.083	0.149	0.056	0.93	92	-5.47	100	31.7	0	80	177	68	67
529	79.231	0.148	0.056	0.87	92	-5.47	100	31.7	0	81	185	68	67
530	79.379	0.148	0.056	0.98	92	-5.47	100	30.8	-0.9	82	193	68	67
531	79.528	0.149	0.056	0.88	92	-5.47	100	30.8	0	83	201	68	67
532	79.676	0.148	0.056	0.77	92	-5.47	100	29.8	-1	83	208	69	67
533	79.825	0.149	0.056	0.92	92	-5.47	101	29.7	-0.1	84	215	69	67
534	79.974	0.149	0.056	0.91	92	-5.47	101	28.3	-1.4	85	221	69	67
535	80.121	0.147	0.056	0.91	92	-5.47	99	28.8	0.5	85	228	69	67
536	80.269	0.148	0.056	1.06	91	-5.47	100	27.7	-1.1	86	233	69	67
537	80.418	0.149	0.056	1.11	92	-5.47	101	26.9	-0.8	86	238	69	67
538	80.567	0.149	0.056	0.90	92	-5.47	101	25.9	-1	87	243	69	67
539	80.715	0.148	0.056	0.93	91	-5.47	100	25.7	-0.2	87	247	69	67
540	80.864	0.149	0.056	0.89	91	-5.47	101	25.8	0.1	87	251	69	68
541	81.013	0.149	0.056	0.95	91	-5.47	101	24.8	-1	88	256	69	68
542	81.163	0.150	0.056	0.90	91	-5.47	102	23.8	-1	88	259	70	68
543	81.311	0.148	0.056	0.91	91	-5.47	101	22.9	-0.9	89	262	70	68

BOX A TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 2

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/1/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
544	81.460	0.149	0.056	0.93	91	-5.47	101	22.8	-0.1	89	266	70	68
545	81.609	0.149	0.056	1.03	91	-5.47	101	21.8	-1	89	269	70	68
546	81.757	0.148	0.056	0.96	91	-5.47	101	21.5	-0.3	90	272	70	68
547	81.905	0.148	0.056	1.02	91	-5.47	101	20.5	-1	90	275	70	68
548	82.054	0.149	0.056	0.90	91	-5.47	101	19.7	-0.8	90	278	70	68
549	82.203	0.149	0.056	0.92	91	-5.47	101	19.9	0.2	84	277	70	68
550	82.353	0.150	0.056	0.95	91	-5.47	100	19.4	-0.5	74	253	70	68
551	82.502	0.149	0.056	0.89	91	-5.47	100	18.9	-0.5	73	238	70	68
552	82.652	0.150	0.056	0.85	91	-5.47	100	19.0	0.1	72	226	70	68
553	82.802	0.150	0.056	1.06	91	-5.47	100	17.8	-1.2	71	216	70	68
554	82.952	0.150	0.056	0.96	91	-5.47	100	18.5	0.7	71	209	70	68
555	83.101	0.149	0.056	0.94	91	-5.47	100	16.9	-1.6	71	202	70	68
556	83.265	0.164	0.056	0.99	91	-5.47	110	17.9	1	71	197	70	68
557	83.415	0.150	0.056	0.99	91	-5.47	100	17.6	-0.3	71	192	70	68
558	83.564	0.149	0.056	0.93	91	-5.47	100	17.9	0.3	71	188	70	68
559	83.714	0.150	0.056	0.96	91	-5.47	100	16.8	-1.1	70	184	70	68
560	83.864	0.150	0.056	0.93	91	-5.47	100	16.9	0.1	70	181	70	68
561	84.013	0.149	0.056	0.96	92	-5.47	99	17.1	0.2	70	178	70	67
562	84.163	0.150	0.056	0.97	92	-5.47	100	17.0	-0.1	70	174	70	67
563	84.312	0.149	0.056	0.96	92	-5.47	99	16.9	-0.1	70	172	70	67
564	84.460	0.148	0.056	0.94	92	-5.47	99	16.5	-0.4	70	169	70	67
565	84.610	0.150	0.056	0.91	91	-5.47	100	16.7	0.2	70	167	70	67
566	84.759	0.149	0.056	1.10	92	-5.47	99	16.7	0	70	164	70	67
567	84.909	0.150	0.056	0.92	92	-5.47	100	16.9	0.2	70	162	70	67
568	85.060	0.151	0.056	0.91	92	-5.47	101	16.9	0	70	160	70	67
569	85.209	0.149	0.056	0.90	92	-5.47	99	17.0	0.1	70	158	70	67
570	85.359	0.150	0.056	0.93	91	-5.47	100	17.0	0	70	157	70	67
571	85.508	0.149	0.056	1.02	92	-5.47	99	17.0	0	70	155	69	67
572	85.656	0.148	0.056	0.94	91	-5.47	99	16.9	-0.1	70	153	69	67
573	85.806	0.150	0.056	0.85	91	-5.47	100	16.9	0	70	152	69	67
574	85.957	0.151	0.056	0.96	91	-5.47	101	16.8	-0.1	70	150	69	67
575	86.106	0.149	0.056	0.96	91	-5.47	99	16.9	0.1	70	148	69	67

BOX A TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 2

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/1/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
576	86.257	0.151	0.056	0.94	91	-5.47	101	17.0	0.1	70	147	69	67
577	86.407	0.150	0.056	0.98	91	-5.47	100	16.9	-0.1	70	145	69	67
578	86.556	0.149	0.056	0.94	91	-5.47	99	17.1	0.2	70	144	69	67
579	86.705	0.149	0.056	0.91	91	-5.47	99	16.4	-0.7	70	142	69	67
580	86.854	0.149	0.056	0.94	91	-5.47	99	17.0	0.6	70	141	69	67
581	87.004	0.150	0.056	1.03	91	-5.47	100	17.0	0	70	140	69	67
582	87.153	0.149	0.056	0.92	91	-5.47	99	16.9	-0.1	70	139	69	67
583	87.304	0.151	0.056	0.86	91	-5.47	101	16.6	-0.3	70	138	69	67
584	87.454	0.150	0.056	0.94	91	-5.47	100	16.2	-0.4	70	136	69	67
585	87.604	0.150	0.056	0.95	91	-5.47	100	16.8	0.6	70	135	69	67
586	87.753	0.149	0.056	0.94	91	-5.47	99	16.8	0	70	135	69	67
587	87.902	0.149	0.056	0.95	91	-5.47	99	16.8	0	70	134	69	67
588	88.051	0.149	0.056	0.94	91	-5.47	99	16.2	-0.6	70	133	69	67
589	88.200	0.149	0.056	0.92	91	-5.47	99	16.9	0.7	70	132	69	67
590	88.352	0.152	0.056	0.97	91	-5.47	101	16.7	-0.2	70	131	69	67
591	88.502	0.150	0.056	0.84	91	-5.47	100	16.9	0.2	70	130	69	67
592	88.653	0.151	0.056	0.96	91	-5.47	101	16.9	0	70	128	69	67
593	88.802	0.149	0.056	0.94	91	-5.47	99	16.9	0	70	127	69	67
594	88.953	0.151	0.056	0.97	91	-5.47	101	17.2	0.3	70	127	68	67
595	89.101	0.148	0.056	0.93	91	-5.47	99	16.5	-0.7	70	126	68	67
596	89.251	0.150	0.056	1.01	91	-5.47	100	16.9	0.4	70	125	68	67
597	89.401	0.150	0.056	0.92	91	-5.47	100	18.3	1.4	70	125	68	67
598	89.552	0.151	0.056	0.95	91	-5.47	101	16.9	-1.4	70	124	68	67
599	89.702	0.150	0.056	0.93	91	-5.47	100	17.3	0.4	70	123	68	67
600	89.852	0.150	0.056	0.95	91	-5.47	100	17.1	-0.2	70	123	68	67
601	90.003	0.151	0.056	0.99	91	-5.47	101	16.9	-0.2	70	122	68	67
602	90.152	0.149	0.056	0.93	91	-5.47	99	17.6	0.7	70	121	68	67
603	90.301	0.149	0.056	0.92	91	-5.47	99	16.7	-0.9	70	121	68	67
604	90.450	0.149	0.056	0.96	91	-5.47	99	16.9	0.2	70	119	68	67
605	90.601	0.151	0.056	0.97	91	-5.47	101	16.9	0	70	120	68	67
606	90.750	0.149	0.056	0.88	91	-5.47	99	16.6	-0.3	70	119	68	67
607	90.901	0.151	0.056	1.07	91	-5.47	101	17.0	0.4	70	118	68	67

BOX A TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 2

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/1/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
608	91.050	0.149	0.056	0.92	91	-5.47	99	17.0	0	70	118	68	67
609	91.200	0.150	0.056	0.89	91	-5.47	100	17.0	0	70	117	68	67
610	91.348	0.148	0.056	0.98	91	-5.47	99	16.9	-0.1	70	116	68	67
611	91.498	0.150	0.056	0.94	91	-5.47	100	16.9	0	70	116	68	67
612	91.648	0.150	0.056	1.02	91	-5.47	100	17.1	0.2	70	116	68	67
613	91.799	0.151	0.056	0.81	91	-5.47	101	16.9	-0.2	70	115	68	67
614	91.950	0.151	0.056	0.94	91	-5.47	101	16.9	0	70	114	68	67
615	92.099	0.149	0.056	0.97	91	-5.47	99	18.2	1.3	70	113	68	67
616	92.249	0.150	0.056	0.94	91	-5.47	100	17.0	-1.2	70	113	68	67
617	92.398	0.149	0.056	0.98	91	-5.47	99	17.0	0	70	112	68	67
618	92.547	0.149	0.056	0.93	91	-5.47	99	17.0	0	70	112	68	67
619	92.697	0.150	0.056	0.91	91	-5.47	100	16.9	-0.1	70	112	68	67
620	92.848	0.151	0.056	0.96	91	-5.47	101	16.9	0	70	112	68	67
621	92.998	0.150	0.056	0.92	91	-5.47	100	16.8	-0.1	70	111	68	67
622	93.148	0.150	0.056	0.92	91	-5.47	100	17.0	0.2	70	111	68	67
623	93.299	0.151	0.056	1.03	91	-5.47	101	17.0	0	70	110	68	67
624	93.448	0.149	0.056	0.99	91	-5.47	99	17.0	0	70	110	68	67
625	93.597	0.149	0.056	0.90	91	-5.47	99	16.8	-0.2	70	110	68	67
626	93.746	0.149	0.056	0.83	91	-5.47	99	16.7	-0.1	70	109	68	67
627	93.896	0.150	0.056	0.91	91	-5.47	100	16.9	0.2	70	110	68	67
628	94.046	0.150	0.056	0.92	91	-5.47	100	16.6	-0.3	70	109	68	67
629	94.197	0.151	0.056	0.96	91	-5.47	101	17.0	0.4	70	109	68	67
630	94.347	0.150	0.056	0.96	91	-5.47	100	16.9	-0.1	70	108	68	67
631	94.496	0.149	0.056	1.00	91	-5.47	99	16.9	0	70	108	68	67
632	94.645	0.149	0.056	0.94	91	-5.47	99	16.8	-0.1	70	107	68	67
633	94.795	0.150	0.056	1.00	91	-5.47	100	16.8	0	70	107	68	67
634	94.944	0.149	0.056	0.92	91	-5.47	99	16.9	0.1	70	107	68	67
635	95.095	0.151	0.056	0.91	91	-5.47	101	17.0	0.1	70	107	68	67
636	95.244	0.149	0.056	0.94	91	-5.47	99	16.9	-0.1	70	106	68	67
637	95.395	0.151	0.056	0.96	91	-5.47	101	17.1	0.2	70	105	68	67
638	95.545	0.150	0.056	0.97	91	-5.47	100	16.9	-0.2	70	105	68	67
639	95.695	0.150	0.056	0.79	91	-5.47	100	16.8	-0.1	70	105	68	67

BOX A TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 2

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/1/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
640	95.844	0.149	0.056	0.90	91	-5.47	99	16.9	0.1	70	105	68	67
641	95.994	0.150	0.056	0.87	91	-5.47	100	16.9	0	70	104	68	67
642	96.144	0.150	0.056	0.95	91	-5.47	100	17.2	0.3	70	103	68	67
643	96.294	0.150	0.056	0.95	91	-5.47	100	17.0	-0.2	70	104	68	67
644	96.444	0.150	0.056	0.90	91	-5.47	100	16.9	-0.1	70	103	68	67
645	96.594	0.150	0.056	0.95	91	-5.47	100	16.9	0	70	103	68	67
646	96.745	0.151	0.056	0.97	91	-5.47	101	16.9	0	69	103	68	67
647	96.894	0.149	0.056	0.97	91	-5.47	99	16.9	0	69	102	68	67
648	97.043	0.149	0.056	0.98	91	-5.47	99	16.9	0	69	102	68	67
649	97.193	0.150	0.056	1.01	91	-5.47	100	16.9	0	69	103	68	67
650	97.343	0.150	0.056	0.94	91	-5.47	100	16.9	0	69	103	68	67
651	97.493	0.150	0.056	0.95	91	-5.47	100	17.6	0.7	69	102	68	67
652	97.643	0.150	0.056	0.98	91	-5.47	100	17.0	-0.6	69	102	68	67
653	97.794	0.151	0.056	0.97	91	-5.47	101	16.9	-0.1	69	102	68	67
654	97.944	0.150	0.056	0.93	91	-5.47	100	17.2	0.3	69	101	68	67
655	98.093	0.149	0.056	0.94	91	-5.47	99	16.9	-0.3	69	101	68	67
656	98.244	0.151	0.056	0.92	91	-5.47	101	17.4	0.5	69	101	68	67
657	98.394	0.150	0.056	0.95	91	-5.47	100	16.8	-0.6	69	101	68	67
658	98.543	0.149	0.056	0.91	91	-5.47	99	17.0	0.2	69	101	68	67
659	98.694	0.151	0.056	0.92	91	-5.47	101	18.0	1	69	100	68	67
660	98.845	0.151	0.056	0.96	91	-5.47	101	16.2	-1.8	69	100	68	67
661	98.995	0.150	0.056	0.95	91	-5.47	100	16.9	0.7	69	99	68	67
662	99.144	0.149	0.056	1.02	91	-5.47	99	17.0	0.1	69	99	68	67
663	99.293	0.149	0.056	0.91	91	-5.47	99	17.0	0	69	100	68	67
664	99.443	0.150	0.056	0.94	91	-5.47	100	16.9	-0.1	69	100	68	67
665	99.593	0.150	0.056	0.95	91	-5.47	100	17.0	0.1	69	99	68	67
666	99.743	0.150	0.056	0.95	91	-5.47	100	17.0	0	69	99	68	67
667	99.894	0.151	0.056	0.98	91	-5.47	101	17.0	0	69	99	68	67
668	100.044	0.150	0.056	0.97	91	-5.47	100	16.8	-0.2	69	99	68	67
669	100.193	0.149	0.056	0.95	91	-5.47	99	16.8	0	69	99	68	67
670	100.342	0.149	0.056	0.94	91	-5.47	99	16.9	0.1	69	99	68	67
671	100.492	0.150	0.056	0.93	91	-5.47	100	17.0	0.1	69	99	68	67

BOX A TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 2

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/1/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
672	100.642	0.150	0.056	0.92	91	-5.47	100	16.8	-0.2	69	99	68	67
673	100.792	0.150	0.056	0.95	91	-5.47	100	17.2	0.4	69	97	68	67
674	100.943	0.151	0.056	0.96	91	-5.47	101	17.2	0	69	98	68	67
675	101.093	0.150	0.056	0.95	91	-5.47	100	16.9	-0.3	69	98	68	67
676	101.243	0.150	0.056	0.96	91	-5.47	100	17.0	0.1	69	98	68	67
677	101.392	0.149	0.056	0.92	91	-5.47	99	17.0	0	69	98	68	67
678	101.542	0.150	0.056	0.93	91	-5.47	100	16.8	-0.2	69	97	68	67
679	101.691	0.149	0.056	0.88	91	-5.47	99	17.0	0.2	69	97	68	67
680	101.842	0.151	0.056	0.94	91	-5.47	101	16.0	-1	69	97	68	67
681	101.991	0.149	0.056	0.93	91	-5.47	99	16.9	0.9	69	97	68	67
682	102.141	0.150	0.056	0.95	91	-5.47	100	17.2	0.3	69	97	68	67
683	102.291	0.150	0.056	0.93	91	-5.47	100	17.0	-0.2	69	97	68	67
684	102.441	0.150	0.056	0.89	91	-5.47	100	16.9	-0.1	69	96	68	67
685	102.590	0.149	0.056	0.94	91	-5.47	99	17.4	0.5	69	96	68	67
686	102.740	0.150	0.056	0.93	91	-5.47	100	16.9	-0.5	69	96	68	67
687	102.889	0.149	0.056	0.82	91	-5.47	99	17.0	0.1	69	96	68	67
688	103.039	0.150	0.056	0.92	91	-5.47	100	16.8	-0.2	69	96	68	67
689	103.190	0.151	0.056	0.93	91	-5.47	101	16.9	0.1	69	96	68	67

BOX B TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 2

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/1/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
0	0.000		0.00	89	-1		76	2.000	7.40	0.42
1	0.140	0.140	1.51	88	-1	91	76	2.210	11.88	0.22
2	0.309	0.169	1.72	88	-0.93	110	76	2.210	14.26	0.26
3	0.474	0.165	1.73	87	-0.92	108	76	2.200	14.49	0.16
4	0.638	0.164	1.15	87	-1.12	107	77	2.210	14.82	0.18
5	0.806	0.168	1.71	87	-0.93	110	77	2.200	14.88	0.21
6	0.968	0.162	0.51	87	-1.29	106	77	2.210	15.37	0.27
7	1.132	0.164	0.53	87	-1.29	107	77	2.200	15.44	0.24
8	1.296	0.164	1.70	87	-0.92	107	77	2.200	15.51	0.25
9	1.461	0.165	1.44	87	-1.01	108	77	2.150	15.57	0.24
10	1.625	0.164	0.87	86	-1.21	107	77	2.200	15.70	0.27
11	1.787	0.162	0.50	86	-1.31	106	77	2.200	15.40	0.32
12	1.951	0.164	1.56	86	-0.97	107	77	2.200	15.29	0.26
13	2.113	0.162	0.41	86	-1.32	106	77	2.200	15.25	0.23
14	2.278	0.165	1.26	86	-1.06	107	77	2.210	15.25	0.25
15	2.440	0.162	0.32	86	-1.32	104	77	2.230	6.94	0.58
16	2.607	0.167	1.57	86	-0.96	108	76	2.220	1.85	0.25
17	2.769	0.162	1.45	86	-1	104	76	2.220	0.89	0.07
18	2.932	0.163	1.22	87	-1.1	105	76	2.220	0.53	0.07
19	3.095	0.163	1.52	87	-0.98	105	76	2.230	0.51	0.07
20	3.258	0.163	0.52	87	-1.29	105	76	2.220	0.40	0.07
21	3.418	0.160	1.66	87	-0.93	103	76	2.220	0.22	0.01
22	3.583	0.165	1.53	87	-0.97	106	76	2.220	0.27	0.03
23	3.743	0.160	1.60	87	-0.95	103	76	2.220	0.21	0.02
24	3.907	0.164	1.08	87	-1	105	76	2.220	0.17	0.03
25	4.069	0.162	1.51	87	-0.98	104	75	2.220	0.12	0.02
26	4.232	0.163	2.02	87	-0.99	105	75	2.220	0.19	0.02
27	4.396	0.164	0.48	87	-1.29	105	75	2.240	0.21	(0.01)
28	4.561	0.165	0.44	87	-1.31	106	75	2.220	0.17	0.00
29	4.721	0.160	1.49	87	-0.98	103	75	2.220	0.22	(0.01)
30	4.887	0.166	1.44	87	-1	106	75	2.210	0.17	0.05
31	5.049	0.162	1.67	88	-0.93	104	75	2.220	0.16	0.05

BOX B TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 2

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/1/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
32	5.213	0.164	1.65	88	-0.93	105	75	2.230	0.12	0.01
33	5.376	0.163	0.54	88	-1.27	104	75	2.220	0.10	(0.07)
34	5.541	0.165	0.80	88	-1.22	106	74	2.230	0.29	0.05
35	5.704	0.163	0.39	88	-1.32	104	74	2.230	0.17	0.01
36	5.870	0.166	1.06	88	-1.12	106	74	2.230	0.12	0.00
37	6.031	0.161	1.59	88	-0.95	103	74	2.230	0.21	0.03
38	6.193	0.162	0.70	88	-1.23	104	74	2.230	0.10	0.03
39	6.356	0.163	1.56	88	-0.96	104	74	2.230	0.13	(0.02)
40	6.520	0.164	0.51	88	-1.29	105	74	2.230	0.06	(0.01)
41	6.682	0.162	0.55	89	-1.27	103	74	2.230	0.12	(0.03)
42	6.846	0.164	1.13	89	-1.11	105	74	2.230	0.16	0.00
43	7.010	0.164	1.67	89	-0.92	105	74	2.260	0.08	0.02
44	7.171	0.161	1.83	89	-0.98	103	74	2.270	0.12	(0.01)
45	7.336	0.165	0.42	89	-1.31	105	74	2.230	0.22	0.02
46	7.497	0.161	0.93	89	-1.08	103	74	2.230	0.11	0.02
47	7.662	0.165	1.47	89	-1.2	105	74	2.230	0.05	0.02
48	7.826	0.164	0.71	89	-1.22	105	74	2.230	0.34	0.03
49	7.991	0.165	1.46	89	-0.99	105	74	2.180	0.11	0.02
50	8.157	0.166	0.37	89	-1.32	106	74	2.220	0.12	0.02
51	8.322	0.165	1.57	90	-0.93	105	73	2.230	0.08	0.01
52	8.484	0.162	1.64	90	-0.93	103	73	2.230	0.06	0.00
53	8.649	0.165	0.60	90	-1.25	105	73	2.240	0.10	(0.06)
54	8.811	0.162	1.55	90	-0.96	103	73	2.230	(0.02)	0.00
55	8.974	0.163	1.02	90	-1.14	104	73	2.230	0.09	0.00
56	9.136	0.162	1.45	90	-0.99	103	73	2.230	0.08	(0.03)
57	9.302	0.166	1.38	90	-1.02	106	73	2.230	0.16	0.00
58	9.465	0.163	1.67	90	-0.92	104	73	2.230	0.08	0.00
59	9.628	0.163	1.39	90	-1	104	73	2.230	0.19	0.00
60	9.789	0.161	1.73	90	-0.93	103	73	2.230	0.23	(0.09)
61	9.955	0.166	1.47	90	-0.99	106	73	2.230	0.33	0.03
62	10.115	0.160	1.38	90	-1.02	102	73	2.230	0.06	0.00
63	10.280	0.165	0.39	91	-1.31	105	73	2.230	0.15	0.00

BOX B TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 2

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/1/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
64	10.443	0.163	1.53	91	-0.97	104	73	2.230	0.05	0.02
65	10.608	0.165	1.37	91	-1.02	105	73	2.230	0.14	0.02
66	10.770	0.162	1.66	91	-0.92	103	73	2.230	0.17	0.03
67	10.933	0.163	0.47	91	-1.29	104	73	2.230	0.09	0.00
68	11.094	0.161	0.40	91	-1.28	102	73	2.230	0.08	(0.01)
69	11.258	0.164	0.59	91	-1.25	104	73	2.230	0.06	0.04
70	11.422	0.164	1.48	91	-0.99	104	73	2.230	0.09	(0.01)
71	11.584	0.162	0.77	91	-1.2	103	73	2.230	0.04	0.01
72	11.747	0.163	1.55	91	-0.97	104	73	2.230	0.21	(0.03)
73	11.908	0.161	0.45	91	-1.3	102	73	2.230	0.09	0.02
74	12.070	0.162	1.62	91	-0.94	103	73	2.230	0.13	0.03
75	12.233	0.163	0.45	91	-1.3	104	73	2.240	0.08	0.00
76	12.397	0.164	0.50	92	-1.29	104	73	2.230	0.09	(0.03)
77	12.559	0.162	0.70	92	-1.23	103	73	2.230	0.31	0.05
78	12.722	0.163	0.93	92	-1.17	103	73	2.230	0.12	(0.05)
79	12.886	0.164	1.40	92	-1.02	104	73	2.230	0.07	(0.01)
80	13.051	0.165	0.42	92	-1.3	105	73	2.230	0.09	(0.01)
81	13.209	0.158	1.53	92	-0.98	100	73	2.230	0.03	0.02
82	13.372	0.163	1.38	92	-0.98	103	73	2.230	(0.06)	0.03
83	13.535	0.163	1.02	92	-1.14	103	73	2.230	0.09	0.05
84	13.701	0.166	0.98	92	-1	105	73	2.230	0.20	(0.02)
85	13.861	0.160	1.35	92	-1.03	101	73	2.240	(0.06)	(0.02)
86	14.022	0.161	1.66	92	-0.91	102	73	2.230	0.11	0.03
87	14.182	0.160	1.64	92	-0.91	101	73	2.240	0.08	0.00
88	14.340	0.158	0.83	92	-1.16	100	73	2.220	0.12	0.00
89	14.498	0.158	0.80	92	-1.18	100	73	2.230	0.08	0.01
90	14.657	0.159	1.62	92	-0.92	101	73	2.230	0.05	0.02
91	14.813	0.156	1.48	92	-1	99	73	2.230	(0.09)	0.01
92	14.973	0.160	1.22	92	-1.06	101	73	2.240	0.05	0.06
93	15.129	0.156	1.42	92	-0.95	99	73	2.240	0.10	(0.04)
94	15.286	0.157	0.46	92	-1.3	100	72	2.240	0.07	0.00
95	15.443	0.157	0.85	92	-1.16	100	72	2.240	(0.02)	0.03

BOX B TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 2

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/1/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
96	15.600	0.157	1.59	92	-0.92	100	72	2.230	0.19	0.04
97	15.757	0.157	0.73	93	-1.18	99	72	2.230	0.05	0.02
98	15.915	0.158	1.48	93	-1.01	100	72	2.230	0.03	(0.01)
99	16.073	0.158	0.56	93	-1.25	100	72	2.230	0.03	0.02
100	16.230	0.157	1.09	93	-1.11	99	72	2.240	0.13	0.01
101	16.389	0.159	1.42	93	-0.98	101	72	2.230	0.05	(0.03)
102	16.548	0.159	1.42	93	-0.98	101	72	2.240	0.07	0.01
103	16.704	0.156	1.51	93	-0.95	99	72	2.240	0.21	0.04
104	16.862	0.158	0.21	93	-1.24	100	72	2.250	0.08	0.01
105	17.020	0.158	0.75	93	-1.19	100	72	2.240	0.10	0.00
106	17.178	0.158	1.64	93	-0.91	100	72	2.250	0.06	(0.01)
107	17.333	0.155	1.64	93	-0.9	98	72	2.240	0.04	0.03
108	17.488	0.155	0.71	93	-1.19	98	72	2.240	0.12	(0.01)
109	17.648	0.160	1.49	93	-0.95	101	72	2.230	0.24	(0.01)
110	17.806	0.158	0.92	93	-1.14	100	72	2.240	0.05	(0.01)
111	17.961	0.155	1.54	93	-0.95	98	72	2.240	0.04	0.00
112	18.120	0.159	1.31	93	-1	101	72	2.260	0.10	0.01
113	18.280	0.160	0.43	93	-1.27	101	72	2.240	(0.40)	(0.05)
114	18.439	0.159	0.63	93	-1.22	101	72	2.240	0.19	0.02
115	18.595	0.156	0.73	93	-1.19	99	72	2.240	0.12	(0.03)
116	18.756	0.161	1.37	93	-0.99	102	72	2.240	0.12	0.02
117	18.913	0.157	0.58	93	-1.23	99	72	2.240	0.00	(0.01)
118	19.071	0.158	0.70	93	-1.21	100	72	2.230	0.04	0.00
119	19.227	0.156	0.38	93	-1.29	99	72	2.240	(0.06)	(0.06)
120	19.386	0.159	0.68	93	-1.25	101	72	2.240	0.01	(0.02)
121	19.543	0.157	0.31	93	-1.31	99	72	2.240	0.10	0.05
122	19.700	0.157	0.88	93	-1.15	99	72	2.240	0.05	(0.01)
123	19.857	0.157	0.27	93	-1.29	99	72	2.240	0.01	(0.04)
124	20.014	0.157	1.26	93	-1.03	99	72	2.240	(0.11)	(0.03)
125	20.173	0.159	0.35	93	-1.31	101	72	2.240	(0.53)	0.01
126	20.333	0.160	1.21	93	-1.17	101	72	2.240	0.07	0.01
127	20.487	0.154	1.43	93	-0.98	97	72	2.240	0.15	0.01

BOX B TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 2

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/1/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
128	20.645	0.158	0.96	93	-1.12	100	72	2.240	0.07	(0.06)
129	20.804	0.159	1.85	93	-0.91	101	72	2.200	0.09	0.00
130	20.962	0.158	0.32	93	-1.3	100	72	2.230	(0.04)	0.01
131	21.118	0.156	1.60	93	-0.92	99	72	2.230	0.05	0.00
132	21.278	0.160	1.18	93	-1.08	101	72	2.240	0.05	(0.03)
133	21.439	0.161	0.99	93	-1.11	102	72	2.240	0.07	0.00
134	21.597	0.158	1.50	93	-0.95	100	72	2.240	(0.08)	(0.04)
135	21.754	0.157	1.58	93	-0.93	99	72	2.240	(0.03)	0.02
136	21.912	0.158	0.78	94	-1.2	100	72	2.240	0.20	(0.02)
137	22.070	0.158	1.54	93	-0.93	100	72	2.240	0.21	0.03
138	22.228	0.158	0.53	94	-1.24	100	72	2.310	0.06	0.00
139	22.384	0.156	0.79	94	-1.18	98	72	2.240	0.04	(0.01)
140	22.542	0.158	1.20	94	-1.04	100	72	2.240	0.21	(0.07)
141	22.701	0.159	1.60	94	-0.92	100	72	2.240	0.06	0.00
142	22.858	0.157	1.41	94	-0.99	99	72	2.230	0.15	0.02
143	23.016	0.158	0.59	94	-1.23	100	72	2.240	0.05	(0.06)
144	23.172	0.156	0.63	94	-1.22	98	72	2.240	(0.05)	0.00
145	23.330	0.158	0.41	94	-1.29	100	72	2.240	(0.04)	(0.02)
146	23.487	0.157	0.35	94	-1.29	99	72	2.240	(0.06)	(0.02)
147	23.645	0.158	0.37	94	-1.3	100	72	2.240	0.04	0.02
148	23.803	0.158	0.48	94	-1.26	100	72	2.280	0.03	(0.01)
149	23.960	0.157	1.57	94	-0.92	99	72	2.240	0.04	(0.02)
150	24.115	0.155	1.43	94	-0.91	98	72	2.230	0.03	(0.01)
151	24.272	0.157	0.82	94	-1.17	99	72	2.260	0.04	0.00
152	24.431	0.159	1.05	94	-1.11	100	72	2.240	0.18	0.03
153	24.589	0.158	0.40	94	-1.29	100	72	2.240	0.16	0.03
154	24.744	0.155	1.40	94	-0.98	98	72	2.240	(0.01)	(0.01)
155	24.902	0.158	1.60	94	-0.92	100	72	2.210	0.11	0.00
156	25.062	0.160	0.79	94	-1.17	101	72	2.240	0.11	0.02
157	25.220	0.158	0.37	94	-1.29	100	72	2.230	0.08	(0.01)
158	25.376	0.156	1.57	94	-0.93	98	72	2.240	0.05	0.02
159	25.534	0.158	1.53	94	-0.94	100	72	2.230	0.05	(0.01)

BOX B TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 2

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/1/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
160	25.692	0.158	0.72	94	-1.2	100	72	2.240	0.18	(0.02)
161	25.850	0.158	1.25	94	-1.13	100	72	2.240	0.06	0.01
162	26.007	0.157	0.43	94	-1.28	99	72	2.240	0.07	(0.03)
163	26.166	0.159	1.63	94	-0.91	100	72	2.240	0.07	0.00
164	26.325	0.159	0.46	94	-1.25	100	71	2.240	0.11	(0.05)
165	26.483	0.158	0.34	94	-1.3	100	71	2.240	0.06	(0.02)
166	26.641	0.158	1.09	94	-1.12	100	71	2.240	0.09	0.01
167	26.802	0.161	0.73	94	-1.2	102	71	2.240	0.11	(0.02)
168	26.958	0.156	1.47	94	-0.92	98	71	2.240	0.00	(0.02)
169	27.115	0.157	1.53	94	-0.94	99	71	2.240	0.19	(0.04)
170	27.272	0.157	0.70	94	-1.2	99	71	2.210	(0.01)	0.00
171	27.430	0.158	0.89	94	-1.15	100	71	2.320	0.03	(0.04)
172	27.590	0.160	0.84	94	-1.15	101	71	2.240	(0.05)	(0.03)
173	27.746	0.156	1.57	94	-0.92	98	71	2.240	(0.04)	0.00
174	27.904	0.158	0.75	94	-1.18	100	71	2.230	0.00	(0.03)
175	28.063	0.159	0.34	94	-1.31	100	71	2.240	0.07	0.00
176	28.220	0.157	1.27	94	-1.03	99	71	2.240	0.05	0.00
177	28.379	0.159	1.66	94	-0.9	100	71	2.240	0.02	(0.06)
178	28.538	0.159	0.56	94	-1.3	100	71	2.240	0.31	0.00
179	28.697	0.159	1.70	94	-0.91	100	71	2.230	0.01	(0.04)
180	28.856	0.159	0.30	94	-1.31	100	71	2.240	0.12	0.05
181	29.011	0.155	0.74	94	-1.19	98	71	2.240	0.12	0.01
182	29.171	0.160	0.71	94	-1.2	101	71	2.240	0.16	0.02
183	29.330	0.159	0.53	94	-1.25	100	71	2.240	0.07	0.07
184	29.488	0.158	0.34	94	-1.31	100	71	2.240	0.01	0.02
185	29.644	0.156	1.25	94	-1	98	71	2.240	0.08	(0.03)
186	29.802	0.158	1.47	94	-0.97	100	71	2.260	(0.04)	(0.01)
187	29.960	0.158	0.43	94	-1.28	100	71	2.240	(0.02)	(0.08)
188	30.118	0.158	0.90	94	-1.14	100	71	2.240	0.34	0.06
189	30.274	0.156	0.41	94	-1.29	98	71	2.240	0.04	0.07
190	30.432	0.158	1.03	94	-1.12	100	71	2.240	0.04	(0.01)
191	30.592	0.160	1.13	94	-1.07	101	71	2.280	0.04	(0.03)

BOX B TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 2

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/1/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
192	30.750	0.158	0.52	94	-1.24	100	71	2.240	0.08	0.01
193	30.905	0.155	1.14	94	-1.08	98	71	2.240	0.05	0.08
194	31.063	0.158	0.81	94	-1.17	100	71	2.300	0.11	0.01
195	31.222	0.159	0.41	94	-1.28	100	71	2.240	0.18	0.02
196	31.380	0.158	0.82	94	-1.23	100	71	2.240	0.04	(0.03)
197	31.537	0.157	0.75	94	-1.3	99	71	2.240	0.07	0.00
198	31.697	0.160	1.55	94	-0.93	101	71	2.240	0.09	(0.02)
199	31.855	0.158	0.36	94	-1.31	100	71	2.240	(0.04)	(0.05)
200	32.011	0.156	0.38	94	-1.3	98	71	2.220	0.06	(0.01)
201	32.172	0.161	1.26	94	-1.03	102	71	2.240	(0.08)	(0.03)
202	32.333	0.161	1.61	94	-0.92	102	71	2.240	0.04	(0.01)
203	32.490	0.157	0.63	94	-1.2	99	71	2.240	0.05	0.02
204	32.648	0.158	0.84	94	-1.16	100	71	2.240	0.01	(0.02)
205	32.807	0.159	1.56	94	-0.92	100	71	2.230	0.07	(0.03)
206	32.964	0.157	0.71	94	-1.2	99	71	2.280	0.06	0.02
207	33.123	0.159	1.46	94	-0.96	100	71	2.240	0.09	0.01
208	33.281	0.158	0.33	94	-1.31	100	71	2.240	(0.14)	(0.08)
209	33.439	0.158	1.44	94	-0.98	100	71	2.240	0.05	(0.04)
210	33.600	0.161	0.33	94	-1.31	102	71	2.250	0.04	0.00
211	33.758	0.158	0.85	94	-1.15	100	71	2.240	0.21	0.07
212	33.918	0.160	1.29	94	-1.02	101	71	2.230	0.06	0.00
213	34.078	0.160	0.51	94	-1.29	101	71	2.240	0.06	0.02
214	34.234	0.156	0.76	94	-1.18	98	71	2.240	(0.04)	(0.03)
215	34.391	0.157	1.40	94	-0.99	99	71	2.280	0.06	0.00
216	34.550	0.159	1.18	94	-1.15	100	71	2.240	0.07	(0.01)
217	34.707	0.157	0.62	94	-1.23	99	71	2.240	(0.06)	0.00
218	34.863	0.156	1.49	94	-0.95	98	71	2.210	0.01	0.01
219	35.020	0.157	0.81	94	-1.13	99	71	2.240	0.02	0.06
220	35.182	0.162	1.39	94	-1.09	102	71	2.240	0.07	(0.01)
221	35.341	0.159	0.86	94	-1.16	100	71	2.240	0.03	0.02
222	35.497	0.156	0.56	94	-1.24	98	71	2.240	0.07	0.00
223	35.658	0.161	1.54	94	-0.95	102	71	2.240	0.03	(0.04)

BOX B TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 2

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/1/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
224	35.814	0.156	1.65	94	-0.91	98	71	2.240	0.02	0.00
225	35.972	0.158	0.49	94	-1.29	100	71	2.240	(0.03)	(0.02)
226	36.131	0.159	0.59	94	-1.22	100	71	2.240	0.02	0.03
227	36.292	0.161	0.54	94	-1.24	102	71	2.240	0.05	(0.01)
228	36.452	0.160	1.48	94	-0.97	101	71	2.220	0.10	0.00
229	36.607	0.155	0.38	94	-1.29	98	71	2.240	0.11	0.03
230	36.765	0.158	1.31	93	-1.01	100	71	2.240	(0.05)	0.01
231	36.924	0.159	1.58	93	-0.93	100	71	2.240	0.04	(0.01)
232	37.081	0.157	0.43	93	-1.28	99	71	2.240	0.14	(0.01)
233	37.238	0.157	1.60	94	-0.93	99	71	2.240	0.00	(0.01)
234	37.396	0.158	1.44	93	-0.98	100	71	2.240	(0.02)	(0.02)
235	37.556	0.160	1.32	93	-1.02	101	71	2.240	0.00	0.08
236	37.714	0.158	1.58	93	-0.92	100	71	2.240	0.05	(0.02)
237	37.873	0.159	0.74	93	-1.2	100	71	2.240	0.05	(0.01)
238	38.032	0.159	0.87	93	-0.98	100	71	2.240	0.09	0.01
239	38.192	0.160	1.35	93	-1.01	101	71	2.240	0.16	0.00
240	38.349	0.157	1.37	93	-0.99	99	71	2.240	0.07	(0.02)
241	38.507	0.158	1.38	93	-1	100	71	2.240	0.04	0.03
242	38.668	0.161	1.45	93	-0.9	102	71	2.240	0.09	0.02
243	38.826	0.158	1.72	93	-0.99	100	71	2.240	0.01	(0.01)
244	38.982	0.156	0.38	93	-1.29	99	71	2.240	0.07	(0.02)
245	39.142	0.160	1.33	93	-1.01	101	71	2.240	0.01	0.01
246	39.300	0.158	1.64	93	-0.91	100	71	2.250	0.10	(0.01)
247	39.457	0.157	1.52	93	-0.96	99	71	2.240	(0.05)	(0.01)
248	39.616	0.159	1.37	93	-1	100	71	2.260	0.11	0.02
249	39.777	0.161	0.76	93	-1.18	102	71	2.230	0.02	(0.01)
250	39.935	0.158	0.64	93	-1.21	100	71	2.200	0.00	(0.01)
251	40.092	0.157	1.52	93	-0.94	99	71	2.250	0.09	0.01
252	40.252	0.160	0.72	93	-1.19	101	71	2.240	0.00	0.02
253	40.410	0.158	0.60	93	-1.23	100	71	2.240	0.04	(0.01)
254	40.568	0.158	1.53	93	-0.95	100	71	2.240	0.03	0.00
255	40.725	0.157	0.34	93	-1.31	99	71	2.240	0.04	0.01

BOX B TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 2

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/1/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
256	40.887	0.162	0.40	93	-1.3	102	71	2.240	(0.01)	(0.02)
257	41.044	0.157	1.27	93	-0.96	99	71	2.230	0.07	(0.03)
258	41.199	0.155	1.43	93	-0.98	98	71	2.230	0.00	0.01
259	41.359	0.160	0.72	93	-1.2	101	71	2.240	0.03	0.09
260	41.518	0.159	0.48	93	-1.26	100	71	2.300	0.13	0.02
261	41.676	0.158	1.41	93	-0.99	100	71	2.240	0.02	0.03
262	41.834	0.158	0.50	93	-1.28	100	71	2.240	0.13	0.03
263	41.994	0.160	1.05	93	-1.12	101	71	2.240	0.05	(0.04)
264	42.153	0.159	1.57	93	-0.93	100	71	2.240	0.04	0.02
265	42.309	0.156	1.40	93	-0.99	99	71	2.240	0.08	(0.05)
266	42.468	0.159	1.61	93	-0.92	100	71	2.210	0.02	(0.04)
267	42.628	0.160	1.67	93	-0.91	101	71	2.240	0.07	(0.04)
268	42.784	0.156	1.61	93	-0.92	99	71	2.180	0.04	0.00
269	42.942	0.158	0.67	93	-1.27	100	71	2.240	(0.01)	(0.02)
270	43.101	0.159	1.59	93	-0.92	100	71	2.240	(0.02)	0.00
271	43.260	0.159	1.24	93	-1.01	100	71	2.240	0.07	(0.01)
272	43.418	0.158	1.02	93	-1.2	100	71	2.240	0.03	0.01
273	43.576	0.158	0.56	93	-1.25	100	71	2.240	0.11	(0.01)
274	43.734	0.158	0.22	93	-1.29	100	71	2.230	(0.01)	(0.01)
275	43.892	0.158	0.43	93	-1.3	100	71	2.240	(0.08)	0.00
276	44.050	0.158	0.56	93	-1.24	100	71	2.240	0.18	0.03
277	44.210	0.160	1.60	93	-0.91	101	71	2.240	0.02	0.00
278	44.369	0.159	0.83	93	-1.17	100	71	2.240	0.10	0.05
279	44.528	0.159	0.38	93	-1.29	100	71	2.240	0.05	0.00
280	44.685	0.157	1.59	93	-0.92	99	71	2.240	(0.01)	(0.11)
281	44.842	0.157	0.78	93	-1.17	99	71	2.230	0.11	0.01
282	45.003	0.161	0.90	93	-1.15	102	71	2.240	0.21	0.04
283	45.165	0.162	0.78	93	-1.19	102	71	2.250	0.28	0.03
284	45.321	0.156	0.79	93	-1.17	99	70	2.240	0.28	0.02
285	45.477	0.156	0.86	93	-1.15	98	70	2.240	0.16	(0.02)
286	45.635	0.158	1.16	93	-0.99	100	70	2.240	0.23	0.04
287	45.793	0.158	1.38	93	-1	100	70	2.250	0.24	0.04

BOX B TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 2

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/1/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
288	45.950	0.157	1.51	93	-0.95	99	70	2.240	0.21	0.02
289	46.108	0.158	0.98	93	-1.12	100	70	2.220	0.19	0.03
290	46.267	0.159	0.96	93	-1.12	100	71	2.240	0.16	(0.05)
291	46.425	0.158	2.12	93	-0.94	101	71	2.210	3.72	0.76
292	46.581	0.156	1.65	93	-0.91	99	71	2.220	0.08	(0.03)
293	46.735	0.154	0.37	93	-1.28	98	71	2.210	0.24	0.02
294	46.894	0.159	0.55	93	-1.3	102	71	2.220	0.73	0.23
295	47.051	0.157	1.29	93	-0.97	100	71	2.210	1.84	0.32
296	47.210	0.159	0.71	93	-1.2	102	71	2.190	4.07	0.34
297	47.366	0.156	0.44	93	-1.26	100	71	2.210	7.45	(0.01)
298	47.523	0.157	1.61	93	-0.92	101	71	2.160	9.99	0.05
299	47.682	0.159	1.66	93	-0.92	102	71	2.210	10.85	0.11
300	47.841	0.159	1.43	93	-0.98	102	72	2.180	11.05	0.09
301	47.997	0.156	1.43	93	-0.98	100	72	2.210	11.53	0.17
302	48.152	0.155	1.44	93	-0.97	99	72	2.200	11.82	0.27
303	48.311	0.159	1.61	93	-0.91	102	72	2.200	12.05	0.44
304	48.469	0.158	0.83	93	-1.16	102	72	2.210	12.48	0.75
305	48.628	0.159	1.58	93	-0.92	102	72	2.210	12.47	0.96
306	48.784	0.156	1.65	93	-0.92	100	72	2.210	12.56	1.23
307	48.941	0.157	1.38	93	-0.92	101	72	2.210	12.60	1.37
308	49.102	0.161	0.37	93	-1.29	104	72	2.210	12.72	1.46
309	49.260	0.158	1.19	93	-1.07	102	72	2.210	13.07	1.36
310	49.417	0.157	1.40	93	-0.99	101	73	2.200	12.44	2.57
311	49.572	0.155	1.30	93	-1.01	100	73	2.200	12.48	2.25
312	49.731	0.159	0.91	93	-1.14	102	73	2.170	12.62	2.10
313	49.888	0.157	0.79	93	-1.15	101	73	2.200	12.64	1.90
314	50.045	0.157	0.93	93	-1.12	101	73	2.210	12.57	1.88
315	50.203	0.158	1.59	93	-0.91	102	73	2.210	12.76	1.90
316	50.357	0.154	0.72	93	-1.18	99	73	2.200	12.75	1.99
317	50.510	0.153	1.42	93	-0.97	98	73	2.210	12.90	1.92
318	50.668	0.158	1.36	93	-0.99	100	72	2.220	8.36	2.59
319	50.824	0.156	0.43	93	-1.27	99	72	2.220	3.07	1.07

BOX B TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 2

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/1/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
320	50.980	0.156	1.41	93	-0.98	99	72	2.220	1.68	0.64
321	51.136	0.156	0.63	93	-1.2	99	72	2.220	1.18	0.49
322	51.290	0.154	1.09	93	-1.07	97	72	2.210	1.03	0.48
323	51.445	0.155	1.44	93	-0.96	98	72	2.220	0.92	0.45
324	51.603	0.158	0.71	93	-1.18	100	72	2.220	0.85	0.45
325	51.760	0.157	1.43	93	-0.97	99	72	2.220	0.82	0.36
326	51.916	0.156	0.34	93	-1.29	99	72	2.220	0.64	0.39
327	52.071	0.155	1.03	93	-1.09	98	72	2.230	0.61	0.34
328	52.226	0.155	0.87	93	-1.15	98	72	2.220	0.66	0.35
329	52.382	0.156	0.00	93	-1.31	99	72	2.220	0.49	0.28
330	52.540	0.158	1.53	93	-0.93	100	72	2.230	0.43	0.24
331	52.696	0.156	1.59	93	-0.91	99	72	2.230	0.41	0.22
332	52.854	0.158	0.53	93	-1.21	100	72	2.230	0.42	0.22
333	53.012	0.158	1.31	93	-1.01	100	72	2.210	0.37	0.21
334	53.169	0.157	1.03	93	-1.1	99	72	2.230	0.49	0.18
335	53.326	0.157	1.57	93	-0.92	99	72	2.230	0.40	0.15
336	53.483	0.157	1.12	93	-1.06	99	71	2.260	0.39	0.18
337	53.640	0.157	1.62	93	-0.91	99	71	2.230	0.36	0.17
338	53.797	0.157	0.34	93	-1.29	99	71	2.230	0.41	0.16
339	53.951	0.154	1.53	93	-0.94	97	71	2.230	0.50	0.17
340	54.108	0.157	1.56	93	-0.93	99	71	2.230	0.34	0.09
341	54.264	0.156	0.43	93	-1.26	99	71	2.230	0.28	0.12
342	54.421	0.157	1.42	93	-0.94	99	71	2.230	0.33	0.13
343	54.578	0.157	0.46	93	-1.26	99	71	2.230	0.38	0.15
344	54.736	0.158	1.47	93	-0.96	100	71	2.230	0.27	0.12
345	54.892	0.156	0.89	93	-1.19	99	71	2.230	0.36	0.12
346	55.049	0.157	0.80	93	-1.17	99	71	2.230	0.31	0.15
347	55.206	0.157	1.46	93	-0.96	99	71	2.230	0.20	0.10
348	55.363	0.157	1.40	93	-0.98	99	71	2.230	0.31	0.20
349	55.518	0.155	1.39	93	-0.98	98	71	2.230	0.23	0.12
350	55.673	0.155	0.28	93	-1.31	98	71	2.230	0.29	0.13
351	55.832	0.159	1.54	93	-0.93	100	71	2.240	0.22	0.11

BOX B TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 2

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/1/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
352	55.988	0.156	0.95	93	-1.11	99	71	2.170	0.25	0.12
353	56.147	0.159	0.41	93	-1.27	100	71	2.230	0.33	0.08
354	56.303	0.156	0.38	93	-1.28	99	71	2.230	0.32	0.10
355	56.458	0.155	1.21	93	-1.04	98	71	2.230	0.25	0.12
356	56.616	0.158	1.59	93	-0.91	100	71	2.230	0.39	0.16
357	56.773	0.157	1.35	93	-0.98	99	71	2.230	0.20	0.11
358	56.931	0.158	0.82	93	-1.16	100	71	2.230	0.21	0.10
359	57.088	0.157	0.40	93	-1.28	99	71	2.230	0.36	0.11
360	57.243	0.155	0.53	93	-1.25	98	71	2.250	0.28	0.25
361	57.397	0.154	1.25	93	-0.96	97	71	2.230	0.29	0.12
362	57.554	0.157	0.45	93	-1.27	99	71	2.230	0.23	0.11
363	57.709	0.155	1.30	93	-0.94	98	71	2.230	0.11	0.11
364	57.866	0.157	1.58	93	-0.92	99	71	2.230	0.26	0.09
365	58.020	0.154	1.23	93	-0.98	97	70	2.230	0.23	0.07
366	58.177	0.157	1.00	93	-1.17	99	70	2.230	0.21	0.07
367	58.333	0.156	0.96	93	-1.11	99	70	2.230	0.29	0.07
368	58.493	0.160	0.36	93	-1.29	101	70	2.170	0.16	0.12
369	58.651	0.158	0.88	93	-1.13	100	70	2.230	0.24	0.06
370	58.807	0.156	1.61	93	-0.91	99	70	2.240	0.18	0.06
371	58.961	0.154	1.55	93	-0.93	97	70	2.230	0.15	0.03
372	59.117	0.156	1.44	93	-0.96	99	70	2.230	0.20	0.10
373	59.277	0.160	0.39	93	-1.28	101	70	2.270	0.10	0.07
374	59.433	0.156	1.61	93	-0.91	99	70	2.230	0.21	0.05
375	59.589	0.156	0.66	93	-1.29	99	70	2.230	0.12	0.06
376	59.744	0.155	0.44	93	-1.26	98	70	2.230	0.17	0.07
377	59.898	0.154	1.54	93	-1.01	97	70	2.240	0.19	0.06
378	60.053	0.155	1.57	93	-0.92	98	70	2.240	0.08	0.01
379	60.209	0.156	0.67	93	-1.2	99	70	2.240	0.18	0.04
380	60.365	0.156	1.60	93	-0.91	99	70	2.240	0.31	0.02
381	60.520	0.155	0.51	93	-1.24	98	70	2.230	0.11	0.05
382	60.677	0.157	0.51	93	-1.25	99	70	2.230	0.17	0.05
383	60.831	0.154	0.30	93	-1.31	97	70	2.240	0.13	0.03

BOX B TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 2

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/1/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
384	60.988	0.157	1.36	93	-0.99	99	70	2.230	0.13	0.13
385	61.146	0.158	0.46	93	-1.26	100	70	2.230	0.12	0.05
386	61.302	0.156	0.29	93	-1.31	98	70	2.230	0.22	0.05
387	61.457	0.155	0.27	93	-1.31	98	70	2.230	0.22	0.06
388	61.614	0.157	1.07	93	-0.97	99	70	2.240	0.17	0.07
389	61.770	0.156	0.82	93	-1.14	98	70	2.230	0.17	0.14
390	61.925	0.155	0.29	93	-1.31	98	70	2.240	0.16	0.04
391	62.082	0.157	1.08	93	-1.08	99	70	2.240	0.17	(0.01)
392	62.238	0.156	1.13	93	-1.06	98	70	2.230	0.16	0.14
393	62.394	0.156	0.46	93	-1.26	98	70	2.230	0.09	0.05
394	62.552	0.158	0.48	93	-1.24	100	70	2.240	0.11	0.06
395	62.710	0.158	1.55	93	-0.93	100	70	2.240	0.30	0.09
396	62.867	0.157	1.60	93	-0.91	99	70	2.240	0.27	0.11
397	63.022	0.155	0.91	93	-1.14	98	70	2.230	0.11	(0.02)
398	63.176	0.154	0.30	93	-1.31	97	70	2.240	0.14	0.17
399	63.331	0.155	0.46	93	-1.25	98	70	2.240	0.17	0.01
400	63.490	0.159	0.72	93	-1.18	100	70	2.230	0.37	0.08
401	63.647	0.157	1.58	93	-0.92	99	70	2.230	0.18	0.04
402	63.805	0.158	0.36	93	-1.29	100	70	2.240	0.12	0.09
403	63.961	0.156	1.55	93	-0.92	98	70	2.240	0.12	0.08
404	64.115	0.154	0.67	93	-1.2	97	70	2.240	0.13	0.04
405	64.270	0.155	0.40	93	-1.28	98	70	2.240	0.05	0.03
406	64.427	0.157	1.19	93	-1.04	99	70	2.240	0.17	0.09
407	64.586	0.159	1.60	93	-0.91	100	70	2.230	0.08	0.04
408	64.743	0.157	0.85	93	-1.14	99	70	2.240	0.18	0.00
409	64.899	0.156	0.55	93	-1.24	98	70	2.230	0.11	0.10
410	65.055	0.156	1.37	93	-0.99	98	70	2.230	0.20	0.06
411	65.213	0.158	0.75	93	-1.18	100	70	2.240	0.02	0.05
412	65.370	0.157	0.37	93	-1.29	99	70	2.240	0.14	0.04
413	65.526	0.156	1.49	93	-0.94	98	70	2.240	0.24	0.06
414	65.682	0.156	1.40	93	-0.94	98	70	2.240	0.09	0.02
415	65.840	0.158	0.37	93	-1.28	100	70	2.240	0.02	0.02

BOX B TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 2

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/1/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
416	65.997	0.157	1.58	93	-0.92	99	70	2.240	0.16	(0.02)
417	66.156	0.159	0.65	93	-1.16	100	70	2.240	0.13	0.01
418	66.311	0.155	1.50	93	-0.93	98	70	2.240	0.05	(0.02)
419	66.467	0.156	1.43	93	-0.97	98	70	2.240	0.06	0.02
420	66.623	0.156	0.31	93	-1.31	98	70	2.240	0.11	0.02
421	66.778	0.155	1.60	93	-0.91	98	70	2.230	0.10	(0.02)
422	66.935	0.157	0.32	93	-1.3	99	70	2.240	0.02	0.06
423	67.096	0.161	1.51	93	-0.93	102	70	2.240	0.09	0.05
424	67.254	0.158	1.18	93	-1.05	100	70	2.240	0.12	0.00
425	67.410	0.156	1.31	93	-1.01	98	70	2.240	0.03	0.04
426	67.566	0.156	0.32	93	-1.3	98	70	2.240	0.02	(0.02)
427	67.722	0.156	0.83	93	-1.16	98	70	2.240	0.07	(0.02)
428	67.881	0.159	1.53	93	-0.94	100	70	2.240	0.06	(0.02)
429	68.038	0.157	0.50	93	-1.26	99	70	2.240	0.13	(0.03)
430	68.193	0.155	0.33	93	-1.31	98	70	2.240	0.11	0.03
431	68.350	0.157	0.62	93	-1.23	99	70	2.240	0.06	0.00
432	68.507	0.157	0.34	93	-1.3	99	70	2.250	0.14	0.06
433	68.667	0.160	0.58	93	-1.23	101	70	2.240	0.12	(0.08)
434	68.823	0.156	0.27	93	-1.31	98	70	2.220	0.17	0.05
435	68.978	0.155	1.49	93	-0.98	98	70	2.240	0.10	0.01
436	69.136	0.158	0.39	93	-1.28	100	70	2.240	(0.03)	0.01
437	69.293	0.157	0.65	93	-1.21	99	70	2.240	0.13	0.05
438	69.449	0.156	1.49	93	-0.91	98	70	2.240	0.14	0.03
439	69.606	0.157	0.40	93	-1.28	99	70	2.230	0.07	0.02
440	69.762	0.156	1.14	93	-0.97	98	70	2.240	0.15	0.05
441	69.917	0.155	0.68	93	-1.2	98	70	2.240	0.06	0.04
442	70.075	0.158	1.57	93	-0.91	100	70	2.240	0.06	0.05
443	70.232	0.157	0.61	93	-1.22	99	70	2.240	0.11	0.03
444	70.391	0.159	0.27	93	-1.31	100	70	2.240	0.12	0.03
445	70.548	0.157	1.37	93	-0.99	99	70	2.240	0.09	0.05
446	70.703	0.155	0.96	93	-1.12	98	70	2.240	0.14	0.04
447	70.860	0.157	0.42	93	-1.27	99	70	2.240	0.08	0.03

BOX B TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 2

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/1/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
448	71.018	0.158	0.29	93	-1.31	100	70	2.240	0.22	0.04
449	71.178	0.160	1.52	93	-0.94	101	70	2.240	0.09	0.02
450	71.335	0.157	1.56	93	-0.92	99	70	2.240	0.19	0.03
451	71.490	0.155	0.82	93	-1.15	98	70	2.240	0.03	0.00
452	71.645	0.155	0.80	93	-1.16	98	70	2.240	0.16	0.02
453	71.805	0.160	1.61	93	-0.92	101	70	2.240	0.19	0.03
454	71.961	0.156	0.43	93	-1.27	98	70	2.270	0.08	0.01
455	72.119	0.158	0.34	93	-1.3	100	70	2.240	0.11	0.04
456	72.275	0.156	0.79	93	-1.17	98	70	2.240	0.06	0.04
457	72.429	0.154	0.92	93	-1.12	97	70	2.230	0.04	0.02
458	72.588	0.159	0.80	93	-1.17	100	70	2.240	0.06	0.02
459	72.745	0.157	1.02	93	-1.11	99	70	2.240	0.16	0.02
460	72.902	0.157	1.10	93	-1.22	99	70	2.240	0.07	0.01
461	73.057	0.155	1.39	93	-0.98	98	70	2.240	0.32	0.02
462	73.214	0.157	0.45	93	-1.27	99	70	2.240	(0.25)	0.03
463	73.371	0.157	0.29	93	-1.31	99	70	2.280	0.02	0.02
464	73.530	0.159	1.63	93	-0.91	100	70	2.240	0.02	0.00
465	73.687	0.157	0.55	93	-1.24	99	70	2.240	0.22	(0.01)
466	73.844	0.157	0.47	93	-1.3	99	70	2.240	0.06	0.02
467	73.999	0.155	0.44	93	-1.26	98	70	2.240	0.02	0.04
468	74.155	0.156	1.46	93	-0.96	98	70	2.240	0.17	(0.02)
469	74.311	0.156	1.34	93	-1	98	70	2.240	0.02	0.00
470	74.471	0.160	1.28	93	-1.02	101	70	2.240	0.01	0.04
471	74.627	0.156	1.56	93	-0.91	98	70	2.240	0.09	0.05
472	74.782	0.155	0.72	93	-1.18	98	70	2.240	0.23	0.07
473	74.940	0.158	1.30	93	-1.02	100	70	2.240	0.14	0.01
474	75.096	0.156	0.34	93	-1.3	98	69	2.250	0.02	0.02
475	75.253	0.157	1.61	93	-0.91	99	69	2.240	0.16	0.05
476	75.408	0.155	0.40	93	-1.28	98	70	2.240	0.16	0.01
477	75.564	0.156	0.45	93	-1.27	98	70	2.240	0.11	0.03
478	75.720	0.156	0.69	93	-1.2	98	69	2.240	0.11	0.03
479	75.877	0.157	1.29	93	-1.01	99	69	2.240	0.11	(0.05)

BOX B TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 2

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/1/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
480	76.035	0.158	0.47	93	-1.27	100	69	2.240	0.19	0.04
481	76.192	0.157	1.40	93	-0.97	99	69	2.240	0.08	0.04
482	76.346	0.154	0.52	93	-1.24	97	69	2.240	0.12	0.03
483	76.501	0.155	0.47	93	-1.26	98	69	2.240	0.07	(0.02)
484	76.657	0.156	1.51	93	-0.94	98	69	2.240	0.09	0.02
485	76.814	0.157	0.31	93	-1.28	99	69	2.240	0.12	0.00
486	76.970	0.156	1.64	93	-0.92	98	69	2.240	(0.02)	0.03
487	77.125	0.155	1.16	93	-1	98	69	2.240	0.07	0.03
488	77.281	0.156	0.42	93	-1.27	98	69	2.240	(0.01)	0.05
489	77.437	0.156	1.58	93	-0.92	98	69	2.240	0.01	0.04
490	77.596	0.159	0.89	93	-1.13	100	69	2.240	(0.03)	0.01
491	77.754	0.158	1.52	93	-0.94	100	69	2.240	(0.12)	0.05
492	77.910	0.156	1.59	93	-0.91	98	69	2.240	0.03	0.00
493	78.066	0.156	1.50	93	-0.95	98	69	2.240	0.28	0.07
494	78.222	0.156	1.23	93	-1.04	98	69	2.240	0.10	0.02
495	78.379	0.157	0.28	93	-1.31	99	69	2.240	0.14	0.00
496	78.535	0.156	1.56	93	-0.93	98	69	2.240	0.02	0.03
497	78.692	0.157	1.58	93	-0.92	99	69	2.240	(0.02)	0.02
498	78.846	0.154	0.67	93	-1.2	97	69	2.170	0.03	0.01
499	79.002	0.156	1.56	93	-0.92	98	69	2.240	0.04	0.01
500	79.159	0.157	1.49	93	-0.94	99	69	2.280	0.09	0.03
501	79.316	0.157	1.42	93	-0.96	99	69	2.240	0.11	0.01
502	79.472	0.156	0.68	93	-1.2	98	69	2.240	(0.01)	0.05
503	79.628	0.156	1.60	93	-0.91	98	69	2.240	0.06	0.00
504	79.783	0.155	1.60	93	-0.91	98	69	2.240	0.09	0.04
505	79.941	0.158	1.23	93	-1.03	100	69	2.240	0.05	0.00
506	80.099	0.158	0.90	93	-1.14	100	69	2.240	0.03	0.00
507	80.256	0.157	0.76	92	-1.19	99	69	2.230	(0.10)	0.02
508	80.412	0.156	0.57	92	-1.23	99	69	2.240	0.07	(0.01)
509	80.567	0.155	1.25	92	-1.03	98	69	2.240	0.19	(0.07)
510	80.722	0.155	0.62	92	-1.22	98	69	2.240	0.22	0.04
511	80.879	0.157	1.19	92	-1.06	99	69	2.240	0.13	0.05

BOX B TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 2

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/1/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
512	81.036	0.157	0.62	92	-1.23	99	69	2.210	0.06	0.02
513	81.194	0.158	1.61	92	-0.91	100	69	2.240	0.07	(0.01)
514	81.349	0.155	1.33	92	-1	98	69	2.240	0.15	0.02
515	81.507	0.158	1.60	92	-0.91	100	69	2.240	0.20	0.03
516	81.665	0.158	1.26	92	-1.02	100	69	2.240	0.21	0.10
517	81.824	0.159	0.32	92	-1.29	100	69	2.240	0.06	0.03
518	81.982	0.158	0.54	92	-1.24	100	69	2.240	0.06	0.07
519	82.137	0.155	0.68	92	-1.2	98	69	2.240	(0.09)	0.05
520	82.295	0.158	0.37	92	-1.29	100	69	2.240	0.10	0.01
521	82.452	0.157	1.52	92	-0.92	99	69	2.240	0.05	0.01
522	82.607	0.155	0.83	92	-1.15	98	69	2.240	0.10	0.01
523	82.764	0.157	1.45	92	-0.96	99	69	2.240	0.06	0.04
524	82.920	0.156	1.24	92	-1.02	99	69	2.240	0.20	0.04
525	83.075	0.155	0.46	92	-1.25	99	70	2.190	5.56	2.00
526	83.228	0.153	1.44	92	-0.96	97	69	2.210	0.44	0.07
527	83.385	0.157	0.66	92	-1.2	100	70	2.210	0.98	0.23
528	83.539	0.154	1.37	92	-0.99	98	70	2.210	2.39	0.45
529	83.695	0.156	0.36	92	-1.3	100	70	2.210	6.93	0.33
530	83.849	0.154	1.65	92	-0.96	98	70	2.210	8.45	0.15
531	84.004	0.155	1.32	92	-1	99	70	2.210	9.32	0.10
532	84.161	0.157	1.50	92	-0.95	101	70	2.210	9.91	0.13
533	84.318	0.157	0.33	92	-1.29	101	70	2.210	10.28	0.11
534	84.475	0.157	0.33	92	-1.3	101	70	2.210	10.87	0.14
535	84.633	0.158	0.88	92	-1.13	101	70	2.210	11.34	0.14
536	84.790	0.157	1.09	92	-1.07	101	70	2.210	11.46	0.17
537	84.944	0.154	0.75	92	-1.19	99	71	2.210	12.03	0.29
538	85.102	0.158	1.36	92	-1.06	102	71	2.210	12.16	0.28
539	85.259	0.157	0.28	92	-1.32	101	71	2.210	12.50	0.28
540	85.416	0.157	0.56	92	-1.23	101	71	2.210	12.75	0.29
541	85.571	0.155	0.00	92	-1.31	100	71	2.210	12.92	0.34
542	85.727	0.156	1.36	92	-0.99	100	71	2.210	13.15	0.40
543	85.884	0.157	0.27	92	-1.31	101	71	2.210	13.29	0.72

BOX B TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 2

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/1/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
544	86.039	0.155	1.52	92	-0.93	100	72	2.200	13.30	0.73
545	86.196	0.157	1.24	92	-1.03	101	72	2.230	13.42	0.57
546	86.353	0.157	1.43	92	-0.91	101	72	2.210	13.31	0.45
547	86.511	0.158	1.42	92	-0.98	102	72	2.200	13.36	0.52
548	86.671	0.160	1.60	92	-0.91	103	72	2.210	13.11	0.32
549	86.829	0.158	1.29	92	-1.02	101	72	2.220	13.20	0.28
550	86.985	0.156	0.24	92	-1.31	99	72	2.220	14.08	4.37
551	87.139	0.154	1.51	92	-0.94	98	72	2.220	4.26	1.37
552	87.293	0.154	0.54	92	-1.24	98	72	2.220	2.55	1.01
553	87.451	0.158	1.28	92	-1.02	100	72	2.220	1.92	0.84
554	87.609	0.158	1.23	92	-1.03	100	72	2.230	1.74	0.90
555	87.767	0.158	1.12	92	-1.07	100	72	2.220	1.61	0.82
556	87.924	0.157	1.59	92	-0.91	99	72	2.220	1.46	0.76
557	88.080	0.156	0.93	92	-1.13	99	72	2.220	1.39	0.83
558	88.238	0.158	0.57	92	-1.23	100	72	2.220	1.22	0.68
559	88.395	0.157	1.32	92	-0.98	99	72	2.230	1.20	0.65
560	88.553	0.158	0.38	92	-1.29	100	72	2.230	1.10	0.61
561	88.708	0.155	1.58	92	-0.91	98	72	2.230	1.06	0.57
562	88.865	0.157	1.46	92	-0.98	99	72	2.250	1.16	0.60
563	89.024	0.159	0.94	92	-1.13	101	71	2.230	1.16	0.64
564	89.184	0.160	0.55	92	-1.24	101	71	2.220	1.14	0.61
565	89.341	0.157	1.59	92	-0.92	99	71	2.230	1.16	0.58
566	89.496	0.155	0.67	92	-1.2	98	71	2.220	0.93	0.47
567	89.652	0.156	0.88	92	-1.15	99	71	2.230	0.94	0.49
568	89.813	0.161	0.67	92	-1.2	102	71	2.230	0.85	0.39
569	89.971	0.158	0.32	92	-1.3	100	71	2.230	0.85	0.34
570	90.128	0.157	0.86	92	-1.16	99	71	2.230	0.65	0.38
571	90.284	0.156	0.98	92	-1.19	99	71	2.210	0.67	0.34
572	90.440	0.156	1.37	92	-0.99	99	71	2.230	0.64	0.33
573	90.596	0.156	0.33	92	-1.3	99	71	2.220	0.63	0.29
574	90.753	0.157	1.47	92	-0.96	99	71	2.170	0.62	0.29
575	90.913	0.160	1.46	92	-0.97	101	71	2.230	0.41	0.25

BOX B TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 2

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/1/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
576	91.068	0.155	0.33	92	-1.3	98	71	2.230	0.49	0.23
577	91.224	0.156	0.48	92	-1.25	99	71	2.230	0.53	0.24
578	91.381	0.157	0.99	92	-1.12	99	71	2.230	0.35	0.20
579	91.539	0.158	1.36	92	-1	100	70	2.220	0.33	0.36
580	91.697	0.158	1.59	92	-0.92	100	70	2.230	0.37	0.15
581	91.855	0.158	1.61	92	-0.91	100	70	2.250	0.29	0.15
582	92.012	0.157	0.37	92	-1.29	99	70	2.220	0.33	0.16
583	92.169	0.157	0.31	92	-1.28	99	70	2.230	0.19	0.11
584	92.326	0.157	1.22	92	-1.05	99	70	2.230	0.26	0.12
585	92.481	0.155	1.38	92	-0.99	98	70	2.230	0.28	0.17
586	92.639	0.158	0.35	92	-1.29	100	70	2.230	0.30	0.13
587	92.798	0.159	1.39	92	-0.92	101	70	2.240	0.22	0.12
588	92.956	0.158	0.35	92	-1.3	100	70	2.230	0.22	0.08
589	93.113	0.157	0.49	92	-1.21	99	70	2.230	0.11	0.06
590	93.271	0.158	0.98	92	-1.11	100	70	2.230	0.18	0.07
591	93.429	0.158	1.59	92	-0.91	100	70	2.230	0.16	0.08
592	93.590	0.161	1.64	92	-0.91	102	70	2.230	0.18	0.05
593	93.747	0.157	0.30	92	-1.31	99	70	2.240	0.16	0.04
594	93.903	0.156	0.35	92	-1.29	99	70	2.230	0.10	0.07
595	94.061	0.158	0.76	92	-1.18	100	70	2.230	0.21	0.08
596	94.221	0.160	1.52	92	-0.92	101	70	2.230	0.17	0.04
597	94.378	0.157	0.35	92	-1.26	99	70	2.230	0.19	0.06
598	94.533	0.155	1.57	92	-0.93	98	70	2.230	0.17	0.10
599	94.692	0.159	1.60	92	-0.92	101	70	2.230	0.21	0.12
600	94.853	0.161	0.64	92	-1.21	102	70	2.230	0.02	0.08
601	95.012	0.159	1.61	92	-0.91	101	70	2.250	0.24	0.07
602	95.168	0.156	1.60	92	-0.91	99	70	2.230	0.14	0.05
603	95.324	0.156	0.33	92	-1.3	99	70	2.230	0.18	0.07
604	95.483	0.159	1.43	92	-0.98	101	70	2.260	0.20	0.06
605	95.643	0.160	0.67	92	-1.2	101	70	2.250	0.11	0.08
606	95.798	0.155	1.42	92	-0.98	98	70	2.250	0.10	0.09
607	95.955	0.157	0.29	92	-1.31	99	70	2.230	0.18	0.08

BOX B TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 2

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/1/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
608	96.111	0.156	0.68	92	-1.2	99	70	2.230	0.21	0.06
609	96.270	0.159	1.53	92	-0.97	101	70	2.230	0.17	(0.05)
610	96.426	0.156	1.58	92	-0.92	99	70	2.230	0.12	0.07
611	96.583	0.157	0.64	92	-1.21	99	70	2.230	0.11	0.07
612	96.739	0.156	1.59	92	-0.91	99	70	2.230	0.19	0.00
613	96.898	0.159	1.61	92	-0.92	101	70	2.230	0.15	0.08
614	97.056	0.158	0.31	92	-1.31	100	70	2.230	0.12	0.05
615	97.211	0.155	1.63	92	-0.91	98	70	2.230	0.09	0.02
616	97.369	0.158	1.90	92	-0.92	100	70	2.240	0.10	0.05
617	97.526	0.157	1.59	92	-0.92	99	70	2.240	0.19	0.01
618	97.684	0.158	0.76	92	-1.19	100	70	2.260	0.10	0.07
619	97.840	0.156	0.67	92	-1.2	99	70	2.240	0.10	0.04
620	97.998	0.158	0.69	92	-1.27	100	70	2.240	0.20	0.02
621	98.158	0.160	0.33	92	-1.31	101	70	2.240	0.13	0.03
622	98.316	0.158	1.75	92	-0.96	100	70	2.230	0.14	0.07
623	98.473	0.157	1.61	92	-0.92	99	69	2.190	0.10	0.04
624	98.628	0.155	1.55	92	-0.93	98	69	2.240	0.19	0.09
625	98.785	0.157	0.46	92	-1.24	99	69	2.240	0.09	0.05
626	98.942	0.157	0.29	92	-1.31	99	69	2.230	0.13	0.05
627	99.100	0.158	1.06	92	-1.1	100	69	2.240	0.15	0.08
628	99.254	0.154	1.38	92	-1.02	97	69	2.240	0.19	0.04
629	99.415	0.161	0.27	92	-1.31	102	69	2.240	0.15	0.09
630	99.575	0.160	1.55	92	-0.92	101	69	2.300	0.14	0.03
631	99.730	0.155	1.74	92	-0.95	98	69	2.240	0.04	0.01
632	99.889	0.159	1.31	92	-1.01	101	69	2.240	0.16	0.04
633	100.047	0.158	1.55	92	-0.91	100	69	2.240	0.17	0.00
634	100.206	0.159	0.41	92	-1.27	101	69	2.230	0.17	0.05
635	100.364	0.158	1.47	92	-0.96	100	69	2.240	0.09	0.02
636	100.520	0.156	1.53	92	-0.9	99	69	2.240	0.12	(0.03)
637	100.677	0.157	0.70	92	-1.19	99	69	2.240	0.07	0.05
638	100.836	0.159	1.57	92	-0.93	101	69	2.230	0.20	0.05
639	100.995	0.159	1.53	92	-0.94	101	69	2.230	0.06	0.07

BOX B TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 2

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/1/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
640	101.152	0.157	1.59	92	-0.92	99	69	2.240	0.08	0.06
641	101.308	0.156	1.43	92	-0.98	99	69	2.240	0.12	0.05
642	101.467	0.159	1.54	92	-0.98	101	69	2.240	0.09	0.06
643	101.625	0.158	1.58	92	-0.93	100	69	2.230	0.08	0.07
644	101.782	0.157	1.41	92	-0.98	99	69	2.240	0.02	0.01
645	101.937	0.155	0.72	92	-1.19	98	69	2.240	0.18	0.05
646	102.094	0.157	1.39	92	-0.99	99	69	2.240	0.08	0.03
647	102.253	0.159	0.60	92	-1.22	100	69	2.240	0.12	0.03
648	102.411	0.158	1.00	92	-1.13	100	69	2.240	0.11	0.04
649	102.569	0.158	0.70	92	-1.2	100	69	2.240	0.09	0.03
650	102.725	0.156	0.99	92	-1.13	99	69	2.240	0.05	0.02
651	102.883	0.158	1.31	92	-1.01	100	69	2.240	0.16	0.08
652	103.042	0.159	1.63	92	-0.91	100	69	2.230	0.14	0.06
653	103.199	0.157	0.36	92	-1.3	99	69	2.240	0.19	0.04
654	103.355	0.156	1.29	92	-1.01	99	69	2.240	0.10	0.05
655	103.514	0.159	1.62	92	-0.91	100	69	2.240	0.14	0.07
656	103.672	0.158	1.51	92	-0.95	100	69	2.240	0.08	0.11
657	103.829	0.157	0.86	92	-1.16	99	69	2.240	0.25	0.08
658	103.986	0.157	0.31	92	-1.3	99	69	2.240	0.23	0.05
659	104.145	0.159	0.66	92	-1.2	100	69	2.260	0.09	0.05
660	104.302	0.157	1.63	92	-0.9	99	69	2.240	0.09	0.04
661	104.461	0.159	1.50	92	-0.96	100	69	2.240	0.20	0.08
662	104.619	0.158	0.93	92	-1.13	100	69	2.240	0.05	(0.05)
663	104.780	0.161	0.64	92	-1.21	102	69	2.240	0.14	0.06
664	104.938	0.158	1.44	92	-0.97	100	69	2.240	0.16	0.04
665	105.094	0.156	0.42	92	-1.19	99	69	2.230	0.13	0.05
666	105.252	0.158	1.37	92	-0.99	100	69	2.240	0.13	0.07
667	105.411	0.159	1.53	92	-0.95	100	69	2.240	0.16	0.05
668	105.568	0.157	1.27	92	-1.03	99	69	2.250	0.13	0.04
669	105.723	0.155	0.84	92	-1.16	98	69	2.200	0.21	0.05
670	105.881	0.158	0.50	92	-1.23	100	69	2.240	0.10	0.07
671	106.040	0.159	0.52	92	-1.25	100	69	2.240	0.14	0.04

BOX B TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 2

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/1/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
672	106.200	0.160	1.00	92	-1.01	101	69	2.240	0.14	0.08
673	106.357	0.157	1.57	92	-0.93	99	69	2.240	0.13	0.05
674	106.516	0.159	0.69	92	-1.19	100	69	2.240	0.04	0.05
675	106.673	0.157	0.70	92	-1.16	99	69	2.240	0.10	0.03
676	106.830	0.157	1.60	92	-0.91	99	69	2.240	0.11	0.04
677	106.985	0.155	0.74	92	-1.11	98	69	2.240	0.19	0.04
678	107.144	0.159	1.38	92	-0.99	100	69	2.240	0.13	0.05
679	107.303	0.159	1.27	92	-1.01	100	69	2.260	0.08	0.18
680	107.462	0.159	1.41	92	-0.99	100	69	2.250	0.14	0.07
681	107.620	0.158	0.56	92	-1.24	100	69	2.240	0.05	0.05
682	107.779	0.159	1.58	92	-0.92	100	69	2.240	0.06	0.03
683	107.936	0.157	1.47	92	-0.97	99	69	2.220	0.14	0.04
684	108.095	0.159	0.95	92	-1.14	100	69	2.240	0.07	0.04
685	108.251	0.156	1.44	92	-0.97	99	69	2.240	0.09	0.03
686	108.410	0.159	0.37	92	-1.3	100	69	2.240	0.03	0.06
687	108.570	0.160	0.72	92	-1.2	101	69	2.240	0.15	0.06
688	108.729	0.159	0.76	92	-1.19	100	69	2.240	0.16	0.01
689	108.886	0.157	1.59	92	-0.93	99	69	2.240	0.06	0.05

WATER FLOW AND TEMPERATURE DATA - ASTM E2618

Client: Greentech
Model: RS7200E
Run #: 2

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/1/2020

	Flow (GPM)		Temperature Data (°F)						
Elapsed Time (min)	Load Side Flow	Appliance Flow (optional)	HEX Load In	HEX Load Out	HEX Supply In	HEX Supply Out	Specific Heat of Inlet Water (BTU/lb-°F)	Mass Flow Rate of Inlet Water (lb/min)	Heat Output (Btu)
0	0.31		44.37	165.87	164	163	1.00	2.57	
1	0.29		44.55	167.14	166	164	1.00	2.44	300
2	0.27		44.83	168.27	166	165	1.00	2.28	282
3	0.31		45.15	169.59	168	166	1.00	2.58	321
4	0.29		45.43	170.91	170	168	1.00	2.40	301
5	0.36		45.71	172.18	170	169	1.00	2.99	379
6	0.48		46.08	173.64	172	170	1.00	4.03	515
7	0.29		46.40	175.06	173	171	1.00	2.43	314
8	0.36		46.77	176.57	175	173	1.00	3.00	391
9	0.33		47.05	177.99	176	174	1.00	2.72	356
10	0.31		47.32	179.60	178	176	1.00	2.55	338
11	0.39		47.55	181.07	179	177	1.00	3.26	435
12	0.48		47.83	182.58	181	179	1.00	3.99	539
13	0.34		48.06	184.05	182	180	1.00	2.86	389
14	0.32		48.29	185.57	184	182	1.00	2.70	371
15	0.38		48.57	186.84	185	183	1.00	3.15	436
16	0.36		48.80	187.64	186	184	1.00	3.00	418
17	0.33		48.98	188.44	186	184	1.00	2.72	379
18	0.29		49.22	188.82	187	185	1.00	2.42	338
19	0.43		49.45	189.29	187	185	1.00	3.60	504
20	0.32		49.63	189.67	188	185	1.00	2.69	378
21	0.34		49.86	190.04	188	186	1.00	2.82	396
22	0.39		50.00	190.42	189	186	1.00	3.29	463
23	0.31		50.19	190.65	189	186	1.00	2.57	362
24	0.34		50.37	190.94	189	187	1.00	2.86	403
25	0.39		50.55	191.22	190	187	1.00	3.29	464
26	0.41		50.69	191.36	190	187	1.00	3.43	483
27	0.31		50.88	191.64	190	187	1.00	2.57	362
28	0.39		51.06	191.79	190	187	1.00	3.29	464
29	0.33		51.29	192.02	190	188	1.00	2.77	391
30	0.36		51.43	192.21	191	188	1.00	3.02	425
31	0.27		51.61	192.30	191	188	1.00	2.29	323
32	0.40		51.80	192.44	191	188	1.00	3.30	465
33	0.33		51.99	192.59	191	188	1.00	2.73	384
34	0.45		52.22	192.73	191	188	1.00	3.72	524
35	0.39		52.35	192.82	191	188	1.00	3.28	461
36	0.34		52.58	192.92	191	189	1.00	2.85	401
37	0.31		52.77	193.06	192	189	1.00	2.54	357
38	0.30		53.00	193.11	192	189	1.00	2.47	346
39	0.33		53.18	193.15	192	189	1.00	2.73	382
40	0.39		53.37	193.25	192	189	1.00	3.28	460
41	0.39		53.55	193.34	192	189	1.00	3.29	461
42	0.35		53.74	193.39	192	189	1.00	2.88	402
43	0.38		53.97	193.43	192	189	1.00	3.16	441
44	0.43		54.15	193.48	192	189	1.00	3.59	501
45	0.26		54.34	193.58	192	189	1.00	2.17	303
46	0.29		54.57	193.58	192	189	1.00	2.45	342
47	0.33		54.71	193.58	192	189	1.00	2.73	379

WATER FLOW AND TEMPERATURE DATA - ASTM E2618

Client: Greentech
Model: RS7200E
Run #: 2

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/1/2020

	Flow (GPM)		Temperature Data (°F)						
Elapsed Time (min)	Load Side Flow	Appliance Flow (optional)	HEX Load In	HEX Load Out	HEX Supply In	HEX Supply Out	Specific Heat of Inlet Water (BTU/lb-°F)	Mass Flow Rate of Inlet Water (lb/min)	Heat Output (Btu)
48	0.35		54.89	193.67	192	189	1.00	2.88	400
49	0.28		55.08	193.72	192	189	1.00	2.31	320
50	0.29		55.26	193.76	192	189	1.00	2.45	339
51	0.33		55.40	193.72	192	189	1.00	2.72	377
52	0.36		55.59	193.76	192	189	1.00	3.01	416
53	0.38		55.77	193.81	192	190	1.00	3.16	436
54	0.35		55.95	193.81	192	189	1.00	2.88	397
55	0.39		56.05	193.76	192	189	1.00	3.24	447
56	0.38		56.23	193.81	192	189	1.00	3.16	435
57	0.36		56.37	193.81	192	190	1.00	3.01	414
58	0.29		56.51	193.81	192	190	1.00	2.45	336
59	0.38		56.65	193.76	192	189	1.00	3.16	434
60	0.35		56.78	193.76	192	189	1.00	2.88	394
61	0.35		56.88	193.76	192	189	1.00	2.88	394
62	0.39		57.01	193.72	192	189	1.00	3.29	450
63	0.41		57.15	193.67	192	189	1.00	3.42	467
64	0.46		57.25	193.67	192	189	1.00	3.81	520
65	0.37		57.34	193.67	192	189	1.00	3.12	426
66	0.38		57.48	193.67	192	189	1.00	3.16	431
67	0.33		57.62	193.58	192	189	1.00	2.72	370
68	0.35		57.71	193.58	192	189	1.00	2.88	391
69	0.28		57.85	193.53	192	189	1.00	2.32	315
70	0.36		57.94	193.48	192	189	1.00	3.04	412
71	0.25		58.08	193.48	192	189	1.00	2.05	277
72	0.37		58.22	193.43	192	189	1.00	3.07	415
73	0.34		58.31	193.34	192	189	1.00	2.83	383
74	0.38		58.45	193.29	192	189	1.00	3.16	427
75	0.38		58.54	193.25	192	189	1.00	3.17	428
76	0.33		58.63	193.25	192	189	1.00	2.74	370
77	0.36		58.72	193.15	192	189	1.00	3.02	407
78	0.43		58.86	193.11	192	189	1.00	3.61	485
79	0.40		58.95	193.06	192	189	1.00	3.31	445
80	0.31		59.05	192.96	191	189	1.00	2.60	349
81	0.08		59.14	192.96	191	189	1.00	0.67	90
82	0.48		59.14	192.82	191	189	1.00	4.04	540
83	0.29		59.28	192.82	191	189	1.00	2.45	327
84	0.26		59.42	192.77	191	189	1.00	2.17	290
85	0.26		59.65	192.73	191	190	1.00	2.17	289
86	0.31		59.65	192.73	191	189	1.00	2.59	346
87	0.40		59.56	192.68	191	189	1.00	3.30	440
88	0.30		59.65	192.63	191	188	1.00	2.46	327
89	0.31		59.79	192.59	191	189	1.00	2.59	345
90	0.38		59.79	192.49	191	188	1.00	3.18	422
91	0.06		59.84	192.49	191	188	1.00	0.51	68
92	0.33		59.88	192.40	191	188	1.00	2.74	364
93	0.33		59.97	192.30	191	188	1.00	2.75	364
94	0.26		60.02	192.30	191	188	1.00	2.17	287
95	0.40		60.07	192.21	191	188	1.00	3.30	436

WATER FLOW AND TEMPERATURE DATA - ASTM E2618

Client: Greentech
Model: RS7200E
Run #: 2

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/1/2020

	Flow (GPM)		Temperature Data (°F)						
Elapsed Time (min)	Load Side Flow	Appliance Flow (optional)	HEX Load In	HEX Load Out	HEX Supply In	HEX Supply Out	Specific Heat of Inlet Water (BTU/lb-°F)	Mass Flow Rate of Inlet Water (lb/min)	Heat Output (Btu)
96	0.31		60.11	192.12	191	188	1.00	2.62	347
97	0.34		60.11	192.07	191	188	1.00	2.85	377
98	0.06		60.16	191.97	191	188	1.00	0.53	70
99	0.06		60.21	191.88	190	188	1.00	0.52	68
100	0.38		60.25	191.88	190	188	1.00	3.17	418
101	0.26		60.30	191.79	190	188	1.00	2.17	286
102	0.33		60.34	191.74	190	188	1.00	2.75	362
103	0.26		60.34	191.64	190	188	1.00	2.17	285
104	0.06		60.34	191.55	190	188	1.00	0.50	66
105	0.31		60.34	191.50	190	188	1.00	2.59	340
106	0.31		60.44	191.45	190	187	1.00	2.59	340
107	0.07		60.44	191.31	190	187	1.00	0.55	72
108	0.29		60.49	191.27	190	187	1.00	2.45	321
109	0.47		60.49	191.17	190	187	1.00	3.90	511
110	0.34		60.49	191.08	190	187	1.00	2.80	366
111	0.06		60.49	191.03	189	187	1.00	0.53	69
112	0.36		60.53	190.94	189	187	1.00	3.02	394
113	0.33		60.53	190.84	189	187	1.00	2.73	356
114	0.30		60.53	190.80	189	187	1.00	2.47	322
115	0.06		60.53	190.65	189	187	1.00	0.52	68
116	0.38		60.62	190.56	189	187	1.00	3.19	414
117	0.29		60.62	190.51	189	187	1.00	2.45	319
118	0.31		60.62	190.42	189	187	1.00	2.59	336
119	0.35		60.67	190.32	189	186	1.00	2.88	374
120	0.29		60.67	190.23	189	186	1.00	2.45	318
121	0.26		60.67	190.14	189	186	1.00	2.17	281
122	0.33		60.67	190.04	188	186	1.00	2.76	358
123	0.33		60.67	189.99	188	186	1.00	2.74	355
124	0.33		60.72	189.90	188	186	1.00	2.73	354
125	0.31		60.72	189.76	188	186	1.00	2.61	337
126	0.26		60.72	189.67	188	186	1.00	2.19	282
127	0.36		60.72	189.62	188	186	1.00	3.03	391
128	0.31		60.76	189.52	188	186	1.00	2.59	334
129	0.33		60.76	189.43	188	186	1.00	2.74	353
130	0.35		60.76	189.33	188	185	1.00	2.90	373
131	0.33		60.76	189.24	188	185	1.00	2.76	355
132	0.36		60.81	189.15	188	185	1.00	3.02	387
133	0.28		60.81	189.01	187	185	1.00	2.33	300
134	0.33		60.86	188.91	187	185	1.00	2.76	353
135	0.06		60.86	188.82	187	185	1.00	0.53	67
136	0.33		60.86	188.72	187	185	1.00	2.73	350
137	0.40		60.90	188.63	187	185	1.00	3.31	423
138	0.30		60.90	188.53	187	185	1.00	2.47	315
139	0.31		60.95	188.44	187	185	1.00	2.61	334
140	0.31		60.90	188.35	187	184	1.00	2.62	335
141	0.28		60.99	188.25	187	184	1.00	2.33	296
142	0.28		60.99	188.11	187	184	1.00	2.33	297
143	0.23		60.99	188.01	186	184	1.00	1.91	243

WATER FLOW AND TEMPERATURE DATA - ASTM E2618

Client: Greentech
Model: RS7200E
Run #: 2

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/1/2020

	Flow (GPM)		Temperature Data (°F)						
Elapsed Time (min)	Load Side Flow	Appliance Flow (optional)	HEX Load In	HEX Load Out	HEX Supply In	HEX Supply Out	Specific Heat of Inlet Water (BTU/lb-°F)	Mass Flow Rate of Inlet Water (lb/min)	Heat Output (Btu)
144	0.29		60.99	187.87	186	184	1.00	2.39	303
145	0.29		61.04	187.83	186	184	1.00	2.42	307
146	0.28		61.04	187.73	186	184	1.00	2.33	296
147	0.30		61.04	187.59	186	184	1.00	2.48	314
148	0.40		61.04	187.50	186	184	1.00	3.32	420
149	0.25		61.09	187.36	186	184	1.00	2.07	261
150	0.30		61.04	187.26	186	183	1.00	2.47	313
151	0.06		61.09	187.17	186	183	1.00	0.53	66
152	0.28		61.09	187.07	185	183	1.00	2.32	292
153	0.31		61.09	186.93	185	183	1.00	2.61	329
154	0.25		61.09	186.84	185	183	1.00	2.08	262
155	0.06		61.09	186.70	185	183	1.00	0.53	66
156	0.06		61.09	186.60	185	183	1.00	0.52	65
157	0.06		61.09	186.51	185	183	1.00	0.54	68
158	0.28		61.13	186.37	185	183	1.00	2.32	291
159	0.31		61.13	186.27	185	182	1.00	2.61	328
160	0.28		61.13	186.13	185	182	1.00	2.32	290
161	0.37		61.13	186.04	184	182	1.00	3.05	382
162	0.30		61.13	185.89	184	182	1.00	2.47	308
163	0.33		61.18	185.85	184	182	1.00	2.74	342
164	0.35		61.13	185.71	184	182	1.00	2.88	359
165	0.38		61.13	185.57	184	182	1.00	3.17	395
166	0.30		61.18	185.47	184	182	1.00	2.46	306
167	0.25		61.18	185.38	184	182	1.00	2.05	255
168	0.33		61.18	185.24	184	181	1.00	2.74	340
169	0.06		61.18	185.09	183	181	1.00	0.53	65
170	0.26		61.18	185.00	183	181	1.00	2.19	272
171	0.28		61.18	184.90	183	181	1.00	2.33	288
172	0.06		61.18	184.72	183	181	1.00	0.54	67
173	0.36		61.23	184.62	183	181	1.00	3.03	374
174	0.06		61.23	184.53	183	181	1.00	0.53	65
175	0.26		61.23	184.38	183	181	1.00	2.19	270
176	0.06		61.23	184.29	183	180	1.00	0.53	65
177	0.06		61.23	184.15	183	180	1.00	0.52	64
178	0.40		61.23	184.05	182	180	1.00	3.33	410
179	0.30		61.23	183.91	182	180	1.00	2.47	303
180	0.23		61.18	183.77	182	180	1.00	1.94	238
181	0.08		61.18	183.67	182	180	1.00	0.63	77
182	0.25		61.18	183.53	182	180	1.00	2.10	257
183	0.30		61.18	183.44	182	180	1.00	2.53	310
184	0.28		61.18	183.30	182	179	1.00	2.37	290
185	0.30		61.18	183.15	182	179	1.00	2.48	303
186	0.33		61.13	183.06	181	179	1.00	2.75	335
187	0.31		61.13	182.92	181	179	1.00	2.62	320
188	0.37		61.13	182.77	181	179	1.00	3.04	371
189	0.33		61.13	182.63	181	179	1.00	2.76	335
190	0.23		61.09	182.54	181	179	1.00	1.94	236
191	0.30		61.09	182.40	181	179	1.00	2.48	301

WATER FLOW AND TEMPERATURE DATA - ASTM E2618

Client: Greentech
Model: RS7200E
Run #: 2

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/1/2020

	Flow (GPM)		Temperature Data (°F)						
Elapsed Time (min)	Load Side Flow	Appliance Flow (optional)	HEX Load In	HEX Load Out	HEX Supply In	HEX Supply Out	Specific Heat of Inlet Water (BTU/lb-°F)	Mass Flow Rate of Inlet Water (lb/min)	Heat Output (Btu)
192	0.06		61.04	182.30	181	178	1.00	0.53	64
193	0.30		61.09	182.16	180	178	1.00	2.49	302
194	0.38		61.04	182.02	180	178	1.00	3.17	384
195	0.30		61.04	181.92	180	178	1.00	2.48	300
196	0.07		61.04	181.73	180	178	1.00	0.61	73
197	0.27		61.04	181.64	180	178	1.00	2.21	267
198	0.31		61.04	181.50	180	178	1.00	2.62	316
199	0.28		60.99	181.35	180	178	1.00	2.35	283
200	0.06		60.99	181.26	180	177	1.00	0.52	62
201	0.06		60.95	181.07	179	177	1.00	0.53	63
202	0.06		60.95	180.93	179	177	1.00	0.53	64
203	0.25		60.99	180.83	179	177	1.00	2.07	249
204	0.33		60.99	180.69	179	177	1.00	2.77	332
205	0.35		60.99	180.60	179	177	1.00	2.90	347
206	0.26		60.99	180.45	179	177	1.00	2.20	263
207	0.30		60.99	180.31	179	177	1.00	2.47	295
208	0.07		60.95	180.17	179	176	1.00	0.57	68
209	0.37		60.99	180.03	178	176	1.00	3.04	363
210	0.30		60.95	179.93	178	176	1.00	2.50	298
211	0.06		60.95	179.79	178	176	1.00	0.52	62
212	0.32		60.95	179.65	178	176	1.00	2.63	313
213	0.06		60.99	179.50	178	176	1.00	0.53	62
214	0.26		60.99	179.36	178	176	1.00	2.20	261
215	0.30		60.99	179.27	178	176	1.00	2.49	295
216	0.31		60.99	179.08	177	175	1.00	2.60	307
217	0.28		60.99	178.98	177	175	1.00	2.36	278
218	0.35		60.99	178.84	177	175	1.00	2.91	344
219	0.06		60.99	178.70	177	175	1.00	0.54	64
220	0.33		60.99	178.56	177	175	1.00	2.77	326
221	0.35		60.99	178.42	177	175	1.00	2.90	341
222	0.25		60.95	178.32	177	175	1.00	2.09	245
223	0.28		60.99	178.18	177	174	1.00	2.30	270
224	0.30		60.95	178.04	176	174	1.00	2.50	294
225	0.06		60.95	177.90	176	174	1.00	0.53	62
226	0.35		60.95	177.75	176	174	1.00	2.89	338
227	0.06		60.90	177.61	176	174	1.00	0.53	61
228	0.37		60.90	177.47	176	174	1.00	3.05	356
229	0.40		60.90	177.37	176	174	1.00	3.33	389
230	0.23		60.90	177.18	176	174	1.00	1.94	226
231	0.26		60.90	177.09	175	173	1.00	2.21	257
232	0.33		60.90	176.95	175	173	1.00	2.76	320
233	0.38		60.90	176.80	175	173	1.00	3.20	371
234	0.28		60.90	176.66	175	173	1.00	2.32	269
235	0.32		60.90	176.52	175	173	1.00	2.63	304
236	0.32		60.90	176.38	175	173	1.00	2.68	310
237	0.29		60.90	176.28	175	173	1.00	2.43	281
238	0.25		60.90	176.14	174	172	1.00	2.07	239
239	0.07		60.86	176.00	174	172	1.00	0.55	63

WATER FLOW AND TEMPERATURE DATA - ASTM E2618

Client: Greentech
Model: RS7200E
Run #: 2

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/1/2020

	Flow (GPM)		Temperature Data (°F)						
Elapsed Time (min)	Load Side Flow	Appliance Flow (optional)	HEX Load In	HEX Load Out	HEX Supply In	HEX Supply Out	Specific Heat of Inlet Water (BTU/lb-°F)	Mass Flow Rate of Inlet Water (lb/min)	Heat Output (Btu)
240	0.33		60.90	175.86	174	172	1.00	2.78	320
241	0.33		60.86	175.72	174	172	1.00	2.77	319
242	0.07		60.86	175.58	174	172	1.00	0.55	63
243	0.35		60.86	175.43	174	172	1.00	2.92	335
244	0.26		60.86	175.29	174	172	1.00	2.19	251
245	0.33		60.86	175.15	173	172	1.00	2.77	317
246	0.35		60.86	175.01	173	171	1.00	2.91	333
247	0.06		60.86	174.92	173	171	1.00	0.53	61
248	0.27		60.86	174.77	173	171	1.00	2.21	253
249	0.30		60.81	174.63	173	171	1.00	2.51	286
250	0.38		60.86	174.44	173	171	1.00	3.19	362
251	0.30		60.81	174.35	173	171	1.00	2.50	284
252	0.06		60.81	174.21	173	171	1.00	0.54	61
253	0.06		60.76	174.07	172	170	1.00	0.54	61
254	0.06		60.76	173.97	172	170	1.00	0.53	60
255	0.26		60.76	173.83	172	170	1.00	2.21	250
256	0.31		60.76	173.69	172	170	1.00	2.62	297
257	0.07		60.72	173.50	172	170	1.00	0.55	62
258	0.28		60.76	173.36	172	170	1.00	2.36	266
259	0.38		60.72	173.27	172	170	1.00	3.18	358
260	0.29		60.72	173.13	171	169	1.00	2.44	275
261	0.32		60.67	172.99	171	169	1.00	2.67	301
262	0.31		60.67	172.84	171	169	1.00	2.62	295
263	0.33		60.62	172.70	171	169	1.00	2.76	310
264	0.37		60.62	172.56	171	169	1.00	3.05	342
265	0.35		60.58	172.47	171	169	1.00	2.93	328
266	0.06		60.58	172.28	171	169	1.00	0.52	58
267	0.25		60.58	172.14	170	169	1.00	2.07	232
268	0.28		60.58	172.04	170	168	1.00	2.36	263
269	0.30		60.58	171.85	170	168	1.00	2.50	278
270	0.30		60.53	171.76	170	168	1.00	2.47	276
271	0.27		60.53	171.62	170	168	1.00	2.22	246
272	0.25		60.58	171.48	170	168	1.00	2.09	232
273	0.33		60.53	171.33	170	168	1.00	2.77	307
274	0.37		60.53	171.19	170	168	1.00	3.06	339
275	0.32		60.49	171.05	169	167	1.00	2.63	291
276	0.26		60.58	170.91	169	167	1.00	2.21	244
277	0.23		60.53	170.77	169	167	1.00	1.94	214
278	0.35		60.49	170.68	169	167	1.00	2.91	321
279	0.33		60.49	170.53	169	167	1.00	2.76	304
280	0.30		60.49	170.39	169	167	1.00	2.47	272
281	0.30		60.49	170.25	169	167	1.00	2.47	271
282	0.28		60.49	170.11	168	167	1.00	2.36	259
283	0.32		60.49	169.97	168	166	1.00	2.64	289
284	0.33		60.49	169.83	168	166	1.00	2.73	298
285	0.35		60.49	169.69	168	166	1.00	2.91	318
286	0.35		60.49	169.50	168	166	1.00	2.92	319
287	0.37		60.49	169.40	168	166	1.00	3.04	332

WATER FLOW AND TEMPERATURE DATA - ASTM E2618

Client: Greentech
Model: RS7200E
Run #: 2

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/1/2020

	Flow (GPM)		Temperature Data (°F)						
Elapsed Time (min)	Load Side Flow	Appliance Flow (optional)	HEX Load In	HEX Load Out	HEX Supply In	HEX Supply Out	Specific Heat of Inlet Water (BTU/lb-°F)	Mass Flow Rate of Inlet Water (lb/min)	Heat Output (Btu)
288	0.40		60.49	169.26	168	166	1.00	3.36	365
289	0.37		60.49	169.12	167	166	1.00	3.06	333
290	0.28		60.53	168.98	167	165	1.00	2.33	253
291	0.26		60.49	168.84	167	165	1.00	2.19	238
292	0.35		60.53	168.60	167	165	1.00	2.91	315
293	0.31		60.53	168.46	167	165	1.00	2.62	283
294	0.32		60.53	168.32	167	165	1.00	2.63	284
295	0.31		60.49	168.13	166	165	1.00	2.61	281
296	0.25		60.49	168.08	166	165	1.00	2.05	221
297	0.28		60.49	168.04	166	165	1.00	2.34	252
298	0.28		60.49	168.13	166	165	1.00	2.34	252
299	0.26		60.49	168.37	166	165	1.00	2.21	238
300	0.27		60.49	168.70	167	165	1.00	2.22	240
301	0.38		60.49	169.07	167	166	1.00	3.20	348
302	0.40		60.44	169.64	168	166	1.00	3.35	366
303	0.26		60.49	170.20	168	167	1.00	2.20	242
304	0.31		60.44	170.77	169	168	1.00	2.62	290
305	0.37		60.49	171.48	169	168	1.00	3.05	339
306	0.09		60.44	172.32	170	169	1.00	0.75	84
307	0.30		60.49	173.13	171	170	1.00	2.47	278
308	0.28		60.44	173.97	172	171	1.00	2.33	264
309	0.33		60.44	174.96	173	172	1.00	2.76	317
310	0.31		60.44	175.95	174	173	1.00	2.62	303
311	0.38		60.49	177.04	175	174	1.00	3.18	371
312	0.30		60.49	178.04	176	175	1.00	2.47	291
313	0.28		60.44	179.13	177	176	1.00	2.33	276
314	0.31		60.44	180.40	179	177	1.00	2.62	314
315	0.25		60.44	181.40	179	178	1.00	2.07	250
316	0.26		60.44	182.58	181	179	1.00	2.20	269
317	0.07		60.44	183.67	182	180	1.00	0.59	72
318	0.35		60.49	185.00	183	182	1.00	2.90	361
319	0.32		60.49	185.71	184	182	1.00	2.67	334
320	0.26		60.49	186.23	184	183	1.00	2.19	276
321	0.38		60.49	186.65	185	183	1.00	3.19	402
322	0.06		60.49	187.07	185	183	1.00	0.53	68
323	0.28		60.49	187.40	185	184	1.00	2.33	297
324	0.30		60.49	187.73	186	184	1.00	2.48	316
325	0.06		60.49	187.92	186	184	1.00	0.52	66
326	0.35		60.53	188.16	186	184	1.00	2.90	371
327	0.26		60.53	188.35	186	185	1.00	2.19	281
328	0.07		60.53	188.49	187	185	1.00	0.57	73
329	0.30		60.53	188.63	187	185	1.00	2.48	318
330	0.38		60.53	188.86	187	185	1.00	3.13	403
331	0.29		60.53	188.91	187	185	1.00	2.44	313
332	0.27		60.53	189.01	187	185	1.00	2.22	285
333	0.26		60.53	189.15	187	185	1.00	2.19	282
334	0.28		60.53	189.19	188	185	1.00	2.33	301
335	0.33		60.53	189.29	188	185	1.00	2.77	357

WATER FLOW AND TEMPERATURE DATA - ASTM E2618

Client: Greentech
Model: RS7200E
Run #: 2

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/1/2020

	Flow (GPM)		Temperature Data (°F)						
Elapsed Time (min)	Load Side Flow	Appliance Flow (optional)	HEX Load In	HEX Load Out	HEX Supply In	HEX Supply Out	Specific Heat of Inlet Water (BTU/lb-°F)	Mass Flow Rate of Inlet Water (lb/min)	Heat Output (Btu)
336	0.23		60.53	189.38	188	185	1.00	1.93	248
337	0.06		60.53	189.33	188	185	1.00	0.53	69
338	0.35		60.53	189.43	188	186	1.00	2.90	375
339	0.06		60.53	189.48	188	186	1.00	0.54	70
340	0.30		60.58	189.52	188	186	1.00	2.47	319
341	0.26		60.53	189.52	188	186	1.00	2.13	275
342	0.31		60.58	189.57	188	186	1.00	2.54	328
343	0.29		60.58	189.52	188	186	1.00	2.39	308
344	0.07		60.58	189.57	188	186	1.00	0.60	77
345	0.30		60.58	189.57	188	186	1.00	2.50	322
346	0.31		60.62	189.62	188	186	1.00	2.62	339
347	0.06		60.58	189.57	188	186	1.00	0.54	70
348	0.36		60.62	189.57	188	186	1.00	3.04	392
349	0.06		60.62	189.52	188	186	1.00	0.53	68
350	0.31		60.62	189.57	188	186	1.00	2.62	339
351	0.06		60.62	189.48	188	186	1.00	0.53	69
352	0.25		60.67	189.48	188	186	1.00	2.09	269
353	0.07		60.62	189.48	188	186	1.00	0.57	74
354	0.26		60.67	189.43	188	186	1.00	2.15	277
355	0.30		60.67	189.43	188	185	1.00	2.53	326
356	0.32		60.67	189.33	188	185	1.00	2.63	339
357	0.37		60.67	189.29	188	185	1.00	3.04	392
358	0.30		60.67	189.29	188	185	1.00	2.50	322
359	0.32		60.67	189.24	188	185	1.00	2.63	339
360	0.32		60.67	189.19	188	185	1.00	2.63	338
361	0.33		60.67	189.15	188	185	1.00	2.77	356
362	0.40		60.67	189.10	188	185	1.00	3.34	430
363	0.26		60.67	189.05	187	185	1.00	2.20	283
364	0.25		60.67	188.96	187	185	1.00	2.08	267
365	0.26		60.67	188.96	187	185	1.00	2.20	283
366	0.28		60.67	188.86	187	185	1.00	2.34	300
367	0.25		60.67	188.82	187	185	1.00	2.05	263
368	0.28		60.62	188.72	187	185	1.00	2.33	299
369	0.26		60.62	188.68	187	185	1.00	2.14	274
370	0.32		60.62	188.63	187	185	1.00	2.70	347
371	0.28		60.67	188.53	187	185	1.00	2.36	302
372	0.30		60.62	188.49	187	185	1.00	2.50	320
373	0.32		60.62	188.39	187	184	1.00	2.64	337
374	0.25		60.62	188.30	187	184	1.00	2.09	267
375	0.28		60.62	188.25	187	184	1.00	2.35	300
376	0.30		60.62	188.16	187	184	1.00	2.49	318
377	0.39		60.58	188.06	187	184	1.00	3.22	410
378	0.35		60.62	188.01	186	184	1.00	2.93	374
379	0.07		60.58	187.92	186	184	1.00	0.55	70
380	0.32		60.58	187.83	186	184	1.00	2.63	335
381	0.25		60.58	187.73	186	184	1.00	2.10	268
382	0.26		60.58	187.64	186	184	1.00	2.16	275
383	0.28		60.58	187.55	186	184	1.00	2.36	299

WATER FLOW AND TEMPERATURE DATA - ASTM E2618

Client: Greentech
Model: RS7200E
Run #: 2

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/1/2020

	Flow (GPM)		Temperature Data (°F)						
Elapsed Time (min)	Load Side Flow	Appliance Flow (optional)	HEX Load In	HEX Load Out	HEX Supply In	HEX Supply Out	Specific Heat of Inlet Water (BTU/lb-°F)	Mass Flow Rate of Inlet Water (lb/min)	Heat Output (Btu)
384	0.34		60.58	187.50	186	184	1.00	2.87	364
385	0.36		60.53	187.40	186	184	1.00	2.97	377
386	0.38		60.58	187.31	186	183	1.00	3.13	397
387	0.28		60.58	187.21	186	183	1.00	2.36	299
388	0.28		60.58	187.12	186	183	1.00	2.35	298
389	0.28		60.53	187.03	185	183	1.00	2.36	299
390	0.25		60.53	186.93	185	183	1.00	2.07	263
391	0.28		60.53	186.84	185	183	1.00	2.36	298
392	0.25		60.53	186.74	185	183	1.00	2.08	263
393	0.28		60.53	186.65	185	183	1.00	2.36	297
394	0.32		60.49	186.51	185	183	1.00	2.64	333
395	0.32		60.53	186.46	185	183	1.00	2.64	333
396	0.24		60.53	186.32	185	182	1.00	2.01	253
397	0.28		60.49	186.23	185	182	1.00	2.33	293
398	0.21		60.49	186.13	185	182	1.00	1.72	216
399	0.18		60.53	186.04	184	182	1.00	1.54	194
400	0.35		60.49	185.89	184	182	1.00	2.91	366
401	0.27		60.49	185.85	184	182	1.00	2.23	280
402	0.33		60.53	185.71	184	182	1.00	2.79	349
403	0.32		60.49	185.61	184	182	1.00	2.64	331
404	0.06		60.49	185.52	184	182	1.00	0.53	67
405	0.25		60.49	185.38	184	182	1.00	2.09	261
406	0.30		60.49	185.33	184	181	1.00	2.50	312
407	0.32		60.49	185.19	184	181	1.00	2.63	328
408	0.25		60.49	185.09	183	181	1.00	2.10	262
409	0.27		60.49	184.95	183	181	1.00	2.23	278
410	0.35		60.44	184.86	183	181	1.00	2.89	360
411	0.36		60.44	184.76	183	181	1.00	2.99	372
412	0.28		60.44	184.62	183	181	1.00	2.30	286
413	0.30		60.44	184.53	183	181	1.00	2.49	309
414	0.26		60.44	184.38	183	181	1.00	2.21	274
415	0.07		60.39	184.29	183	180	1.00	0.55	68
416	0.35		60.44	184.20	183	180	1.00	2.93	364
417	0.06		60.39	184.05	182	180	1.00	0.53	66
418	0.27		60.39	183.96	182	180	1.00	2.23	276
419	0.30		60.39	183.82	182	180	1.00	2.50	309
420	0.32		60.39	183.72	182	180	1.00	2.66	328
421	0.33		60.39	183.63	182	180	1.00	2.77	342
422	0.33		60.39	183.44	182	180	1.00	2.79	343
423	0.28		60.39	183.39	182	180	1.00	2.36	291
424	0.30		60.34	183.25	182	179	1.00	2.49	306
425	0.30		60.34	183.15	181	179	1.00	2.50	308
426	0.33		60.34	183.01	181	179	1.00	2.77	340
427	0.32		60.34	182.92	181	179	1.00	2.64	324
428	0.30		60.34	182.77	181	179	1.00	2.50	307
429	0.32		60.34	182.63	181	179	1.00	2.64	324
430	0.32		60.34	182.58	181	179	1.00	2.64	324
431	0.37		60.30	182.44	181	179	1.00	3.07	376

WATER FLOW AND TEMPERATURE DATA - ASTM E2618

Client: Greentech
Model: RS7200E
Run #: 2

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/1/2020

	Flow (GPM)		Temperature Data (°F)						
Elapsed Time (min)	Load Side Flow	Appliance Flow (optional)	HEX Load In	HEX Load Out	HEX Supply In	HEX Supply Out	Specific Heat of Inlet Water (BTU/lb-°F)	Mass Flow Rate of Inlet Water (lb/min)	Heat Output (Btu)
432	0.32		60.30	182.30	181	178	1.00	2.66	325
433	0.25		60.30	182.16	181	178	1.00	2.10	256
434	0.32		60.30	182.02	180	178	1.00	2.63	321
435	0.25		60.25	181.92	180	178	1.00	2.10	256
436	0.31		60.25	181.83	180	178	1.00	2.59	315
437	0.24		60.25	181.68	180	178	1.00	1.99	242
438	0.25		60.25	181.54	180	178	1.00	2.08	253
439	0.33		60.25	181.45	180	178	1.00	2.79	338
440	0.32		60.25	181.30	180	178	1.00	2.63	319
441	0.32		60.21	181.16	180	177	1.00	2.64	319
442	0.35		60.25	181.07	179	177	1.00	2.93	354
443	0.30		60.21	180.93	179	177	1.00	2.48	300
444	0.24		60.21	180.83	179	177	1.00	1.98	239
445	0.28		60.21	180.69	179	177	1.00	2.36	284
446	0.30		60.21	180.55	179	177	1.00	2.51	303
447	0.33		60.16	180.40	179	177	1.00	2.79	335
448	0.28		60.21	180.31	179	177	1.00	2.36	284
449	0.42		60.16	180.17	179	176	1.00	3.49	419
450	0.32		60.16	180.07	178	176	1.00	2.70	325
451	0.35		60.16	179.93	178	176	1.00	2.92	350
452	0.27		60.16	179.79	178	176	1.00	2.27	272
453	0.06		60.16	179.65	178	176	1.00	0.54	65
454	0.37		60.16	179.55	178	176	1.00	3.08	368
455	0.32		60.16	179.41	178	176	1.00	2.64	316
456	0.42		60.16	179.27	178	175	1.00	3.50	417
457	0.27		60.11	179.13	177	175	1.00	2.23	266
458	0.28		60.11	179.03	177	175	1.00	2.36	281
459	0.37		60.11	178.89	177	175	1.00	3.08	367
460	0.07		60.11	178.75	177	175	1.00	0.55	65
461	0.33		60.11	178.65	177	175	1.00	2.79	331
462	0.30		60.16	178.51	177	175	1.00	2.50	297
463	0.27		60.16	178.37	177	175	1.00	2.22	263
464	0.32		60.11	178.27	177	174	1.00	2.64	313
465	0.28		60.11	178.08	176	174	1.00	2.34	277
466	0.13		60.11	177.99	176	174	1.00	1.07	127
467	0.31		60.11	177.85	176	174	1.00	2.55	300
468	0.27		60.11	177.70	176	174	1.00	2.23	263
469	0.32		60.11	177.56	176	174	1.00	2.64	310
470	0.25		60.11	177.42	176	174	1.00	2.10	246
471	0.39		60.11	177.33	176	174	1.00	3.23	379
472	0.07		60.11	177.18	175	173	1.00	0.57	67
473	0.28		60.11	177.04	175	173	1.00	2.37	278
474	0.27		60.11	176.95	175	173	1.00	2.22	259
475	0.33		60.11	176.76	175	173	1.00	2.79	325
476	0.34		60.11	176.66	175	173	1.00	2.80	327
477	0.38		60.07	176.52	175	173	1.00	3.19	371
478	0.39		60.11	176.38	175	173	1.00	3.22	375
479	0.34		60.11	176.28	175	173	1.00	2.85	332

WATER FLOW AND TEMPERATURE DATA - ASTM E2618

Client: Greentech
Model: RS7200E
Run #: 2

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/1/2020

	Flow (GPM)		Temperature Data (°F)						
Elapsed Time (min)	Load Side Flow	Appliance Flow (optional)	HEX Load In	HEX Load Out	HEX Supply In	HEX Supply Out	Specific Heat of Inlet Water (BTU/lb-°F)	Mass Flow Rate of Inlet Water (lb/min)	Heat Output (Btu)
480	0.40		60.07	176.14	174	172	1.00	3.35	389
481	0.07		60.07	176.00	174	172	1.00	0.56	64
482	0.27		60.11	175.86	174	172	1.00	2.23	258
483	0.33		60.07	175.72	174	172	1.00	2.77	321
484	0.07		60.07	175.58	174	172	1.00	0.56	64
485	0.32		60.07	175.43	174	172	1.00	2.66	307
486	0.37		60.07	175.34	174	172	1.00	3.07	355
487	0.37		60.07	175.20	173	171	1.00	3.08	355
488	0.27		60.07	175.01	173	171	1.00	2.22	256
489	0.39		60.07	174.92	173	171	1.00	3.22	370
490	0.28		60.07	174.77	173	171	1.00	2.37	272
491	0.27		60.07	174.63	173	171	1.00	2.28	262
492	0.31		60.07	174.49	173	171	1.00	2.62	300
493	0.38		60.07	174.35	173	171	1.00	3.15	360
494	0.07		60.07	174.26	173	171	1.00	0.56	64
495	0.28		60.02	174.12	172	170	1.00	2.37	271
496	0.40		60.07	173.97	172	170	1.00	3.36	383
497	0.30		60.07	173.83	172	170	1.00	2.51	286
498	0.27		60.02	173.69	172	170	1.00	2.22	252
499	0.27		60.07	173.55	172	170	1.00	2.23	253
500	0.33		60.02	173.41	172	170	1.00	2.79	316
501	0.37		60.02	173.31	172	170	1.00	3.09	350
502	0.44		60.02	173.13	171	170	1.00	3.64	412
503	0.24		60.02	173.03	171	169	1.00	1.96	222
504	0.35		60.02	172.94	171	169	1.00	2.94	333
505	0.29		60.02	172.75	171	169	1.00	2.38	268
506	0.28		60.02	172.61	171	169	1.00	2.35	265
507	0.23		60.02	172.51	171	169	1.00	1.94	219
508	0.33		60.02	172.32	171	169	1.00	2.76	310
509	0.24		59.97	172.23	171	169	1.00	1.96	221
510	0.39		60.02	172.09	170	168	1.00	3.23	362
511	0.27		60.02	171.95	170	168	1.00	2.24	252
512	0.07		60.02	171.81	170	168	1.00	0.55	61
513	0.40		60.02	171.71	170	168	1.00	3.36	376
514	0.28		60.02	171.57	170	168	1.00	2.36	264
515	0.28		60.02	171.38	170	168	1.00	2.37	264
516	0.37		59.97	171.29	170	168	1.00	3.07	343
517	0.39		59.97	171.15	169	168	1.00	3.22	358
518	0.34		59.97	171.01	169	167	1.00	2.80	311
519	0.33		59.97	170.86	169	167	1.00	2.78	308
520	0.30		59.97	170.72	169	167	1.00	2.48	275
521	0.31		59.97	170.58	169	167	1.00	2.56	283
522	0.32		59.97	170.49	169	167	1.00	2.65	293
523	0.35		59.97	170.35	169	167	1.00	2.92	323
524	0.33		59.97	170.20	168	167	1.00	2.78	307
525	0.32		59.97	170.01	168	166	1.00	2.64	291
526	0.35		59.97	169.87	168	166	1.00	2.93	323
527	0.27		59.97	169.69	168	166	1.00	2.22	243

WATER FLOW AND TEMPERATURE DATA - ASTM E2618

Client: Greentech
Model: RS7200E
Run #: 2

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/1/2020

	Flow (GPM)		Temperature Data (°F)						
Elapsed Time (min)	Load Side Flow	Appliance Flow (optional)	HEX Load In	HEX Load Out	HEX Supply In	HEX Supply Out	Specific Heat of Inlet Water (BTU/lb-°F)	Mass Flow Rate of Inlet Water (lb/min)	Heat Output (Btu)
528	0.35		59.97	169.59	168	166	1.00	2.93	322
529	0.30		59.97	169.50	168	166	1.00	2.51	275
530	0.35		59.97	169.55	168	166	1.00	2.91	319
531	0.24		59.97	169.69	168	166	1.00	2.02	222
532	0.27		59.97	169.92	168	167	1.00	2.26	249
533	0.28		59.93	170.25	168	167	1.00	2.37	262
534	0.32		59.97	170.63	169	167	1.00	2.64	293
535	0.07		59.93	171.15	169	168	1.00	0.55	61
536	0.30		59.97	171.71	170	168	1.00	2.49	278
537	0.07		59.93	172.42	171	169	1.00	0.55	62
538	0.28		59.97	173.27	171	170	1.00	2.37	269
539	0.25		59.97	173.93	172	171	1.00	2.08	238
540	0.07		59.93	174.87	173	172	1.00	0.55	63
541	0.28		59.97	175.95	174	173	1.00	2.36	274
542	0.07		59.97	177.00	175	174	1.00	0.55	64
543	0.07		59.93	178.18	176	175	1.00	0.55	65
544	0.32		59.93	179.27	178	176	1.00	2.70	322
545	0.35		59.93	180.45	179	177	1.00	2.92	352
546	0.23		59.93	181.73	180	178	1.00	1.96	239
547	0.35		59.97	183.06	181	180	1.00	2.93	361
548	0.35		59.97	184.24	182	181	1.00	2.91	362
549	0.25		59.93	185.66	184	182	1.00	2.08	262
550	0.28		59.97	186.93	185	184	1.00	2.36	299
551	0.33		59.97	187.83	186	184	1.00	2.78	356
552	0.32		59.97	188.44	186	185	1.00	2.64	339
553	0.25		59.97	188.91	187	185	1.00	2.09	270
554	0.23		60.02	189.43	187	186	1.00	1.93	251
555	0.37		60.02	189.81	188	186	1.00	3.10	403
556	0.26		60.02	190.09	188	186	1.00	2.18	284
557	0.37		60.02	190.42	188	187	1.00	3.09	403
558	0.30		60.02	190.65	189	187	1.00	2.50	327
559	0.30		60.02	190.89	189	187	1.00	2.47	324
560	0.37		60.07	191.08	189	187	1.00	3.04	399
561	0.23		60.07	191.22	189	187	1.00	1.95	256
562	0.33		60.07	191.41	190	188	1.00	2.76	363
563	0.06		60.07	191.55	190	188	1.00	0.54	71
564	0.06		60.07	191.69	190	188	1.00	0.54	71
565	0.32		60.11	191.83	190	188	1.00	2.63	347
566	0.07		60.11	191.93	190	188	1.00	0.58	76
567	0.35		60.11	192.02	190	188	1.00	2.93	386
568	0.27		60.11	192.12	191	188	1.00	2.24	296
569	0.23		60.11	192.21	191	188	1.00	1.93	256
570	0.27		60.11	192.26	191	188	1.00	2.28	302
571	0.07		60.11	192.30	191	188	1.00	0.59	78
572	0.27		60.11	192.35	191	188	1.00	2.22	293
573	0.35		60.16	192.40	191	189	1.00	2.92	386
574	0.33		60.11	192.44	191	189	1.00	2.77	367
575	0.37		60.16	192.49	191	189	1.00	3.04	403

WATER FLOW AND TEMPERATURE DATA - ASTM E2618

Client: Greentech
Model: RS7200E
Run #: 2

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/1/2020

	Flow (GPM)		Temperature Data (°F)						
Elapsed Time (min)	Load Side Flow	Appliance Flow (optional)	HEX Load In	HEX Load Out	HEX Supply In	HEX Supply Out	Specific Heat of Inlet Water (BTU/lb-°F)	Mass Flow Rate of Inlet Water (lb/min)	Heat Output (Btu)
576	0.35		60.11	192.44	191	189	1.00	2.91	386
577	0.35		60.11	192.44	191	189	1.00	2.93	388
578	0.25		60.16	192.49	191	189	1.00	2.08	276
579	0.06		60.11	192.49	191	189	1.00	0.54	72
580	0.30		60.11	192.44	191	189	1.00	2.50	332
581	0.06		60.11	192.49	191	189	1.00	0.54	72
582	0.33		60.11	192.49	191	189	1.00	2.78	368
583	0.42		60.11	192.44	191	189	1.00	3.46	458
584	0.27		60.11	192.40	191	189	1.00	2.27	300
585	0.07		60.07	192.40	191	188	1.00	0.56	74
586	0.34		60.11	192.35	190	188	1.00	2.82	373
587	0.28		60.07	192.30	191	188	1.00	2.36	312
588	0.32		60.07	192.30	191	188	1.00	2.64	349
589	0.30		60.02	192.26	191	188	1.00	2.51	333
590	0.07		60.07	192.21	191	188	1.00	0.55	73
591	0.31		60.02	192.16	190	188	1.00	2.62	347
592	0.32		60.02	192.16	190	188	1.00	2.64	349
593	0.30		60.07	192.07	190	188	1.00	2.49	329
594	0.25		60.07	192.02	190	188	1.00	2.08	275
595	0.35		60.07	191.97	190	188	1.00	2.92	385
596	0.39		60.02	191.97	190	188	1.00	3.21	424
597	0.30		60.07	191.88	190	188	1.00	2.51	331
598	0.27		60.07	191.83	190	188	1.00	2.24	295
599	0.32		60.07	191.79	190	188	1.00	2.63	347
600	0.32		60.02	191.69	190	188	1.00	2.66	351
601	0.33		60.02	191.64	190	188	1.00	2.76	363
602	0.34		60.02	191.55	190	188	1.00	2.87	378
603	0.31		60.02	191.50	190	188	1.00	2.55	335
604	0.26		60.02	191.45	190	188	1.00	2.21	291
605	0.07		59.97	191.36	190	187	1.00	0.56	73
606	0.30		59.97	191.27	190	187	1.00	2.50	329
607	0.32		59.97	191.17	190	187	1.00	2.63	345
608	0.37		59.97	191.08	189	187	1.00	3.07	404
609	0.27		59.93	191.03	189	187	1.00	2.22	291
610	0.34		59.88	190.99	189	187	1.00	2.79	367
611	0.27		59.88	190.89	189	187	1.00	2.22	291
612	0.28		59.88	190.80	189	187	1.00	2.36	310
613	0.37		59.84	190.70	189	187	1.00	3.07	402
614	0.28		59.79	190.61	189	187	1.00	2.36	310
615	0.42		59.74	190.51	189	187	1.00	3.49	457
616	0.27		59.74	190.42	189	186	1.00	2.24	294
617	0.25		59.74	190.37	189	186	1.00	2.09	273
618	0.25		59.70	190.28	189	186	1.00	2.10	274
619	0.27		59.65	190.18	189	186	1.00	2.25	294
620	0.30		59.65	190.04	188	186	1.00	2.46	321
621	0.25		59.65	189.99	188	186	1.00	2.11	276
622	0.07		59.60	189.85	188	186	1.00	0.56	72
623	0.35		59.60	189.81	188	186	1.00	2.92	381

WATER FLOW AND TEMPERATURE DATA - ASTM E2618

Client: Greentech
Model: RS7200E
Run #: 2

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/1/2020

	Flow (GPM)		Temperature Data (°F)						
Elapsed Time (min)	Load Side Flow	Appliance Flow (optional)	HEX Load In	HEX Load Out	HEX Supply In	HEX Supply Out	Specific Heat of Inlet Water (BTU/lb-°F)	Mass Flow Rate of Inlet Water (lb/min)	Heat Output (Btu)
624	0.07		59.56	189.67	188	186	1.00	0.56	72
625	0.35		59.60	189.57	188	186	1.00	2.93	381
626	0.35		59.56	189.48	188	186	1.00	2.93	381
627	0.32		59.56	189.38	188	185	1.00	2.65	345
628	0.07		59.56	189.29	188	185	1.00	0.56	72
629	0.40		59.60	189.19	188	185	1.00	3.36	436
630	0.28		59.56	189.05	187	185	1.00	2.36	306
631	0.07		59.56	188.96	187	185	1.00	0.55	71
632	0.07		59.56	188.82	187	185	1.00	0.56	72
633	0.25		59.60	188.72	187	185	1.00	2.07	267
634	0.28		59.60	188.68	187	185	1.00	2.36	304
635	0.33		59.60	188.53	187	184	1.00	2.78	359
636	0.31		59.60	188.44	187	184	1.00	2.55	329
637	0.32		59.60	188.30	187	184	1.00	2.64	340
638	0.28		59.65	188.16	187	184	1.00	2.35	302
639	0.29		59.65	188.11	186	184	1.00	2.38	306
640	0.07		59.65	187.97	186	184	1.00	0.55	70
641	0.33		59.65	187.83	186	184	1.00	2.79	358
642	0.32		59.65	187.73	186	184	1.00	2.66	341
643	0.28		59.65	187.59	186	184	1.00	2.36	302
644	0.25		59.65	187.50	186	184	1.00	2.10	268
645	0.06		59.70	187.40	186	183	1.00	0.54	69
646	0.40		59.70	187.26	186	183	1.00	3.36	429
647	0.37		59.70	187.12	186	183	1.00	3.08	393
648	0.39		59.70	187.03	185	183	1.00	3.21	409
649	0.33		59.74	186.88	185	183	1.00	2.78	354
650	0.29		59.70	186.74	185	183	1.00	2.39	303
651	0.37		59.74	186.65	185	183	1.00	3.06	389
652	0.33		59.74	186.56	185	183	1.00	2.79	354
653	0.32		59.74	186.41	185	182	1.00	2.64	335
654	0.37		59.74	186.27	185	182	1.00	3.07	390
655	0.28		59.74	186.18	185	182	1.00	2.36	299
656	0.38		59.74	186.04	184	182	1.00	3.20	405
657	0.30		59.74	185.89	184	182	1.00	2.50	316
658	0.39		59.79	185.75	184	182	1.00	3.22	406
659	0.07		59.79	185.66	184	182	1.00	0.55	69
660	0.37		59.79	185.52	184	182	1.00	3.07	386
661	0.28		59.79	185.42	184	181	1.00	2.36	297
662	0.38		59.79	185.28	184	181	1.00	3.20	402
663	0.25		59.79	185.19	183	181	1.00	2.09	262
664	0.35		59.79	185.05	183	181	1.00	2.88	361
665	0.29		59.74	184.90	183	181	1.00	2.38	298
666	0.35		59.79	184.81	183	181	1.00	2.93	366
667	0.32		59.74	184.62	183	181	1.00	2.65	331
668	0.28		59.74	184.53	183	181	1.00	2.37	296
669	0.27		59.74	184.38	183	180	1.00	2.24	279
670	0.07		59.70	184.24	183	180	1.00	0.56	70
671	0.35		59.70	184.15	182	180	1.00	2.93	366

WATER FLOW AND TEMPERATURE DATA - ASTM E2618

Client: Greentech
Model: RS7200E
Run #: 2

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/1/2020

	Flow (GPM)		Temperature Data (°F)						
Elapsed Time (min)	Load Side Flow	Appliance Flow (optional)	HEX Load In	HEX Load Out	HEX Supply In	HEX Supply Out	Specific Heat of Inlet Water (BTU/lb-°F)	Mass Flow Rate of Inlet Water (lb/min)	Heat Output (Btu)
672	0.25		59.65	184.00	182	180	1.00	2.08	259
673	0.37		59.65	183.86	182	180	1.00	3.07	381
674	0.29		59.65	183.72	182	180	1.00	2.38	295
675	0.28		59.60	183.63	182	180	1.00	2.36	293
676	0.32		59.60	183.44	182	180	1.00	2.66	330
677	0.37		59.60	183.34	182	179	1.00	3.07	381
678	0.28		59.60	183.20	182	179	1.00	2.36	292
679	0.30		59.60	183.10	181	179	1.00	2.50	309
680	0.34		59.60	182.96	181	179	1.00	2.79	345
681	0.37		59.60	182.82	181	179	1.00	3.06	377
682	0.40		59.60	182.68	181	179	1.00	3.35	413
683	0.33		59.60	182.54	181	179	1.00	2.78	342
684	0.34		59.60	182.40	181	178	1.00	2.79	343
685	0.35		59.60	182.25	181	178	1.00	2.92	358
686	0.30		59.60	182.16	180	178	1.00	2.50	307
687	0.30		59.60	182.02	180	178	1.00	2.51	308
688	0.07		59.60	181.87	180	178	1.00	0.59	73
689	0.31		59.60	181.68	180	178	1.00	2.62	320
690	0.33		59.60	181.59	180	177	1.00	2.72	332
691	0.22		59.60	181.40	180	177	1.00	1.80	220
692	0.09		59.60	181.26	179	177	1.00	0.72	88
693	0.30		59.65	181.16	179	177	1.00	2.51	306
694	0.07		59.65	181.02	179	177	1.00	0.56	68
695	0.32		59.65	180.88	179	177	1.00	2.66	323
696	0.39		59.65	180.74	179	177	1.00	3.23	392
697	0.25		59.65	180.60	179	177	1.00	2.09	253
698	0.35		59.70	180.45	179	177	1.00	2.93	354
699	0.32		59.70	180.31	178	176	1.00	2.66	321
700	0.25		59.70	180.17	178	176	1.00	2.09	252
701	0.35		59.70	180.03	178	176	1.00	2.93	353
702	0.32		59.70	179.88	178	176	1.00	2.67	321
703	0.31		59.70	179.74	178	176	1.00	2.62	315
704	0.32		59.70	179.60	177	176	1.00	2.68	322
705	0.25		59.70	179.41	178	175	1.00	2.09	250
706	0.37		59.70	179.32	178	175	1.00	3.06	366
707	0.35		59.70	179.17	177	175	1.00	2.92	349
708	0.28		59.70	178.98	177	175	1.00	2.36	281
709	0.28		59.70	178.89	177	175	1.00	2.36	282
710	0.35		59.70	178.75	177	175	1.00	2.93	349
711	0.07		59.70	178.60	177	175	1.00	0.55	65
712	0.34		59.74	178.46	176	175	1.00	2.79	332
713	0.07		59.74	178.32	176	174	1.00	0.56	66
714	0.27		59.74	178.13	176	174	1.00	2.22	263
715	0.35		59.74	178.04	176	174	1.00	2.93	347
716	0.31		59.79	177.85	176	174	1.00	2.55	301
717	0.33		59.79	177.75	176	174	1.00	2.77	327
718	0.30		59.74	177.61	176	174	1.00	2.50	295
719	0.30		59.74	177.47	176	174	1.00	2.50	294

WATER FLOW AND TEMPERATURE DATA - ASTM E2618

Client: Greentech
Model: RS7200E
Run #: 2

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/1/2020

	Flow (GPM)		Temperature Data (°F)						
Elapsed Time (min)	Load Side Flow	Appliance Flow (optional)	HEX Load In	HEX Load Out	HEX Supply In	HEX Supply Out	Specific Heat of Inlet Water (BTU/lb-°F)	Mass Flow Rate of Inlet Water (lb/min)	Heat Output (Btu)
720	0.33		59.79	177.33	175	173	1.00	2.78	327
721	0.30		59.74	177.14	175	173	1.00	2.50	294
722	0.28		59.74	177.04	175	173	1.00	2.36	278
723	0.37		59.74	176.90	175	173	1.00	3.09	362
724	0.37		59.74	176.71	175	173	1.00	3.07	359
725	0.32		59.74	176.57	175	173	1.00	2.65	309
726	0.37		59.74	176.43	174	172	1.00	3.07	358
727	0.37		59.74	176.28	174	172	1.00	3.08	360
728	0.30		59.74	176.10	175	172	1.00	2.50	291
729	0.30		59.74	176.00	174	172	1.00	2.49	290
730	0.25		59.74	175.86	174	172	1.00	2.09	243
731	0.32		59.74	175.72	174	172	1.00	2.65	307
732	0.25		59.79	175.53	174	172	1.00	2.09	242
733	0.27		59.79	175.39	173	172	1.00	2.23	258
734	0.35		59.79	175.25	173	171	1.00	2.93	339
735	0.25		59.79	175.11	173	171	1.00	2.07	240
736	0.28		59.79	174.96	173	171	1.00	2.35	271
737	0.25		59.79	174.82	173	171	1.00	2.10	242
738	0.37		59.74	174.68	173	171	1.00	3.07	353
739	0.33		59.74	174.54	173	171	1.00	2.77	318
740	0.27		59.74	174.35	172	171	1.00	2.22	255
741	0.28		59.74	174.26	172	170	1.00	2.36	270
742	0.07		59.74	174.12	172	170	1.00	0.56	64
743	0.40		59.74	173.93	172	170	1.00	3.36	384
744	0.23		59.79	173.79	172	170	1.00	1.95	222
745	0.30		59.74	173.64	172	170	1.00	2.50	285
746	0.27		59.74	173.50	172	170	1.00	2.23	254
747	0.28		59.74	173.36	171	170	1.00	2.36	269
748	0.28		59.74	173.22	171	169	1.00	2.37	269
749	0.34		59.74	173.08	171	169	1.00	2.85	323
750	0.06		59.74	172.94	171	169	1.00	0.53	60
751	0.25		59.74	172.75	171	169	1.00	2.10	238
752	0.37		59.74	172.61	171	169	1.00	3.07	347
753	0.23		59.79	172.51	171	169	1.00	1.96	221
754	0.33		59.74	172.32	170	169	1.00	2.78	313
755	0.30		59.74	172.18	170	168	1.00	2.50	282
756	0.33		59.74	172.04	170	168	1.00	2.77	312
757	0.35		59.74	171.90	170	168	1.00	2.93	329
758	0.37		59.79	171.76	170	168	1.00	3.06	343
759	0.24		59.74	171.62	170	168	1.00	1.97	221
760	0.38		59.70	171.43	170	168	1.00	3.14	351
761	0.32		59.70	171.33	170	168	1.00	2.64	295
762	0.25		59.70	171.19	169	167	1.00	2.10	234
763	0.37		59.70	171.01	169	167	1.00	3.07	343
764	0.30		59.70	170.86	169	167	1.00	2.50	278
765	0.28		59.65	170.72	169	167	1.00	2.36	262
766	0.28		59.65	170.58	169	167	1.00	2.36	262
767	0.35		59.65	170.39	168	167	1.00	2.93	324

WATER FLOW AND TEMPERATURE DATA - ASTM E2618

Client: Greentech
Model: RS7200E
Run #: 2

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/1/2020

	Flow (GPM)		Temperature Data (°F)						
Elapsed Time (min)	Load Side Flow	Appliance Flow (optional)	HEX Load In	HEX Load Out	HEX Supply In	HEX Supply Out	Specific Heat of Inlet Water (BTU/lb-°F)	Mass Flow Rate of Inlet Water (lb/min)	Heat Output (Btu)
768	0.07		59.60	170.25	169	166	1.00	0.58	64
769	0.34		59.60	170.11	168	166	1.00	2.79	309
770	0.23		59.60	169.97	168	166	1.00	1.92	212
771	0.38		59.60	169.87	168	166	1.00	3.16	348
772	0.07		59.56	169.73	168	166	1.00	0.56	62
773	0.28		59.56	169.73	168	166	1.00	2.37	262
774	0.37		59.51	169.78	168	166	1.00	3.07	339
775	0.32		59.51	169.97	168	166	1.00	2.65	293
776	0.06		59.46	170.25	168	167	1.00	0.54	60
777	0.28		59.46	170.58	169	167	1.00	2.35	261
778	0.33		59.46	170.96	169	167	1.00	2.78	310
779	0.32		59.46	171.52	170	168	1.00	2.64	296
780	0.35		59.46	172.14	170	169	1.00	2.92	329
781	0.40		59.42	172.75	171	169	1.00	3.35	380
782	0.34		59.42	173.50	172	170	1.00	2.80	320
783	0.25		59.42	174.26	172	171	1.00	2.09	240
784	0.25		59.46	175.01	173	172	1.00	2.09	242
785	0.37		59.46	176.00	174	173	1.00	3.06	357
786	0.30		59.46	176.90	175	174	1.00	2.49	293
787	0.35		59.46	177.80	176	174	1.00	2.93	347
788	0.37		59.42	178.65	177	175	1.00	3.09	369
789	0.35		59.42	179.70	178	176	1.00	2.93	353
790	0.25		59.46	180.78	179	177	1.00	2.08	253
791	0.33		59.42	181.73	180	178	1.00	2.77	339
792	0.31		59.46	182.87	181	180	1.00	2.62	324
793	0.29		59.42	183.86	182	181	1.00	2.40	299
794	0.37		59.42	185.09	183	182	1.00	3.07	386
795	0.25		59.42	186.08	185	183	1.00	2.09	265
796	0.35		59.42	187.26	186	184	1.00	2.93	376
797	0.30		59.42	187.87	186	184	1.00	2.50	321
798	0.37		59.37	188.39	186	185	1.00	3.06	395
799	0.32		59.37	188.72	187	185	1.00	2.64	342
800	0.28		59.37	189.15	187	185	1.00	2.36	306
801	0.25		59.42	189.43	187	186	1.00	2.10	274
802	0.33		59.42	189.71	188	186	1.00	2.77	361
803	0.30		59.42	189.95	188	186	1.00	2.49	325
804	0.23		59.42	190.14	188	186	1.00	1.94	254
805	0.30		59.42	190.23	188	186	1.00	2.49	326
806	0.28		59.42	190.42	188	186	1.00	2.36	309
807	0.37		59.42	190.51	189	187	1.00	3.06	402
808	0.25		59.42	190.65	189	187	1.00	2.07	273
809	0.33		59.42	190.75	189	187	1.00	2.77	364
810	0.07		59.42	190.80	189	187	1.00	0.55	72
811	0.25		59.42	190.89	189	187	1.00	2.09	275
812	0.38		59.42	190.94	189	187	1.00	3.20	421
813	0.30		59.42	190.94	189	187	1.00	2.51	331
814	0.09		59.46	190.99	189	187	1.00	0.76	100
815	0.07		59.46	191.03	189	187	1.00	0.56	73

WATER FLOW AND TEMPERATURE DATA - ASTM E2618

Client: Greentech
Model: RS7200E
Run #: 2

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/1/2020

	Flow (GPM)		Temperature Data (°F)						
Elapsed Time (min)	Load Side Flow	Appliance Flow (optional)	HEX Load In	HEX Load Out	HEX Supply In	HEX Supply Out	Specific Heat of Inlet Water (BTU/lb-°F)	Mass Flow Rate of Inlet Water (lb/min)	Heat Output (Btu)
816	0.27		59.46	191.03	189	187	1.00	2.23	294
817	0.32		59.51	191.03	189	187	1.00	2.65	349
818	0.34		59.46	191.03	189	187	1.00	2.79	368
819	0.39		59.51	191.08	189	187	1.00	3.22	425
820	0.42		59.46	191.03	189	187	1.00	3.52	464
821	0.28		59.51	191.03	189	187	1.00	2.36	311
822	0.25		59.51	190.99	189	187	1.00	2.09	275
823	0.39		59.56	190.99	189	187	1.00	3.22	424
824	0.42		59.56	190.89	189	187	1.00	3.46	455
825	0.36		59.51	190.89	189	187	1.00	3.00	395
826	0.34		59.51	190.84	189	187	1.00	2.80	368
827	0.40		59.56	190.80	189	187	1.00	3.36	442
828	0.37		59.56	190.70	189	187	1.00	3.05	401
829	0.32		59.56	190.70	189	187	1.00	2.64	346
830	0.25		59.56	190.61	189	187	1.00	2.08	273
831	0.07		59.56	190.56	189	186	1.00	0.57	75
832	0.25		59.60	190.47	189	186	1.00	2.10	275
833	0.35		59.60	190.42	189	186	1.00	2.93	383
834	0.30		59.56	190.37	189	186	1.00	2.52	330
835	0.24		59.56	190.28	189	186	1.00	2.01	263
836	0.28		59.60	190.23	189	186	1.00	2.32	303
837	0.32		59.60	190.14	189	186	1.00	2.63	344
838	0.37		59.60	190.04	188	186	1.00	3.06	400
839	0.33		59.60	189.99	188	186	1.00	2.78	363
840	0.25		59.60	189.85	188	186	1.00	2.10	274
841	0.06		59.60	189.76	188	186	1.00	0.54	70
842	0.25		59.60	189.67	188	186	1.00	2.09	272
843	0.35		59.65	189.62	188	185	1.00	2.94	383
844	0.27		59.65	189.52	188	185	1.00	2.22	289
845	0.39		59.65	189.43	188	185	1.00	3.21	417
846	0.32		59.65	189.29	188	185	1.00	2.65	344
847	0.27		59.65	189.24	188	185	1.00	2.29	297
848	0.07		59.65	189.10	187	185	1.00	0.55	71
849	0.25		59.65	189.05	187	185	1.00	2.10	273
850	0.30		59.65	188.91	187	185	1.00	2.50	323
851	0.30		59.65	188.82	187	185	1.00	2.50	323
852	0.32		59.65	188.68	187	185	1.00	2.65	342
853	0.28		59.65	188.58	187	185	1.00	2.37	306
854	0.25		59.65	188.49	187	184	1.00	2.10	270
855	0.32		59.65	188.39	187	184	1.00	2.63	339
856	0.39		59.65	188.25	187	184	1.00	3.22	414
857	0.27		59.65	188.16	187	184	1.00	2.24	289
858	0.38		59.65	188.06	186	184	1.00	3.14	404
859	0.35		59.65	187.97	186	184	1.00	2.93	377
860	0.37		59.65	187.83	186	184	1.00	3.07	395
861	0.30		59.65	187.73	186	184	1.00	2.50	321
862	0.32		59.65	187.59	186	184	1.00	2.65	339
863	0.28		59.65	187.45	186	183	1.00	2.37	303

WATER FLOW AND TEMPERATURE DATA - ASTM E2618

Client: Greentech
Model: RS7200E
Run #: 2

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/1/2020

	Flow (GPM)		Temperature Data (°F)						
Elapsed Time (min)	Load Side Flow	Appliance Flow (optional)	HEX Load In	HEX Load Out	HEX Supply In	HEX Supply Out	Specific Heat of Inlet Water (BTU/lb-°F)	Mass Flow Rate of Inlet Water (lb/min)	Heat Output (Btu)
864	0.39		59.65	187.36	186	183	1.00	3.22	411
865	0.25		59.70	187.26	186	183	1.00	2.11	270
866	0.07		59.65	187.12	185	183	1.00	0.55	70
867	0.27		59.70	186.98	185	183	1.00	2.24	285
868	0.31		59.70	186.88	185	183	1.00	2.56	325
869	0.34		59.70	186.74	185	183	1.00	2.85	363
870	0.37		59.70	186.65	185	183	1.00	3.07	390
871	0.28		59.70	186.51	185	182	1.00	2.36	299
872	0.39		59.70	186.41	185	182	1.00	3.22	408
873	0.32		59.70	186.27	185	182	1.00	2.66	337
874	0.35		59.70	186.13	184	182	1.00	2.95	373
875	0.29		59.70	186.04	184	182	1.00	2.39	302
876	0.35		59.70	185.89	184	182	1.00	2.95	373
877	0.32		59.70	185.80	184	182	1.00	2.67	337
878	0.25		59.65	185.66	184	182	1.00	2.05	259
879	0.36		59.65	185.52	184	181	1.00	3.03	382
880	0.29		59.65	185.42	184	181	1.00	2.38	299
881	0.32		59.70	185.28	184	181	1.00	2.65	333
882	0.39		59.70	185.09	183	181	1.00	3.23	406
883	0.27		59.70	185.00	183	181	1.00	2.24	282
884	0.29		59.70	184.86	183	181	1.00	2.38	298
885	0.32		59.70	184.72	183	181	1.00	2.65	332
886	0.30		59.65	184.62	183	181	1.00	2.53	317
887	0.25		59.70	184.48	183	180	1.00	2.12	265
888	0.27		59.70	184.38	183	180	1.00	2.22	277
889	0.30		59.70	184.24	182	180	1.00	2.53	315
890	0.35		59.70	184.05	182	180	1.00	2.93	364
891	0.32		59.70	183.91	182	180	1.00	2.65	329
892	0.28		59.70	183.77	182	180	1.00	2.36	294
893	0.29		59.74	183.67	182	180	1.00	2.38	295
894	0.30		59.70	183.53	182	180	1.00	2.52	312
895	0.39		59.70	183.39	182	179	1.00	3.23	400
896	0.35		59.70	183.30	182	179	1.00	2.93	362
897	0.34		59.70	183.10	181	179	1.00	2.79	345
898	0.30		59.70	182.96	181	179	1.00	2.46	304
899	0.30		59.70	182.82	181	179	1.00	2.51	310
900	0.30		59.70	182.73	181	179	1.00	2.51	309
901	0.37		59.70	182.58	181	179	1.00	3.07	377
902	0.34		59.65	182.44	181	178	1.00	2.80	344
903	0.34		59.65	182.30	181	178	1.00	2.81	345
904	0.34		59.65	182.16	180	178	1.00	2.79	343
905	0.46		59.65	182.02	180	178	1.00	3.79	465
906	0.27		59.65	181.87	180	178	1.00	2.26	277
907	0.28		59.65	181.73	180	178	1.00	2.37	290
908	0.39		59.65	181.59	180	178	1.00	3.22	393
909	0.38		59.65	181.45	180	177	1.00	3.17	387
910	0.34		59.60	181.30	180	177	1.00	2.79	340
911	0.27		59.60	181.21	179	177	1.00	2.24	272

WATER FLOW AND TEMPERATURE DATA - ASTM E2618

Client: Greentech
Model: RS7200E
Run #: 2

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/1/2020

	Flow (GPM)		Temperature Data (°F)						
Elapsed Time (min)	Load Side Flow	Appliance Flow (optional)	HEX Load In	HEX Load Out	HEX Supply In	HEX Supply Out	Specific Heat of Inlet Water (BTU/lb-°F)	Mass Flow Rate of Inlet Water (lb/min)	Heat Output (Btu)
912	0.30		59.60	181.02	179	177	1.00	2.51	305
913	0.35		59.60	180.93	179	177	1.00	2.93	356
914	0.28		59.60	180.78	179	177	1.00	2.37	288
915	0.35		59.60	180.60	179	177	1.00	2.95	357
916	0.30		59.60	180.45	179	176	1.00	2.51	304
917	0.26		59.60	180.36	179	176	1.00	2.13	257
918	0.09		59.60	180.22	178	176	1.00	0.73	89
919	0.28		59.56	180.03	178	176	1.00	2.35	283
920	0.34		59.56	179.88	178	176	1.00	2.82	339
921	0.25		59.56	179.74	178	176	1.00	2.11	254
922	0.34		59.56	179.60	178	176	1.00	2.81	337
923	0.37		59.56	179.46	178	175	1.00	3.09	371
924	0.30		59.60	179.32	177	175	1.00	2.52	302
925	0.34		59.56	179.17	177	175	1.00	2.80	335
926	0.27		59.56	179.03	177	175	1.00	2.25	269
927	0.24		59.56	178.89	177	175	1.00	2.00	239
928	0.35		59.56	178.75	177	175	1.00	2.92	348
929	0.24		59.56	178.60	177	175	1.00	1.99	237
930	0.33		59.56	178.46	177	174	1.00	2.78	331
931	0.39		59.56	178.27	176	174	1.00	3.23	384
932	0.32		59.56	178.13	176	174	1.00	2.67	317
933	0.39		59.56	177.99	176	174	1.00	3.25	385
934	0.35		59.56	177.85	176	174	1.00	2.94	348
935	0.37		59.56	177.70	176	174	1.00	3.08	365
936	0.30		59.56	177.56	176	174	1.00	2.52	298
937	0.35		59.56	177.42	176	173	1.00	2.91	344
938	0.24		59.56	177.28	175	173	1.00	2.02	238
939	0.07		59.56	177.14	175	173	1.00	0.57	67
940	0.28		59.51	177.00	175	173	1.00	2.37	279
941	0.25		59.51	176.80	175	173	1.00	2.10	246
942	0.35		59.51	176.71	175	173	1.00	2.93	343
943	0.34		59.51	176.52	175	173	1.00	2.79	327
944	0.35		59.51	176.38	175	173	1.00	2.93	343
945	0.35		59.56	176.24	174	172	1.00	2.93	343
946	0.25		59.51	176.10	174	172	1.00	2.10	246
947	0.32		59.56	175.95	174	172	1.00	2.67	311
948	0.30		59.56	175.81	174	172	1.00	2.51	292
949	0.34		59.56	175.67	174	172	1.00	2.84	330
950	0.33		59.51	175.53	174	172	1.00	2.79	324
951	0.39		59.56	175.39	174	172	1.00	3.23	375
952	0.30		59.56	175.20	173	171	1.00	2.52	292
953	0.35		59.51	175.06	173	171	1.00	2.95	341
954	0.30		59.51	174.92	173	171	1.00	2.53	292
955	0.32		59.51	174.77	173	171	1.00	2.66	307
956	0.29		59.51	174.63	173	171	1.00	2.38	274
957	0.26		59.51	174.49	173	171	1.00	2.13	245
958	0.07		59.46	174.35	173	170	1.00	0.59	68
959	0.38		59.46	174.16	172	170	1.00	3.16	362

WATER FLOW AND TEMPERATURE DATA - ASTM E2618

Client: Greentech
Model: RS7200E
Run #: 2

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/1/2020

	Flow (GPM)		Temperature Data (°F)						
Elapsed Time (min)	Load Side Flow	Appliance Flow (optional)	HEX Load In	HEX Load Out	HEX Supply In	HEX Supply Out	Specific Heat of Inlet Water (BTU/lb-°F)	Mass Flow Rate of Inlet Water (lb/min)	Heat Output (Btu)
960	0.07		59.46	174.02	172	170	1.00	0.57	65
961	0.25		59.51	173.93	172	170	1.00	2.10	241
962	0.27		59.46	173.74	172	170	1.00	2.25	257
963	0.30		59.46	173.55	172	170	1.00	2.51	287
964	0.39		59.51	173.45	172	170	1.00	3.23	369
965	0.35		59.46	173.27	172	169	1.00	2.94	335
966	0.32		59.46	173.17	171	169	1.00	2.66	303
967	0.37		59.46	172.99	171	169	1.00	3.10	352
968	0.41		59.46	172.84	171	169	1.00	3.42	388
969	0.07		59.42	172.70	171	169	1.00	0.56	63
970	0.35		59.46	172.56	171	169	1.00	2.93	332
971	0.27		59.46	172.42	171	169	1.00	2.25	254
972	0.34		59.42	172.28	170	168	1.00	2.79	316
973	0.07		59.42	172.09	170	168	1.00	0.58	65
974	0.35		59.42	171.95	170	168	1.00	2.93	331
975	0.32		59.42	171.81	170	168	1.00	2.65	298
976	0.35		59.42	171.67	170	168	1.00	2.94	331
977	0.07		59.42	171.52	170	168	1.00	0.59	67
978	0.37		59.37	171.38	170	168	1.00	3.05	342
979	0.34		59.37	171.24	169	167	1.00	2.82	315
980	0.42		59.37	171.10	169	167	1.00	3.48	390
981	0.27		59.32	170.91	169	167	1.00	2.24	250
982	0.27		59.32	170.77	169	167	1.00	2.23	249
983	0.30		59.32	170.63	169	167	1.00	2.51	280
984	0.37		59.37	170.49	168	167	1.00	3.08	343
985	0.32		59.32	170.30	169	166	1.00	2.64	293
986	0.32		59.32	170.20	169	166	1.00	2.63	292
987	0.42		59.32	170.06	168	166	1.00	3.50	389
988	0.33		59.32	169.87	168	166	1.00	2.76	306
989	0.37		59.32	169.73	168	166	1.00	3.09	342
990	0.28		59.32	169.64	168	166	1.00	2.37	262
991	0.25		59.32	169.50	167	166	1.00	2.11	233
992	0.34		59.32	169.31	167	166	1.00	2.79	308
993	0.37		59.32	169.17	167	165	1.00	3.08	339
994	0.32		59.32	169.03	167	165	1.00	2.64	290
995	0.35		59.32	168.88	166	165	1.00	2.90	318
996	0.31		59.32	168.74	166	165	1.00	2.62	287
997	0.27		59.32	168.60	166	165	1.00	2.23	244
998	0.28		59.32	168.51	166	165	1.00	2.37	259
999	0.34		59.32	168.41	166	165	1.00	2.79	305
1000	0.34		59.37	168.37	166	165	1.00	2.79	305
1001	0.24		59.32	168.37	166	165	1.00	1.97	215
1002	0.39		59.32	168.46	166	165	1.00	3.25	355
1003	0.37		59.32	168.56	166	165	1.00	3.08	337
1004	0.30		59.32	168.70	167	165	1.00	2.51	275
1005	0.35		59.32	168.93	167	166	1.00	2.95	324
1006	0.29		59.32	169.21	167	166	1.00	2.42	267
1007	0.33		59.37	169.55	167	166	1.00	2.79	307

WATER FLOW AND TEMPERATURE DATA - ASTM E2618

Client: Greentech
Model: RS7200E
Run #: 2

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/1/2020

	Flow (GPM)		Temperature Data (°F)						
Elapsed Time (min)	Load Side Flow	Appliance Flow (optional)	HEX Load In	HEX Load Out	HEX Supply In	HEX Supply Out	Specific Heat of Inlet Water (BTU/lb-°F)	Mass Flow Rate of Inlet Water (lb/min)	Heat Output (Btu)
1008	0.30		59.32	169.92	168	167	1.00	2.50	276
1009	0.34		59.32	170.30	168	167	1.00	2.79	310
1010	0.35		59.32	170.77	169	167	1.00	2.93	327
1011	0.27		59.32	171.29	169	168	1.00	2.23	250
1012	0.30		59.32	171.90	170	168	1.00	2.50	282
1013	0.32		59.32	172.47	171	169	1.00	2.65	300
1014	0.30		59.32	173.08	171	170	1.00	2.51	286
1015	0.35		59.37	173.74	172	170	1.00	2.93	335
1016	0.32		59.37	174.40	173	171	1.00	2.70	311
1017	0.35		59.37	175.20	173	172	1.00	2.93	340
1018	0.28		59.37	175.81	174	173	1.00	2.37	276
1019	0.28		59.37	176.57	175	173	1.00	2.37	278
1020	0.37		59.37	177.33	175	174	1.00	3.08	364
1021	0.37		59.37	178.04	176	175	1.00	3.07	365
1022	0.33		59.37	178.80	177	175	1.00	2.79	333
1023	0.30		59.42	179.50	178	176	1.00	2.50	301
1024	0.25		59.37	180.17	178	177	1.00	2.10	254
1025	0.40		59.37	180.88	179	177	1.00	3.36	409
1026	0.19		59.37	181.54	180	178	1.00	1.59	194
1027	0.25		59.42	182.25	180	179	1.00	2.09	257
1028	0.27		59.42	183.01	181	180	1.00	2.22	275
1029	0.37		59.42	183.58	182	180	1.00	3.08	383
1030	0.27		59.42	184.29	182	181	1.00	2.22	277
1031	0.07		59.42	184.95	183	181	1.00	0.56	70
1032	0.27		59.42	185.57	184	182	1.00	2.23	282
1033	0.33		59.42	186.08	184	183	1.00	2.78	352
1034	0.32		59.42	186.51	184	183	1.00	2.65	337
1035	0.32		59.42	186.84	185	183	1.00	2.66	339
1036	0.38		59.42	187.03	185	183	1.00	3.13	399
1037	0.33		59.46	187.17	185	183	1.00	2.73	349
1038	0.30		59.46	187.31	185	183	1.00	2.51	322
1039	0.29		59.46	187.36	185	184	1.00	2.38	305
1040	0.32		59.51	187.45	185	184	1.00	2.65	339
1041	0.07		59.46	187.50	185	184	1.00	0.56	71
1042	0.32		59.51	187.55	185	184	1.00	2.65	339
1043	0.27		59.51	187.55	185	184	1.00	2.22	284
1044	0.35		59.51	187.55	186	184	1.00	2.92	374
1045	0.30		59.51	187.50	186	184	1.00	2.50	320
1046	0.29		59.56	187.50	186	184	1.00	2.38	305
1047	0.24		59.51	187.50	186	184	1.00	1.96	252
1048	0.32		59.51	187.45	186	183	1.00	2.66	341
1049	0.28		59.51	187.40	186	183	1.00	2.37	304
1050	0.35		59.51	187.36	186	183	1.00	2.93	375
1051	0.38		59.51	187.26	185	183	1.00	3.20	409
1052	0.35		59.51	187.21	185	183	1.00	2.93	374
1053	0.30		59.51	187.17	185	183	1.00	2.50	319
1054	0.25		59.51	187.07	185	183	1.00	2.09	267
1055	0.30		59.51	186.98	185	183	1.00	2.52	321

WATER FLOW AND TEMPERATURE DATA - ASTM E2618

Client: Greentech
Model: RS7200E
Run #: 2

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/1/2020

	Flow (GPM)		Temperature Data (°F)						
Elapsed Time (min)	Load Side Flow	Appliance Flow (optional)	HEX Load In	HEX Load Out	HEX Supply In	HEX Supply Out	Specific Heat of Inlet Water (BTU/lb-°F)	Mass Flow Rate of Inlet Water (lb/min)	Heat Output (Btu)
1056	0.32		59.51	186.93	185	183	1.00	2.69	343
1057	0.37		59.51	186.84	185	183	1.00	3.10	396
1058	0.31		59.51	186.70	185	183	1.00	2.59	329
1059	0.30		59.51	186.65	185	183	1.00	2.50	319
1060	0.28		59.51	186.56	185	183	1.00	2.37	302
1061	0.44		59.51	186.46	185	182	1.00	3.65	463
1062	0.32		59.51	186.37	185	182	1.00	2.65	337
1063	0.35		59.51	186.23	184	182	1.00	2.93	372
1064	0.35		59.51	186.13	184	182	1.00	2.94	373
1065	0.32		59.51	185.99	184	182	1.00	2.65	335
1066	0.30		59.51	185.89	184	182	1.00	2.50	316
1067	0.30		59.51	185.85	184	182	1.00	2.49	315
1068	0.27		59.51	185.66	184	182	1.00	2.24	283
1069	0.35		59.46	185.52	184	182	1.00	2.89	365
1070	0.35		59.51	185.42	184	181	1.00	2.94	371
1071	0.29		59.46	185.33	184	181	1.00	2.38	300
1072	0.35		59.46	185.19	183	181	1.00	2.93	369
1073	0.39		59.42	185.05	183	181	1.00	3.22	404
1074	0.30		59.42	184.95	183	181	1.00	2.51	316
1075	0.30		59.37	184.86	183	181	1.00	2.52	317
1076	0.40		59.37	184.72	183	181	1.00	3.36	422
1077	0.07		59.32	184.57	183	181	1.00	0.60	75
1078	0.28		59.32	184.43	183	180	1.00	2.36	296
1079	0.37		59.28	184.29	183	180	1.00	3.12	390
1080	0.08		59.23	184.15	182	180	1.00	0.64	80
1081	0.40		59.23	184.00	182	180	1.00	3.37	421
1082	0.07		59.19	183.91	182	180	1.00	0.57	71
1083	0.35		59.14	183.77	182	180	1.00	2.95	368
1084	0.28		59.14	183.63	182	180	1.00	2.36	294
1085	0.24		59.14	183.48	182	179	1.00	1.97	245
1086	0.32		59.09	183.34	182	179	1.00	2.65	329
1087	0.32		59.09	183.20	181	179	1.00	2.66	331
1088	0.29		59.05	183.06	181	179	1.00	2.38	295
1089	0.35		59.05	182.87	181	179	1.00	2.94	365
1090	0.38		59.05	182.82	181	179	1.00	3.13	388
1091	0.25		59.05	182.63	181	179	1.00	2.10	259
1092	0.40		59.05	182.49	181	178	1.00	3.36	415
1093	0.28		59.05	182.35	181	178	1.00	2.37	293
1094	0.28		59.00	182.20	180	178	1.00	2.37	292
1095	0.35		59.05	182.06	180	178	1.00	2.93	360
1096	0.35		59.09	181.92	180	178	1.00	2.95	363
1097	0.29		59.05	181.78	180	178	1.00	2.38	292
1098	0.40		59.05	181.59	180	178	1.00	3.36	412
1099	0.39		59.09	181.50	180	177	1.00	3.23	396
1100	0.30		59.09	181.30	180	177	1.00	2.52	308
1101	0.30		59.09	181.21	179	177	1.00	2.53	309
1102	0.31		59.09	181.07	179	177	1.00	2.59	316
1103	0.28		59.09	180.93	179	177	1.00	2.37	289

WATER FLOW AND TEMPERATURE DATA - ASTM E2618

Client: Greentech
Model: RS7200E
Run #: 2

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/1/2020

	Flow (GPM)		Temperature Data (°F)						
Elapsed Time (min)	Load Side Flow	Appliance Flow (optional)	HEX Load In	HEX Load Out	HEX Supply In	HEX Supply Out	Specific Heat of Inlet Water (BTU/lb-°F)	Mass Flow Rate of Inlet Water (lb/min)	Heat Output (Btu)
1104	0.25		59.09	180.74	179	177	1.00	2.12	258
1105	0.32		59.09	180.60	179	177	1.00	2.65	322
1106	0.32		59.14	180.45	179	176	1.00	2.64	320
1107	0.32		59.14	180.31	178	176	1.00	2.64	320
1108	0.32		59.14	180.17	178	176	1.00	2.65	321
1109	0.27		59.14	180.03	178	176	1.00	2.23	270
1110	0.35		59.14	179.84	178	176	1.00	2.93	355
1111	0.26		59.19	179.70	178	176	1.00	2.16	260
1112	0.30		59.19	179.55	178	176	1.00	2.50	302
1113	0.21		59.19	179.41	178	175	1.00	1.78	214
1114	0.07		59.19	179.27	177	175	1.00	0.57	69
1115	0.25		59.19	179.13	177	175	1.00	2.11	254
1116	0.37		59.23	178.94	177	175	1.00	3.07	368
1117	0.30		59.23	178.84	177	175	1.00	2.51	301
1118	0.07		59.19	178.65	177	175	1.00	0.55	66
1119	0.27		59.23	178.51	177	175	1.00	2.23	266
1120	0.25		59.23	178.32	177	174	1.00	2.10	250
1121	0.32		59.28	178.23	176	174	1.00	2.66	317
1122	0.29		59.23	178.08	176	174	1.00	2.41	287
1123	0.17		59.28	177.90	176	174	1.00	1.43	170
1124	0.28		59.28	177.75	176	174	1.00	2.37	281
1125	0.30		59.28	177.61	176	174	1.00	2.51	298
1126	0.25		59.28	177.47	176	174	1.00	2.10	249
1127	0.35		59.28	177.28	175	173	1.00	2.95	348
1128	0.28		59.28	177.14	175	173	1.00	2.37	280
1129	0.37		59.32	177.00	175	173	1.00	3.07	362
1130	0.27		59.32	176.85	175	173	1.00	2.22	262
1131	0.23		59.32	176.71	175	173	1.00	1.95	229
1132	0.29		59.32	176.52	175	173	1.00	2.38	279
1133	0.26		59.32	176.38	175	172	1.00	2.15	252
1134	0.31		59.32	176.24	174	172	1.00	2.60	304
1135	0.27		59.32	176.10	174	172	1.00	2.24	262
1136	0.35		59.32	175.95	174	172	1.00	2.95	344
1137	0.25		59.32	175.76	174	172	1.00	2.10	245
1138	0.32		59.32	175.62	174	172	1.00	2.66	310
1139	0.30		59.32	175.48	174	172	1.00	2.53	294
1140	0.29		59.32	175.34	173	171	1.00	2.39	277
1141	0.37		59.32	175.15	173	171	1.00	3.09	358
1142	0.08		59.32	175.01	173	171	1.00	0.67	77
1143	0.34		59.32	174.87	173	171	1.00	2.82	327
1144	0.29		59.32	174.73	173	171	1.00	2.41	278
1145	0.37		59.32	174.59	173	171	1.00	3.09	357
1146	0.39		59.32	174.44	173	171	1.00	3.22	371
1147	0.32		59.32	174.26	172	170	1.00	2.65	304
1148	0.28		59.32	174.12	172	170	1.00	2.36	272
1149	0.32		59.32	173.97	172	170	1.00	2.65	304
1150	0.42		59.28	173.79	172	170	1.00	3.51	403
1151	0.07		59.28	173.64	172	170	1.00	0.58	66

WATER FLOW AND TEMPERATURE DATA - ASTM E2618

Client: Greentech
Model: RS7200E
Run #: 2

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/1/2020

	Flow (GPM)		Temperature Data (°F)						
Elapsed Time (min)	Load Side Flow	Appliance Flow (optional)	HEX Load In	HEX Load Out	HEX Supply In	HEX Supply Out	Specific Heat of Inlet Water (BTU/lb-°F)	Mass Flow Rate of Inlet Water (lb/min)	Heat Output (Btu)
1152	0.07		59.28	173.50	172	170	1.00	0.61	70
1153	0.30		59.28	173.36	172	169	1.00	2.50	285
1154	0.38		59.23	173.17	171	169	1.00	3.13	357
1155	0.36		59.23	173.03	171	169	1.00	2.97	339
1156	0.40		59.23	172.89	171	169	1.00	3.37	384
1157	0.40		59.23	172.80	171	169	1.00	3.36	382
1158	0.37		59.23	172.61	171	169	1.00	3.07	348
1159	0.32		59.19	172.47	171	169	1.00	2.65	301
1160	0.07		59.14	172.28	170	168	1.00	0.56	63
1161	0.27		59.14	172.14	170	168	1.00	2.23	252
1162	0.34		59.14	171.99	170	168	1.00	2.79	316
1163	0.28		59.09	171.85	170	168	1.00	2.36	266
1164	0.29		59.09	171.71	170	168	1.00	2.39	269
1165	0.08		59.05	171.57	170	168	1.00	0.69	78
1166	0.34		59.09	171.38	170	168	1.00	2.84	319
1167	0.27		59.09	171.29	169	167	1.00	2.22	250
1168	0.39		59.05	171.10	169	167	1.00	3.22	362
1169	0.35		59.05	170.96	169	167	1.00	2.94	330
1170	0.37		59.05	170.82	169	167	1.00	3.08	345
1171	0.40		59.05	170.68	169	167	1.00	3.37	377
1172	0.32		59.09	170.49	168	167	1.00	2.66	297
1173	0.25		59.05	170.35	169	166	1.00	2.11	235
1174	0.27		59.05	170.16	169	166	1.00	2.22	246
1175	0.27		59.09	170.06	168	166	1.00	2.22	246
1176	0.35		59.05	169.92	168	166	1.00	2.94	327
1177	0.09		59.05	169.78	168	166	1.00	0.77	85
1178	0.24		59.05	169.64	167	166	1.00	1.97	218
1179	0.33		59.05	169.50	167	166	1.00	2.76	305
1180	0.32		59.05	169.36	167	166	1.00	2.65	292
1181	0.29		59.05	169.26	167	165	1.00	2.39	263
1182	0.44		59.05	169.12	167	165	1.00	3.65	403
1183	0.33		59.05	169.03	167	165	1.00	2.79	307
1184	0.35		59.05	168.88	166	165	1.00	2.95	324
1185	0.30		59.09	168.84	166	165	1.00	2.50	274
1186	0.30		59.05	168.74	166	165	1.00	2.52	277
1187	0.35		59.09	168.70	166	165	1.00	2.92	320
1188	0.32		59.09	168.60	166	165	1.00	2.70	297
1189	0.34		59.05	168.60	166	165	1.00	2.85	313
1190	0.34		59.09	168.60	166	165	1.00	2.79	306
1191	0.28		59.09	168.60	166	165	1.00	2.36	258
1192	0.27		59.09	168.60	166	165	1.00	2.24	245
1193	0.07		59.09	168.65	166	165	1.00	0.55	60
1194	0.07		59.14	168.70	166	165	1.00	0.55	60
1195	0.32		59.14	168.79	166	165	1.00	2.64	290
1196	0.30		59.14	168.88	167	165	1.00	2.50	275
1197	0.30		59.14	168.98	167	165	1.00	2.50	275
1198	0.30		59.19	169.12	167	166	1.00	2.50	275
1199	0.33		59.19	169.21	167	166	1.00	2.76	304

WATER FLOW AND TEMPERATURE DATA - ASTM E2618

Client: Greentech
Model: RS7200E
Run #: 2

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/1/2020

	Flow (GPM)		Temperature Data (°F)						
Elapsed Time (min)	Load Side Flow	Appliance Flow (optional)	HEX Load In	HEX Load Out	HEX Supply In	HEX Supply Out	Specific Heat of Inlet Water (BTU/lb-°F)	Mass Flow Rate of Inlet Water (lb/min)	Heat Output (Btu)
Average	0	#DIV/0!	59	182	180	178	1	2	297
								TOTAL:	**356726**

LAB SAMPLE DATA - ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 2

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/1/2020

	Sample ID	Tare, mg	Total, mg	Final, mg	Catch, mg
Train A Filters - First Hour	3776	119.6	119.6	120.1	0.5
Train A Filters - Remainder	A003	119.5	238.7	241.1	2.4
	3777	119.2			
Train A Probe	19A	117025.1	117025.1	117025.1	0.0
Train A O-Rings	19A	3366.0	3366.0	3364.8	0.0*
Train B Filters	3778	119.0	238.2	241.4	3.2
	3779	119.2			
Train B Probe	19B	117011.7	117011.7	117011.7	0.0
Train B O-Rings	19B	3438.8	3438.8	3437.7	0.0*
Background Filter	A004	118.2	118.2	119.6	1.4

**Negative value corrected to zero*

Placed in Dessicator on:	5/7/2020

Train A Filters - First Hour	120.3		120.1					
Train A Filters - Remainder	241.1		241.1					
Train A Probe	117024.9				117025.1			
Train A O-Rings	3364.1		3364.7		3364.8			
Train B Filters	241.4		241.4					
Train B Probe	117011.5				117011.7			
Train B O-Rings	3436.8		3437.5		3437.7			
Background Filter	119.5		119.6					

1st hour Sub-Total, mg:	0.5
Remainder Sub-Total, mg:	2.4
Train 1 Aggregate, mg:	**2.9**
Train 2 Aggregate, mg:	**3.2**
Ambient Aggregate, mg:	1.4

ASTM E2618 Hydronic Heater Run Sheets

Client: Greentech Job Number: 20-565 Tracking #: 69
Model: G4000 Run Number: 1 Test Date: 5/1/2020

Wood Heater Run Notes

Pre-Test Notes
Pre-Test Start Time: 13:10
Target Load (BTU/hr): 125,000

Time	Notes
0 min	Began preburn
115 min	Stirred remaining fuel load to ensure uniform charcoal bed
148 min	End PB

Test Notes
Test Burn Start Time: 14:10
Target Load (BTU/hr): 125,000 (Category 4)

Time	Notes
0 min	Loaded test fuel within 60 seconds, door closed immediately
60 min	Changed 1st hour filter
218 min	End of Test

Test Burn End Time: 17:48

Flue Gas Concentration Measurement

Calibration Gas Values: Span Gas CO_2 (%): 15.30 CO (%): 4.98

Calibration Results:

	Pre Test			Post Test		
	Zero		Span	Zero		Span
Time	13:15		13:17	18:12		18:16
CO_2	0.00		15.30	-0.15		15.18
CO	0.000		4.981	0.008		4.915

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

Technician Signature: Date: 5/10/2020

HYDRONIC HEATER TES DATA PACKET
ASTM E2618/E2515

Run 3 Data Summary

Client:	Greentech
Model:	RS7200E
Job #:	20-565
Tracking #:	0069
Test Date:	5/2/2020

Techician Signature

5/13/2022
Date

TEST RESULTS - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 3

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/2/2020

Particulate Data

	Ambient Sample	Sample Train A	Sample Train B	1st Hour Filter
Total Sample Volume (ft^3)	205.447	109.438	111.538	9.084
Average Gas Velocity in Dilution Tunnel (ft/sec)	14.1			
Average Gas Flow Rate in Dilution Tunnel (dscf/hr)	37223.6			
Average Gas Meter Temperature (°F)	64.1	87.2	89.0	75.6
Total Sample Volume (dscf)	197.199	100.459	103.085	8.519
Average Tunnel Temperature (°F)	70.6			
Total Time of Test (min)	715			
Total Particulate Catch (mg)	0.3	4.3	2.4	0.2
Particulate Concentration, dry-standard (g/dscf)	0.0000015	0.0000428	0.0000233	0.0000235
Total PM Emissions (g)	0.67	18.31	9.65	0.82
Particulate Emission Rate (g/hr)	0.06	1.54	0.81	0.82
Emissions Factor (g/kg)	-	0.74	0.39	-
Difference from Average Total Particulate Emissions (%)	-	31.0%	31.0%	-
Difference from Average Emissions Factor (g/kg)	-	0.18	0.18	-

Boiler/ HEX Data

Appliance Average Start Temperature (F)	167.0	
Appliance Average Final Temperature (F)	165.0	**First Hour**
Heat Output (BTU)	354,973	28,157
Heat Output Rate (BTU/hr)	29,788	
Heat Input - HHV (BTU)	466,626	75,688
Heat Input - LHV (BTU)	433,420	

Emissions Rates and Factors

Total Particulate Emissions (g)	14.0	0.8
Emissions Factor (g/MJ)	0.0373	
Emissions Factor (g/kg)	0.5669	
Emissions Rate (g/hr)	1.17	
Emissions Rate (lb/mmbtu output)	0.087	0.064
HHV Delivered Efficiency (%)	76.1%	37.2%
LHV Delivered Efficiency (%)	81.9%	
HHV SLM Efficiency (%)	71.8%	
LHV SLM Efficiency (%)	76.9%	
CO Emissions (g/min)	3.85	

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	73.0	OK
Face Velocity	< 30 ft/min	8.6	OK
Leakage Rate	Less than 4% of average sample rate	0 cfm	OK
Ambient Temp	55-90 °F	Min: 63 / Max: 67	OK
Negative Probe Weight Evaluation	<5% of Total Catch	-4.7%	OK
Pro-Rate Variation	90% of readings between 90-110%; none greater than 120% or less than 80%	See Data Tabs	OK
Return Temp > 120°F	>120°F	162.0	OK

B415.1 Efficiency Results

Manufacturer: Greentech
Model: RS7200E
Date: 05/02/20
Run: 3
Control #: 20-565
Test Duration: 715
Output Category: 2

Test Results in Accordance with CSA B415.1-09

	HHV Basis	LHV Basis
Overall Efficiency	71.8%	76.9%
Combustion Efficiency	93.0%	93.0%
Heat Transfer Efficiency	77.3%	82.7%

Output Rate (kJ/h)	29,959	28,420	**(Btu/h)**
Burn Rate (kg/h)	2.12	4.68	**(lb/h)**
Input (kJ/h)	41,703	39,560	**(Btu/h)**

Test Load Weight (dry kg)	25.28	55.71	**dry lb**
MC wet (%)	19.26		
MC dry (%)	23.85		
Particulate (g)	13.98		
CO (g)	2,752		
Test Duration (h)	11.92		

Emissions	Particulate	CO
g/MJ Output	0.04	7.71
g/kg Dry Fuel	0.55	108.86
g/h	1.17	230.92
g/min	0.02	3.85
lb/MM Btu Output	0.09	17.91

Air/Fuel Ratio (A/F)	40.22

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

BOILER CORDWOOD FUEL DATA - ASTM E2618

Client: Greentech
Model: RS7200E
Run #: 3

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/2/2020

Firebox Volume (ft^3):	6.25	Minimun Piece Weight (lbs):	4.40
Target Load Weight (lbs):	62.50	Maximun Piece Weight (lbs):	17.60
Number of Fuel Pieces Allowed:	5 - 10	80% of piece of weight range (lbs):	6.6 to 15.4

Pretest Fuel Information

Length (in)	Weight (lbs)	MC (%DB)	Length (in)	Weight (lbs)	MC (%DB)
20.00	67.50	28.0			
20.00		21.0			
20.00		27.0			
20.00		24.0			
20.00		23.0			
20.00		26.0			
20.00		24.0			
20.00		26.0			

Total Preburn Weight (lbs): 67.50
Averge Preburn Moisture (% DB): 24.88

Test Fuel Information

Length (in)	Weight (lbs)	Moisture Content (%DB)					Avg MC (%DB)	Dry Weight (lbs)
20.00	7.50	28.0	24.0	26.0	26.0	26.0	26.00	5.95
20.00	7.28	27.0	23.0	26.0	24.0	26.0	25.20	5.81
20.00	9.00	24.0	24.0	22.0	22.0	24.0	23.20	7.31
20.00	7.73	28.0	21.0	27.0	24.0	26.0	25.20	6.17
20.00	10.00	25.0	22.0	21.0	22.0	24.0	22.80	8.14
20.00	12.04	18.0	28.0	19.0	21.0	23.0	21.80	9.89
20.00	7.00	26.0	23.0	21.0	24.0	23.0	23.40	5.67
20.00	6.65	26.0	24.0	25.0	26.0	25.0	25.20	5.31
Total (lbs):	67.20						Total Dry Weight (lbs):	54.26

Allowable Coal Bed Range (10-20%): 6.7 - 13.4

Quality checks

Individual Piece Weights:	OK
80% Piece weight range:	OK
Piece Count:	OK

DILUTION TUNNEL & MISC. DATA - ASTM E2618 / E2515

Client:	Greentech	Job #:	20-565
Model:	RS7200E	Tracking #:	0069
Run #:	3	Technician:	AK
Test Start Time:	20:05	Date:	5/2/2020
Manufacturer's Rated Output (BTU/hr):	125,000		

715

Total Sampling Time (min):	715
Recording Interval (min):	1

Meter Box γ Factor:	0.992	(A)
Meter Box γ Factor:	1.002	(B)
Meter Box γ Factor:	0.996	(Ambient)

	Pre-Test	Post Test	Avg.
Barometric Pressure (in. Hg)	28.56	28.71	28.64
Relative Humidity (%)	33.7	36.8	
Room Air Velocity (ft/min)	0	0	
Scale Audit (lbs)	10.0	10.0	
Ambient Sample Volume:		205.447	ft^3

Induced Draft Check (in. H_2O):	0
Smoke Capture Check (%):	100%
Date Flue Pipe Last Cleaned:	4/30/2020
Boiler Dry Weight (lbs):	1964
Supply Side Water Weight (lbs):	1502

Sample Train Post-Test Leak Checks

(A)	0.000	cfm @	-10	in. Hg
(B)	0.000	cfm @	-11	in. Hg
(Ambient)	0.000	cfm @	-15	in. Hg

DILUTION TUNNEL FLOW

Traverse Data

Point	dP (in H_2O)	Temp (°F)
1	0.034	68
2	0.046	68
3	0.052	68
4	0.050	68
5	0.042	68
6	0.032	68
7	0.038	68
8	0.046	68
9	0.052	68
10	0.054	68
11	0.046	68
12	0.038	68
Center	0.056	68

Static Pressure: -0.160 in. H_2O

Dilution Tunnel H_2O:	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	ft^2
V_{strav}:	14.35	ft/sec
V_{scent}:	16.06	ft/sec
F_p:	0.894	[ratio]
Initial Tunnel Flow:	627.0	scf/min

TEST FUEL PROPERTIES

Default Fuel Values

Fuel Type:	D. Fir	Oak
HHV (kJ/kg)	19,810	19,887
%C	48.73	50
%H	6.37	6.3
%O	43.9	42.9
%Ash	0.5	0.5

Actual Fuel Used Properties

Fuel Type:	Maple
HHV (kJ/kg)	19,960
%C	50.64
%H	6.02
%O	41.74
%Ash	1.35
MC (%DB)	23.9%

BOX A TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 3

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/2/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
0	0.002		0.054	-0.01	71	-5.47		69.0		91	287	67	66
1	0.132	0.130	0.054	1.05	71	-5.47	89	68.9	-0.1	91	287	68	66
2	0.289	0.157	0.054	1.01	71	-5.47	108	68.0	-0.9	90	285	68	67
3	0.445	0.156	0.054	1.02	71	-5.47	107	67.3	-0.7	90	288	68	67
4	0.596	0.151	0.054	1.00	71	-5.47	104	66.0	-1.3	90	290	68	66
5	0.749	0.153	0.054	1.00	71	-5.47	105	65.3	-0.7	91	292	68	66
6	0.903	0.154	0.054	0.99	71	-5.47	106	64.9	-0.4	91	294	68	66
7	1.056	0.153	0.054	1.00	71	-5.47	105	64.0	-0.9	91	296	69	66
8	1.206	0.150	0.054	0.99	71	-5.47	103	63.0	-1	91	298	69	66
9	1.358	0.152	0.054	1.01	71	-5.47	104	62.8	-0.2	91	301	69	66
10	1.510	0.152	0.054	0.83	71	-5.47	104	62.1	-0.7	91	303	69	66
11	1.662	0.152	0.054	1.01	71	-5.47	104	61.0	-1.1	92	305	69	66
12	1.813	0.151	0.054	0.95	71	-5.47	104	61.3	0.3	92	307	69	66
13	1.963	0.150	0.054	1.00	72	-5.47	102	59.0	-2.3	84	304	69	66
14	2.114	0.151	0.054	0.81	72	-5.47	102	59.0	0	74	282	69	66
15	2.266	0.152	0.054	1.00	72	-5.47	102	59.3	0.3	72	267	69	66
16	2.418	0.152	0.054	0.98	72	-5.47	102	59.0	-0.3	72	255	69	66
17	2.570	0.152	0.054	1.00	72	-5.47	102	58.7	-0.3	71	246	69	66
18	2.720	0.150	0.054	0.97	73	-5.47	101	59.0	0.3	71	238	69	66
19	2.872	0.152	0.054	0.92	73	-5.47	102	59.5	0.5	70	232	69	66
20	3.024	0.152	0.054	0.99	73	-5.47	102	58.9	-0.6	70	226	69	66
21	3.176	0.152	0.054	0.96	73	-5.47	102	59.5	0.6	70	221	69	66
22	3.327	0.151	0.054	0.99	73	-5.47	101	58.8	-0.7	70	216	69	66
23	3.477	0.150	0.054	0.97	74	-5.47	100	59.3	0.5	70	212	69	66
24	3.629	0.152	0.054	0.90	74	-5.47	102	58.0	-1.3	69	208	69	66
25	3.781	0.152	0.054	1.05	74	-5.47	102	58.1	0.1	70	204	68	66
26	3.932	0.151	0.054	1.00	74	-5.47	101	58.1	0	69	201	68	66
27	4.083	0.151	0.054	0.85	75	-5.47	101	58.0	-0.1	69	197	68	66
28	4.234	0.151	0.054	0.94	75	-5.47	101	58.2	0.2	69	194	68	66
29	4.385	0.151	0.054	0.99	75	-5.47	101	57.9	-0.3	69	191	68	66
30	4.537	0.152	0.054	0.96	75	-5.47	101	58.0	0.1	69	189	68	66
31	4.689	0.152	0.054	0.98	76	-5.47	101	58.2	0.2	69	186	68	66

BOX A TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 3

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/2/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
32	4.840	0.151	0.054	0.97	76	-5.47	101	58.1	-0.1	69	183	68	66
33	4.989	0.149	0.054	0.97	76	-5.47	99	57.9	-0.2	69	181	68	66
34	5.141	0.152	0.054	0.99	76	-5.47	101	57.8	-0.1	69	179	68	66
35	5.292	0.151	0.054	0.97	77	-5.47	100	58.0	0.2	69	176	68	66
36	5.444	0.152	0.054	0.97	77	-5.47	101	58.0	0	69	174	68	66
37	5.595	0.151	0.054	0.96	77	-5.47	100	58.0	0	69	172	68	66
38	5.745	0.150	0.054	0.97	77	-5.47	100	57.9	-0.1	69	170	68	66
39	5.896	0.151	0.054	0.89	77	-5.47	100	58.0	0.1	69	168	68	66
40	6.048	0.152	0.054	0.94	78	-5.47	101	58.0	0	69	167	68	66
41	6.200	0.152	0.054	0.93	78	-5.47	101	58.0	0	69	165	68	66
42	6.352	0.152	0.054	0.96	78	-5.47	101	58.0	0	69	163	68	66
43	6.502	0.150	0.054	0.99	78	-5.47	100	57.9	-0.1	69	161	68	66
44	6.653	0.151	0.054	0.95	79	-5.47	100	57.8	-0.1	69	160	68	66
45	6.805	0.152	0.054	0.98	79	-5.47	101	58.0	0.2	69	158	68	66
46	6.957	0.152	0.054	1.00	79	-5.47	101	58.1	0.1	69	156	68	66
47	7.108	0.151	0.054	1.00	79	-5.47	100	58.0	-0.1	69	154	68	66
48	7.259	0.151	0.054	0.97	80	-5.47	100	57.9	-0.1	69	153	68	66
49	7.410	0.151	0.054	1.10	80	-5.47	100	58.0	0.1	69	152	68	66
50	7.563	0.153	0.054	0.97	80	-5.47	101	58.2	0.2	69	150	68	66
51	7.715	0.152	0.054	0.89	80	-5.47	100	58.0	-0.2	69	149	68	66
52	7.865	0.150	0.054	0.92	80	-5.47	99	58.0	0	69	148	68	66
53	8.017	0.152	0.054	0.99	81	-5.47	100	58.5	0.5	69	146	68	66
54	8.169	0.152	0.054	0.97	81	-5.47	100	58.0	-0.5	69	145	68	66
55	8.326	0.157	0.054	1.16	81	-5.47	104	58.7	0.7	69	144	71	66
56	8.478	0.152	0.054	0.89	81	-5.47	100	58.1	-0.6	69	143	73	66
57	8.631	0.153	0.054	1.02	81	-5.47	101	58.0	-0.1	69	141	72	66
58	8.783	0.152	0.054	1.01	82	-5.47	100	58.1	0.1	69	140	71	66
59	8.936	0.153	0.054	1.00	82	-5.47	101	58.0	-0.1	69	140	71	66
60	9.086	0.150	0.054	0.96	82	-5.47	99	58.1	0.1	69	139	70	66
61	9.238	0.152	0.054	0.95	82	-5.47	100	57.9	-0.2	69	137	70	66
62	9.391	0.153	0.054	0.96	82	-5.47	101	58.0	0.1	68	136	70	66
63	9.543	0.152	0.054	0.90	82	-5.47	100	58.3	0.3	68	135	69	66

BOX A TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 3

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/2/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
64	9.694	0.151	0.054	0.94	83	-5.47	99	58.1	-0.2	68	134	69	66
65	9.846	0.152	0.054	0.89	83	-5.47	100	57.9	-0.2	68	133	69	66
66	9.999	0.153	0.054	1.00	83	-5.47	100	58.0	0.1	68	132	69	66
67	10.152	0.153	0.054	0.96	83	-5.47	100	58.0	0	68	131	69	66
68	10.300	0.148	0.054	0.96	83	-5.47	97	58.0	0	68	131	69	66
69	10.456	0.156	0.054	1.09	83	-5.47	102	58.0	0	68	129	69	66
70	10.608	0.152	0.054	1.01	84	-5.47	100	58.2	0.2	68	128	69	66
71	10.761	0.153	0.054	1.05	84	-5.47	100	58.1	-0.1	68	128	69	66
72	10.913	0.152	0.054	1.00	84	-5.47	100	57.5	-0.6	68	127	69	66
73	11.065	0.152	0.054	0.98	84	-5.47	100	58.5	1	68	126	68	66
74	11.218	0.153	0.054	0.77	84	-5.47	100	58.0	-0.5	68	125	68	66
75	11.371	0.153	0.054	1.01	84	-5.47	100	57.9	-0.1	68	124	68	66
76	11.523	0.152	0.054	0.95	84	-5.47	100	57.9	0	68	124	68	66
77	11.675	0.152	0.054	0.99	85	-5.47	99	58.3	0.4	68	123	68	66
78	11.827	0.152	0.054	0.97	85	-5.47	99	57.3	-1	68	123	68	66
79	11.980	0.153	0.054	0.95	85	-5.47	100	58.0	0.7	68	122	68	65
80	12.132	0.152	0.054	1.00	85	-5.47	99	58.0	0	68	122	68	65
81	12.285	0.153	0.054	1.05	85	-5.47	100	58.0	0	68	121	68	65
82	12.438	0.153	0.054	0.93	85	-5.47	100	58.0	0	68	121	68	65
83	12.592	0.154	0.054	1.03	85	-5.47	101	58.0	0	68	120	68	65
84	12.743	0.151	0.054	0.98	85	-5.47	99	58.2	0.2	68	119	68	65
85	12.896	0.153	0.054	0.98	86	-5.47	100	58.0	-0.2	68	118	68	65
86	13.049	0.153	0.054	0.94	86	-5.47	100	58.0	0	68	118	68	66
87	13.202	0.153	0.054	0.87	86	-5.47	100	58.0	0	68	117	68	66
88	13.354	0.152	0.054	0.98	86	-5.47	99	57.9	-0.1	68	117	68	65
89	13.507	0.153	0.054	0.96	86	-5.47	100	58.4	0.5	68	116	68	65
90	13.661	0.154	0.054	0.99	86	-5.47	101	57.7	-0.7	68	115	68	65
91	13.814	0.153	0.054	0.99	86	-5.47	100	58.0	0.3	68	115	68	65
92	13.965	0.151	0.054	1.01	86	-5.47	99	58.3	0.3	68	115	68	65
93	14.119	0.154	0.054	1.01	86	-5.47	101	58.1	-0.2	68	114	68	65
94	14.273	0.154	0.054	0.95	86	-5.47	101	57.8	-0.3	68	113	68	65
95	14.425	0.152	0.054	1.09	87	-5.47	99	57.9	0.1	67	113	68	65

BOX A TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 3

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/2/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
96	14.578	0.153	0.054	0.99	87	-5.47	100	57.9	0	68	112	68	65
97	14.732	0.154	0.054	0.98	87	-5.47	100	57.9	0	67	112	67	65
98	14.886	0.154	0.054	0.98	87	-5.47	100	58.0	0.1	67	112	67	65
99	15.037	0.151	0.054	0.97	87	-5.47	98	58.0	0	67	111	67	65
100	15.191	0.154	0.054	1.01	87	-5.47	100	57.5	-0.5	67	111	67	65
101	15.345	0.154	0.054	0.98	87	-5.47	100	57.9	0.4	67	110	67	65
102	15.498	0.153	0.054	0.80	87	-5.47	100	58.0	0.1	67	110	67	65
103	15.651	0.153	0.054	0.91	87	-5.47	100	58.3	0.3	67	109	67	65
104	15.804	0.153	0.054	1.00	87	-5.47	100	57.8	-0.5	67	109	67	65
105	15.958	0.154	0.054	0.96	87	-5.47	100	58.5	0.7	67	108	67	65
106	16.110	0.152	0.054	0.96	87	-5.47	99	58.4	-0.1	67	107	67	65
107	16.264	0.154	0.054	0.95	87	-5.47	100	58.3	-0.1	67	107	67	65
108	16.418	0.154	0.054	1.02	88	-5.47	100	57.2	-1.1	67	107	67	65
109	16.571	0.153	0.054	1.02	88	-5.47	99	57.8	0.6	67	107	67	65
110	16.723	0.152	0.054	1.01	88	-5.47	99	58.1	0.3	67	106	67	65
111	16.877	0.154	0.054	0.97	88	-5.47	100	57.6	-0.5	67	105	67	65
112	17.030	0.153	0.054	0.97	88	-5.47	99	58.0	0.4	67	105	67	65
113	17.183	0.153	0.054	0.94	88	-5.47	99	58.2	0.2	67	106	67	65
114	17.336	0.153	0.054	1.02	88	-5.47	99	58.1	-0.1	67	105	67	65
115	17.490	0.154	0.054	1.03	88	-5.47	100	57.9	-0.2	67	105	67	65
116	17.644	0.154	0.054	0.97	88	-5.47	100	58.0	0.1	67	105	67	65
117	17.796	0.152	0.054	1.03	88	-5.47	99	58.1	0.1	67	105	67	65
118	17.950	0.154	0.054	0.88	88	-5.47	100	58.1	0	67	104	67	65
119	18.104	0.154	0.054	0.98	88	-5.47	100	58.0	-0.1	67	104	67	65
120	18.256	0.152	0.054	0.99	88	-5.47	99	58.6	0.6	67	103	67	65
121	18.410	0.154	0.054	0.99	88	-5.47	100	58.0	-0.6	67	103	67	65
122	18.564	0.154	0.054	1.00	88	-5.47	100	58.0	0	67	102	67	65
123	18.718	0.154	0.054	1.01	88	-5.47	100	58.1	0.1	67	102	67	65
124	18.870	0.152	0.054	1.01	88	-5.47	99	57.8	-0.3	67	102	67	65
125	19.025	0.155	0.054	1.00	88	-5.47	101	58.0	0.2	67	102	66	65
126	19.179	0.154	0.054	1.02	88	-5.47	100	58.4	0.4	67	101	67	65
127	19.331	0.152	0.054	0.98	88	-5.47	99	57.9	-0.5	67	102	67	65

BOX A TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 3

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/2/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
128	19.485	0.154	0.054	0.99	88	-5.47	100	58.0	0.1	67	101	66	65
129	19.639	0.154	0.054	1.03	88	-5.47	100	58.3	0.3	67	101	66	65
130	19.792	0.153	0.054	0.98	88	-5.47	99	56.9	-1.4	67	101	66	65
131	19.945	0.153	0.054	0.96	88	-5.47	99	58.0	1.1	67	100	66	65
132	20.099	0.154	0.054	1.00	89	-5.47	100	58.0	0	67	100	66	65
133	20.253	0.154	0.054	1.00	89	-5.47	100	58.1	0.1	67	99	66	65
134	20.405	0.152	0.054	0.97	89	-5.47	99	56.9	-1.2	67	99	66	65
135	20.561	0.156	0.054	1.02	89	-5.47	101	58.9	2	67	99	66	65
136	20.715	0.154	0.054	0.99	89	-5.47	100	57.5	-1.4	67	98	66	65
137	20.868	0.153	0.054	0.96	89	-5.47	99	58.0	0.5	67	99	66	65
138	21.023	0.155	0.054	0.99	89	-5.47	101	58.1	0.1	67	99	66	65
139	21.178	0.155	0.054	0.99	89	-5.47	101	58.2	0.1	67	99	66	65
140	21.331	0.153	0.054	1.14	89	-5.47	99	57.9	-0.3	67	98	66	65
141	21.485	0.154	0.054	0.95	89	-5.47	100	58.0	0.1	67	98	66	65
142	21.641	0.156	0.054	1.02	89	-5.47	101	57.9	-0.1	67	98	66	65
143	21.794	0.153	0.054	0.98	89	-5.47	99	57.7	-0.2	67	98	66	65
144	21.948	0.154	0.054	1.01	89	-5.47	100	58.1	0.4	67	98	66	65
145	22.103	0.155	0.054	1.02	89	-5.47	101	57.5	-0.6	67	99	66	65
146	22.257	0.154	0.054	0.95	89	-5.47	100	57.9	0.4	67	97	66	65
147	22.411	0.154	0.054	1.00	89	-5.47	100	58.1	0.2	67	97	66	65
148	22.566	0.155	0.054	0.99	89	-5.47	101	57.8	-0.3	67	97	66	65
149	22.720	0.154	0.054	1.04	89	-5.47	100	58.8	1	67	97	66	65
150	22.873	0.153	0.054	0.93	89	-5.47	99	58.0	-0.8	66	96	66	65
151	23.029	0.156	0.054	1.00	89	-5.47	101	59.0	1	66	96	66	65
152	23.183	0.154	0.054	1.00	89	-5.47	100	58.2	-0.8	66	95	66	65
153	23.336	0.153	0.054	1.09	89	-5.47	99	58.1	-0.1	66	95	66	65
154	23.491	0.155	0.054	1.00	89	-5.47	101	58.1	0	66	95	66	65
155	23.646	0.155	0.054	0.99	89	-5.47	101	58.0	-0.1	66	96	66	65
156	23.799	0.153	0.054	0.96	89	-5.47	99	58.0	0	66	96	66	65
157	23.954	0.155	0.054	1.01	89	-5.47	101	57.7	-0.3	66	95	66	64
158	24.109	0.155	0.054	1.04	89	-5.47	101	57.6	-0.1	66	95	66	64
159	24.262	0.153	0.054	0.96	89	-5.47	101	57.8	0.2	80	156	67	65

BOX A TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 3

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/2/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
160	24.415	0.153	0.054	0.97	89	-5.47	100	56.9	-0.9	77	178	67	65
161	24.570	0.155	0.054	0.99	89	-5.47	102	57.1	0.2	78	189	66	65
162	24.722	0.152	0.054	0.99	89	-5.47	100	56.5	-0.6	80	199	67	65
163	24.875	0.153	0.054	1.02	89	-5.47	101	55.9	-0.6	81	209	67	65
164	25.030	0.155	0.054	1.01	89	-5.47	102	55.1	-0.8	82	218	67	65
165	25.184	0.154	0.054	0.97	89	-5.47	101	53.9	-1.2	82	226	67	65
166	25.336	0.152	0.054	0.98	89	-5.47	100	53.0	-0.9	83	233	67	65
167	25.496	0.160	0.054	0.98	89	-5.47	106	52.0	-1	84	241	67	65
168	25.650	0.154	0.054	0.96	89	-5.47	102	49.8	-2.2	84	247	68	65
169	25.802	0.152	0.054	1.06	89	-5.47	100	49.9	0.1	85	252	68	65
170	25.954	0.152	0.054	0.99	89	-5.47	100	48.9	-1	86	256	68	65
171	26.108	0.154	0.054	0.93	89	-5.47	102	47.9	-1	86	260	68	65
172	26.262	0.154	0.054	0.98	89	-5.47	102	46.7	-1.2	87	264	68	65
173	26.413	0.151	0.054	1.00	89	-5.47	100	45.8	-0.9	87	267	68	65
174	26.566	0.153	0.054	0.96	89	-5.47	101	45.0	-0.8	87	269	68	65
175	26.719	0.153	0.054	0.97	89	-5.47	101	44.1	-0.9	87	271	68	65
176	26.872	0.153	0.054	0.97	89	-5.47	101	43.7	-0.4	88	273	68	65
177	27.025	0.153	0.054	1.04	89	-5.47	101	41.8	-1.9	88	275	68	65
178	27.179	0.154	0.054	0.95	89	-5.47	102	40.9	-0.9	88	277	68	65
179	27.332	0.153	0.054	0.84	89	-5.47	101	39.9	-1	89	278	69	65
180	27.484	0.152	0.054	0.96	89	-5.47	101	38.9	-1	89	280	69	65
181	27.635	0.151	0.054	0.98	89	-5.47	100	38.8	-0.1	89	282	69	65
182	27.786	0.151	0.054	0.95	89	-5.47	100	37.8	-1	89	284	69	65
183	27.938	0.152	0.054	0.95	89	-5.47	100	37.0	-0.8	78	277	68	65
184	28.091	0.153	0.054	1.00	89	-5.47	100	35.7	-1.3	71	257	68	65
185	28.244	0.153	0.054	1.00	89	-5.47	100	35.8	0.1	70	242	68	65
186	28.396	0.152	0.054	0.97	89	-5.47	99	36.0	0.2	69	230	68	65
187	28.549	0.153	0.054	0.96	89	-5.47	99	35.2	-0.8	69	221	68	65
188	28.703	0.154	0.054	0.96	89	-5.47	100	34.9	-0.3	68	214	68	65
189	28.854	0.151	0.054	0.98	89	-5.47	98	34.8	-0.1	68	208	68	65
190	29.008	0.154	0.054	0.96	90	-5.47	100	33.4	-1.4	68	202	68	65
191	29.162	0.154	0.054	0.95	90	-5.47	100	34.8	1.4	68	198	68	65

BOX A TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 3

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/2/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
192	29.315	0.153	0.054	0.98	90	-5.47	99	34.4	-0.4	68	193	68	65
193	29.467	0.152	0.054	0.98	90	-5.47	99	34.8	0.4	68	189	68	65
194	29.621	0.154	0.054	0.95	90	-5.47	100	35.2	0.4	68	186	68	65
195	29.774	0.153	0.054	0.97	90	-5.47	99	34.7	-0.5	68	183	68	65
196	29.927	0.153	0.054	0.96	90	-5.47	99	35.3	0.6	68	179	68	65
197	30.079	0.152	0.054	0.84	90	-5.47	99	34.8	-0.5	68	177	68	65
198	30.232	0.153	0.054	0.91	90	-5.47	99	34.8	0	68	174	68	65
199	30.387	0.155	0.054	0.93	90	-5.47	101	34.8	0	68	171	68	65
200	30.538	0.151	0.054	0.95	90	-5.47	98	33.9	-0.9	68	169	67	65
201	30.691	0.153	0.054	0.95	90	-5.47	99	33.8	-0.1	68	167	67	65
202	30.846	0.155	0.054	0.97	90	-5.47	101	34.6	0.8	68	164	67	65
203	31.000	0.154	0.054	0.97	90	-5.47	100	33.8	-0.8	68	163	67	65
204	31.151	0.151	0.054	1.00	90	-5.47	98	33.9	0.1	68	161	67	65
205	31.304	0.153	0.054	0.97	90	-5.47	99	33.8	-0.1	68	159	67	64
206	31.458	0.154	0.054	1.07	90	-5.47	100	33.8	0	68	157	67	64
207	31.611	0.153	0.054	1.14	90	-5.47	99	33.9	0.1	67	155	67	65
208	31.764	0.153	0.054	1.01	90	-5.47	99	33.8	-0.1	67	153	67	64
209	31.917	0.153	0.054	1.00	90	-5.47	99	33.7	-0.1	67	151	67	65
210	32.071	0.154	0.054	0.99	90	-5.47	100	33.9	0.2	67	150	67	64
211	32.224	0.153	0.054	1.05	90	-5.47	99	33.9	0	67	148	67	64
212	32.377	0.153	0.054	0.99	90	-5.47	99	33.8	-0.1	67	147	67	64
213	32.531	0.154	0.054	1.07	90	-5.47	100	32.8	-1	67	146	67	65
214	32.685	0.154	0.054	1.01	90	-5.47	100	35.3	2.5	67	144	67	65
215	32.836	0.151	0.054	0.98	90	-5.47	98	33.7	-1.6	67	143	67	64
216	32.990	0.154	0.054	0.97	90	-5.47	100	33.8	0.1	67	142	67	64
217	33.144	0.154	0.054	0.97	90	-5.47	100	33.8	0	67	140	67	65
218	33.296	0.152	0.054	1.03	90	-5.47	98	33.8	0	67	139	67	64
219	33.449	0.153	0.054	0.97	90	-5.47	99	33.7	-0.1	67	138	67	64
220	33.602	0.153	0.054	0.95	90	-5.47	99	33.8	0.1	67	137	67	64
221	33.756	0.154	0.054	0.94	90	-5.47	100	34.0	0.2	67	136	67	64
222	33.908	0.152	0.054	1.01	90	-5.47	98	32.7	-1.3	67	135	67	64
223	34.062	0.154	0.054	0.99	90	-5.47	100	33.9	1.2	67	134	67	64

BOX A TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 3

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/2/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
224	34.215	0.153	0.054	0.96	90	-5.47	99	33.9	0	67	132	67	64
225	34.368	0.153	0.054	1.01	90	-5.47	99	33.7	-0.2	67	131	67	64
226	34.520	0.152	0.054	0.98	90	-5.47	98	33.9	0.2	67	130	66	64
227	34.674	0.154	0.054	0.99	90	-5.47	100	33.8	-0.1	67	129	66	64
228	34.828	0.154	0.054	0.96	90	-5.47	100	34.4	0.6	67	129	66	64
229	34.980	0.152	0.054	1.00	90	-5.47	98	34.0	-0.4	67	128	66	64
230	35.133	0.153	0.054	0.98	90	-5.47	99	33.7	-0.3	67	126	66	64
231	35.287	0.154	0.054	0.92	90	-5.47	100	34.8	1.1	67	126	66	64
232	35.441	0.154	0.054	1.01	90	-5.47	100	33.8	-1	67	125	66	64
233	35.592	0.151	0.054	0.99	90	-5.47	98	33.8	0	67	124	66	64
234	35.746	0.154	0.054	0.94	90	-5.47	100	33.7	-0.1	67	123	66	64
235	35.900	0.154	0.054	0.96	90	-5.47	100	34.0	0.3	67	123	66	64
236	36.053	0.153	0.054	1.00	90	-5.47	99	33.7	-0.3	67	122	66	64
237	36.205	0.152	0.054	0.97	90	-5.47	98	33.7	0	67	121	66	64
238	36.358	0.153	0.054	0.96	90	-5.47	99	33.8	0.1	67	121	66	64
239	36.512	0.154	0.054	0.98	90	-5.47	100	33.7	-0.1	67	120	66	64
240	36.665	0.153	0.054	0.99	90	-5.47	99	34.0	0.3	67	119	66	64
241	36.818	0.153	0.054	0.95	90	-5.47	99	34.0	0	67	119	66	64
242	36.972	0.154	0.054	0.91	90	-5.47	100	33.7	-0.3	67	118	66	64
243	37.126	0.154	0.054	1.00	90	-5.47	100	34.9	1.2	66	117	66	64
244	37.277	0.151	0.054	0.96	90	-5.47	98	33.7	-1.2	67	117	66	64
245	37.431	0.154	0.054	1.10	90	-5.47	100	35.1	1.4	67	116	66	64
246	37.585	0.154	0.054	0.95	90	-5.47	100	33.8	-1.3	66	116	66	64
247	37.738	0.153	0.054	1.00	90	-5.47	99	33.8	0	67	115	66	64
248	37.890	0.152	0.054	1.05	90	-5.47	98	33.9	0.1	67	114	66	64
249	38.044	0.154	0.054	0.92	90	-5.47	100	33.9	0	67	113	66	64
250	38.198	0.154	0.054	1.00	90	-5.47	100	33.8	-0.1	67	112	66	64
251	38.349	0.151	0.054	0.97	90	-5.47	98	32.7	-1.1	67	112	66	64
252	38.503	0.154	0.054	1.02	90	-5.47	100	33.8	1.1	67	111	66	64
253	38.657	0.154	0.054	1.01	90	-5.47	100	33.7	-0.1	67	111	66	64
254	38.810	0.153	0.054	1.02	90	-5.47	99	33.7	0	67	111	66	64
255	38.962	0.152	0.054	0.96	90	-5.47	98	33.4	-0.3	67	110	66	64

BOX A TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 3

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/2/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
256	39.115	0.153	0.054	0.96	90	-5.47	99	33.7	0.3	67	110	66	64
257	39.269	0.154	0.054	0.99	90	-5.47	100	33.9	0.2	67	110	66	64
258	39.422	0.153	0.054	0.94	90	-5.47	99	33.9	0	66	109	66	64
259	39.575	0.153	0.054	0.98	90	-5.47	99	33.7	-0.2	66	109	66	64
260	39.729	0.154	0.054	1.03	90	-5.47	100	33.8	0.1	66	108	66	64
261	39.883	0.154	0.054	0.98	90	-5.47	100	34.2	0.4	66	107	66	64
262	40.035	0.152	0.054	0.95	90	-5.47	98	34.0	-0.2	66	107	66	64
263	40.188	0.153	0.054	1.00	90	-5.47	99	33.8	-0.2	66	107	66	64
264	40.342	0.154	0.054	0.94	89	-5.47	100	34.0	0.2	66	106	66	64
265	40.495	0.153	0.054	0.87	89	-5.47	99	33.8	-0.2	66	107	66	64
266	40.647	0.152	0.054	1.06	89	-5.47	99	33.8	0	66	106	66	64
267	40.801	0.154	0.054	1.01	89	-5.47	100	33.8	0	66	105	66	64
268	40.955	0.154	0.054	0.98	89	-5.47	100	33.6	-0.2	66	105	66	64
269	41.107	0.152	0.054	0.98	89	-5.47	99	35.0	1.4	66	105	66	64
270	41.261	0.154	0.054	1.02	89	-5.47	100	33.8	-1.2	66	104	66	64
271	41.415	0.154	0.054	1.01	89	-5.47	100	33.6	-0.2	66	104	66	64
272	41.568	0.153	0.054	0.94	89	-5.47	99	33.8	0.2	66	104	66	64
273	41.720	0.152	0.054	1.00	89	-5.47	99	33.8	0	66	103	66	64
274	41.874	0.154	0.054	0.98	89	-5.47	100	34.2	0.4	66	102	66	64
275	42.028	0.154	0.054	0.98	89	-5.47	100	33.7	-0.5	66	102	66	64
276	42.180	0.152	0.054	0.80	89	-5.47	99	34.0	0.3	66	102	66	64
277	42.334	0.154	0.054	0.97	89	-5.47	100	33.9	-0.1	66	102	66	64
278	42.487	0.153	0.054	1.08	89	-5.47	99	33.6	-0.3	66	101	66	64
279	42.642	0.155	0.054	0.99	89	-5.47	101	34.0	0.4	66	100	66	64
280	42.793	0.151	0.054	1.01	89	-5.47	98	34.8	0.8	66	100	66	64
281	42.947	0.154	0.054	0.99	89	-5.47	100	34.8	0	66	100	66	64
282	43.101	0.154	0.054	0.96	89	-5.47	100	34.7	-0.1	66	100	66	64
283	43.253	0.152	0.054	1.00	89	-5.47	99	34.2	-0.5	66	100	66	64
284	43.407	0.154	0.054	0.94	89	-5.47	100	34.2	0	66	100	66	64
285	43.560	0.153	0.054	1.03	89	-5.47	99	33.9	-0.3	66	99	66	64
286	43.714	0.154	0.054	0.94	89	-5.47	100	33.8	-0.1	66	99	66	64
287	43.865	0.151	0.054	0.93	89	-5.47	98	34.7	0.9	66	99	66	64

BOX A TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 3

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/2/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
288	44.019	0.154	0.054	1.01	89	-5.47	100	34.8	0.1	66	98	66	64
289	44.174	0.155	0.054	0.98	89	-5.47	101	33.9	-0.9	66	99	66	64
290	44.327	0.153	0.054	0.99	89	-5.47	99	33.8	-0.1	66	99	66	64
291	44.479	0.152	0.054	0.99	89	-5.47	99	35.2	1.4	66	98	66	64
292	44.632	0.153	0.054	1.02	89	-5.47	99	34.7	-0.5	66	97	66	64
293	44.786	0.154	0.054	0.99	89	-5.47	100	34.9	0.2	66	97	66	64
294	44.938	0.152	0.054	1.04	89	-5.47	99	33.8	-1.1	66	97	66	64
295	45.091	0.153	0.054	1.00	89	-5.47	100	33.7	-0.1	77	149	66	64
296	45.244	0.153	0.054	0.95	89	-5.47	100	33.8	0.1	75	175	66	64
297	45.398	0.154	0.054	1.08	89	-5.47	101	33.6	-0.2	77	186	66	64
298	45.548	0.150	0.054	0.98	89	-5.47	98	32.7	-0.9	78	195	66	64
299	45.702	0.154	0.054	0.96	89	-5.47	101	32.5	-0.2	79	203	66	64
300	45.855	0.153	0.054	0.97	89	-5.47	101	31.9	-0.6	80	210	66	64
301	46.008	0.153	0.054	1.01	89	-5.47	101	31.5	-0.4	80	217	66	64
302	46.159	0.151	0.054	1.03	89	-5.47	99	31.9	0.4	81	222	66	64
303	46.312	0.153	0.054	0.98	89	-5.47	101	30.6	-1.3	81	228	66	64
304	46.466	0.154	0.054	0.94	89	-5.47	101	29.9	-0.7	82	233	67	64
305	46.619	0.153	0.054	0.92	89	-5.47	101	29.9	0	82	237	67	64
306	46.770	0.151	0.054	0.98	89	-5.47	99	28.8	-1.1	83	242	67	64
307	46.922	0.152	0.054	1.07	89	-5.47	100	28.8	0	83	246	67	64
308	47.075	0.153	0.054	0.97	89	-5.47	101	27.8	-1	84	250	67	64
309	47.228	0.153	0.054	0.99	89	-5.47	101	27.8	0	84	253	67	64
310	47.380	0.152	0.054	0.97	89	-5.47	100	28.3	0.5	84	257	67	64
311	47.533	0.153	0.054	0.95	89	-5.47	101	25.7	-2.6	85	260	67	64
312	47.686	0.153	0.054	1.00	89	-5.47	101	25.8	0.1	85	264	67	64
313	47.838	0.152	0.054	0.96	89	-5.47	100	24.8	-1	85	266	67	64
314	47.990	0.152	0.054	1.00	89	-5.47	100	24.6	-0.2	85	269	67	64
315	48.142	0.152	0.054	0.98	89	-5.47	100	23.7	-0.9	86	272	68	64
316	48.295	0.153	0.054	1.01	89	-5.47	101	23.3	-0.4	86	274	68	64
317	48.448	0.153	0.054	1.02	89	-5.47	101	22.8	-0.5	86	277	68	64
318	48.599	0.151	0.054	1.00	89	-5.47	100	21.8	-1	86	279	68	64
319	48.752	0.153	0.054	0.97	89	-5.47	100	20.9	-0.9	75	270	68	64

BOX A TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 3

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/2/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
320	48.905	0.153	0.054	0.94	89	-5.47	100	21.0	0.1	70	250	68	64
321	49.058	0.153	0.054	0.97	89	-5.47	99	20.6	-0.4	68	235	67	64
322	49.211	0.153	0.054	0.93	89	-5.47	99	20.9	0.3	68	224	67	64
323	49.365	0.154	0.054	0.98	89	-5.47	100	19.9	-1	67	215	67	64
324	49.519	0.154	0.054	1.00	89	-5.47	100	20.0	0.1	67	208	67	64
325	49.671	0.152	0.054	0.99	89	-5.47	99	20.0	0	67	202	67	64
326	49.824	0.153	0.054	0.98	89	-5.47	99	19.9	-0.1	67	196	67	64
327	49.978	0.154	0.054	0.96	89	-5.47	100	19.8	-0.1	67	192	67	64
328	50.132	0.154	0.054	0.99	89	-5.47	100	20.0	0.2	67	188	67	64
329	50.284	0.152	0.054	0.99	89	-5.47	99	19.9	-0.1	66	184	67	64
330	50.438	0.154	0.054	0.98	89	-5.47	100	20.1	0.2	67	180	67	64
331	50.593	0.155	0.054	1.02	89	-5.47	101	18.8	-1.3	67	177	67	64
332	50.745	0.152	0.054	1.01	89	-5.47	99	18.9	0.1	66	174	67	64
333	50.899	0.154	0.054	0.98	89	-5.47	100	19.1	0.2	66	171	67	64
334	51.053	0.154	0.054	1.01	89	-5.47	100	19.0	-0.1	66	169	67	64
335	51.206	0.153	0.054	0.93	89	-5.47	99	18.9	-0.1	66	166	67	64
336	51.359	0.153	0.054	0.94	89	-5.47	99	19.0	0.1	66	164	67	64
337	51.513	0.154	0.054	1.02	89	-5.47	100	18.9	-0.1	66	162	66	64
338	51.667	0.154	0.054	1.01	89	-5.47	100	19.7	0.8	66	160	66	64
339	51.819	0.152	0.054	0.93	89	-5.47	99	19.0	-0.7	66	158	66	64
340	51.973	0.154	0.054	1.00	89	-5.47	100	18.9	-0.1	66	156	66	64
341	52.128	0.155	0.054	0.96	89	-5.47	101	18.7	-0.2	66	154	66	64
342	52.281	0.153	0.054	0.98	89	-5.47	99	19.0	0.3	66	153	66	64
343	52.434	0.153	0.054	0.98	89	-5.47	99	18.9	-0.1	66	151	66	64
344	52.589	0.155	0.054	0.97	89	-5.47	101	18.8	-0.1	66	149	66	64
345	52.743	0.154	0.054	0.98	89	-5.47	100	19.1	0.3	66	148	66	64
346	52.895	0.152	0.054	1.01	89	-5.47	99	18.8	-0.3	66	145	66	63
347	53.049	0.154	0.054	1.02	89	-5.47	100	20.4	1.6	66	144	66	64
348	53.203	0.154	0.054	0.98	89	-5.47	100	19.3	-1.1	66	143	66	64
349	53.356	0.153	0.054	1.01	89	-5.47	99	19.2	-0.1	66	141	66	64
350	53.510	0.154	0.054	1.00	89	-5.47	100	18.9	-0.3	66	140	66	64
351	53.664	0.154	0.054	0.99	89	-5.47	100	18.9	0	66	139	66	64

BOX A TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 3

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/2/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
352	53.817	0.153	0.054	0.97	89	-5.47	99	18.5	-0.4	66	138	66	64
353	53.970	0.153	0.054	0.95	89	-5.47	99	18.5	0	66	137	66	64
354	54.124	0.154	0.054	0.98	89	-5.47	100	18.9	0.4	66	136	66	64
355	54.279	0.155	0.054	1.04	89	-5.47	101	18.9	0	66	135	65	64
356	54.431	0.152	0.054	0.93	89	-5.47	99	18.9	0	66	134	65	64
357	54.585	0.154	0.054	1.01	89	-5.47	100	18.9	0	66	133	65	64
358	54.740	0.155	0.054	0.99	89	-5.47	101	18.9	0	66	131	65	64
359	54.893	0.153	0.054	1.00	89	-5.47	99	18.9	0	66	130	65	64
360	55.046	0.153	0.054	1.03	89	-5.47	99	18.8	-0.1	66	129	65	64
361	55.201	0.155	0.054	1.01	89	-5.47	101	18.7	-0.1	66	128	65	64
362	55.356	0.155	0.054	1.01	89	-5.47	101	19.0	0.3	66	127	65	64
363	55.509	0.153	0.054	0.97	89	-5.47	99	18.6	-0.4	66	126	65	63
364	55.663	0.154	0.054	0.99	89	-5.47	100	19.0	0.4	66	125	65	64
365	55.817	0.154	0.054	0.94	89	-5.47	100	19.2	0.2	65	124	65	64
366	55.970	0.153	0.054	1.02	89	-5.47	99	19.0	-0.2	65	123	65	64
367	56.124	0.154	0.054	0.95	88	-5.47	100	19.0	0	65	123	65	63
368	56.278	0.154	0.054	1.02	88	-5.47	100	19.3	0.3	65	122	65	64
369	56.431	0.153	0.054	1.00	88	-5.47	99	19.0	-0.3	65	121	65	64
370	56.584	0.153	0.054	1.01	88	-5.47	99	18.4	-0.6	65	121	65	63
371	56.738	0.154	0.054	1.01	88	-5.47	100	19.7	1.3	65	120	65	64
372	56.893	0.155	0.054	0.99	88	-5.47	101	18.9	-0.8	65	120	65	64
373	57.045	0.152	0.054	0.97	88	-5.47	99	18.9	0	65	119	65	64
374	57.199	0.154	0.054	0.99	88	-5.47	100	18.9	0	65	118	65	63
375	57.353	0.154	0.054	1.02	88	-5.47	100	18.9	0	65	117	65	63
376	57.505	0.152	0.054	1.01	88	-5.47	99	18.8	-0.1	65	117	64	63
377	57.659	0.154	0.054	1.02	88	-5.47	100	18.9	0.1	65	116	64	63
378	57.814	0.155	0.054	0.96	88	-5.47	101	19.0	0.1	65	116	64	63
379	57.967	0.153	0.054	0.96	88	-5.47	99	19.0	0	65	115	64	63
380	58.120	0.153	0.054	1.01	88	-5.47	99	18.9	-0.1	65	114	64	63
381	58.274	0.154	0.054	1.12	88	-5.47	100	19.6	0.7	65	114	64	63
382	58.429	0.155	0.054	1.02	88	-5.47	101	19.9	0.3	65	113	64	63
383	58.581	0.152	0.054	1.00	88	-5.47	99	19.0	-0.9	65	112	64	63

BOX A TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 3

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/2/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
384	58.735	0.154	0.054	1.01	88	-5.47	100	19.0	0	65	111	64	63
385	58.890	0.155	0.054	0.99	88	-5.47	101	19.2	0.2	65	112	64	63
386	59.043	0.153	0.054	0.95	88	-5.47	99	19.1	-0.1	65	111	64	63
387	59.197	0.154	0.054	1.02	88	-5.47	100	19.9	0.8	65	110	64	63
388	59.351	0.154	0.054	1.03	88	-5.47	100	18.9	-1	65	110	64	63
389	59.506	0.155	0.054	1.03	88	-5.47	101	19.0	0.1	65	109	64	63
390	59.659	0.153	0.054	0.96	88	-5.47	99	19.8	0.8	65	109	64	63
391	59.814	0.155	0.054	0.97	88	-5.47	101	18.9	-0.9	65	108	64	63
392	59.968	0.154	0.054	0.98	88	-5.47	100	17.5	-1.4	65	108	64	63
393	60.120	0.152	0.054	1.01	88	-5.47	99	19.1	1.6	65	107	64	63
394	60.274	0.154	0.054	0.97	88	-5.47	100	19.9	0.8	65	107	64	63
395	60.429	0.155	0.054	1.01	88	-5.47	101	19.9	0	65	106	64	63
396	60.581	0.152	0.054	1.02	88	-5.47	99	19.0	-0.9	65	106	64	63
397	60.736	0.155	0.054	1.00	88	-5.47	101	18.8	-0.2	65	105	64	63
398	60.890	0.154	0.054	0.96	88	-5.47	100	18.8	0	65	105	64	63
399	61.043	0.153	0.054	0.93	88	-5.47	99	18.9	0.1	65	105	64	64
400	61.197	0.154	0.054	0.99	88	-5.47	100	18.9	0	65	104	64	63
401	61.352	0.155	0.054	0.99	88	-5.47	101	18.9	0	65	104	64	63
402	61.506	0.154	0.054	1.13	88	-5.47	100	19.2	0.3	65	104	64	63
403	61.659	0.153	0.054	1.11	88	-5.47	99	18.6	-0.6	65	103	64	63
404	61.813	0.154	0.054	0.97	88	-5.47	100	19.7	1.1	65	103	64	63
405	61.968	0.155	0.054	1.00	88	-5.47	101	18.9	-0.8	65	102	64	63
406	62.120	0.152	0.054	1.02	88	-5.47	99	18.9	0	65	102	64	63
407	62.274	0.154	0.054	0.95	88	-5.47	100	19.4	0.5	65	101	64	63
408	62.429	0.155	0.054	1.00	88	-5.47	101	19.7	0.3	65	101	64	63
409	62.581	0.152	0.054	0.91	88	-5.47	99	18.9	-0.8	65	100	64	64
410	62.735	0.154	0.054	1.02	88	-5.47	100	19.0	0.1	65	100	64	64
411	62.890	0.155	0.054	0.74	88	-5.47	101	19.9	0.9	65	100	64	64
412	63.043	0.153	0.054	1.01	88	-5.47	99	19.0	-0.9	65	99	64	63
413	63.197	0.154	0.054	1.16	88	-5.47	100	19.9	0.9	65	99	64	63
414	63.352	0.155	0.054	1.00	88	-5.47	101	18.8	-1.1	65	100	64	63
415	63.506	0.154	0.054	0.98	88	-5.47	100	18.8	0	65	99	64	63

BOX A TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 3

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/2/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
416	63.658	0.152	0.054	1.05	88	-5.47	99	19.0	0.2	65	99	64	63
417	63.812	0.154	0.054	0.95	88	-5.47	100	19.9	0.9	65	98	64	63
418	63.967	0.155	0.054	0.93	88	-5.47	101	19.8	-0.1	65	98	64	63
419	64.119	0.152	0.054	0.97	87	-5.47	99	19.9	0.1	65	98	64	64
420	64.273	0.154	0.054	0.90	87	-5.47	100	19.8	-0.1	65	97	64	63
421	64.428	0.155	0.054	1.01	87	-5.47	101	18.9	-0.9	65	98	64	63
422	64.581	0.153	0.054	0.98	87	-5.47	99	19.9	1	65	97	64	64
423	64.735	0.154	0.054	0.95	87	-5.47	100	19.7	-0.2	65	97	64	63
424	64.890	0.155	0.054	1.00	87	-5.47	101	20.4	0.7	65	97	64	63
425	65.043	0.153	0.054	0.99	87	-5.47	99	19.9	-0.5	65	96	64	63
426	65.196	0.153	0.054	1.03	87	-5.47	99	19.8	-0.1	65	96	64	63
427	65.350	0.154	0.054	0.96	87	-5.47	100	19.0	-0.8	65	96	64	63
428	65.505	0.155	0.054	0.96	87	-5.47	101	19.9	0.9	65	96	64	63
429	65.657	0.152	0.054	0.94	87	-5.47	99	18.7	-1.2	65	96	64	63
430	65.811	0.154	0.054	1.02	87	-5.47	100	20.3	1.6	65	96	64	63
431	65.967	0.156	0.054	1.01	87	-5.47	101	19.8	-0.5	65	95	64	63
432	66.119	0.152	0.054	1.00	87	-5.47	99	19.7	-0.1	65	95	64	63
433	66.273	0.154	0.054	0.97	87	-5.47	100	19.8	0.1	65	95	64	63
434	66.428	0.155	0.054	1.00	87	-5.47	101	20.1	0.3	72	140	64	63
435	66.581	0.153	0.054	0.99	87	-5.47	100	19.2	-0.9	74	172	64	63
436	66.733	0.152	0.054	0.98	87	-5.47	100	18.5	-0.7	76	184	64	63
437	66.887	0.154	0.054	1.01	87	-5.47	101	18.9	0.4	76	192	64	64
438	67.041	0.154	0.054	0.97	87	-5.47	101	18.8	-0.1	77	199	64	63
439	67.193	0.152	0.054	1.00	87	-5.47	100	18.8	0	78	204	64	63
440	67.347	0.154	0.054	1.07	87	-5.47	101	18.1	-0.7	79	210	64	64
441	67.501	0.154	0.054	0.95	87	-5.47	102	18.4	0.3	80	215	64	64
442	67.654	0.153	0.054	1.08	87	-5.47	101	17.9	-0.5	80	219	64	63
443	67.807	0.153	0.054	0.94	87	-5.47	101	17.0	-0.9	81	224	65	63
444	67.961	0.154	0.054	0.99	87	-5.47	102	17.0	0	81	227	65	63
445	68.115	0.154	0.054	1.03	87	-5.47	102	16.8	-0.2	81	231	65	63
446	68.267	0.152	0.054	0.98	87	-5.47	100	15.8	-1	82	234	65	63
447	68.419	0.152	0.054	0.98	87	-5.47	100	16.6	0.8	82	236	65	63

BOX A TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 3

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/2/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
448	68.573	0.154	0.054	1.03	87	-5.47	102	15.5	-1.1	82	238	65	63
449	68.727	0.154	0.054	1.01	87	-5.47	102	16.2	0.7	82	240	65	63
450	68.878	0.151	0.054	0.98	87	-5.47	100	14.4	-1.8	83	242	66	63
451	69.031	0.153	0.054	0.98	87	-5.47	101	15.0	0.6	83	244	66	63
452	69.184	0.153	0.054	0.92	87	-5.47	101	15.0	0	83	246	66	63
453	69.337	0.153	0.054	0.98	87	-5.47	101	14.0	-1	83	248	66	63
454	69.489	0.152	0.054	0.97	87	-5.47	101	14.1	0.1	84	250	66	63
455	69.642	0.153	0.054	1.12	87	-5.47	101	14.2	0.1	84	251	66	63
456	69.796	0.154	0.054	0.97	87	-5.47	102	13.0	-1.2	84	252	66	63
457	69.949	0.153	0.054	0.94	87	-5.47	101	12.8	-0.2	84	253	66	63
458	70.101	0.152	0.054	1.00	87	-5.47	101	12.9	0.1	85	254	66	63
459	70.254	0.153	0.054	0.97	87	-5.47	101	11.9	-1	85	257	67	63
460	70.407	0.153	0.054	0.95	87	-5.47	101	12.0	0.1	85	258	67	63
461	70.559	0.152	0.054	0.87	87	-5.47	101	12.2	0.2	85	259	67	63
462	70.711	0.152	0.054	1.09	87	-5.47	101	11.0	-1.2	85	261	67	63
463	70.863	0.152	0.054	0.96	87	-5.47	100	10.9	-0.1	77	257	67	63
464	71.017	0.154	0.054	1.01	87	-5.47	101	9.1	-1.8	69	239	67	63
465	71.169	0.152	0.054	1.00	87	-5.47	99	10.0	0.9	68	226	67	63
466	71.321	0.152	0.054	0.96	87	-5.47	99	10.0	0	67	216	67	63
467	71.474	0.153	0.054	0.95	87	-5.47	100	10.1	0.1	67	208	66	63
468	71.628	0.154	0.054	0.96	87	-5.47	100	10.1	0	66	201	66	63
469	71.779	0.151	0.054	0.96	87	-5.47	98	9.6	-0.5	66	196	66	63
470	71.932	0.153	0.054	0.93	87	-5.47	100	10.0	0.4	66	191	66	63
471	72.085	0.153	0.054	1.00	87	-5.47	100	10.2	0.2	66	187	66	63
472	72.239	0.154	0.054	0.95	87	-5.47	100	10.2	0	66	183	66	63
473	72.390	0.151	0.054	1.02	87	-5.47	98	10.0	-0.2	66	179	66	64
474	72.543	0.153	0.054	1.00	87	-5.47	100	10.0	0	66	176	66	63
475	72.697	0.154	0.054	1.09	87	-5.47	100	10.3	0.3	66	173	66	64
476	72.850	0.153	0.054	0.97	87	-5.47	100	10.0	-0.3	66	171	66	64
477	73.001	0.151	0.054	0.99	87	-5.47	98	10.1	0.1	66	168	66	64
478	73.155	0.154	0.054	1.02	87	-5.47	100	9.8	-0.3	66	165	66	63
479	73.308	0.153	0.054	1.13	87	-5.47	100	10.0	0.2	66	163	66	63

BOX A TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 3

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/2/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
480	73.461	0.153	0.054	0.92	87	-5.47	100	10.1	0.1	66	161	66	63
481	73.613	0.152	0.054	0.99	87	-5.47	99	9.8	-0.3	66	159	66	63
482	73.766	0.153	0.054	0.95	87	-5.47	100	8.9	-0.9	66	157	66	63
483	73.920	0.154	0.054	0.98	87	-5.47	100	10.0	1.1	66	155	66	63
484	74.072	0.152	0.054	0.99	87	-5.47	99	10.1	0.1	66	153	66	63
485	74.224	0.152	0.054	0.96	87	-5.47	99	9.1	-1	66	151	66	63
486	74.379	0.155	0.054	0.96	87	-5.47	101	10.0	0.9	65	150	66	63
487	74.532	0.153	0.054	1.00	87	-5.47	100	9.8	-0.2	66	148	65	63
488	74.683	0.151	0.054	1.00	87	-5.47	98	10.1	0.3	65	146	65	63
489	74.837	0.154	0.054	0.97	87	-5.47	100	10.7	0.6	65	145	65	63
490	74.990	0.153	0.054	0.99	87	-5.47	99	9.1	-1.6	65	144	65	63
491	75.144	0.154	0.054	0.94	87	-5.47	100	10.1	1	65	142	65	63
492	75.296	0.152	0.054	1.02	88	-5.47	99	10.0	-0.1	65	141	65	63
493	75.449	0.153	0.054	1.17	88	-5.47	99	10.4	0.4	65	140	65	63
494	75.603	0.154	0.054	0.96	88	-5.47	100	9.6	-0.8	65	138	65	63
495	75.755	0.152	0.054	0.97	88	-5.47	99	10.1	0.5	65	137	65	64
496	75.908	0.153	0.054	0.97	88	-5.47	99	9.9	-0.2	65	136	65	63
497	76.062	0.154	0.054	0.98	88	-5.47	100	10.0	0.1	65	135	65	63
498	76.215	0.153	0.054	1.00	88	-5.47	99	9.9	-0.1	65	133	65	64
499	76.367	0.152	0.054	0.97	88	-5.47	99	9.9	0	65	132	65	63
500	76.521	0.154	0.054	0.99	88	-5.47	100	10.1	0.2	65	131	65	63
501	76.675	0.154	0.054	0.99	88	-5.47	100	10.6	0.5	65	131	65	63
502	76.828	0.153	0.054	0.97	88	-5.47	99	9.9	-0.7	65	130	65	63
503	76.981	0.153	0.054	1.00	88	-5.47	99	10.1	0.2	65	129	65	63
504	77.134	0.153	0.054	1.01	88	-5.47	99	10.1	0	65	128	65	63
505	77.289	0.155	0.054	0.95	88	-5.47	101	10.0	-0.1	65	127	65	63
506	77.440	0.151	0.054	0.94	88	-5.47	98	10.0	0	65	126	65	63
507	77.594	0.154	0.054	1.03	88	-5.47	100	10.0	0	65	125	65	63
508	77.748	0.154	0.054	1.00	88	-5.47	100	9.9	-0.1	65	124	65	63
509	77.901	0.153	0.054	0.98	88	-5.47	99	10.2	0.3	65	123	65	63
510	78.053	0.152	0.054	1.01	88	-5.47	99	10.0	-0.2	65	122	65	63
511	78.207	0.154	0.054	0.96	88	-5.47	100	10.3	0.3	65	121	65	63

BOX A TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 3

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/2/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
512	78.360	0.153	0.054	1.00	88	-5.47	99	8.9	-1.4	65	120	65	63
513	78.513	0.153	0.054	0.98	88	-5.47	99	12.1	3.2	65	120	65	63
514	78.665	0.152	0.054	0.91	88	-5.47	99	10.0	-2.1	65	119	65	63
515	78.820	0.155	0.054	0.97	88	-5.47	101	9.8	-0.2	65	119	65	63
516	78.974	0.154	0.054	0.97	88	-5.47	100	10.1	0.3	65	118	65	63
517	79.125	0.151	0.054	0.98	88	-5.47	98	10.2	0.1	65	117	65	63
518	79.279	0.154	0.054	0.90	88	-5.47	100	10.1	-0.1	65	116	65	63
519	79.433	0.154	0.054	0.96	88	-5.47	100	10.1	0	65	115	65	63
520	79.586	0.153	0.054	0.93	88	-5.47	99	10.6	0.5	65	115	65	63
521	79.738	0.152	0.054	0.93	88	-5.47	99	9.8	-0.8	65	114	65	63
522	79.891	0.153	0.054	0.98	88	-5.47	99	10.3	0.5	65	114	65	63
523	80.045	0.154	0.054	0.86	88	-5.47	100	10.0	-0.3	65	113	65	63
524	80.197	0.152	0.054	0.97	88	-5.47	99	10.0	0	65	113	65	63
525	80.350	0.153	0.054	0.84	88	-5.47	99	10.0	0	65	113	65	63
526	80.504	0.154	0.054	1.00	88	-5.47	100	9.9	-0.1	65	112	65	63
527	80.658	0.154	0.054	1.01	88	-5.47	100	10.1	0.2	65	111	65	64
528	80.810	0.152	0.054	0.96	88	-5.47	99	10.0	-0.1	65	111	65	64
529	80.963	0.153	0.054	0.99	88	-5.47	99	10.1	0.1	65	110	65	63
530	81.117	0.154	0.054	0.99	88	-5.47	100	9.9	-0.2	65	109	65	64
531	81.269	0.152	0.054	0.99	88	-5.47	99	9.9	0	65	109	65	63
532	81.423	0.154	0.054	0.98	88	-5.47	100	10.0	0.1	65	108	65	63
533	81.577	0.154	0.054	1.00	88	-5.47	100	9.7	-0.3	65	107	65	63
534	81.730	0.153	0.054	1.01	88	-5.47	99	10.0	0.3	65	107	65	63
535	81.882	0.152	0.054	1.00	88	-5.47	99	9.6	-0.4	65	107	65	63
536	82.036	0.154	0.054	1.09	88	-5.47	100	10.0	0.4	65	107	65	63
537	82.190	0.154	0.054	1.07	88	-5.47	100	10.0	0	65	106	65	63
538	82.342	0.152	0.054	0.93	88	-5.47	99	10.0	0	65	106	65	63
539	82.495	0.153	0.054	0.92	88	-5.47	99	9.9	-0.1	65	105	65	64
540	82.649	0.154	0.054	0.99	88	-5.47	100	10.0	0.1	65	104	65	63
541	82.803	0.154	0.054	1.08	88	-5.47	100	10.4	0.4	65	104	65	63
542	82.954	0.151	0.054	0.94	88	-5.47	98	10.0	-0.4	65	104	65	63
543	83.108	0.154	0.054	0.98	88	-5.47	100	10.1	0.1	65	104	65	63

BOX A TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 3

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/2/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
544	83.261	0.153	0.054	1.01	88	-5.47	99	9.9	-0.2	65	103	65	64
545	83.414	0.153	0.054	0.99	88	-5.47	99	10.0	0.1	65	103	65	64
546	83.567	0.153	0.054	0.97	88	-5.47	99	9.6	-0.4	65	103	65	64
547	83.721	0.154	0.054	0.99	88	-5.47	100	10.8	1.2	65	102	65	64
548	83.875	0.154	0.054	1.02	88	-5.47	100	10.8	0	65	102	65	64
549	84.027	0.152	0.054	1.07	88	-5.47	99	10.0	-0.8	65	102	65	64
550	84.181	0.154	0.054	1.01	88	-5.47	100	9.9	-0.1	65	102	65	64
551	84.336	0.155	0.054	1.01	88	-5.47	101	9.3	-0.6	65	101	65	64
552	84.489	0.153	0.054	0.98	88	-5.47	99	9.5	0.2	65	101	65	63
553	84.641	0.152	0.054	0.99	88	-5.47	99	10.0	0.5	65	100	65	63
554	84.794	0.153	0.054	0.95	88	-5.47	99	9.7	-0.3	65	99	65	63
555	84.948	0.154	0.054	0.95	88	-5.47	100	10.1	0.4	65	99	65	63
556	85.100	0.152	0.054	1.00	88	-5.47	99	10.0	-0.1	65	98	65	63
557	85.254	0.154	0.054	1.02	88	-5.47	100	10.0	0	65	98	65	64
558	85.408	0.154	0.054	0.98	88	-5.47	100	9.7	-0.3	65	98	65	64
559	85.561	0.153	0.054	0.95	88	-5.47	99	10.0	0.3	65	98	65	63
560	85.714	0.153	0.054	1.03	88	-5.47	99	9.2	-0.8	65	98	65	64
561	85.867	0.153	0.054	1.00	88	-5.47	99	10.1	0.9	65	98	65	64
562	86.021	0.154	0.054	0.94	88	-5.47	101	10.0	-0.1	71	135	65	63
563	86.173	0.152	0.054	1.00	88	-5.47	100	10.0	0	75	173	65	63
564	86.326	0.153	0.054	0.97	88	-5.47	100	10.1	0.1	76	184	65	63
565	86.480	0.154	0.054	0.95	88	-5.47	101	10.0	-0.1	77	192	65	64
566	86.633	0.153	0.054	1.04	88	-5.47	101	9.1	-0.9	78	198	65	63
567	86.784	0.151	0.054	0.99	88	-5.47	99	9.2	0.1	79	203	65	64
568	86.937	0.153	0.054	1.09	88	-5.47	101	9.2	0	80	208	65	64
569	87.091	0.154	0.054	0.96	88	-5.47	101	8.5	-0.7	81	212	66	64
570	87.244	0.153	0.054	0.96	88	-5.47	101	9.0	0.5	81	215	66	64
571	87.396	0.152	0.054	0.99	88	-5.47	100	8.1	-0.9	81	218	66	64
572	87.549	0.153	0.054	1.02	88	-5.47	101	8.0	-0.1	81	219	66	64
573	87.702	0.153	0.054	0.97	88	-5.47	101	8.0	0	82	221	66	64
574	87.855	0.153	0.054	1.02	88	-5.47	101	8.0	0	82	224	66	64
575	88.006	0.151	0.054	1.04	88	-5.47	100	8.2	0.2	82	226	66	63

BOX A TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 3

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/2/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
576	88.159	0.153	0.054	0.99	88	-5.47	101	8.1	-0.1	83	228	66	63
577	88.313	0.154	0.054	0.98	88	-5.47	102	6.7	-1.4	83	230	66	63
578	88.465	0.152	0.054	0.99	88	-5.47	100	6.7	0	83	231	66	64
579	88.617	0.152	0.054	0.97	88	-5.47	100	6.9	0.2	83	233	67	64
580	88.770	0.153	0.054	0.97	88	-5.47	101	7.4	0.5	84	235	67	64
581	88.923	0.153	0.054	0.98	88	-5.47	101	7.2	-0.2	84	237	67	64
582	89.075	0.152	0.054	0.89	88	-5.47	100	6.0	-1.2	84	238	67	64
583	89.227	0.152	0.054	0.99	88	-5.47	100	6.0	0	84	240	67	64
584	89.381	0.154	0.054	0.96	88	-5.47	102	6.1	0.1	84	240	67	64
585	89.534	0.153	0.054	0.95	88	-5.47	101	5.7	-0.4	85	241	67	64
586	89.686	0.152	0.054	0.99	88	-5.47	101	6.0	0.3	85	242	67	63
587	89.839	0.153	0.054	0.97	88	-5.47	101	6.1	0.1	85	242	67	64
588	89.993	0.154	0.054	1.15	88	-5.47	102	5.1	-1	85	242	67	64
589	90.147	0.154	0.054	1.07	88	-5.47	102	5.0	-0.1	85	242	67	64
590	90.298	0.151	0.054	1.00	88	-5.47	100	4.9	-0.1	85	242	67	64
591	90.451	0.153	0.054	1.03	88	-5.47	101	4.5	-0.4	85	242	67	64
592	90.604	0.153	0.054	0.98	88	-5.47	101	4.9	0.4	85	242	68	64
593	90.757	0.153	0.054	0.98	88	-5.47	101	4.9	0	86	242	68	64
594	90.908	0.151	0.054	0.97	88	-5.47	100	5.1	0.2	86	242	68	63
595	91.061	0.153	0.054	0.96	88	-5.47	101	5.1	0	86	242	68	64
596	91.214	0.153	0.054	1.00	88	-5.47	101	5.0	-0.1	86	241	68	63
597	91.367	0.153	0.054	0.96	88	-5.47	101	4.0	-1	86	241	68	64
598	91.518	0.151	0.054	0.96	88	-5.47	100	4.1	0.1	86	241	68	64
599	91.672	0.154	0.054	0.98	88	-5.47	102	4.1	0	86	241	68	64
600	91.825	0.153	0.054	0.93	88	-5.47	101	3.9	-0.2	85	240	68	64
601	91.977	0.152	0.054	1.02	88	-5.47	99	4.1	0.2	71	227	68	64
602	92.129	0.152	0.054	0.97	88	-5.47	99	4.1	0	69	217	68	64
603	92.283	0.154	0.054	0.96	88	-5.47	100	3.8	-0.3	68	209	68	64
604	92.437	0.154	0.054	0.99	88	-5.47	100	4.0	0.2	68	202	67	64
605	92.588	0.151	0.054	0.96	89	-5.47	98	3.1	-0.9	67	196	67	64
606	92.741	0.153	0.054	1.01	89	-5.47	99	4.1	1	67	192	67	64
607	92.896	0.155	0.054	1.01	89	-5.47	101	5.3	1.2	67	187	67	64

BOX A TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 3

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/2/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
608	93.049	0.153	0.054	1.05	89	-5.47	99	3.7	-1.6	67	183	67	64
609	93.200	0.151	0.054	0.94	89	-5.47	98	3.8	0.1	67	180	67	64
610	93.354	0.154	0.054	0.94	89	-5.47	100	4.1	0.3	67	177	67	63
611	93.508	0.154	0.054	0.97	89	-5.47	100	4.1	0	67	174	67	64
612	93.660	0.152	0.054	0.94	89	-5.47	99	3.9	-0.2	67	171	67	64
613	93.812	0.152	0.054	0.97	89	-5.47	99	4.0	0.1	67	169	67	64
614	93.966	0.154	0.054	1.02	89	-5.47	100	3.9	-0.1	67	166	67	64
615	94.120	0.154	0.054	1.00	89	-5.47	100	4.6	0.7	67	164	67	64
616	94.272	0.152	0.054	0.92	89	-5.47	99	4.0	-0.6	67	162	67	64
617	94.425	0.153	0.054	0.93	89	-5.47	99	4.1	0.1	66	160	67	63
618	94.579	0.154	0.054	0.96	89	-5.47	100	4.0	-0.1	66	158	67	64
619	94.732	0.153	0.054	0.98	89	-5.47	99	3.8	-0.2	66	156	67	64
620	94.884	0.152	0.054	0.95	89	-5.47	99	4.0	0.2	66	154	67	64
621	95.038	0.154	0.054	1.00	89	-5.47	100	4.0	0	66	153	66	64
622	95.192	0.154	0.054	0.97	89	-5.47	100	3.7	-0.3	66	151	66	64
623	95.344	0.152	0.054	0.98	89	-5.47	99	4.2	0.5	66	149	66	64
624	95.497	0.153	0.054	0.91	89	-5.47	99	4.1	-0.1	66	148	66	63
625	95.652	0.155	0.054	1.02	89	-5.47	101	5.2	1.1	66	146	66	64
626	95.805	0.153	0.054	0.97	89	-5.47	99	3.9	-1.3	66	145	66	63
627	95.957	0.152	0.054	1.01	89	-5.47	99	3.9	0	66	143	66	64
628	96.110	0.153	0.054	1.05	89	-5.47	99	4.0	0.1	66	142	66	63
629	96.265	0.155	0.054	1.08	89	-5.47	101	4.5	0.5	66	141	66	64
630	96.417	0.152	0.054	0.97	89	-5.47	99	3.8	-0.7	66	140	66	63
631	96.570	0.153	0.054	0.99	89	-5.47	99	4.1	0.3	66	138	66	64
632	96.724	0.154	0.054	0.97	89	-5.47	100	5.6	1.5	66	137	66	64
633	96.877	0.153	0.054	0.97	89	-5.47	99	3.9	-1.7	66	136	66	64
634	97.030	0.153	0.054	1.00	89	-5.47	99	3.9	0	66	135	66	64
635	97.183	0.153	0.054	0.98	89	-5.47	99	4.3	0.4	66	134	66	64
636	97.338	0.155	0.054	0.97	89	-5.47	101	4.0	-0.3	66	133	66	64
637	97.490	0.152	0.054	1.00	89	-5.47	99	4.0	0	66	132	66	64
638	97.643	0.153	0.054	1.02	89	-5.47	99	4.1	0.1	66	131	66	63
639	97.797	0.154	0.054	1.02	89	-5.47	100	4.0	-0.1	66	129	66	63

BOX A TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 3

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/2/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
640	97.951	0.154	0.054	0.98	89	-5.47	100	4.1	0.1	66	128	66	64
641	98.103	0.152	0.054	0.97	89	-5.47	99	4.0	-0.1	66	127	66	64
642	98.257	0.154	0.054	0.98	89	-5.47	100	3.9	-0.1	66	127	66	63
643	98.412	0.155	0.054	0.99	89	-5.47	101	4.2	0.3	66	126	66	64
644	98.564	0.152	0.054	1.12	89	-5.47	99	4.3	0.1	66	125	66	63
645	98.717	0.153	0.054	0.96	89	-5.47	99	3.5	-0.8	66	124	66	64
646	98.871	0.154	0.054	1.02	89	-5.47	100	4.0	0.5	66	123	66	64
647	99.025	0.154	0.054	0.99	89	-5.47	100	4.1	0.1	66	122	66	64
648	99.177	0.152	0.054	0.97	89	-5.47	99	4.0	-0.1	66	122	66	64
649	99.331	0.154	0.054	1.01	89	-5.47	100	4.0	0	66	121	66	64
650	99.486	0.155	0.054	1.00	89	-5.47	101	4.0	0	66	120	66	64
651	99.638	0.152	0.054	1.03	89	-5.47	99	4.1	0.1	66	120	66	64
652	99.791	0.153	0.054	1.02	89	-5.47	99	4.0	-0.1	66	119	66	64
653	99.945	0.154	0.054	1.02	89	-5.47	100	4.1	0.1	66	118	65	63
654	100.099	0.154	0.054	0.93	89	-5.47	100	3.8	-0.3	66	117	65	64
655	100.251	0.152	0.054	0.94	89	-5.47	99	3.8	0	66	116	65	64
656	100.405	0.154	0.054	1.02	89	-5.47	100	3.9	0.1	66	116	65	63
657	100.559	0.154	0.054	0.94	89	-5.47	100	4.0	0.1	66	115	65	64
658	100.712	0.153	0.054	0.99	89	-5.47	99	3.8	-0.2	66	114	65	64
659	100.865	0.153	0.054	1.01	89	-5.47	99	4.0	0.2	66	114	65	64
660	101.020	0.155	0.054	1.04	89	-5.47	101	4.0	0	66	114	65	64
661	101.173	0.153	0.054	0.98	89	-5.47	99	3.1	-0.9	66	113	65	64
662	101.325	0.152	0.054	0.99	89	-5.47	99	4.1	1	66	113	65	64
663	101.479	0.154	0.054	1.02	89	-5.47	100	4.0	-0.1	66	112	65	64
664	101.634	0.155	0.054	0.76	89	-5.47	101	2.8	-1.2	66	111	65	64
665	101.786	0.152	0.054	0.98	89	-5.47	99	4.3	1.5	66	111	65	63
666	101.939	0.153	0.054	0.93	89	-5.47	99	4.0	-0.3	66	111	65	63
667	102.094	0.155	0.054	1.03	89	-5.47	101	4.5	0.5	66	110	65	64
668	102.248	0.154	0.054	0.97	89	-5.47	100	4.4	-0.1	66	109	65	64
669	102.400	0.152	0.054	0.99	89	-5.47	99	3.9	-0.5	66	108	65	64
670	102.554	0.154	0.054	0.98	89	-5.47	100	3.9	0	66	108	65	64
671	102.709	0.155	0.054	0.96	89	-5.47	101	3.9	0	66	108	65	64

BOX A TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 3

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/2/2020

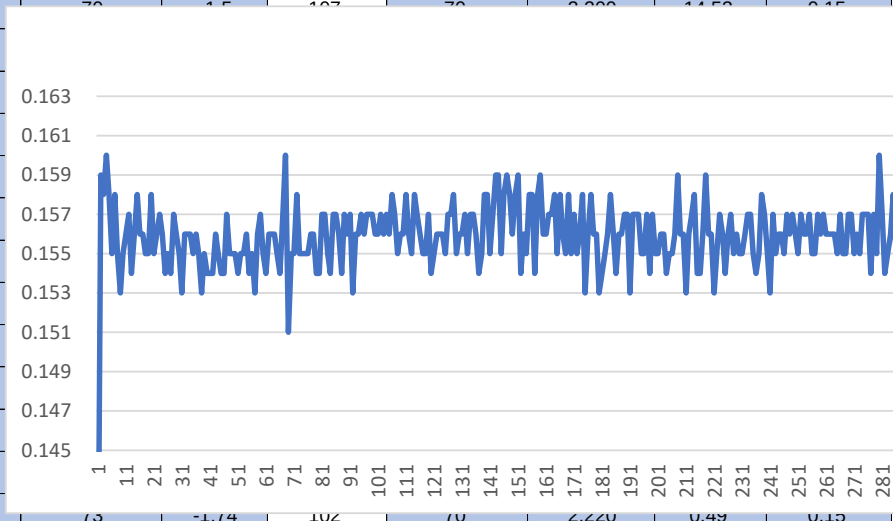
	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
672	102.861	0.152	0.054	0.96	89	-5.47	98	3.1	-0.8	65	107	65	64
673	103.014	0.153	0.054	1.03	89	-5.47	99	4.1	1	65	106	65	64
674	103.169	0.155	0.054	0.97	89	-5.47	101	4.0	-0.1	74	170	65	64
675	103.322	0.153	0.054	0.98	89	-5.47	100	4.1	0.1	77	182	65	64
676	103.474	0.152	0.054	1.00	89	-5.47	100	3.9	-0.2	78	186	65	64
677	103.628	0.154	0.054	0.98	89	-5.47	101	3.9	0	79	189	65	63
678	103.782	0.154	0.054	1.00	89	-5.47	101	3.8	-0.1	80	190	66	64
679	103.934	0.152	0.054	1.08	89	-5.47	100	4.1	0.3	80	191	66	64
680	104.087	0.153	0.054	1.05	89	-5.47	101	4.8	0.7	80	192	66	64
681	104.242	0.155	0.054	0.98	89	-5.47	102	3.9	-0.9	81	193	66	64
682	104.395	0.153	0.054	0.95	89	-5.47	101	4.0	0.1	81	193	66	63
683	104.547	0.152	0.054	1.03	89	-5.47	100	3.8	-0.2	81	194	66	63
684	104.700	0.153	0.054	0.98	89	-5.47	101	4.0	0.2	81	194	66	63
685	104.854	0.154	0.054	1.00	89	-5.47	101	4.4	0.4	81	195	66	64
686	105.006	0.152	0.054	1.00	89	-5.47	100	4.0	-0.4	82	195	66	64
687	105.159	0.153	0.054	0.99	89	-5.47	101	4.0	0	82	196	66	64
688	105.312	0.153	0.054	0.99	89	-5.47	101	4.0	0	82	196	66	64
689	105.466	0.154	0.054	0.97	89	-5.47	101	2.8	-1.2	82	197	67	64

BOX B TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 3

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/2/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
0	0.001		0.00	70	-1		68	2.000	4.89	1.32
1	0.137	0.136	0.00	70	-4.48	92	69	2.200	13.29	0.27
2	0.296	0.159	2.74	70	-0.75	108	69	2.240	12.54	0.15
3	0.454	0.158	0.44	70	-1.58	107	70	2.200	13.44	0.13
4	0.614	0.160	1.48	70	-0.98	108	70	2.200	13.63	0.05
5	0.772	0.158	0.00	70	-2.43	107	70	2.200	14.09	0.16
6	0.927	0.155	1.96	70	-1.2	105	70	2.180	14.35	0.20
7	1.085	0.158	1.04							
8	1.240	0.155	0.00							
9	1.393	0.153	1.60							
10	1.548	0.155	1.59							
11	1.704	0.156	1.86							
12	1.861	0.157	1.26							
13	2.015	0.154	1.82							
14	2.171	0.156	1.19							
15	2.329	0.158	0.39							
16	2.485	0.156	0.56							
17	2.641	0.156	0.91							
18	2.796	0.155	0.75							
19	2.951	0.155	0.05							
20	3.109	0.158	0.00	73	-1.83	104	70	2.210	0.31	0.11
21	3.264	0.155	2.40	73	-1.03	102	70	2.250	0.22	0.07
22	3.420	0.156	2.19	73	-1.1	103	70	2.220	0.20	0.07
23	3.577	0.157	0.86	74	-1.65	103	70	2.220	0.04	0.03
24	3.733	0.156	1.29	74	-1.36	103	70	2.200	0.17	0.07
25	3.887	0.154	0.00	74	-1.84	101	70	2.190	0.19	0.06
26	4.042	0.155	0.83	74	-1.74	102	70	2.220	0.10	0.01
27	4.196	0.154	1.64	75	-1.46	101	70	2.220	0.14	0.08
28	4.353	0.157	0.52	75	-1.59	103	70	2.220	0.16	0.05
29	4.509	0.156	0.50	75	-1.6	102	70	2.220	0.15	0.08
30	4.664	0.155	0.00	75	-1.92	102	70	2.220	0.21	0.09
31	4.817	0.153	0.61	76	-1.6	100	70	2.220	0.17	0.05



BOX B TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 3

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/2/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
32	4.973	0.156	0.00	76	-1.77	102	70	2.220	0.19	0.10
33	5.129	0.156	2.05	76	-1.05	102	70	2.220	(0.06)	0.07
34	5.285	0.156	1.22	76	-1.38	102	70	2.220	0.14	0.04
35	5.440	0.155	1.55	77	-1.28	101	70	2.220	0.18	0.10
36	5.596	0.156	1.46	77	-1.3	102	70	2.220	0.14	0.06
37	5.751	0.155	1.09	77	-1.48	101	70	2.220	0.16	0.05
38	5.904	0.153	0.37	78	-1.62	100	70	2.210	0.14	0.07
39	6.059	0.155	1.43	78	-1.38	101	70	2.220	0.14	0.10
40	6.213	0.154	0.40	78	-1.63	101	70	2.230	0.10	(0.02)
41	6.367	0.154	0.00	78	-1.82	101	69	2.220	0.12	0.03
42	6.521	0.154	0.74	79	-1.61	100	69	2.220	0.02	(0.01)
43	6.677	0.156	1.32	79	-1.39	102	69	2.220	0.11	0.05
44	6.832	0.155	1.07	79	-1.64	101	69	2.220	0.08	0.03
45	6.986	0.154	0.70	79	-1.52	100	69	2.230	0.08	0.02
46	7.140	0.154	1.44	80	-1.34	100	69	2.230	0.08	0.03
47	7.297	0.157	1.95	80	-1.1	102	69	2.230	0.15	0.01
48	7.452	0.155	0.98	80	-1.49	101	69	2.220	0.09	0.04
49	7.607	0.155	0.24	80	-1.66	101	69	2.230	0.07	0.05
50	7.762	0.155	1.19	81	-1.37	101	69	2.230	0.10	0.11
51	7.916	0.154	0.00	81	-1.79	100	69	2.230	0.09	0.06
52	8.071	0.155	2.19	81	-1.07	101	69	2.230	0.04	(0.10)
53	8.226	0.155	0.46	81	-1.59	101	69	2.240	0.01	0.03
54	8.382	0.156	0.00	81	-1.79	101	69	2.230	(0.02)	0.02
55	8.536	0.154	1.32	82	-1.39	100	69	2.210	0.04	0.04
56	8.691	0.155	0.00	82	-1.77	101	69	2.220	0.02	(0.06)
57	8.844	0.153	0.00	82	-1.85	99	69	2.230	0.04	0.01
58	9.000	0.156	0.40	82	-1.61	101	69	2.230	0.06	0.03
59	9.157	0.157	0.00	83	-1.73	102	69	2.230	0.06	0.06
60	9.312	0.155	1.80	83	-1.18	100	69	2.230	(0.01)	0.10
61	9.466	0.154	1.71	83	-1.28	100	69	2.230	0.03	0.03
62	9.622	0.156	2.08	83	-1.11	101	69	2.230	(0.02)	(0.01)
63	9.778	0.156	2.05	83	-1.1	101	69	2.230	0.06	0.10

BOX B TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 3

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/2/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
64	9.934	0.156	0.00	83	-1.94	101	69	2.230	0.02	(0.01)
65	10.089	0.155	1.23	84	-1.41	100	69	2.230	(0.03)	0.04
66	10.243	0.154	0.00	84	-1.95	99	69	2.230	0.07	0.03
67	10.400	0.157	0.00	84	-1.88	101	69	2.230	0.06	0.06
68	10.560	0.160	0.00	84	-1.88	103	69	2.230	0.06	0.06
69	10.711	0.151	0.60	84	-1.65	97	69	2.230	(0.04)	(0.12)
70	10.866	0.155	0.15	85	-1.72	100	69	2.230	0.12	0.02
71	11.021	0.155	0.00	85	-1.92	100	69	2.230	0.05	0.03
72	11.179	0.158	1.86	85	-1.18	102	69	2.230	0.06	0.02
73	11.334	0.155	2.24	85	-1.07	100	69	2.230	0.06	0.03
74	11.489	0.155	1.48	85	-1.2	100	69	2.230	(0.03)	(0.03)
75	11.644	0.155	1.98	85	-1.16	100	69	2.230	(0.08)	0.01
76	11.799	0.155	1.48	85	-1.32	100	69	2.230	0.05	0.05
77	11.955	0.156	1.12	86	-1.35	100	69	2.230	0.05	0.04
78	12.111	0.156	1.27	86	-1.43	100	69	2.230	0.02	0.01
79	12.265	0.154	0.00	86	-1.82	99	69	2.230	0.22	0.07
80	12.419	0.154	0.00	86	-1.81	99	69	2.230	0.03	0.05
81	12.576	0.157	0.13	86	-1.68	101	68	2.260	0.03	0.00
82	12.733	0.157	0.94	86	-1.22	101	68	2.230	0.01	(0.03)
83	12.888	0.155	0.93	86	-1.51	100	68	2.230	0.04	0.05
84	13.042	0.154	0.00	87	-1.91	99	68	2.200	0.01	0.04
85	13.199	0.157	0.74	87	-1.52	101	68	2.240	(0.02)	0.02
86	13.356	0.157	1.19	87	-1.44	101	68	2.240	0.03	0.04
87	13.512	0.156	0.00	87	-1.85	100	68	2.240	0.02	(0.03)
88	13.666	0.154	1.73	87	-1.25	99	68	2.230	(0.06)	0.00
89	13.823	0.157	1.24	87	-1.4	101	68	2.240	(0.06)	(0.05)
90	13.979	0.156	0.76	87	-1.51	100	68	2.240	0.11	0.02
91	14.136	0.157	0.00	87	-1.87	101	68	2.240	0.04	0.03
92	14.289	0.153	2.06	88	-1.11	98	68	2.240	0.03	(0.02)
93	14.445	0.156	0.00	88	-1.76	100	68	2.230	(0.07)	(0.04)
94	14.601	0.156	0.27	88	-1.67	100	68	2.220	(0.05)	0.03
95	14.758	0.157	0.99	88	-1.52	100	68	2.240	(0.02)	0.01

BOX B TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 3

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/2/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
96	14.914	0.156	1.24	88	-1.38	100	68	2.230	0.03	0.03
97	15.071	0.157	0.88	88	-1.44	100	68	2.240	0.06	0.03
98	15.228	0.157	1.07	88	-1.28	100	68	2.230	(0.09)	(0.01)
99	15.385	0.157	0.85	88	-1.5	100	68	2.240	0.01	0.08
100	15.541	0.156	2.40	88	-1.17	100	68	2.230	0.00	0.04
101	15.697	0.156	2.19	88	-1.1	100	68	2.240	0.03	0.02
102	15.854	0.157	0.78	88	-1.51	100	68	2.230	0.00	0.04
103	16.010	0.156	0.68	89	-1.53	100	68	2.230	0.04	0.02
104	16.167	0.157	0.77	89	-1.51	100	68	2.230	(0.01)	0.14
105	16.323	0.156	0.96	89	-1.4	100	68	2.230	(0.07)	0.04
106	16.481	0.158	1.32	89	-1.33	101	68	2.230	0.05	0.04
107	16.638	0.157	0.34	89	-1.62	100	68	2.240	(0.07)	0.02
108	16.793	0.155	1.50	89	-1.31	99	68	2.220	0.00	0.01
109	16.949	0.156	1.75	89	-1.16	100	68	2.230	0.17	0.02
110	17.105	0.156	0.96	89	-1.49	100	68	2.240	0.03	0.05
111	17.263	0.158	1.83	89	-1.22	101	68	2.240	0.02	0.01
112	17.419	0.156	0.00	89	-1.77	100	68	2.240	0.04	(0.02)
113	17.574	0.155	1.43	89	-1.35	99	68	2.240	(0.09)	0.04
114	17.732	0.158	0.71	89	-1.5	101	68	2.230	0.00	0.01
115	17.889	0.157	2.06	89	-1.08	100	68	2.240	0.11	0.04
116	18.045	0.156	1.57	89	-1.27	100	68	2.240	0.00	0.05
117	18.200	0.155	0.74	90	-1.72	99	68	2.240	(0.07)	(0.02)
118	18.355	0.155	0.12	90	-1.56	99	68	2.240	0.01	(0.05)
119	18.512	0.157	0.00	90	-1.82	100	68	2.240	(0.04)	0.04
120	18.666	0.154	0.52	90	-1.57	98	68	2.240	0.13	0.00
121	18.821	0.155	1.60	90	-1.27	99	68	2.240	0.05	0.01
122	18.977	0.156	2.00	90	-1.18	99	68	2.240	0.10	0.03
123	19.133	0.156	2.08	90	-1.16	99	68	2.240	0.01	0.04
124	19.289	0.156	0.30	90	-1.64	99	68	2.230	0.00	0.02
125	19.444	0.155	0.66	90	-1.62	99	68	2.170	(0.04)	0.02
126	19.601	0.157	1.54	90	-1.29	100	68	2.240	(0.02)	(0.01)
127	19.758	0.157	1.45	90	-1.36	100	68	2.240	(0.01)	0.02

BOX B TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 3

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/2/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
128	19.916	0.158	1.49	90	-1.26	101	68	2.240	0.01	0.07
129	20.071	0.155	0.61	90	-1.52	99	68	2.240	0.06	0.01
130	20.227	0.156	1.29	90	-1.46	99	68	2.220	0.06	0.03
131	20.383	0.156	0.28	90	-1.66	99	68	2.240	0.03	0.03
132	20.540	0.157	1.44	90	-1.31	100	68	2.250	0.00	0.03
133	20.695	0.155	0.19	90	-1.63	99	68	2.230	0.10	0.05
134	20.852	0.157	0.75	90	-1.65	100	68	2.230	0.11	0.01
135	21.009	0.157	0.00	90	-1.87	100	67	2.250	0.06	0.03
136	21.165	0.156	0.62	90	-1.52	99	67	2.240	(0.01)	0.03
137	21.319	0.154	0.63	90	-1.58	98	67	2.240	0.04	0.06
138	21.474	0.155	0.00	90	-1.72	99	67	2.250	(0.16)	0.00
139	21.632	0.158	1.01	91	-1.44	101	67	2.240	0.02	(0.01)
140	21.790	0.158	2.00	91	-1.17	101	67	2.240	(0.08)	(0.03)
141	21.945	0.155	1.67	91	-1.26	99	67	2.240	0.05	(0.04)
142	22.102	0.157	1.41	91	-1.36	100	67	2.240	(0.01)	0.01
143	22.261	0.159	0.92	91	-1.45	101	67	2.240	0.03	0.01
144	22.420	0.159	0.42	91	-1.57	101	67	2.260	0.01	0.00
145	22.575	0.155	1.23	91	-1.4	99	67	2.260	0.03	0.04
146	22.733	0.158	1.93	91	-1.15	101	67	2.200	(0.04)	0.04
147	22.892	0.159	1.79	91	-1.2	101	67	2.240	0.12	0.05
148	23.050	0.158	0.79	91	-1.52	101	67	2.240	(0.05)	0.01
149	23.206	0.156	0.00	91	-1.79	99	67	2.240	(0.10)	0.02
150	23.364	0.158	0.69	91	-1.53	100	67	2.240	(0.11)	0.04
151	23.523	0.159	1.34	91	-1.44	101	67	2.200	(0.04)	0.01
152	23.677	0.154	0.99	91	-1.43	98	67	2.240	0.00	0.00
153	23.833	0.156	0.94	91	-1.48	99	67	2.240	(0.14)	0.06
154	23.988	0.155	0.53	91	-1.58	99	67	2.240	0.02	0.03
155	24.146	0.158	0.87	91	-1.49	100	67	2.230	(0.03)	0.01
156	24.304	0.158	0.29	91	-1.65	100	67	2.240	0.14	0.03
157	24.458	0.154	0.00	91	-1.84	98	67	2.240	(0.01)	0.03
158	24.616	0.158	1.66	91	-1.28	100	67	2.230	0.01	0.03
159	24.775	0.159	0.00	91	-1.81	102	68	2.190	1.51	0.35

BOX B TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 3

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/2/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
160	24.931	0.156	0.60	91	-1.54	100	68	2.210	2.38	0.44
161	25.087	0.156	0.00	91	-1.75	100	68	2.210	4.32	0.44
162	25.244	0.157	1.25	91	-1.38	101	68	2.210	8.56	0.11
163	25.401	0.157	1.69	91	-1.28	101	68	2.210	10.48	0.06
164	25.559	0.158	1.09	91	-1.39	102	68	2.210	11.87	0.47
165	25.714	0.155	0.50	91	-1.64	100	68	2.210	11.88	1.77
166	25.872	0.158	0.92	91	-1.51	102	69	2.200	12.11	1.58
167	26.028	0.156	0.70	91	-1.51	101	69	2.200	12.03	1.81
168	26.183	0.155	1.07	91	-1.42	100	69	2.200	12.02	2.09
169	26.341	0.158	0.21	91	-1.42	102	69	2.200	11.87	2.72
170	26.496	0.155	1.00	91	-1.41	100	69	2.200	11.63	3.38
171	26.653	0.157	1.66	91	-1.25	102	69	2.200	11.62	3.70
172	26.808	0.155	1.59	91	-1.23	101	69	2.200	11.35	4.09
173	26.964	0.156	0.23	91	-1.61	101	70	2.200	11.44	4.04
174	27.122	0.158	0.28	91	-1.63	102	70	2.200	11.41	4.10
175	27.275	0.153	1.13	91	-1.39	99	70	2.200	11.41	4.13
176	27.431	0.156	0.45	91	-1.58	101	70	2.200	11.63	4.23
177	27.589	0.158	0.49	91	-1.28	103	69	2.200	11.47	5.17
178	27.745	0.156	1.55	91	-0.93	101	69	2.200	11.42	3.93
179	27.901	0.156	1.49	91	-0.96	101	70	2.200	11.91	2.97
180	28.054	0.153	1.11	91	-1.09	99	70	2.200	12.01	2.59
181	28.208	0.154	0.66	91	-1.2	100	70	2.240	12.36	2.09
182	28.363	0.155	1.28	91	-1.02	101	70	2.200	12.48	1.64
183	28.519	0.156	0.89	91	-1.14	100	69	2.210	12.81	1.72
184	28.677	0.158	1.09	91	-1.1	101	69	2.270	4.98	1.36
185	28.833	0.156	1.57	91	-0.92	100	69	2.220	1.58	0.47
186	28.987	0.154	0.86	91	-1.27	98	69	2.220	0.79	0.25
187	29.143	0.156	1.39	91	-0.98	99	69	2.220	0.54	0.22
188	29.299	0.156	2.20	91	-1	99	69	2.220	0.48	0.20
189	29.456	0.157	1.58	91	-0.93	100	69	2.220	0.44	0.19
190	29.613	0.157	1.45	91	-0.97	100	69	2.220	0.33	0.18
191	29.766	0.153	0.35	91	-1.29	97	69	2.220	0.26	0.10

BOX B TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 3

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/2/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
192	29.923	0.157	1.39	91	-0.99	100	69	2.220	0.35	0.22
193	30.080	0.157	1.37	91	-0.99	100	69	2.220	0.24	0.15
194	30.237	0.157	1.12	91	-1.07	100	69	2.230	0.30	0.17
195	30.392	0.155	0.15	91	-1.31	99	69	2.230	0.40	0.20
196	30.547	0.155	0.70	91	-1.2	99	69	2.240	0.34	0.22
197	30.704	0.157	0.33	91	-1.3	100	69	2.220	0.32	0.16
198	30.858	0.154	2.05	91	-0.93	98	69	2.220	0.27	0.21
199	31.015	0.157	1.55	91	-0.91	100	69	2.220	0.36	0.20
200	31.170	0.155	1.22	91	-1.16	99	69	2.230	0.35	0.20
201	31.325	0.155	1.27	91	-1.09	99	68	2.220	0.34	0.25
202	31.481	0.156	1.24	91	-1.02	99	68	2.220	0.31	0.21
203	31.637	0.156	0.62	91	-1.22	99	68	2.230	0.33	0.25
204	31.791	0.154	1.57	91	-0.93	98	68	2.230	0.39	0.14
205	31.946	0.155	0.60	91	-1.22	99	68	2.220	0.16	0.14
206	32.101	0.155	1.25	91	-1.03	99	68	2.230	0.33	0.16
207	32.257	0.156	1.38	91	-0.91	99	68	2.230	0.37	0.17
208	32.416	0.159	1.58	91	-0.92	101	68	2.230	0.24	0.16
209	32.572	0.156	0.44	91	-1.27	99	68	2.230	0.24	0.15
210	32.728	0.156	1.38	91	-0.99	99	68	2.230	0.19	0.06
211	32.881	0.153	0.32	91	-1.31	97	68	2.190	0.20	0.11
212	33.037	0.156	0.32	91	-1.3	99	68	2.210	0.35	0.13
213	33.194	0.157	0.36	91	-1.29	100	68	2.230	0.19	0.09
214	33.352	0.158	0.16	91	-1.29	101	68	2.230	0.22	0.15
215	33.506	0.154	1.36	91	-0.99	98	68	2.230	0.18	0.11
216	33.660	0.154	1.55	91	-0.93	98	68	2.230	0.16	0.11
217	33.816	0.156	1.62	91	-0.91	99	68	2.230	0.07	0.10
218	33.975	0.159	1.47	91	-1.03	101	68	2.230	0.17	0.03
219	34.131	0.156	0.05	91	-1.29	99	68	2.230	0.23	0.09
220	34.287	0.156	1.36	91	-0.94	99	68	2.230	0.12	0.10
221	34.440	0.153	1.37	91	-0.99	97	68	2.230	0.14	0.09
222	34.595	0.155	1.91	91	-0.91	99	68	2.230	0.09	0.11
223	34.752	0.157	0.96	91	-1.11	100	68	2.230	0.12	0.07

BOX B TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 3

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/2/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
224	34.908	0.156	0.81	91	-1.16	99	67	2.230	0.18	0.12
225	35.062	0.154	0.29	91	-1.32	98	67	2.230	0.15	0.07
226	35.218	0.156	0.98	91	-1.11	99	67	2.230	0.25	0.18
227	35.375	0.157	1.39	91	-0.99	100	67	2.230	0.01	0.08
228	35.530	0.155	0.37	91	-1.29	99	67	2.230	0.22	0.08
229	35.686	0.156	1.83	91	-1.05	99	67	2.230	(0.02)	0.08
230	35.841	0.155	0.63	91	-1.22	99	67	2.240	0.17	0.09
231	35.996	0.155	0.79	91	-1.16	99	67	2.220	0.11	0.07
232	36.152	0.156	0.38	91	-1.29	99	67	2.230	0.10	0.10
233	36.309	0.157	1.60	91	-0.91	100	67	2.230	0.09	0.08
234	36.466	0.157	0.36	91	-1.3	100	67	2.250	0.10	0.10
235	36.621	0.155	1.28	91	-0.99	99	67	2.230	0.11	0.08
236	36.775	0.154	1.41	91	-0.98	98	67	2.230	0.09	0.05
237	36.930	0.155	1.73	91	-0.91	99	67	2.230	0.12	0.06
238	37.088	0.158	0.32	91	-1.31	101	67	2.230	(0.06)	0.02
239	37.245	0.157	1.45	91	-0.96	100	67	2.230	0.04	0.01
240	37.400	0.155	0.47	91	-1.26	99	67	2.230	(0.02)	0.11
241	37.553	0.153	0.77	91	-1.18	97	67	2.230	0.18	0.09
242	37.710	0.157	0.47	91	-1.26	100	67	2.230	(0.05)	0.08
243	37.865	0.155	0.86	91	-1.18	99	67	2.230	0.06	0.06
244	38.021	0.156	1.29	91	-0.92	99	67	2.230	0.05	0.07
245	38.177	0.156	0.68	91	-1.2	99	67	2.230	0.03	0.04
246	38.332	0.155	0.67	91	-1.2	99	67	2.230	0.06	0.04
247	38.489	0.157	1.57	91	-0.92	100	67	2.230	(0.02)	0.04
248	38.645	0.156	1.61	91	-0.92	99	67	2.240	0.10	0.08
249	38.802	0.157	0.28	91	-1.32	100	67	2.230	0.01	0.02
250	38.958	0.156	0.57	91	-1.22	99	67	2.240	0.09	0.06
251	39.113	0.155	1.62	91	-0.91	99	67	2.230	(0.04)	0.04
252	39.270	0.157	0.34	91	-1.3	100	67	2.230	0.07	0.04
253	39.426	0.156	0.72	91	-1.18	99	67	2.230	0.02	0.06
254	39.582	0.156	1.39	91	-0.98	99	67	2.230	0.24	0.07
255	39.739	0.157	0.93	91	-1.13	100	67	2.230	0.03	0.00

BOX B TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 3

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/2/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
256	39.894	0.155	1.46	91	-0.96	99	67	2.220	0.03	0.05
257	40.049	0.155	1.15	91	-1.06	99	67	2.190	0.10	0.07
258	40.206	0.157	0.80	91	-1.16	100	67	2.230	0.02	0.10
259	40.362	0.156	1.35	91	-1	99	67	2.240	(0.03)	0.03
260	40.519	0.157	1.46	91	-0.97	100	67	2.240	0.03	0.03
261	40.675	0.156	0.66	91	-1.22	99	67	2.240	0.03	0.05
262	40.831	0.156	0.76	91	-1.19	99	67	2.290	0.02	0.06
263	40.987	0.156	1.04	91	-1.12	99	67	2.240	(0.11)	(0.01)
264	41.143	0.156	1.32	91	-1	99	67	2.230	(0.01)	(0.02)
265	41.298	0.155	0.81	91	-1.16	99	67	2.230	0.23	0.07
266	41.455	0.157	1.61	91	-0.91	100	67	2.240	0.02	(0.02)
267	41.610	0.155	1.47	91	-0.95	99	67	2.240	0.11	0.09
268	41.765	0.155	1.42	91	-0.97	99	67	2.230	0.09	0.06
269	41.922	0.157	0.57	91	-1.24	100	67	2.230	0.04	0.05
270	42.079	0.157	1.61	91	-0.91	100	67	2.240	0.03	0.04
271	42.234	0.155	0.54	91	-1.24	99	67	2.240	(0.03)	(0.01)
272	42.390	0.156	1.57	91	-0.92	99	67	2.240	0.08	0.05
273	42.545	0.155	1.49	91	-0.95	99	67	2.230	0.13	0.09
274	42.702	0.157	0.47	91	-1.18	100	67	2.230	0.10	0.04
275	42.859	0.157	0.93	91	-1.13	100	67	2.240	0.06	0.04
276	43.016	0.157	1.26	91	-0.97	100	67	2.250	0.05	0.03
277	43.170	0.154	0.84	91	-1.18	98	67	2.240	0.03	0.05
278	43.327	0.157	0.96	91	-1.11	100	67	2.240	0.01	0.07
279	43.482	0.155	1.38	91	-1	99	67	2.230	0.11	0.07
280	43.642	0.160	1.90	91	-0.91	102	67	2.240	0.04	0.02
281	43.799	0.157	1.61	91	-0.91	100	67	2.230	0.01	0.02
282	43.953	0.154	0.76	91	-1.19	98	67	2.230	0.01	0.08
283	44.108	0.155	0.50	91	-1.25	99	67	2.240	(0.02)	0.00
284	44.264	0.156	1.57	91	-0.93	99	67	2.240	0.06	0.06
285	44.422	0.158	0.68	91	-1.2	100	67	2.240	0.01	0.04
286	44.577	0.155	0.67	91	-1.21	99	67	2.240	0.01	0.05
287	44.729	0.152	0.66	91	-1.19	97	67	2.240	(0.03)	(0.05)

BOX B TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 3

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/2/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
288	44.886	0.157	1.59	91	-0.91	100	67	2.260	0.06	0.05
289	45.042	0.156	0.62	91	-1.22	99	67	2.240	0.07	0.00
290	45.197	0.155	1.20	91	-1.05	99	67	2.240	0.04	0.09
291	45.353	0.156	0.29	91	-1.32	99	67	2.230	0.02	0.03
292	45.507	0.154	0.76	91	-1.17	98	67	2.240	(0.05)	0.05
293	45.662	0.155	1.43	91	-0.97	99	67	2.240	0.06	0.05
294	45.817	0.155	1.57	91	-0.93	99	67	2.240	0.01	0.03
295	45.973	0.156	0.92	91	-1.28	100	67	2.210	4.31	1.39
296	46.127	0.154	1.62	91	-0.93	99	67	2.210	2.10	0.52
297	46.282	0.155	1.37	91	-0.99	100	67	2.210	5.72	0.41
298	46.435	0.153	0.33	91	-1.3	98	67	2.260	7.05	0.27
299	46.592	0.157	0.90	91	-1.16	101	67	2.210	8.18	0.20
300	46.748	0.156	0.61	91	-1.22	101	67	2.210	9.11	0.18
301	46.904	0.156	0.34	91	-1.3	101	67	2.210	9.56	0.11
302	47.059	0.155	0.81	91	-1.18	100	68	2.210	9.88	0.08
303	47.214	0.155	1.41	91	-0.98	100	68	2.210	10.23	0.14
304	47.369	0.155	0.53	91	-1.24	100	68	2.210	10.40	0.16
305	47.525	0.156	0.30	91	-1.31	101	68	2.210	10.37	0.19
306	47.681	0.156	1.59	91	-0.91	101	68	2.210	10.83	0.14
307	47.835	0.154	0.52	91	-1.25	100	68	2.210	11.19	0.14
308	47.990	0.155	0.28	91	-1.32	100	68	2.210	11.57	0.15
309	48.145	0.155	1.27	91	-1.02	100	68	2.210	11.74	0.06
310	48.301	0.156	0.32	91	-1.3	101	68	2.200	11.90	0.19
311	48.457	0.156	1.55	91	-0.93	101	68	2.220	12.37	0.19
312	48.612	0.155	1.61	91	-0.91	100	69	2.200	12.82	0.18
313	48.767	0.155	0.59	91	-1.22	100	69	2.200	12.65	0.23
314	48.922	0.155	1.53	91	-0.94	100	69	2.210	12.43	0.18
315	49.076	0.154	0.59	91	-1.22	100	69	2.200	12.66	0.24
316	49.232	0.156	0.67	91	-1.22	101	69	2.200	13.06	0.16
317	49.389	0.157	1.59	91	-0.92	102	69	2.200	12.97	0.23
318	49.543	0.154	1.31	91	-1	100	69	2.200	13.12	0.21
319	49.699	0.156	1.59	91	-0.92	100	69	2.240	12.88	0.22

BOX B TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 3

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/2/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
320	49.855	0.156	1.01	91	-1.1	100	69	2.220	5.63	0.18
321	50.009	0.154	0.38	91	-1.29	98	68	2.220	2.00	0.07
322	50.164	0.155	1.47	91	-0.95	99	68	2.220	1.42	0.12
323	50.323	0.159	0.62	91	-1.22	101	68	2.220	1.14	0.26
324	50.479	0.156	0.72	91	-1.19	99	68	2.220	0.96	0.30
325	50.634	0.155	1.19	91	-1.1	99	68	2.220	0.93	0.31
326	50.788	0.154	0.50	91	-1.25	98	68	2.280	0.79	0.31
327	50.943	0.155	1.08	91	-1.13	99	68	2.220	0.79	0.30
328	51.098	0.155	0.81	91	-1.15	99	68	2.230	0.80	0.33
329	51.255	0.157	0.30	91	-1.31	100	68	2.220	0.87	0.30
330	51.411	0.156	0.97	91	-1.13	99	68	2.200	0.54	0.24
331	51.566	0.155	0.90	91	-1.11	99	68	2.230	0.86	0.25
332	51.720	0.154	1.36	91	-1	98	68	2.230	0.44	0.29
333	51.877	0.157	1.61	91	-0.91	100	68	2.230	0.39	0.20
334	52.033	0.156	0.35	91	-1.3	99	68	2.220	0.41	0.19
335	52.190	0.157	1.58	91	-0.92	100	68	2.220	0.39	0.23
336	52.345	0.155	1.61	91	-0.91	99	68	2.230	0.29	0.15
337	52.501	0.156	1.17	91	-1.01	99	68	2.230	0.30	0.15
338	52.659	0.158	0.99	91	-1.1	100	68	2.220	0.39	0.15
339	52.816	0.157	0.43	91	-1.3	100	67	2.230	0.17	0.15
340	52.972	0.156	1.63	91	-0.92	99	67	2.230	0.05	0.13
341	53.126	0.154	0.51	91	-1.25	98	67	2.220	0.35	0.14
342	53.282	0.156	0.45	91	-1.28	99	67	2.230	0.34	0.16
343	53.439	0.157	0.81	91	-1.16	100	67	2.240	0.32	0.14
344	53.596	0.157	0.35	91	-1.3	100	67	2.230	0.35	0.14
345	53.752	0.156	0.38	91	-1.28	99	67	2.230	0.30	0.11
346	53.908	0.156	0.42	91	-1.29	99	67	2.230	(0.06)	0.13
347	54.063	0.155	1.35	91	-1	99	67	2.230	0.24	0.12
348	54.221	0.158	0.36	91	-1.3	100	67	2.230	0.15	0.13
349	54.379	0.158	0.95	91	-1	100	67	2.230	0.22	0.10
350	54.535	0.156	0.69	91	-1.21	99	67	2.230	0.18	0.14
351	54.689	0.154	0.70	91	-1.21	98	67	2.230	0.16	0.12

BOX B TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 3

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/2/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
352	54.847	0.158	0.66	91	-1.2	100	67	2.240	0.30	0.15
353	55.005	0.158	0.93	91	-1.13	100	67	2.230	0.12	0.13
354	55.161	0.156	1.63	91	-0.91	99	67	2.230	0.20	0.12
355	55.317	0.156	0.41	91	-1.17	99	67	2.230	0.15	0.12
356	55.474	0.157	0.43	91	-1.27	100	67	2.230	0.17	0.12
357	55.630	0.156	1.61	91	-0.91	99	67	2.230	0.25	0.10
358	55.787	0.157	0.37	91	-1.3	100	67	2.230	0.19	0.12
359	55.943	0.156	1.58	91	-0.93	99	67	2.230	0.06	0.07
360	56.101	0.158	0.33	91	-1.3	100	67	2.230	0.27	0.16
361	56.256	0.155	1.50	91	-0.95	99	67	2.230	0.13	0.09
362	56.415	0.159	1.21	91	-1.04	101	66	2.230	0.25	0.10
363	56.570	0.155	0.57	91	-1.25	99	66	2.230	0.09	0.09
364	56.726	0.156	0.78	91	-1.14	99	66	2.230	0.07	0.16
365	56.880	0.154	1.61	91	-0.91	98	66	2.230	0.09	0.01
366	57.036	0.156	1.61	91	-0.91	99	66	2.230	0.12	0.08
367	57.193	0.157	0.80	91	-1.18	100	66	2.230	0.17	0.08
368	57.351	0.158	1.41	91	-0.98	100	66	2.230	0.13	0.07
369	57.509	0.158	1.20	91	-1.04	100	66	2.210	0.17	0.06
370	57.665	0.156	0.46	91	-1.26	99	66	2.230	0.13	0.07
371	57.820	0.155	1.35	91	-1	98	66	2.220	0.15	0.06
372	57.978	0.158	0.27	91	-1.32	100	66	2.250	0.04	0.04
373	58.136	0.158	0.53	91	-1.25	100	66	2.230	0.15	0.05
374	58.293	0.157	0.28	91	-1.32	100	66	2.230	0.02	0.06
375	58.449	0.156	1.31	91	-1.01	99	66	2.230	0.17	0.11
376	58.607	0.158	1.38	91	-1	100	66	2.230	0.14	0.05
377	58.764	0.157	0.70	91	-1.18	100	66	2.210	0.08	0.08
378	58.922	0.158	0.37	90	-1.29	101	66	2.230	0.10	0.16
379	59.079	0.157	0.31	90	-1.21	100	66	2.230	(0.37)	0.08
380	59.236	0.157	1.56	90	-0.93	100	66	2.240	0.02	0.05
381	59.391	0.155	1.50	90	-0.95	99	66	2.240	0.06	0.09
382	59.550	0.159	1.57	90	-0.93	101	66	2.230	0.04	0.05
383	59.707	0.157	1.01	90	-1.11	100	66	2.230	0.07	0.06

BOX B TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 3

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/2/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
384	59.864	0.157	1.54	90	-0.94	100	66	2.230	0.07	0.06
385	60.018	0.154	0.33	90	-1.3	98	66	2.230	0.09	0.06
386	60.177	0.159	1.57	90	-0.92	101	66	2.230	0.05	0.07
387	60.335	0.158	1.17	90	-1.15	101	66	2.240	0.01	0.04
388	60.491	0.156	0.69	90	-1.2	99	66	2.240	0.11	0.05
389	60.648	0.157	0.68	90	-1.2	100	65	2.230	0.02	0.03
390	60.802	0.154	1.62	90	-0.92	98	65	2.240	0.07	0.05
391	60.960	0.158	0.42	90	-1.28	101	65	2.230	0.04	0.04
392	61.118	0.158	0.56	90	-1.24	101	65	2.230	0.10	0.06
393	61.274	0.156	1.36	90	-1.01	99	65	2.240	0.01	0.02
394	61.431	0.157	0.57	90	-1.23	100	65	2.240	0.06	0.09
395	61.585	0.154	1.54	90	-0.96	98	65	2.230	(0.05)	0.02
396	61.743	0.158	1.23	90	-1.03	101	65	2.230	(0.08)	0.03
397	61.904	0.161	1.57	90	-0.93	102	65	2.230	0.07	0.04
398	62.062	0.158	1.50	90	-0.95	101	65	2.240	(0.17)	0.03
399	62.219	0.157	1.64	90	-0.9	100	65	2.240	0.08	0.03
400	62.375	0.156	0.35	90	-1.3	99	65	2.240	0.07	0.05
401	62.532	0.157	0.93	90	-1.13	100	65	2.240	0.05	0.04
402	62.690	0.158	0.77	90	-1.17	101	65	2.230	(0.02)	0.10
403	62.845	0.155	0.52	90	-1.25	99	65	2.240	0.05	0.01
404	63.002	0.157	0.66	90	-1.23	100	65	2.230	0.02	0.01
405	63.157	0.155	1.61	90	-0.91	99	65	2.240	0.05	0.04
406	63.315	0.158	0.51	90	-1.26	101	65	2.230	0.06	0.08
407	63.471	0.156	1.46	90	-0.92	99	65	2.230	0.07	0.08
408	63.628	0.157	1.44	90	-0.97	100	65	2.240	0.01	0.03
409	63.784	0.156	0.76	90	-1.18	99	65	2.230	0.04	0.02
410	63.940	0.156	0.60	90	-1.22	99	65	2.240	0.05	0.05
411	64.098	0.158	1.58	90	-0.92	101	65	2.230	0.05	0.04
412	64.257	0.159	1.34	90	-1	101	65	2.240	0.02	0.03
413	64.413	0.156	1.43	90	-0.98	99	65	2.230	(0.01)	0.05
414	64.571	0.158	0.63	90	-1.22	101	65	2.240	(0.05)	0.00
415	64.727	0.156	1.34	90	-0.93	99	65	2.240	0.03	0.05

BOX B TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 3

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/2/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
416	64.885	0.158	0.94	90	-1.26	101	65	2.230	0.01	0.07
417	65.042	0.157	1.60	90	-0.92	100	65	2.240	0.11	0.10
418	65.199	0.157	0.94	90	-1.13	100	65	2.240	(0.03)	0.09
419	65.354	0.155	0.65	90	-1.21	99	65	2.230	(0.06)	0.03
420	65.510	0.156	0.54	90	-1.24	99	65	2.240	(0.03)	0.06
421	65.665	0.155	0.64	90	-1.21	99	65	2.240	0.04	0.06
422	65.821	0.156	0.31	90	-1.31	99	65	2.230	0.02	0.02
423	65.975	0.154	0.25	90	-1.27	98	65	2.230	0.00	0.02
424	66.130	0.155	0.29	90	-1.31	99	65	2.240	0.01	0.02
425	66.289	0.159	0.37	90	-1.29	101	65	2.240	(0.07)	0.03
426	66.444	0.155	0.46	90	-1.27	99	65	2.230	0.03	0.04
427	66.601	0.157	1.60	90	-0.91	100	65	2.240	(0.02)	0.08
428	66.755	0.154	1.51	90	-0.96	98	65	2.240	0.00	0.07
429	66.912	0.157	1.42	90	-0.98	100	65	2.240	0.01	0.07
430	67.068	0.156	1.42	90	-0.97	99	65	2.240	0.01	(0.01)
431	67.224	0.156	1.58	90	-0.93	99	65	2.240	(0.01)	(0.01)
432	67.383	0.159	0.79	90	-1.18	101	65	2.270	0.00	0.04
433	67.538	0.155	1.33	90	-1.01	99	65	2.240	0.04	0.03
434	67.696	0.158	1.30	90	-1.01	101	65	2.210	(0.02)	0.07
435	67.853	0.157	0.26	90	-1.32	101	65	2.210	0.89	0.20
436	68.008	0.155	0.67	90	-1.23	100	65	2.210	2.39	0.45
437	68.166	0.158	0.83	90	-1.16	102	65	2.210	5.47	0.51
438	68.324	0.158	0.28	90	-1.32	102	66	2.210	6.42	0.40
439	68.479	0.155	0.70	90	-1.2	100	66	2.210	7.14	0.30
440	68.636	0.157	1.51	90	-0.95	101	66	2.210	7.63	0.35
441	68.792	0.156	0.61	90	-1.2	101	66	2.190	7.23	0.45
442	68.948	0.156	1.40	90	-0.99	101	66	2.210	7.08	0.50
443	69.105	0.157	0.81	90	-1.18	101	66	2.200	7.12	0.53
444	69.260	0.155	0.29	90	-1.32	100	66	2.210	7.31	0.44
445	69.417	0.157	1.53	90	-0.94	101	66	2.210	7.87	0.47
446	69.575	0.158	1.39	90	-0.99	102	67	2.230	7.67	0.42
447	69.731	0.156	1.03	90	-1.09	101	67	2.210	7.66	0.41

BOX B TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 3

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/2/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
448	69.887	0.156	0.83	90	-1.16	101	67	2.210	7.85	0.49
449	70.042	0.155	0.66	90	-1.21	100	67	2.200	7.78	0.43
450	70.196	0.154	0.60	90	-1.22	100	67	2.210	7.78	0.43
451	70.353	0.157	1.47	90	-0.96	102	67	2.210	7.95	0.40
452	70.510	0.157	1.43	90	-0.97	102	67	2.210	7.72	0.52
453	70.667	0.157	1.42	90	-0.98	102	67	2.210	7.57	0.63
454	70.821	0.154	1.19	90	-1.08	100	68	2.210	7.56	0.72
455	70.975	0.154	1.50	90	-0.95	100	68	2.200	7.53	0.72
456	71.131	0.156	1.44	90	-0.97	101	68	2.200	7.48	0.76
457	71.286	0.155	0.46	90	-1.27	100	68	2.210	7.69	0.84
458	71.439	0.153	1.58	90	-0.93	99	68	2.200	7.69	0.80
459	71.594	0.155	1.61	90	-0.91	101	68	2.200	7.72	0.77
460	71.748	0.154	0.42	90	-1.28	100	68	2.200	7.87	0.81
461	71.903	0.155	1.60	90	-0.92	101	68	2.200	7.73	0.91
462	72.059	0.156	0.28	90	-1.32	101	68	2.200	7.77	0.88
463	72.216	0.157	1.53	90	-0.94	101	68	2.220	7.72	0.84
464	72.372	0.156	0.66	90	-1.2	100	68	2.220	4.14	0.46
465	72.526	0.154	1.42	90	-0.98	98	68	2.210	1.73	0.20
466	72.681	0.155	1.16	90	-1.06	99	68	2.220	1.14	0.17
467	72.837	0.156	0.83	90	-1.15	99	68	2.220	0.62	0.18
468	72.993	0.156	0.83	90	-1.23	99	68	2.220	0.45	0.21
469	73.150	0.157	0.61	90	-1.23	100	68	2.220	0.56	0.20
470	73.304	0.154	0.32	90	-1.31	98	68	2.220	0.49	0.25
471	73.460	0.156	0.29	90	-1.32	99	67	2.220	0.52	0.25
472	73.615	0.155	0.90	90	-1.13	99	67	2.220	0.44	0.18
473	73.769	0.154	0.64	90	-1.31	98	67	2.230	0.63	0.23
474	73.924	0.155	1.28	90	-1.02	99	67	2.220	0.34	0.23
475	74.081	0.157	1.64	90	-0.92	100	67	2.220	0.48	0.27
476	74.237	0.156	0.29	90	-1.31	99	67	2.220	0.40	0.29
477	74.391	0.154	1.61	90	-0.91	98	67	2.220	0.42	0.24
478	74.544	0.153	0.45	90	-1.27	97	67	2.230	0.34	0.20
479	74.703	0.159	0.67	90	-1.2	101	67	2.190	0.40	0.26

BOX B TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 3

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/2/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
480	74.861	0.158	0.41	90	-1.27	101	67	2.220	0.43	0.27
481	75.018	0.157	0.73	90	-1.18	100	67	2.230	0.36	0.22
482	75.173	0.155	0.07	90	-1.29	99	67	2.230	0.41	0.21
483	75.328	0.155	1.59	90	-0.92	99	67	2.260	0.43	0.23
484	75.483	0.155	1.44	90	-0.96	99	67	2.230	0.44	0.21
485	75.639	0.156	1.62	90	-0.92	99	67	2.230	0.32	0.21
486	75.795	0.156	1.62	90	-0.98	99	67	2.230	0.38	0.25
487	75.950	0.155	1.47	90	-0.96	99	67	2.230	0.28	0.13
488	76.102	0.152	0.69	90	-1.2	97	67	2.230	0.35	0.21
489	76.257	0.155	1.24	90	-1	99	67	2.230	0.41	0.21
490	76.412	0.155	0.77	90	-1.17	99	67	2.230	0.43	0.19
491	76.568	0.156	0.67	90	-1.2	99	67	2.230	0.36	0.21
492	76.724	0.156	0.68	90	-1.2	99	67	2.230	0.45	0.24
493	76.879	0.155	1.49	90	-0.98	99	67	2.190	0.36	0.21
494	77.033	0.154	1.01	90	-1.1	98	66	2.230	0.36	0.20
495	77.187	0.154	1.28	90	-1.03	98	66	2.230	0.28	0.17
496	77.345	0.158	0.36	90	-1.29	101	66	2.230	0.35	0.19
497	77.501	0.156	1.59	90	-0.92	99	66	2.230	0.21	0.20
498	77.657	0.156	1.53	90	-0.94	99	66	2.230	0.35	0.18
499	77.812	0.155	0.99	90	-1.16	99	66	2.230	0.23	0.25
500	77.968	0.156	1.61	90	-0.91	99	66	2.230	0.31	0.17
501	78.125	0.157	1.54	90	-0.93	100	66	2.230	0.26	0.16
502	78.283	0.158	0.84	90	-1.15	101	66	2.230	0.31	0.16
503	78.441	0.158	1.30	90	-1.01	101	66	2.230	0.20	0.16
504	78.597	0.156	1.60	90	-0.91	99	66	2.240	0.34	0.20
505	78.751	0.154	1.48	90	-0.96	98	66	2.230	0.24	0.14
506	78.907	0.156	0.48	90	-1.26	99	66	2.230	0.43	0.22
507	79.065	0.158	0.96	90	-1.14	101	66	2.230	0.28	0.21
508	79.222	0.157	1.51	90	-0.95	100	66	2.240	0.27	0.18
509	79.378	0.156	0.50	90	-1.25	99	66	2.230	0.33	0.23
510	79.534	0.156	0.26	90	-1.32	99	66	2.200	0.21	0.14
511	79.691	0.157	1.57	90	-0.93	100	66	2.230	0.30	0.15

BOX B TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 3

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/2/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
512	79.848	0.157	0.91	90	-1.13	100	66	2.230	0.30	0.20
513	80.005	0.157	0.94	90	-1.12	100	66	2.230	0.24	0.16
514	80.162	0.157	1.37	90	-0.99	100	66	2.230	0.25	0.17
515	80.318	0.156	1.39	90	-0.99	99	66	2.230	0.24	0.14
516	80.473	0.155	0.23	90	-1.3	99	66	2.230	0.27	0.17
517	80.629	0.156	0.40	90	-1.3	99	66	2.230	0.24	0.15
518	80.787	0.158	1.41	90	-0.98	101	66	2.230	0.27	0.16
519	80.943	0.156	1.60	90	-0.92	99	66	2.230	0.36	0.18
520	81.100	0.157	1.29	90	-1.01	100	66	2.230	0.21	0.14
521	81.256	0.156	0.72	90	-1.19	99	66	2.230	0.12	0.15
522	81.412	0.156	0.47	90	-1.26	99	66	2.230	0.19	0.19
523	81.569	0.157	1.42	90	-0.97	100	66	2.230	0.22	0.11
524	81.724	0.155	0.93	90	-1.12	99	66	2.240	0.38	0.21
525	81.882	0.158	0.67	90	-1.21	101	66	2.230	0.14	0.17
526	82.039	0.157	0.33	90	-1.26	100	66	2.230	0.17	0.13
527	82.195	0.156	1.41	90	-0.98	99	66	2.230	0.35	0.12
528	82.352	0.157	0.89	90	-1.14	100	66	2.240	0.19	0.20
529	82.508	0.156	1.43	90	-0.97	99	66	2.230	0.27	0.16
530	82.665	0.157	0.32	90	-1.3	100	66	2.230	0.27	0.14
531	82.821	0.156	1.51	90	-0.96	99	66	2.230	0.21	0.11
532	82.975	0.154	0.34	90	-1.3	98	66	2.240	0.19	0.14
533	83.131	0.156	0.19	90	-1.3	99	66	2.250	0.25	0.12
534	83.288	0.157	0.30	90	-1.3	100	66	2.250	0.19	0.10
535	83.446	0.158	1.53	90	-0.96	101	66	2.230	0.16	0.11
536	83.603	0.157	0.37	90	-1.3	100	66	2.240	0.15	0.20
537	83.756	0.153	1.26	90	-1.03	97	66	2.240	0.21	0.05
538	83.912	0.156	1.37	90	-0.99	99	66	2.240	0.18	0.12
539	84.070	0.158	0.71	90	-1.19	101	66	2.240	0.20	0.17
540	84.226	0.156	1.26	90	-1.02	99	66	2.230	0.21	0.11
541	84.383	0.157	0.42	90	-1.27	100	66	2.240	0.21	0.11
542	84.538	0.155	1.27	90	-1.02	99	66	2.230	0.20	0.16
543	84.694	0.156	1.59	90	-0.92	99	66	2.200	0.12	0.10

BOX B TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 3

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/2/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
544	84.851	0.157	1.63	90	-0.91	100	66	2.230	0.21	0.11
545	85.009	0.158	0.37	90	-1.29	101	66	2.230	0.19	0.10
546	85.166	0.157	1.49	90	-0.96	100	66	2.230	0.15	0.10
547	85.320	0.154	0.53	90	-1.25	98	66	2.230	0.12	0.07
548	85.476	0.156	0.49	90	-1.26	99	66	2.240	0.00	0.07
549	85.631	0.155	1.14	90	-1.06	99	66	2.170	0.16	0.09
550	85.787	0.156	1.49	90	-0.96	99	66	2.230	0.11	0.06
551	85.942	0.155	0.98	90	-1.12	99	66	2.240	0.03	0.12
552	86.094	0.152	0.77	90	-1.18	97	66	2.230	0.10	0.11
553	86.251	0.157	0.95	90	-1.13	100	66	2.230	0.17	0.10
554	86.406	0.155	1.31	90	-1.12	99	66	2.240	0.10	0.09
555	86.562	0.156	1.58	90	-0.91	99	66	2.230	0.10	0.06
556	86.718	0.156	1.60	90	-0.92	99	66	2.240	0.18	0.07
557	86.875	0.157	0.45	90	-1.26	100	66	2.240	0.08	0.07
558	87.032	0.157	1.62	90	-0.91	100	66	2.230	0.11	0.04
559	87.189	0.157	0.71	90	-1.19	100	66	2.230	0.07	0.08
560	87.347	0.158	1.58	90	-0.92	101	66	2.240	0.28	0.12
561	87.506	0.159	1.47	90	-0.96	101	66	2.240	0.08	0.11
562	87.660	0.154	0.73	90	-1.18	99	66	2.210	0.10	0.10
563	87.814	0.154	1.36	90	-1	99	66	2.210	0.73	0.15
564	87.970	0.156	1.33	90	-1	100	66	2.210	1.66	0.37
565	88.125	0.155	0.76	90	-1.18	100	66	2.210	4.26	0.64
566	88.281	0.156	0.31	90	-1.31	101	66	2.210	4.85	0.79
567	88.436	0.155	1.53	90	-1	100	67	2.210	5.07	0.85
568	88.591	0.155	1.58	90	-0.94	100	67	2.210	5.29	0.84
569	88.748	0.157	1.61	90	-0.91	101	67	2.210	5.77	0.90
570	88.906	0.158	1.73	90	-0.91	102	67	2.210	5.62	0.88
571	89.062	0.156	1.21	90	-1.18	101	67	2.210	5.69	0.81
572	89.219	0.157	0.58	90	-1.23	101	67	2.210	5.89	0.81
573	89.374	0.155	0.34	90	-1.3	100	67	2.210	5.72	0.80
574	89.529	0.155	0.46	90	-1.27	100	67	2.210	5.67	0.75
575	89.684	0.155	0.32	90	-1.31	100	67	2.210	5.62	0.74

BOX B TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 3

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/2/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
576	89.841	0.157	0.41	90	-1.28	102	68	2.210	5.50	0.61
577	89.997	0.156	1.61	90	-0.91	101	68	2.200	6.03	0.66
578	90.154	0.157	1.70	90	-0.93	102	68	2.220	5.73	0.73
579	90.307	0.153	0.95	90	-1.15	99	68	2.210	6.29	0.82
580	90.462	0.155	1.45	90	-0.96	100	68	2.200	5.89	0.95
581	90.618	0.156	1.56	90	-0.91	101	68	2.200	5.91	0.98
582	90.775	0.157	1.42	90	-0.98	102	68	2.210	5.61	1.06
583	90.932	0.157	1.58	90	-0.92	102	68	2.160	5.28	0.98
584	91.086	0.154	1.56	90	-0.94	100	68	2.200	4.99	0.92
585	91.241	0.155	0.68	90	-1.19	101	68	2.210	4.81	0.93
586	91.396	0.155	1.58	90	-0.92	101	68	2.200	4.56	0.82
587	91.552	0.156	0.37	90	-1.29	101	68	2.200	4.25	0.74
588	91.709	0.157	0.55	90	-1.2	102	69	2.210	4.28	0.76
589	91.863	0.154	0.60	90	-1.22	100	69	2.210	3.98	0.56
590	92.017	0.154	1.53	90	-0.94	100	69	2.210	3.82	0.62
591	92.172	0.155	0.46	90	-1.26	101	69	2.200	3.66	0.58
592	92.328	0.156	1.40	91	-0.97	101	69	2.210	3.47	0.48
593	92.485	0.157	1.45	91	-0.97	102	69	2.200	3.37	0.59
594	92.638	0.153	0.58	91	-1.23	99	69	2.200	3.38	0.57
595	92.794	0.156	1.57	91	-0.93	101	69	2.200	3.24	0.54
596	92.949	0.155	1.62	91	-0.91	100	69	2.200	3.12	0.59
597	93.105	0.156	1.55	91	-0.92	101	69	2.210	2.85	0.55
598	93.261	0.156	1.60	91	-0.92	101	69	2.210	2.95	0.56
599	93.417	0.156	1.45	91	-0.92	101	69	2.200	2.98	0.53
600	93.574	0.157	0.68	91	-1.2	102	69	2.210	2.98	0.54
601	93.729	0.155	1.26	91	-1.03	99	69	2.220	1.84	0.37
602	93.885	0.156	0.78	91	-1.16	99	69	2.220	0.85	0.15
603	94.043	0.158	0.68	91	-1.2	101	69	2.220	0.44	0.08
604	94.201	0.158	1.34	91	-1.01	101	69	2.220	0.39	0.12
605	94.357	0.156	0.24	91	-1.27	99	69	2.200	0.29	0.09
606	94.509	0.152	1.39	91	-0.99	97	68	2.210	0.22	0.05
607	94.664	0.155	0.34	91	-1.3	99	68	2.220	0.01	0.05

BOX B TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 3

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/2/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
608	94.821	0.157	0.53	91	-1.18	100	68	2.220	0.19	0.10
609	94.978	0.157	0.65	91	-1.21	100	68	2.230	0.05	0.02
610	95.133	0.155	1.30	91	-0.91	99	68	2.220	0.22	0.10
611	95.288	0.155	0.35	91	-1.3	99	68	2.220	0.11	0.03
612	95.443	0.155	1.40	91	-0.95	99	68	2.220	0.12	0.03
613	95.600	0.157	1.39	91	-0.99	100	68	2.230	0.10	0.02
614	95.757	0.157	1.37	91	-1	100	68	2.230	0.16	0.04
615	95.912	0.155	1.40	91	-0.91	99	68	2.230	0.13	0.07
616	96.066	0.154	0.68	91	-1.21	98	68	2.230	0.14	0.01
617	96.222	0.156	0.62	91	-1.23	99	68	2.230	0.01	0.03
618	96.380	0.158	1.37	91	-1	100	68	2.230	0.17	0.07
619	96.535	0.155	1.43	91	-0.97	99	68	2.230	0.14	0.05
620	96.694	0.159	0.97	91	-1.16	101	67	2.230	(0.61)	0.02
621	96.848	0.154	1.38	91	-0.98	98	67	2.230	0.13	0.05
622	97.005	0.157	1.06	91	-1.23	100	67	2.230	0.14	0.04
623	97.163	0.158	0.70	91	-1.2	100	67	2.230	0.07	0.11
624	97.319	0.156	0.33	91	-1.31	99	67	2.230	0.27	0.08
625	97.477	0.158	0.34	91	-1.3	100	67	2.230	0.21	(0.01)
626	97.632	0.155	1.56	91	-0.93	99	67	2.220	0.15	0.06
627	97.787	0.155	0.17	91	-1.31	99	67	2.230	0.02	(0.05)
628	97.944	0.157	0.34	91	-1.3	100	67	2.230	0.17	0.07
629	98.099	0.155	0.77	91	-1.17	99	67	2.230	0.17	0.09
630	98.255	0.156	1.51	91	-0.96	99	67	2.230	0.14	0.02
631	98.411	0.156	1.40	91	-0.99	99	67	2.230	0.12	0.09
632	98.566	0.155	1.46	91	-0.96	99	67	2.230	0.16	0.04
633	98.724	0.158	0.30	91	-1.31	100	67	2.230	0.09	0.06
634	98.880	0.156	0.75	91	-1.17	99	67	2.230	0.07	0.06
635	99.038	0.158	0.84	91	-1.16	100	67	2.250	0.17	0.06
636	99.194	0.156	1.57	91	-0.92	99	67	2.230	0.12	0.03
637	99.350	0.156	0.66	91	-1.21	99	67	2.230	0.16	0.06
638	99.506	0.156	1.32	91	-1.01	99	67	2.230	0.15	(0.02)
639	99.663	0.157	0.61	91	-1.23	100	67	2.230	0.13	0.04

BOX B TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 3

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/2/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
640	99.819	0.156	0.87	91	-1.14	99	67	2.260	0.21	0.05
641	99.974	0.155	1.73	91	-0.93	99	67	2.230	0.12	0.05
642	100.130	0.156	1.50	91	-0.95	99	67	2.230	0.18	0.07
643	100.288	0.158	0.72	91	-1.19	100	67	2.230	0.21	0.06
644	100.443	0.155	1.62	91	-0.91	99	67	2.230	0.13	0.03
645	100.599	0.156	0.80	91	-1.17	99	67	2.230	0.18	0.05
646	100.752	0.153	0.65	91	-1.22	97	67	2.230	0.14	0.04
647	100.911	0.159	1.46	91	-0.97	101	67	2.230	0.21	0.01
648	101.068	0.157	1.39	91	-0.99	100	67	2.230	0.08	0.04
649	101.225	0.157	1.08	91	-1.14	100	67	2.230	0.15	0.05
650	101.380	0.155	0.43	91	-1.28	99	67	2.230	0.14	0.04
651	101.534	0.154	1.17	91	-1.06	98	67	2.210	0.11	0.04
652	101.691	0.157	1.03	91	-1.1	100	67	2.240	0.09	0.08
653	101.848	0.157	0.41	91	-1.3	100	67	2.230	0.16	0.07
654	102.005	0.157	1.44	91	-0.98	100	67	2.230	(0.01)	0.03
655	102.162	0.157	0.31	91	-1.32	100	67	2.230	0.07	0.05
656	102.316	0.154	1.58	91	-0.93	98	66	2.230	0.12	0.04
657	102.474	0.158	1.40	91	-0.98	100	66	2.230	0.04	0.02
658	102.631	0.157	0.28	91	-1.32	100	66	2.230	0.11	0.07
659	102.787	0.156	0.28	91	-1.31	99	66	2.230	0.20	0.06
660	102.943	0.156	0.32	91	-1.31	99	66	2.230	0.19	0.07
661	103.098	0.155	1.49	91	-1	99	66	2.240	0.18	0.07
662	103.254	0.156	1.91	91	-0.91	99	66	2.230	0.14	0.04
663	103.412	0.158	1.61	91	-0.91	100	66	2.230	0.13	0.02
664	103.567	0.155	0.28	91	-1.32	99	66	2.230	0.20	0.07
665	103.721	0.154	0.35	91	-1.29	98	66	2.230	0.11	0.06
666	103.875	0.154	1.58	91	-0.93	98	66	2.230	0.09	0.10
667	104.031	0.156	1.52	91	-0.95	99	66	2.230	0.10	0.10
668	104.190	0.159	0.51	91	-1.25	101	66	2.230	0.24	0.11
669	104.346	0.156	0.35	91	-1.32	99	66	2.230	0.09	0.06
670	104.503	0.157	0.99	91	-1.1	100	66	2.250	0.17	0.07
671	104.659	0.156	1.92	91	-0.93	99	66	2.230	0.09	0.01

BOX B TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 3

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/2/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
672	104.817	0.158	0.98	91	-1.12	100	66	2.240	0.03	0.05
673	104.973	0.156	1.58	91	-0.93	99	66	2.230	0.28	0.14
674	105.129	0.156	0.70	91	-1.19	100	66	2.210	0.67	0.11
675	105.285	0.156	0.86	91	-1.16	100	67	2.210	0.08	0.05
676	105.440	0.155	1.61	91	-0.91	100	67	2.190	0.38	0.08
677	105.596	0.156	1.61	91	-0.91	100	67	2.210	0.46	0.05
678	105.752	0.156	1.62	91	-0.91	101	67	2.210	0.59	0.09
679	105.908	0.156	1.33	91	-1	101	67	2.210	0.61	0.11
680	106.064	0.156	1.35	91	-0.99	101	67	2.210	1.04	0.24
681	106.222	0.158	1.62	91	-0.92	102	67	2.210	1.08	0.21
682	106.380	0.158	0.31	91	-1.32	102	67	2.200	1.37	0.22
683	106.534	0.154	1.02	91	-1.1	99	67	2.200	1.56	0.30
684	106.691	0.157	0.69	91	-1.2	101	68	2.210	1.79	0.31
685	106.848	0.157	1.44	91	-0.97	101	68	2.260	1.82	0.34
686	107.003	0.155	1.61	91	-0.91	100	68	2.210	1.90	0.27
687	107.161	0.158	0.30	91	-1.28	102	68	2.210	2.00	0.35
688	107.317	0.156	1.62	91	-0.91	101	68	2.210	2.02	0.36
689	107.473	0.156	1.33	91	-1.08	101	68	2.210	2.05	0.36

WATER FLOW AND TEMPERATURE DATA - ASTM E2618

Client: Greentech
Model: RS7200E
Run #: 3

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/2/2020

	Flow (GPM)		Temperature Data (°F)						
Elapsed Time (min)	Load Side Flow	Appliance Flow (optional)	HEX Load In	HEX Load Out	HEX Supply In	HEX Supply Out	Specific Heat of Inlet Water (BTU/lb-°F)	Mass Flow Rate of Inlet Water (lb/min)	Heat Output (Btu)
0	0.37		43.54	167.05	168	166	1.00	3.09	
1	0.39		43.82	170.53	169	166	1.00	3.22	409
2	0.35		44.05	172.18	170	167	1.00	2.94	377
3	0.40		44.37	173.36	171	167	1.00	3.34	432
4	0.37		44.60	174.44	172	168	1.00	3.09	402
5	0.49		44.88	175.62	173	169	1.00	4.05	530
6	0.34		45.15	176.66	174	171	1.00	2.85	375
7	0.47		45.43	177.85	175	172	1.00	3.91	518
8	0.40		45.71	179.32	176	173	1.00	3.36	449
9	0.43		45.98	180.64	178	174	1.00	3.62	488
10	0.37		46.26	182.02	179	176	1.00	3.06	416
11	0.37		46.54	183.48	180	177	1.00	3.08	422
12	0.40		46.82	185.00	182	178	1.00	3.35	464
13	0.45		47.05	186.41	184	180	1.00	3.77	525
14	0.45		47.28	187.07	185	181	1.00	3.73	522
15	0.45		47.55	187.73	185	182	1.00	3.74	526
16	0.43		47.78	188.20	186	182	1.00	3.61	507
17	0.43		48.01	188.58	186	183	1.00	3.62	510
18	0.50		48.29	188.82	187	183	1.00	4.20	591
19	0.37		48.52	189.24	187	183	1.00	3.07	433
20	0.44		48.75	189.48	187	184	1.00	3.63	512
21	0.41		48.98	189.71	188	184	1.00	3.45	487
22	0.43		49.17	189.85	188	184	1.00	3.62	509
23	0.35		49.40	190.09	188	184	1.00	2.92	411
24	0.33		49.63	190.18	188	184	1.00	2.79	393
25	0.42		49.86	190.37	189	185	1.00	3.50	492
26	0.37		50.05	190.51	189	185	1.00	3.07	432
27	0.40		50.28	190.56	189	185	1.00	3.35	470
28	0.48		50.46	190.65	189	185	1.00	4.04	567
29	0.40		50.69	190.75	189	185	1.00	3.33	467
30	0.38		50.83	190.80	189	185	1.00	3.13	439
31	0.35		51.06	190.84	189	185	1.00	2.95	413
32	0.39		51.25	190.89	189	185	1.00	3.21	449
33	0.39		51.43	190.94	189	185	1.00	3.22	450
34	0.42		51.57	190.99	190	185	1.00	3.49	488
35	0.40		51.75	191.03	190	185	1.00	3.35	467
36	0.42		51.89	191.03	190	185	1.00	3.49	487
37	0.45		52.03	190.99	190	185	1.00	3.78	526
38	0.45		52.17	191.03	190	185	1.00	3.74	520
39	0.44		52.31	191.03	190	185	1.00	3.65	507
40	0.37		52.49	190.99	190	185	1.00	3.08	428
41	0.44		52.63	190.99	190	185	1.00	3.64	504
42	0.40		52.77	190.94	190	185	1.00	3.35	463
43	0.37		52.91	190.94	190	185	1.00	3.08	426
44	0.40		53.00	190.89	190	185	1.00	3.37	465
45	0.44		53.14	190.84	189	185	1.00	3.64	502
46	0.40		53.23	190.75	190	185	1.00	3.30	454
47	0.48		53.37	190.75	189	185	1.00	4.01	552

WATER FLOW AND TEMPERATURE DATA - ASTM E2618

Client: Greentech
Model: RS7200E
Run #: 3

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/2/2020

	Flow (GPM)		Temperature Data (°F)						
Elapsed Time (min)	Load Side Flow	Appliance Flow (optional)	HEX Load In	HEX Load Out	HEX Supply In	HEX Supply Out	Specific Heat of Inlet Water (BTU/lb-°F)	Mass Flow Rate of Inlet Water (lb/min)	Heat Output (Btu)
48	0.43		53.51	190.70	189	185	1.00	3.62	497
49	0.39		53.65	190.70	189	185	1.00	3.23	443
50	0.39		53.74	190.61	189	185	1.00	3.22	442
51	0.44		53.83	190.51	189	185	1.00	3.64	498
52	0.37		53.92	190.47	189	185	1.00	3.07	420
53	0.37		54.02	190.42	189	185	1.00	3.10	424
54	0.37		54.11	190.32	189	185	1.00	3.08	420
55	0.35		54.15	190.28	189	185	1.00	2.96	403
56	0.35		54.25	190.18	189	185	1.00	2.96	402
57	0.34		54.29	190.09	189	185	1.00	2.81	383
58	0.52		54.34	189.99	189	184	1.00	4.33	588
59	0.47		54.38	189.90	189	184	1.00	3.91	531
60	0.47		54.38	189.71	188	184	1.00	3.93	532
61	0.54		54.38	189.57	188	183	1.00	4.47	605
62	0.49		54.43	189.43	188	183	1.00	4.11	556
63	0.45		54.43	189.29	188	183	1.00	3.78	511
64	0.50		54.48	189.15	188	183	1.00	4.19	565
65	0.49		54.48	189.01	188	183	1.00	4.07	548
66	0.45		54.52	188.86	188	183	1.00	3.78	509
67	0.49		54.48	188.68	187	183	1.00	4.06	546
68	0.49		54.48	188.58	187	182	1.00	4.05	543
69	0.48		54.48	188.39	187	182	1.00	4.02	539
70	0.55		54.48	188.25	187	182	1.00	4.56	611
71	0.45		54.43	188.06	187	182	1.00	3.77	504
72	0.47		54.43	187.92	186	182	1.00	3.92	524
73	0.44		54.38	187.69	186	181	1.00	3.65	487
74	0.49		54.38	187.55	186	181	1.00	4.07	542
75	0.50		54.38	187.40	186	181	1.00	4.19	558
76	0.41		54.34	187.26	186	181	1.00	3.38	450
77	0.42		54.38	187.07	186	181	1.00	3.54	470
78	0.49		54.34	186.88	185	181	1.00	4.11	545
79	0.52		54.29	186.70	185	181	1.00	4.34	576
80	0.49		54.29	186.56	185	180	1.00	4.05	537
81	0.45		54.29	186.37	185	180	1.00	3.78	500
82	0.49		54.25	186.18	185	180	1.00	4.07	537
83	0.50		54.25	186.04	185	180	1.00	4.20	555
84	0.52		54.25	185.85	184	180	1.00	4.35	573
85	0.54		54.15	185.66	184	179	1.00	4.49	591
86	0.44		54.15	185.47	184	179	1.00	3.65	480
87	0.45		54.15	185.28	184	179	1.00	3.79	498
88	0.49		54.11	185.09	184	179	1.00	4.05	532
89	0.42		54.11	184.95	183	179	1.00	3.52	461
90	0.54		54.06	184.76	183	179	1.00	4.49	587
91	0.50		54.02	184.57	183	178	1.00	4.20	548
92	0.54		54.02	184.34	183	178	1.00	4.46	583
93	0.51		53.97	184.20	183	178	1.00	4.22	550
94	0.45		53.97	183.96	182	178	1.00	3.79	493
95	0.54		53.92	183.77	182	178	1.00	4.49	583

WATER FLOW AND TEMPERATURE DATA - ASTM E2618

Client: Greentech
Model: RS7200E
Run #: 3

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/2/2020

	Flow (GPM)		Temperature Data (°F)						
Elapsed Time (min)	Load Side Flow	Appliance Flow (optional)	HEX Load In	HEX Load Out	HEX Supply In	HEX Supply Out	Specific Heat of Inlet Water (BTU/lb-°F)	Mass Flow Rate of Inlet Water (lb/min)	Heat Output (Btu)
96	0.56		53.92	183.58	182	177	1.00	4.63	602
97	0.45		53.88	183.39	182	177	1.00	3.79	492
98	0.39		53.88	183.20	182	177	1.00	3.23	418
99	0.50		53.83	183.01	181	177	1.00	4.21	544
100	0.46		53.79	182.82	181	177	1.00	3.84	496
101	0.50		53.79	182.58	181	176	1.00	4.21	543
102	0.47		53.74	182.40	181	176	1.00	3.93	507
103	0.57		53.74	182.20	181	176	1.00	4.76	613
104	0.51		53.69	182.02	180	176	1.00	4.22	542
105	0.49		53.69	181.83	180	176	1.00	4.08	524
106	0.56		53.65	181.59	180	175	1.00	4.63	593
107	0.57		53.65	181.40	180	175	1.00	4.76	609
108	0.42		53.65	181.16	180	175	1.00	3.49	446
109	0.49		53.60	180.97	179	175	1.00	4.08	520
110	0.44		53.55	180.78	179	175	1.00	3.67	468
111	0.44		53.51	180.60	179	174	1.00	3.66	465
112	0.51		53.51	180.36	179	174	1.00	4.22	536
113	0.42		53.51	180.17	179	174	1.00	3.52	447
114	0.47		53.51	179.98	178	174	1.00	3.93	497
115	0.46		53.46	179.74	178	174	1.00	3.81	481
116	0.49		53.46	179.50	178	173	1.00	4.08	514
117	0.45		53.41	179.27	178	173	1.00	3.72	469
118	0.51		53.41	179.08	177	173	1.00	4.22	531
119	0.47		53.41	178.84	177	173	1.00	3.93	494
120	0.52		53.41	178.70	177	173	1.00	4.37	548
121	0.49		53.41	178.46	177	172	1.00	4.08	511
122	0.52		53.41	178.23	177	172	1.00	4.34	543
123	0.49		53.37	178.04	176	172	1.00	4.07	508
124	0.44		53.41	177.80	176	172	1.00	3.68	458
125	0.49		53.37	177.56	176	172	1.00	4.07	506
126	0.49		53.37	177.37	176	171	1.00	4.08	507
127	0.46		53.37	177.14	175	171	1.00	3.81	472
128	0.47		53.37	176.95	175	171	1.00	3.94	488
129	0.42		53.37	176.71	175	171	1.00	3.52	435
130	0.44		53.37	176.52	175	170	1.00	3.65	450
131	0.46		53.37	176.28	175	170	1.00	3.81	468
132	0.38		53.37	176.05	174	170	1.00	3.16	388
133	0.46		53.37	175.86	174	170	1.00	3.80	466
134	0.44		53.32	175.62	174	170	1.00	3.67	450
135	0.54		53.32	175.39	174	169	1.00	4.50	550
136	0.47		53.32	175.20	174	169	1.00	3.94	481
137	0.47		53.28	174.96	173	169	1.00	3.93	479
138	0.46		53.28	174.73	173	169	1.00	3.81	463
139	0.43		53.28	174.49	173	169	1.00	3.54	430
140	0.48		53.28	174.30	173	168	1.00	3.98	483
141	0.50		53.23	174.07	172	168	1.00	4.17	505
142	0.49		53.23	173.88	172	168	1.00	4.08	492
143	0.50		53.23	173.64	172	168	1.00	4.21	508

WATER FLOW AND TEMPERATURE DATA - ASTM E2618

Client: Greentech
Model: RS7200E
Run #: 3

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/2/2020

	Flow (GPM)		Temperature Data (°F)						
Elapsed Time (min)	Load Side Flow	Appliance Flow (optional)	HEX Load In	HEX Load Out	HEX Supply In	HEX Supply Out	Specific Heat of Inlet Water (BTU/lb-°F)	Mass Flow Rate of Inlet Water (lb/min)	Heat Output (Btu)
144	0.49		53.23	173.41	172	168	1.00	4.09	492
145	0.54		53.23	173.17	171	167	1.00	4.50	540
146	0.52		53.23	172.99	171	167	1.00	4.34	521
147	0.47		53.23	172.75	171	167	1.00	3.93	471
148	0.54		53.18	172.51	171	167	1.00	4.54	542
149	0.37		53.18	172.32	171	166	1.00	3.11	371
150	0.39		53.18	172.09	170	166	1.00	3.25	387
151	0.49		53.18	171.90	170	166	1.00	4.08	485
152	0.49		53.14	171.67	170	166	1.00	4.08	484
153	0.49		53.14	171.43	170	166	1.00	4.09	484
154	0.46		53.14	171.19	169	165	1.00	3.83	452
155	0.47		53.14	170.96	169	165	1.00	3.93	463
156	0.43		53.18	170.72	169	165	1.00	3.58	421
157	0.52		53.14	170.53	169	165	1.00	4.36	512
158	0.47		53.14	170.25	168	164	1.00	3.93	461
159	0.56		53.14	169.92	168	164	1.00	4.64	543
160	0.47		53.14	169.69	168	164	1.00	3.95	462
161	0.57		53.18	169.59	168	164	1.00	4.79	558
162	0.46		53.14	169.59	168	164	1.00	3.81	444
163	0.52		53.14	169.78	168	164	1.00	4.35	508
164	0.43		53.14	170.06	168	164	1.00	3.61	423
165	0.54		53.14	170.44	169	165	1.00	4.49	527
166	0.51		53.14	170.91	169	165	1.00	4.22	497
167	0.44		53.14	171.52	170	166	1.00	3.66	434
168	0.52		53.14	172.23	170	167	1.00	4.37	521
169	0.46		53.14	173.03	171	168	1.00	3.81	457
170	0.49		53.14	173.79	172	168	1.00	4.08	493
171	0.41		53.18	174.73	173	169	1.00	3.42	416
172	0.42		53.18	175.58	174	170	1.00	3.52	432
173	0.53		53.18	176.47	174	171	1.00	4.44	549
174	0.46		53.14	177.23	175	172	1.00	3.80	472
175	0.49		53.18	178.23	176	173	1.00	4.07	509
176	0.49		53.14	178.94	177	173	1.00	4.08	514
177	0.49		53.14	180.22	178	174	1.00	4.10	521
178	0.47		53.14	181.12	179	175	1.00	3.94	505
179	0.44		53.14	182.02	180	176	1.00	3.66	473
180	0.42		53.14	183.01	181	177	1.00	3.53	459
181	0.49		53.14	183.96	182	178	1.00	4.08	534
182	0.49		53.14	185.09	183	179	1.00	4.07	537
183	0.47		53.14	186.08	184	180	1.00	3.93	523
184	0.52		53.09	186.79	185	181	1.00	4.35	583
185	0.49		53.09	187.26	185	181	1.00	4.08	547
186	0.52		53.09	187.59	185	181	1.00	4.35	586
187	0.47		53.09	187.83	186	182	1.00	3.93	530
188	0.55		53.05	188.01	186	182	1.00	4.55	615
189	0.50		53.05	188.20	186	182	1.00	4.20	569
190	0.44		53.05	188.30	186	182	1.00	3.66	495
191	0.51		53.00	188.39	186	182	1.00	4.22	573

WATER FLOW AND TEMPERATURE DATA - ASTM E2618

Client: Greentech
Model: RS7200E
Run #: 3

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/2/2020

	Flow (GPM)		Temperature Data (°F)						
Elapsed Time (min)	Load Side Flow	Appliance Flow (optional)	HEX Load In	HEX Load Out	HEX Supply In	HEX Supply Out	Specific Heat of Inlet Water (BTU/lb-°F)	Mass Flow Rate of Inlet Water (lb/min)	Heat Output (Btu)
192	0.46		52.95	188.39	186	182	1.00	3.80	515
193	0.47		52.95	188.49	186	182	1.00	3.93	534
194	0.52		52.95	188.49	186	182	1.00	4.34	590
195	0.45		52.91	188.49	187	182	1.00	3.78	514
196	0.43		52.95	188.44	187	182	1.00	3.62	491
197	0.44		52.95	188.44	187	182	1.00	3.71	503
198	0.47		52.91	188.39	186	182	1.00	3.94	535
199	0.49		52.91	188.35	187	182	1.00	4.08	553
200	0.45		52.91	188.30	187	182	1.00	3.79	514
201	0.45		52.86	188.25	186	182	1.00	3.79	514
202	0.41		52.86	188.16	186	182	1.00	3.40	460
203	0.46		52.86	188.06	186	182	1.00	3.81	515
204	0.40		52.86	187.97	186	182	1.00	3.33	451
205	0.50		52.86	187.92	186	182	1.00	4.15	562
206	0.42		52.86	187.83	186	181	1.00	3.52	476
207	0.42		52.86	187.73	186	181	1.00	3.52	476
208	0.44		52.91	187.59	186	181	1.00	3.65	492
209	0.49		52.86	187.50	186	181	1.00	4.08	549
210	0.51		52.86	187.36	186	181	1.00	4.22	568
211	0.37		52.86	187.26	186	181	1.00	3.11	419
212	0.44		52.91	187.07	185	181	1.00	3.69	496
213	0.50		52.86	186.98	185	181	1.00	4.19	562
214	0.46		52.95	186.84	185	180	1.00	3.80	509
215	0.50		52.95	186.70	185	180	1.00	4.21	564
216	0.47		52.95	186.56	185	180	1.00	3.93	525
217	0.52		52.95	186.41	185	180	1.00	4.36	582
218	0.44		52.95	186.27	185	180	1.00	3.66	489
219	0.46		53.00	186.08	184	180	1.00	3.81	507
220	0.47		53.00	185.94	184	180	1.00	3.95	525
221	0.48		52.95	185.75	184	179	1.00	3.98	529
222	0.52		53.00	185.61	184	179	1.00	4.37	580
223	0.59		53.00	185.42	184	179	1.00	4.90	650
224	0.49		53.00	185.28	184	179	1.00	4.08	541
225	0.42		53.05	185.14	183	179	1.00	3.54	468
226	0.52		53.05	184.95	183	179	1.00	4.36	576
227	0.46		53.05	184.76	183	178	1.00	3.81	503
228	0.52		53.05	184.57	183	178	1.00	4.33	570
229	0.41		53.05	184.38	183	178	1.00	3.44	453
230	0.46		53.05	184.20	182	178	1.00	3.80	499
231	0.50		53.05	184.00	182	178	1.00	4.21	552
232	0.54		53.05	183.82	182	177	1.00	4.51	590
233	0.47		53.05	183.63	182	177	1.00	3.94	515
234	0.49		53.05	183.44	182	177	1.00	4.08	533
235	0.44		53.09	183.25	181	177	1.00	3.66	478
236	0.52		53.09	183.06	181	177	1.00	4.37	568
237	0.39		53.09	182.87	181	177	1.00	3.25	422
238	0.38		53.05	182.63	181	176	1.00	3.13	406
239	0.49		53.09	182.49	181	176	1.00	4.08	528

WATER FLOW AND TEMPERATURE DATA - ASTM E2618

Client: Greentech
Model: RS7200E
Run #: 3

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/2/2020

	Flow (GPM)		Temperature Data (°F)						
Elapsed Time (min)	Load Side Flow	Appliance Flow (optional)	HEX Load In	HEX Load Out	HEX Supply In	HEX Supply Out	Specific Heat of Inlet Water (BTU/lb-°F)	Mass Flow Rate of Inlet Water (lb/min)	Heat Output (Btu)
240	0.52		53.09	182.25	181	176	1.00	4.36	564
241	0.44		53.09	182.06	180	176	1.00	3.69	476
242	0.51		53.05	181.87	180	176	1.00	4.22	545
243	0.57		53.05	181.64	180	175	1.00	4.78	616
244	0.52		53.05	181.45	180	175	1.00	4.35	559
245	0.48		53.05	181.26	180	175	1.00	4.00	514
246	0.49		53.05	181.07	179	175	1.00	4.08	522
247	0.46		53.00	180.83	179	175	1.00	3.80	486
248	0.49		53.00	180.64	179	174	1.00	4.08	521
249	0.49		53.00	180.40	179	174	1.00	4.10	523
250	0.46		53.00	180.22	178	174	1.00	3.81	486
251	0.42		52.95	179.98	178	174	1.00	3.54	450
252	0.47		52.95	179.79	178	174	1.00	3.93	500
253	0.49		52.95	179.55	178	173	1.00	4.10	519
254	0.51		52.95	179.36	178	173	1.00	4.23	536
255	0.49		52.95	179.13	177	173	1.00	4.09	517
256	0.47		53.00	178.89	177	173	1.00	3.95	498
257	0.46		53.00	178.70	177	173	1.00	3.82	481
258	0.56		53.00	178.46	177	172	1.00	4.65	584
259	0.47		53.00	178.27	176	172	1.00	3.94	494
260	0.39		53.00	178.04	176	172	1.00	3.27	409
261	0.49		53.00	177.85	176	172	1.00	4.08	509
262	0.39		52.95	177.61	176	171	1.00	3.26	407
263	0.42		52.95	177.37	176	171	1.00	3.54	441
264	0.47		52.95	177.18	175	171	1.00	3.95	492
265	0.46		53.00	176.95	175	171	1.00	3.82	474
266	0.41		52.95	176.71	175	171	1.00	3.40	422
267	0.46		52.95	176.52	175	170	1.00	3.80	470
268	0.52		52.95	176.28	175	170	1.00	4.37	540
269	0.52		52.91	176.05	174	170	1.00	4.34	536
270	0.48		52.95	175.81	174	170	1.00	3.98	489
271	0.51		52.91	175.62	174	170	1.00	4.24	521
272	0.49		52.95	175.39	174	169	1.00	4.09	501
273	0.41		52.91	175.20	173	169	1.00	3.40	417
274	0.44		52.91	174.92	173	169	1.00	3.66	448
275	0.42		52.91	174.68	173	169	1.00	3.54	431
276	0.49		52.91	174.49	173	168	1.00	4.10	500
277	0.43		52.91	174.26	172	168	1.00	3.55	431
278	0.56		52.91	174.02	172	168	1.00	4.65	564
279	0.51		52.91	173.83	172	168	1.00	4.23	512
280	0.42		52.91	173.60	172	168	1.00	3.54	427
281	0.42		52.91	173.36	172	167	1.00	3.54	427
282	0.49		52.91	173.17	171	167	1.00	4.08	492
283	0.47		52.91	172.94	171	167	1.00	3.95	475
284	0.41		52.91	172.70	171	167	1.00	3.42	410
285	0.49		52.86	172.47	171	167	1.00	4.10	491
286	0.46		52.91	172.23	170	166	1.00	3.85	460
287	0.42		52.91	171.99	170	166	1.00	3.52	419

WATER FLOW AND TEMPERATURE DATA - ASTM E2618

Client: Greentech
Model: RS7200E
Run #: 3

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/2/2020

	Flow (GPM)		Temperature Data (°F)						
Elapsed Time (min)	Load Side Flow	Appliance Flow (optional)	HEX Load In	HEX Load Out	HEX Supply In	HEX Supply Out	Specific Heat of Inlet Water (BTU/lb-°F)	Mass Flow Rate of Inlet Water (lb/min)	Heat Output (Btu)
288	0.49		52.91	171.76	170	166	1.00	4.09	487
289	0.44		52.91	171.57	170	166	1.00	3.67	436
290	0.42		52.91	171.33	170	165	1.00	3.53	418
291	0.46		52.91	171.10	169	165	1.00	3.81	451
292	0.44		52.86	170.91	169	165	1.00	3.69	436
293	0.41		52.91	170.68	169	165	1.00	3.41	402
294	0.46		52.91	170.44	168	164	1.00	3.84	452
295	0.54		52.86	170.16	168	164	1.00	4.52	531
296	0.51		52.91	169.97	168	164	1.00	4.24	497
297	0.51		52.86	169.87	168	164	1.00	4.22	494
298	0.57		52.91	169.83	168	164	1.00	4.79	561
299	0.46		52.86	170.06	168	164	1.00	3.81	447
300	0.47		52.91	170.25	168	165	1.00	3.95	464
301	0.52		52.86	170.58	169	165	1.00	4.37	515
302	0.45		52.86	170.91	169	165	1.00	3.77	446
303	0.45		52.91	171.38	169	166	1.00	3.76	446
304	0.47		52.86	171.95	170	166	1.00	3.94	470
305	0.56		52.82	172.65	171	167	1.00	4.65	558
306	0.51		52.86	173.36	171	168	1.00	4.24	511
307	0.46		52.86	174.02	172	168	1.00	3.81	463
308	0.54		52.86	175.01	173	169	1.00	4.50	550
309	0.44		52.86	175.76	174	170	1.00	3.66	450
310	0.52		52.86	176.76	175	171	1.00	4.36	541
311	0.48		52.86	177.90	176	172	1.00	4.03	505
312	0.52		52.91	178.94	177	173	1.00	4.36	550
313	0.39		52.86	179.84	178	174	1.00	3.27	415
314	0.49		52.86	181.21	179	175	1.00	4.08	525
315	0.46		52.91	182.20	180	176	1.00	3.81	493
316	0.56		52.86	183.39	182	178	1.00	4.64	607
317	0.57		52.91	184.38	183	178	1.00	4.78	629
318	0.57		52.91	185.85	184	180	1.00	4.76	634
319	0.48		52.91	186.93	185	181	1.00	4.00	537
320	0.42		52.91	187.78	186	182	1.00	3.52	475
321	0.44		52.91	188.16	186	182	1.00	3.67	497
322	0.54		52.91	188.53	186	182	1.00	4.51	613
323	0.42		52.91	188.82	187	183	1.00	3.53	480
324	0.49		52.91	189.10	187	183	1.00	4.08	557
325	0.44		52.91	189.29	187	183	1.00	3.66	500
326	0.52		52.91	189.48	187	183	1.00	4.34	594
327	0.48		52.91	189.52	187	183	1.00	4.00	548
328	0.49		52.91	189.62	187	183	1.00	4.08	559
329	0.49		52.91	189.67	188	183	1.00	4.08	558
330	0.46		52.91	189.71	188	183	1.00	3.80	520
331	0.54		52.95	189.76	188	183	1.00	4.51	618
332	0.49		52.91	189.71	188	183	1.00	4.09	560
333	0.57		52.95	189.76	188	183	1.00	4.78	655
334	0.44		52.95	189.67	188	183	1.00	3.68	504
335	0.47		52.95	189.67	188	183	1.00	3.94	539

WATER FLOW AND TEMPERATURE DATA - ASTM E2618

Client: Greentech
Model: RS7200E
Run #: 3

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/2/2020

	Flow (GPM)		Temperature Data (°F)						
Elapsed Time (min)	Load Side Flow	Appliance Flow (optional)	HEX Load In	HEX Load Out	HEX Supply In	HEX Supply Out	Specific Heat of Inlet Water (BTU/lb-°F)	Mass Flow Rate of Inlet Water (lb/min)	Heat Output (Btu)
336	0.46		52.95	189.57	188	183	1.00	3.82	523
337	0.47		52.95	189.57	188	183	1.00	3.95	540
338	0.44		53.00	189.48	188	183	1.00	3.67	502
339	0.51		52.95	189.38	188	183	1.00	4.22	577
340	0.49		53.00	189.29	188	183	1.00	4.09	558
341	0.46		53.00	189.19	187	183	1.00	3.80	518
342	0.44		53.00	189.10	187	183	1.00	3.66	499
343	0.51		53.00	189.01	187	183	1.00	4.24	577
344	0.49		52.95	188.86	187	182	1.00	4.08	556
345	0.44		52.95	188.77	187	182	1.00	3.69	501
346	0.51		52.91	188.63	187	182	1.00	4.22	574
347	0.47		52.91	188.49	187	182	1.00	3.95	536
348	0.52		52.95	188.35	187	182	1.00	4.36	591
349	0.46		52.91	188.20	186	182	1.00	3.82	517
350	0.49		52.91	188.06	186	182	1.00	4.10	555
351	0.41		52.91	187.92	186	181	1.00	3.46	468
352	0.47		52.91	187.78	186	181	1.00	3.93	531
353	0.46		52.91	187.64	186	181	1.00	3.81	514
354	0.52		52.91	187.45	186	181	1.00	4.36	587
355	0.51		52.91	187.26	186	181	1.00	4.24	570
356	0.47		52.91	187.12	185	181	1.00	3.95	531
357	0.47		52.91	186.93	185	180	1.00	3.95	531
358	0.56		52.95	186.79	185	180	1.00	4.64	621
359	0.50		52.95	186.60	185	180	1.00	4.15	556
360	0.47		52.91	186.41	185	180	1.00	3.94	527
361	0.47		52.91	186.23	185	180	1.00	3.95	528
362	0.48		52.91	186.08	184	180	1.00	3.96	528
363	0.54		52.91	185.85	184	179	1.00	4.51	600
364	0.43		52.91	185.66	184	179	1.00	3.54	471
365	0.44		52.95	185.52	184	179	1.00	3.66	486
366	0.52		52.91	185.28	184	179	1.00	4.37	580
367	0.44		52.91	185.09	183	179	1.00	3.69	489
368	0.40		52.91	184.90	183	178	1.00	3.33	440
369	0.49		52.91	184.72	183	178	1.00	4.09	540
370	0.47		52.91	184.53	183	178	1.00	3.95	521
371	0.37		52.86	184.34	183	178	1.00	3.12	411
372	0.44		52.91	184.15	182	178	1.00	3.67	482
373	0.47		52.91	183.91	182	178	1.00	3.95	518
374	0.49		52.91	183.72	182	177	1.00	4.10	537
375	0.45		52.91	183.53	182	177	1.00	3.71	486
376	0.50		52.91	183.30	181	177	1.00	4.19	547
377	0.46		52.86	183.10	181	177	1.00	3.83	499
378	0.48		52.86	182.87	181	176	1.00	3.96	516
379	0.43		52.86	182.68	181	176	1.00	3.54	461
380	0.42		52.86	182.49	181	176	1.00	3.54	459
381	0.47		52.86	182.25	180	176	1.00	3.95	511
382	0.46		52.91	182.02	180	176	1.00	3.83	495
383	0.38		52.91	181.83	180	175	1.00	3.14	405

WATER FLOW AND TEMPERATURE DATA - ASTM E2618

Client: Greentech
Model: RS7200E
Run #: 3

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/2/2020

	Flow (GPM)		Temperature Data (°F)						
Elapsed Time (min)	Load Side Flow	Appliance Flow (optional)	HEX Load In	HEX Load Out	HEX Supply In	HEX Supply Out	Specific Heat of Inlet Water (BTU/lb-°F)	Mass Flow Rate of Inlet Water (lb/min)	Heat Output (Btu)
384	0.50		52.91	181.64	180	175	1.00	4.15	534
385	0.41		52.91	181.40	180	175	1.00	3.42	440
386	0.43		52.91	181.16	179	175	1.00	3.54	455
387	0.53		52.91	180.93	179	175	1.00	4.38	561
388	0.56		52.86	180.74	179	174	1.00	4.65	595
389	0.46		52.86	180.50	179	174	1.00	3.81	487
390	0.46		52.86	180.31	178	174	1.00	3.82	487
391	0.49		52.82	180.07	178	174	1.00	4.10	523
392	0.39		52.82	179.84	178	174	1.00	3.27	416
393	0.46		52.82	179.65	178	173	1.00	3.83	486
394	0.48		52.82	179.41	178	173	1.00	3.96	502
395	0.49		52.77	179.17	177	173	1.00	4.10	519
396	0.41		52.82	178.98	177	173	1.00	3.40	429
397	0.46		52.77	178.75	177	172	1.00	3.83	483
398	0.48		52.72	178.51	177	172	1.00	3.96	499
399	0.44		52.77	178.27	176	172	1.00	3.69	464
400	0.50		52.77	178.04	176	172	1.00	4.20	526
401	0.48		52.77	177.80	176	172	1.00	4.04	506
402	0.49		52.72	177.61	176	171	1.00	4.10	512
403	0.52		52.72	177.37	176	171	1.00	4.37	545
404	0.51		52.72	177.14	175	171	1.00	4.25	529
405	0.56		52.68	176.90	175	171	1.00	4.66	579
406	0.53		52.72	176.66	175	171	1.00	4.38	544
407	0.46		52.68	176.47	175	170	1.00	3.83	474
408	0.53		52.63	176.24	174	170	1.00	4.45	551
409	0.54		52.68	176.00	174	170	1.00	4.52	557
410	0.47		52.63	175.76	174	170	1.00	3.96	488
411	0.51		52.63	175.53	174	169	1.00	4.25	522
412	0.41		52.63	175.29	173	169	1.00	3.41	419
413	0.41		52.68	175.11	173	169	1.00	3.41	418
414	0.47		52.68	174.87	173	169	1.00	3.96	484
415	0.49		52.63	174.63	173	169	1.00	4.09	500
416	0.48		52.63	174.40	173	168	1.00	3.98	485
417	0.52		52.68	174.16	172	168	1.00	4.37	532
418	0.39		52.63	173.97	172	168	1.00	3.27	397
419	0.47		52.58	173.74	172	168	1.00	3.96	480
420	0.53		52.63	173.50	172	167	1.00	4.39	531
421	0.54		52.63	173.27	171	167	1.00	4.53	547
422	0.53		52.58	173.03	171	167	1.00	4.39	529
423	0.43		52.63	172.80	171	167	1.00	3.55	427
424	0.51		52.58	172.56	171	167	1.00	4.24	509
425	0.52		52.58	172.32	170	166	1.00	4.30	516
426	0.51		52.58	172.09	170	166	1.00	4.28	512
427	0.56		52.58	171.90	170	166	1.00	4.65	555
428	0.49		52.58	171.67	170	166	1.00	4.09	488
429	0.49		52.58	171.43	170	165	1.00	4.11	489
430	0.44		52.58	171.15	169	165	1.00	3.70	439
431	0.44		52.58	170.91	169	165	1.00	3.69	437

WATER FLOW AND TEMPERATURE DATA - ASTM E2618

Client: Greentech
Model: RS7200E
Run #: 3

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/2/2020

	Flow (GPM)		Temperature Data (°F)						
Elapsed Time (min)	Load Side Flow	Appliance Flow (optional)	HEX Load In	HEX Load Out	HEX Supply In	HEX Supply Out	Specific Heat of Inlet Water (BTU/lb-°F)	Mass Flow Rate of Inlet Water (lb/min)	Heat Output (Btu)
432	0.44		52.58	170.72	169	165	1.00	3.70	438
433	0.43		52.58	170.49	168	164	1.00	3.59	424
434	0.48		52.58	170.20	168	164	1.00	4.00	471
435	0.56		52.54	170.06	168	164	1.00	4.66	548
436	0.49		52.58	169.87	168	164	1.00	4.10	481
437	0.49		52.58	169.83	168	164	1.00	4.10	482
438	0.39		52.54	169.78	168	164	1.00	3.26	383
439	0.41		52.54	169.92	168	164	1.00	3.42	402
440	0.49		52.54	170.11	168	164	1.00	4.10	483
441	0.55		52.58	170.35	168	165	1.00	4.60	542
442	0.47		52.54	170.63	169	165	1.00	3.93	464
443	0.57		52.54	171.05	169	165	1.00	4.79	569
444	0.51		52.54	171.48	169	166	1.00	4.22	503
445	0.53		52.58	171.95	170	166	1.00	4.39	524
446	0.51		52.58	172.56	170	167	1.00	4.26	512
447	0.53		52.58	173.13	171	168	1.00	4.39	530
448	0.49		52.54	173.74	172	168	1.00	4.10	497
449	0.41		52.58	174.35	172	169	1.00	3.40	415
450	0.49		52.58	175.11	173	169	1.00	4.06	498
451	0.42		52.58	175.81	174	170	1.00	3.54	436
452	0.54		52.58	176.62	175	171	1.00	4.51	560
453	0.56		52.58	177.42	175	172	1.00	4.66	582
454	0.48		52.58	178.32	176	172	1.00	3.97	500
455	0.51		52.58	179.08	177	173	1.00	4.25	539
456	0.48		52.58	179.98	178	174	1.00	3.96	505
457	0.53		52.58	180.83	179	175	1.00	4.38	562
458	0.52		52.58	181.83	180	176	1.00	4.33	560
459	0.47		52.58	182.77	181	177	1.00	3.95	515
460	0.47		52.54	183.72	182	178	1.00	3.96	519
461	0.44		52.58	184.86	183	179	1.00	3.69	488
462	0.49		52.54	185.71	184	180	1.00	4.11	548
463	0.53		52.54	186.74	185	181	1.00	4.38	589
464	0.56		52.58	187.26	185	181	1.00	4.65	627
465	0.49		52.58	187.64	185	181	1.00	4.08	552
466	0.44		52.58	187.92	186	182	1.00	3.65	495
467	0.47		52.58	188.11	186	182	1.00	3.96	537
468	0.51		52.58	188.25	186	182	1.00	4.23	575
469	0.44		52.58	188.44	186	182	1.00	3.69	501
470	0.48		52.58	188.49	186	182	1.00	3.97	540
471	0.56		52.58	188.53	186	182	1.00	4.67	636
472	0.56		52.58	188.53	186	182	1.00	4.65	633
473	0.51		52.58	188.53	186	182	1.00	4.24	577
474	0.50		52.63	188.53	186	182	1.00	4.19	570
475	0.41		52.63	188.49	186	182	1.00	3.42	466
476	0.54		52.63	188.39	186	182	1.00	4.51	613
477	0.49		52.63	188.35	186	182	1.00	4.09	556
478	0.47		52.63	188.30	186	182	1.00	3.96	537
479	0.48		52.63	188.16	186	182	1.00	3.96	538

WATER FLOW AND TEMPERATURE DATA - ASTM E2618

Client: Greentech
Model: RS7200E
Run #: 3

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/2/2020

	Flow (GPM)		Temperature Data (°F)						
Elapsed Time (min)	Load Side Flow	Appliance Flow (optional)	HEX Load In	HEX Load Out	HEX Supply In	HEX Supply Out	Specific Heat of Inlet Water (BTU/lb-°F)	Mass Flow Rate of Inlet Water (lb/min)	Heat Output (Btu)
480	0.44		52.63	188.06	186	182	1.00	3.69	501
481	0.41		52.63	187.92	186	182	1.00	3.41	462
482	0.48		52.63	187.83	186	181	1.00	3.97	537
483	0.51		52.58	187.69	186	181	1.00	4.22	571
484	0.44		52.63	187.55	186	181	1.00	3.68	497
485	0.47		52.58	187.40	186	181	1.00	3.96	534
486	0.52		52.63	187.26	185	181	1.00	4.37	589
487	0.51		52.63	187.12	185	181	1.00	4.24	571
488	0.44		52.58	186.93	185	181	1.00	3.69	497
489	0.43		52.63	186.79	185	180	1.00	3.55	477
490	0.43		52.63	186.60	185	180	1.00	3.57	478
491	0.48		52.63	186.41	185	180	1.00	4.00	535
492	0.50		52.58	186.23	184	180	1.00	4.14	554
493	0.54		52.63	186.04	184	180	1.00	4.52	603
494	0.54		52.58	185.85	184	179	1.00	4.50	601
495	0.49		52.63	185.66	184	179	1.00	4.10	546
496	0.48		52.63	185.47	184	179	1.00	3.98	529
497	0.44		52.63	185.28	184	179	1.00	3.69	490
498	0.39		52.63	185.09	183	179	1.00	3.29	436
499	0.42		52.68	184.90	183	178	1.00	3.53	467
500	0.45		52.68	184.67	183	178	1.00	3.76	497
501	0.43		52.63	184.48	183	178	1.00	3.55	469
502	0.44		52.63	184.29	183	178	1.00	3.69	486
503	0.36		52.68	184.10	182	178	1.00	2.99	394
504	0.36		52.68	183.86	182	177	1.00	2.98	392
505	0.46		52.68	183.67	182	177	1.00	3.81	500
506	0.48		52.68	183.44	182	177	1.00	3.97	520
507	0.48		52.68	183.20	181	177	1.00	4.03	527
508	0.47		52.68	182.96	181	177	1.00	3.96	516
509	0.51		52.68	182.77	181	176	1.00	4.23	551
510	0.46		52.68	182.54	181	176	1.00	3.83	498
511	0.46		52.63	182.35	181	176	1.00	3.81	495
512	0.49		52.68	182.11	180	176	1.00	4.09	530
513	0.49		52.68	181.92	180	176	1.00	4.10	531
514	0.48		52.68	181.68	180	175	1.00	3.96	512
515	0.46		52.68	181.40	180	175	1.00	3.82	492
516	0.50		52.68	181.21	179	175	1.00	4.17	537
517	0.44		52.63	180.97	179	175	1.00	3.64	467
518	0.59		52.68	180.74	179	174	1.00	4.94	633
519	0.51		52.63	180.50	179	174	1.00	4.24	543
520	0.46		52.63	180.31	178	174	1.00	3.81	487
521	0.51		52.63	180.03	178	174	1.00	4.23	540
522	0.43		52.63	179.84	178	174	1.00	3.57	454
523	0.44		52.63	179.60	178	173	1.00	3.70	470
524	0.52		52.58	179.36	178	173	1.00	4.34	552
525	0.48		52.58	179.13	177	173	1.00	4.03	510
526	0.49		52.58	178.84	177	173	1.00	4.10	518
527	0.46		52.58	178.65	177	172	1.00	3.82	482

WATER FLOW AND TEMPERATURE DATA - ASTM E2618

Client: Greentech
Model: RS7200E
Run #: 3

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/2/2020

	Flow (GPM)		Temperature Data (°F)						
Elapsed Time (min)	Load Side Flow	Appliance Flow (optional)	HEX Load In	HEX Load Out	HEX Supply In	HEX Supply Out	Specific Heat of Inlet Water (BTU/lb-°F)	Mass Flow Rate of Inlet Water (lb/min)	Heat Output (Btu)
528	0.51		52.58	178.42	177	172	1.00	4.23	533
529	0.49		52.58	178.18	176	172	1.00	4.10	516
530	0.49		52.58	177.94	176	172	1.00	4.10	515
531	0.51		52.58	177.70	176	172	1.00	4.23	530
532	0.50		52.58	177.47	176	171	1.00	4.13	517
533	0.48		52.63	177.23	175	171	1.00	4.03	503
534	0.46		52.63	177.00	175	171	1.00	3.82	476
535	0.51		52.63	176.76	175	171	1.00	4.23	526
536	0.53		52.58	176.52	175	170	1.00	4.38	544
537	0.49		52.63	176.28	174	170	1.00	4.10	508
538	0.46		52.63	176.05	174	170	1.00	3.82	472
539	0.44		52.58	175.81	174	170	1.00	3.69	455
540	0.52		52.63	175.53	174	169	1.00	4.36	536
541	0.45		52.63	175.29	173	169	1.00	3.71	456
542	0.47		52.63	175.06	173	169	1.00	3.96	485
543	0.59		52.63	174.82	173	169	1.00	4.92	602
544	0.59		52.63	174.59	173	169	1.00	4.95	604
545	0.58		52.63	174.40	173	168	1.00	4.80	585
546	0.48		52.63	174.12	172	168	1.00	3.96	482
547	0.46		52.63	173.88	172	168	1.00	3.81	463
548	0.54		52.63	173.64	172	168	1.00	4.48	543
549	0.47		52.63	173.41	172	167	1.00	3.90	471
550	0.51		52.58	173.17	171	167	1.00	4.22	510
551	0.49		52.63	172.94	171	167	1.00	4.11	495
552	0.41		52.63	172.65	171	167	1.00	3.41	410
553	0.46		52.63	172.42	171	167	1.00	3.83	459
554	0.49		52.58	172.18	170	166	1.00	4.09	490
555	0.47		52.63	171.95	170	166	1.00	3.96	472
556	0.46		52.63	171.71	170	166	1.00	3.83	456
557	0.47		52.58	171.48	170	166	1.00	3.93	468
558	0.51		52.63	171.24	169	165	1.00	4.23	503
559	0.44		52.63	171.01	169	165	1.00	3.69	437
560	0.43		52.63	170.77	169	165	1.00	3.55	420
561	0.48		52.58	170.53	168	165	1.00	3.96	468
562	0.49		52.58	170.30	168	164	1.00	4.10	483
563	0.44		52.58	170.06	168	164	1.00	3.67	432
564	0.43		52.58	169.87	168	164	1.00	3.54	416
565	0.44		52.54	169.83	168	164	1.00	3.69	433
566	0.42		52.54	169.78	168	164	1.00	3.53	414
567	0.41		52.54	169.83	168	164	1.00	3.40	400
568	0.49		52.49	169.92	168	164	1.00	4.11	483
569	0.44		52.49	170.11	168	164	1.00	3.68	433
570	0.48		52.45	170.30	168	165	1.00	3.96	468
571	0.42		52.45	170.58	168	165	1.00	3.54	418
572	0.47		52.40	170.96	169	165	1.00	3.94	468
573	0.49		52.40	171.33	169	166	1.00	4.10	488
574	0.48		52.40	171.81	170	166	1.00	3.98	475
575	0.44		52.40	172.28	170	167	1.00	3.66	440

WATER FLOW AND TEMPERATURE DATA - ASTM E2618

Client: Greentech
Model: RS7200E
Run #: 3

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/2/2020

	Flow (GPM)		Temperature Data (°F)						
Elapsed Time (min)	Load Side Flow	Appliance Flow (optional)	HEX Load In	HEX Load Out	HEX Supply In	HEX Supply Out	Specific Heat of Inlet Water (BTU/lb-°F)	Mass Flow Rate of Inlet Water (lb/min)	Heat Output (Btu)
576	0.46		52.35	172.80	171	167	1.00	3.81	460
577	0.44		52.35	173.31	171	168	1.00	3.69	447
578	0.46		52.35	173.93	172	168	1.00	3.82	465
579	0.56		52.35	174.59	172	169	1.00	4.65	569
580	0.41		52.35	175.15	173	169	1.00	3.40	418
581	0.52		52.35	175.72	174	170	1.00	4.37	539
582	0.43		52.35	176.38	174	171	1.00	3.62	450
583	0.56		52.40	177.04	175	171	1.00	4.64	579
584	0.47		52.35	177.66	175	172	1.00	3.96	496
585	0.52		52.40	178.23	176	172	1.00	4.37	551
586	0.46		52.40	178.75	177	173	1.00	3.82	483
587	0.41		52.45	179.36	177	174	1.00	3.40	432
588	0.52		52.45	179.93	178	174	1.00	4.35	555
589	0.52		52.49	180.45	178	175	1.00	4.35	557
590	0.51		52.45	181.02	179	175	1.00	4.24	546
591	0.41		52.49	181.45	179	176	1.00	3.40	439
592	0.51		52.49	182.02	180	176	1.00	4.24	550
593	0.41		52.49	182.44	180	176	1.00	3.40	442
594	0.41		52.49	182.87	181	177	1.00	3.40	443
595	0.51		52.49	183.34	181	177	1.00	4.22	553
596	0.46		52.49	183.72	181	178	1.00	3.83	504
597	0.47		52.54	184.15	182	178	1.00	3.96	521
598	0.46		52.49	184.53	182	178	1.00	3.81	504
599	0.51		52.49	184.90	183	179	1.00	4.23	561
600	0.39		52.54	185.28	183	179	1.00	3.26	433
601	0.39		52.54	185.52	183	179	1.00	3.25	433
602	0.44		52.58	185.61	183	179	1.00	3.67	489
603	0.37		52.54	185.66	183	179	1.00	3.13	417
604	0.44		52.58	185.66	183	179	1.00	3.69	492
605	0.49		52.58	185.61	183	179	1.00	4.10	546
606	0.45		52.58	185.52	183	179	1.00	3.72	495
607	0.47		52.58	185.42	183	179	1.00	3.91	519
608	0.56		52.58	185.38	183	179	1.00	4.64	617
609	0.51		52.63	185.28	183	179	1.00	4.22	560
610	0.42		52.58	185.14	183	179	1.00	3.52	468
611	0.44		52.58	185.00	183	179	1.00	3.68	488
612	0.53		52.58	184.86	183	179	1.00	4.39	581
613	0.44		52.58	184.67	183	178	1.00	3.69	487
614	0.39		52.58	184.53	182	178	1.00	3.28	434
615	0.45		52.58	184.34	182	178	1.00	3.74	493
616	0.52		52.58	184.15	182	178	1.00	4.37	575
617	0.52		52.58	183.96	182	178	1.00	4.37	575
618	0.44		52.58	183.77	182	177	1.00	3.66	481
619	0.51		52.54	183.58	182	177	1.00	4.23	555
620	0.41		52.54	183.39	181	177	1.00	3.40	446
621	0.48		52.58	183.15	181	177	1.00	3.96	518
622	0.41		52.54	182.96	181	177	1.00	3.44	450
623	0.48		52.58	182.73	181	176	1.00	3.98	519

WATER FLOW AND TEMPERATURE DATA - ASTM E2618

Client: Greentech
Model: RS7200E
Run #: 3

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/2/2020

	Flow (GPM)		Temperature Data (°F)						
Elapsed Time (min)	Load Side Flow	Appliance Flow (optional)	HEX Load In	HEX Load Out	HEX Supply In	HEX Supply Out	Specific Heat of Inlet Water (BTU/lb-°F)	Mass Flow Rate of Inlet Water (lb/min)	Heat Output (Btu)
624	0.44		52.58	182.54	181	176	1.00	3.67	478
625	0.56		52.58	182.30	180	176	1.00	4.64	602
626	0.54		52.54	182.11	180	176	1.00	4.52	586
627	0.49		52.58	181.87	180	176	1.00	4.10	531
628	0.39		52.58	181.64	180	175	1.00	3.26	421
629	0.46		52.58	181.40	179	175	1.00	3.81	492
630	0.44		52.58	181.21	179	175	1.00	3.69	476
631	0.51		52.54	180.93	179	175	1.00	4.24	545
632	0.54		52.58	180.69	179	174	1.00	4.51	578
633	0.52		52.54	180.45	179	174	1.00	4.37	560
634	0.46		52.58	180.22	178	174	1.00	3.81	487
635	0.39		52.58	179.98	178	174	1.00	3.26	416
636	0.54		52.54	179.74	178	173	1.00	4.52	576
637	0.41		52.58	179.50	178	173	1.00	3.40	432
638	0.51		52.54	179.27	177	173	1.00	4.24	538
639	0.50		52.54	178.98	177	173	1.00	4.14	524
640	0.48		52.54	178.75	177	173	1.00	3.99	504
641	0.59		52.54	178.51	177	172	1.00	4.93	622
642	0.56		52.58	178.27	176	172	1.00	4.64	583
643	0.47		52.58	177.99	176	172	1.00	3.96	497
644	0.49		52.54	177.75	176	172	1.00	4.09	513
645	0.54		52.54	177.47	176	171	1.00	4.51	564
646	0.46		52.54	177.23	175	171	1.00	3.81	476
647	0.51		52.58	177.00	175	171	1.00	4.27	532
648	0.44		52.54	176.76	175	171	1.00	3.67	457
649	0.49		52.58	176.47	175	170	1.00	4.09	507
650	0.54		52.54	176.24	174	170	1.00	4.51	558
651	0.52		52.54	176.00	174	170	1.00	4.37	541
652	0.43		52.54	175.72	174	170	1.00	3.54	437
653	0.42		52.54	175.48	174	169	1.00	3.53	434
654	0.56		52.49	175.20	173	169	1.00	4.66	572
655	0.48		52.54	174.96	173	169	1.00	4.00	490
656	0.46		52.54	174.73	173	169	1.00	3.83	468
657	0.41		52.54	174.44	173	168	1.00	3.42	417
658	0.46		52.49	174.21	172	168	1.00	3.82	466
659	0.49		52.54	173.93	172	168	1.00	4.09	497
660	0.49		52.49	173.69	172	168	1.00	4.08	495
661	0.41		52.49	173.45	172	167	1.00	3.41	413
662	0.53		52.49	173.17	171	167	1.00	4.38	529
663	0.45		52.49	172.89	171	167	1.00	3.72	449
664	0.46		52.49	172.70	171	167	1.00	3.81	459
665	0.41		52.49	172.42	171	166	1.00	3.41	409
666	0.47		52.45	172.18	170	166	1.00	3.96	474
667	0.41		52.49	171.90	170	166	1.00	3.40	407
668	0.46		52.49	171.62	170	166	1.00	3.81	455
669	0.42		52.45	171.38	169	165	1.00	3.54	421
670	0.53		52.49	171.10	169	165	1.00	4.38	520
671	0.42		52.49	170.86	169	165	1.00	3.52	417

WATER FLOW AND TEMPERATURE DATA - ASTM E2618

Client: Greentech
Model: RS7200E
Run #: 3

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/2/2020

	Flow (GPM)		Temperature Data (°F)						
Elapsed Time (min)	Load Side Flow	Appliance Flow (optional)	HEX Load In	HEX Load Out	HEX Supply In	HEX Supply Out	Specific Heat of Inlet Water (BTU/lb-°F)	Mass Flow Rate of Inlet Water (lb/min)	Heat Output (Btu)
672	0.51		52.45	170.63	169	165	1.00	4.25	502
673	0.44		52.45	170.35	168	164	1.00	3.69	435
674	0.44		52.45	170.11	168	164	1.00	3.68	433
675	0.44		52.45	169.87	168	164	1.00	3.68	432
676	0.46		52.45	169.69	168	164	1.00	3.82	448
677	0.52		52.45	169.45	168	164	1.00	4.36	511
678	0.46		52.45	169.26	167	163	1.00	3.80	444
679	0.54		52.45	169.12	167	163	1.00	4.49	524
680	0.56		52.45	168.93	167	163	1.00	4.66	543
681	0.49		52.45	168.74	166	163	1.00	4.08	475
682	0.46		52.45	168.60	166	163	1.00	3.81	443
683	0.44		52.45	168.41	166	163	1.00	3.69	428
684	0.49		52.45	168.32	166	162	1.00	4.10	476
685	0.47		52.49	168.27	166	162	1.00	3.96	458
686	0.46		52.45	168.18	166	162	1.00	3.81	442
687	0.51		52.45	168.13	166	162	1.00	4.22	489
688	0.54		52.45	168.08	166	162	1.00	4.49	519
689	0.47		52.45	168.08	166	162	1.00	3.95	457
690	0.51		52.45	168.13	166	162	1.00	4.22	488
691	0.51		52.45	168.13	166	162	1.00	4.22	489
692	0.41		52.45	168.18	166	162	1.00	3.41	395
693	0.51		52.45	168.18	166	162	1.00	4.23	490
694	0.42		52.40	168.23	166	162	1.00	3.53	409
695	0.57		52.45	168.27	166	163	1.00	4.78	555
696	0.56		52.40	168.32	166	163	1.00	4.63	537
697	0.49		52.40	168.41	166	163	1.00	4.09	475
698	0.51		52.40	168.51	166	163	1.00	4.22	490
699	0.39		52.40	168.60	166	163	1.00	3.26	379
700	0.42		52.40	168.65	166	163	1.00	3.53	411
701	0.46		52.35	168.65	166	163	1.00	3.81	444
702	0.56		52.35	168.74	166	163	1.00	4.64	541
703	0.54		52.40	168.79	166	163	1.00	4.50	525
704	0.56		52.35	168.88	166	163	1.00	4.64	541
705	0.49		52.35	168.93	166	163	1.00	4.10	478
706	0.49		52.35	168.98	167	163	1.00	4.10	478
707	0.46		52.31	169.03	167	163	1.00	3.83	447
708	0.44		52.35	169.07	167	163	1.00	3.67	429
709	0.47		52.31	169.07	167	163	1.00	3.95	462
710	0.44		52.31	169.12	167	163	1.00	3.66	429
711	0.52		52.26	169.12	167	163	1.00	4.37	511
712	0.46		52.26	169.17	167	163	1.00	3.83	448
713	0.45		52.26	169.17	167	163	1.00	3.78	442
714	0.47		52.22	169.17	167	163	1.00	3.95	462
715	0.52		52.17	169.12	167	163	1.00	4.37	511

WATER FLOW AND TEMPERATURE DATA - ASTM E2618

Client: Greentech
Model: RS7200E
Run #: 3

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/2/2020

	Flow (GPM)		Temperature Data (°F)						
Elapsed Time (min)	Load Side Flow	Appliance Flow (optional)	HEX Load In	HEX Load Out	HEX Supply In	HEX Supply Out	Specific Heat of Inlet Water (BTU/lb-°F)	Mass Flow Rate of Inlet Water (lb/min)	Heat Output (Btu)
Average	0	#DIV/0!	53	180	178	174	1	4	501
								TOTAL:	**358372**

LAB SAMPLE DATA - ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 3

Job #: 20-565
Tracking #: 0069
Technician: AK
Date: 5/2/2020

	Sample ID	Tare, mg	Total, mg	Final, mg	Catch, mg
Train A Filters - First Hour	3780	120.2	120.2	120.4	0.2
Train A Filters - Remainder	A005	119.6	241.1	245.2	4.1
	3781	121.5			
Train A Probe	20A	115625.5	115625.5	115625.3	0.0*
Train A O-Rings	20A	3392.4	3392.4	3391.4	0.0*
Train B Filters	3782	119.4	239.5	241.9	2.4
	3783	120.1			
Train B Probe	20B	115964.7	115964.7	115964.7	0.0
Train B O-Rings	20B	3525.4	3525.4	3424.7	0.0*
Background Filter	A006	119.7	119.7	120.0	0.3

**Negative value corrected to zero*

Placed in Dessicator on:	5/7/2020

Train A Filters - First Hour	120.2		120.4					
Train A Filters - Remainder	245.2		245.2					
Train A Probe	115625.1				115625.3			
Train A O-Rings	3390.8		3391.3		3391.4			
Train B Filters	242.1		241.7		241.9			
Train B Probe	115964.6				115964.7			
Train B O-Rings	3525.1		3424.5		3424.7			
Background Filter	119.9		120.0		120.0			

1st hour Sub-Total, mg:	0.2
Remainder Sub-Total, mg:	4.1
Train 1 Aggregate, mg:	**4.3**
Train 2 Aggregate, mg:	**2.4**
Ambient Aggregate, mg:	0.3

ASTM E2618 Hydronic Heater Run Sheets

Client: Greentech | Job Number: 20-565 | Tracking #: 69
Model: RS7200E | Run Number: 3 | Test Date: 5/2/2020

Wood Heater Run Notes

Pre-Test Notes
Pre-Test Start Time: 19:05
Target Load (BTU/hr): 125,000

Time	Notes
0 min	Began preburn
60 min	End PB

Test Notes
Test Burn Start Time: 20:05
Target Load (BTU/hr): 25,000 (Category 2)

Time	Notes
0 min	Loaded test fuel within 60 seconds, door closed immediately
60 min	Changed 1st hour filter
715 min	End of Test

Test Burn End Time: 5/3 06:20

Flue Gas Concentration Measurement

Calibration Gas Values: Span Gas CO_2 (%): 15.30 CO (%): 4.98

Calibration Results:

	Pre Test			Post Test		
	Zero		Span	Zero		Span
Time	5/2 14:32		5/2 14:36	5/3 06:31		5/3 06:33
CO_2	-0.15		15.18	-0.19		15.10
CO	0.008		4.915	0.003		4.888

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

Technician Signature: Date: 5/10/2020

HYDRONIC HEATER TES DATA PACKET
ASTM E2618/E2515

Run 4 Data Summary

Client:	Greentech
Model:	RS7200E
Job #:	20-565
Tracking #:	69
Test Date:	5/3/2020

Techician Signature

5/13/2022
Date

TEST RESULTS - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 4

Job #: 20-565
Tracking #: 69
Technician: AK
Date: 5/3/2020

Particulate Data

	Ambient Sample	Sample Train A	Sample Train B	1st Hour Filter
Total Sample Volume (ft^3)	111.203	57.887	60.614	8.940
Average Gas Velocity in Dilution Tunnel (ft/sec)	15.0			
Average Gas Flow Rate in Dilution Tunnel (dscf/hr)	39593.3			
Average Gas Meter Temperature (°F)	66.2	88.4	89.4	79.9
Total Sample Volume (dscf)	107.073	53.398	56.393	8.377
Average Tunnel Temperature (°F)	75.6			
Total Time of Test (min)	387			
Total Particulate Catch (mg)	0.1	4.5	4.1	0.2
Particulate Concentration, dry-standard (g/dscf)	0.0000009	0.0000843	0.0000727	0.0000239
Total PM Emissions (g)	0.24	21.28	18.33	0.91
Particulate Emission Rate (g/hr)	0.04	3.30	2.84	0.91
Emissions Factor (g/kg)	-	0.85	0.74	-
Difference from Average Total Particulate Emissions (%)	-	7.5%	7.5%	-
Difference from Average Emissions Factor (g/kg)	-	0.06	0.06	-

Boiler/ HEX Data

Appliance Average Start Temperature (F)	167.5	
Appliance Average Final Temperature (F)	179.0	**First Hour**
Heat Output (BTU)	363,246	54,886
Heat Output Rate (BTU/hr)	56,317	
Heat Input - HHV (BTU)	471,261	76,697
Heat Input - LHV (BTU)	437,725	

Emissions Rates and Factors

Total Particulate Emissions (g)	19.8	0.9
Emissions Factor (g/MJ)	0.0517	
Emissions Factor (g/kg)	0.7951	
Emissions Rate (g/hr)	3.07	
Emissions Rate (lb/mmbtu output)	0.120	0.036
HHV Delivered Efficiency (%)	77.1%	71.6%
LHV Delivered Efficiency (%)	83.0%	
HHV SLM Efficiency (%)	83.7%	
LHV SLM Efficiency (%)	89.6%	
CO Emissions (g/min)	2.60	

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	73.0	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: 65 / Max: 68	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
Return Temp > 120°F	>120°F	160.0	OK

B415.1 Efficiency Results

Manufacturer: Greentech
Model: RS7200E
Date: 05/03/20
Run: 4
Control #: 20-565
Test Duration: 387
Output Category: 3

Test Results in Accordance with CSA B415.1-09

	HHV Basis	LHV Basis
Overall Efficiency	83.7%	89.6%
Combustion Efficiency	96.1%	96.1%
Heat Transfer Efficiency	87.1%	93.2%

Output Rate (kJ/h)	64,810	61,480	**(Btu/h)**
Burn Rate (kg/h)	3.94	8.68	**(lb/h)**
Input (kJ/h)	77,428	73,449	**(Btu/h)**

Test Load Weight (dry kg)	25.40	55.99	**dry lb**
MC wet (%)	17.42		
MC dry (%)	21.10		
Particulate (g)	19.81		
CO (g)	1,005		
Test Duration (h)	6.45		

Emissions	Particulate	CO
g/MJ Output	0.05	2.40
g/kg Dry Fuel	0.78	39.56
g/h	3.07	155.79
g/min	0.05	2.60
lb/MM Btu Output	0.11	5.59

Air/Fuel Ratio (A/F)	20.18

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

BOILER CORDWOOD FUEL DATA - ASTM E2618

Client: Greentech
Model: RS7200E
Run #: 4

Job #: 20-565
Tracking #: 69
Technician: AK
Date: 5/3/2020

Firebox Volume (ft^3):	6.25	Minimun Piece Weight (lbs):	4.40
Target Load Weight (lbs):	62.50	Maximun Piece Weight (lbs):	17.60
Number of Fuel Pieces Allowed:	5 - 10	80% of piece of weight range (lbs):	6.6 to 15.4

Pretest Fuel Information

Length (in)	Weight (lbs)	MC (%DB)	Length (in)	Weight (lbs)	MC (%DB)
20.00	69.00	24.0			
20.00		28.0			
20.00		24.0			
20.00		28.0			
20.00		18.0			
20.00		20.0			
20.00		18.0			
20.00		20.0			

Total Preburn Weight (lbs): 69.00
Averge Preburn Moisture (% DB): 22.50

Test Fuel Information

Length (in)	Weight (lbs)	Moisture Content (%DB)					Avg MC (%DB)	Dry Weight (lbs)
20.00	8.15	22.0	21.0	23.0	21.0	23.0	22.00	6.68
20.00	9.31	18.0	21.0	19.0	21.0	19.0	19.60	7.78
20.00	9.49	18.0	20.0	18.0	20.0	18.0	18.80	7.99
20.00	9.51	21.0	22.0	18.0	22.0	18.0	20.20	7.91
20.00	11.50	19.0	21.0	18.0	21.0	18.0	19.40	9.63
20.00	11.10	24.0	28.0	24.0	28.0	24.0	25.60	8.84
20.00	7.30	20.0	24.0	22.0	24.0	22.0	22.40	5.96
Total (lbs):	66.36						Total Dry Weight (lbs):	54.80

Allowable Coal Bed Range (10-20%): 6.6 - 13.3

Quality checks

Individual Piece Weights:	OK
80% Piece weight range:	OK
Piece Count:	OK

DILUTION TUNNEL & MISC. DATA - ASTM E2618 / E2515

Client:	Greentech	Job #:	20-565
Model:	RS7200E	Tracking #:	69
Run #:	4	Technician:	AK
Test Start Time:	7:18	Date:	5/3/2020
Manufacturer's Rated Output (BTU/hr):	125,000		

Total Sampling Time (min):	387
Recording Interval (min):	1

Meter Box γ Factor:	0.992	(A)
Meter Box γ Factor:	1.002	(B)
Meter Box γ Factor:	0.996	(Ambient)

387

	Pre-Test	Post Test	Avg.
Barometric Pressure (in. Hg)	28.77	28.91	28.84
Relative Humidity (%)	39.3	33.7	
Room Air Velocity (ft/min)	0	0	
Scale Audit (lbs)	10.0	10.0	

Ambient Sample Volume: 111.203 ft^3

Induced Draft Check (in. H_2O):	0
Smoke Capture Check (%):	100%
Date Flue Pipe Last Cleaned:	4/30/2020
Boiler Dry Weight (lbs):	1964
Supply Side Water Weight (lbs):	1502

Sample Train Post-Test Leak Checks

(A)	0.000	cfm @	-10	in. Hg
(B)	0.000	cfm @	-12	in. Hg
(Ambient)	0.000	cfm @	-15	in. Hg

DILUTION TUNNEL FLOW

Traverse Data

Point	dP (in H_2O)	Temp (°F)
1	0.032	88
2	0.045	88
3	0.045	88
4	0.048	88
5	0.035	88
6	0.026	88
7	0.023	87
8	0.038	87
9	0.040	87
10	0.042	87
11	0.037	87
12	0.029	87
Center	0.042	87

Static Pressure: -0.160 in. H_2O

Dilution Tunnel H_2O:	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	ft^2
V_{strav}:	13.18	ft/sec
V_{scent}:	14.10	ft/sec
F_p:	0.935	[ratio]
Initial Tunnel Flow:	561.6	scf/min

TEST FUEL PROPERTIES

Default Fuel Values

Fuel Type:	D. Fir	Oak
HHV (kJ/kg)	19,810	19,887
%C	48.73	50
%H	6.17	6.3
%O	43.9	42.9
%Ash	0.5	0.5

Actual Fuel Used Properties

Fuel Type:	Maple
HHV (kJ/kg)	19,960
%C	50.64
%H	6.62
%O	41.74
%Ash	1.35
MC (%DB)	21.1%

BOX A TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 4

Job #: 20-565
Tracking #: 69
Technician: AK
Date: 5/3/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
0	0.001		0.056	0.02	79	-5.47		67.8		87	269	66	65
1	0.129	0.128	0.056	0.98	78	-5.47	88	67.5	-0.3	87	271	66	65
2	0.281	0.152	0.056	1.01	78	-5.47	105	67.2	-0.3	88	273	67	65
3	0.432	0.151	0.056	0.95	78	-5.47	104	66.0	-1.2	88	276	67	65
4	0.581	0.149	0.056	0.98	78	-5.47	103	65.2	-0.8	88	279	67	65
5	0.731	0.150	0.056	0.93	78	-5.47	103	64.2	-1	88	281	67	65
6	0.881	0.150	0.056	0.97	78	-5.47	103	63.2	-1	88	284	67	65
7	1.031	0.150	0.056	0.97	77	-5.47	104	63.0	-0.2	89	286	67	65
8	1.181	0.150	0.056	0.94	77	-5.47	104	62.1	-0.9	89	287	68	65
9	1.330	0.149	0.056	0.95	77	-5.47	103	62.0	-0.1	89	289	68	65
10	1.480	0.150	0.056	0.93	77	-5.47	104	61.0	-1	89	290	68	65
11	1.628	0.148	0.056	0.93	77	-5.47	102	61.2	0.2	89	292	68	65
12	1.776	0.148	0.056	1.08	77	-5.47	102	59.8	-1.4	89	293	68	65
13	1.925	0.149	0.056	0.91	77	-5.47	103	60.8	1	89	294	68	65
14	2.073	0.148	0.056	0.95	78	-5.47	102	57.9	-2.9	89	295	68	65
15	2.222	0.149	0.056	0.95	78	-5.47	103	58.1	0.2	89	297	68	65
16	2.372	0.150	0.056	0.93	78	-5.47	102	56.9	-1.2	73	276	68	65
17	2.521	0.149	0.056	0.97	78	-5.47	101	56.9	0	71	261	68	65
18	2.670	0.149	0.056	0.92	78	-5.47	101	56.9	0	70	249	68	65
19	2.820	0.150	0.056	0.97	78	-5.47	102	56.9	0	69	239	68	65
20	2.969	0.149	0.056	0.97	78	-5.47	101	56.9	0	69	232	68	65
21	3.117	0.148	0.056	0.96	78	-5.47	100	57.0	0.1	68	225	68	65
22	3.266	0.149	0.056	0.91	78	-5.47	101	56.9	-0.1	68	220	68	65
23	3.414	0.148	0.056	0.98	78	-5.47	100	57.0	0.1	68	215	67	65
24	3.564	0.150	0.056	0.94	79	-5.47	101	57.2	0.2	68	210	67	65
25	3.713	0.149	0.056	0.98	79	-5.47	101	57.6	0.4	68	206	67	65
26	3.863	0.150	0.056	0.94	79	-5.47	101	57.0	-0.6	68	202	67	65
27	4.012	0.149	0.056	0.95	79	-5.47	101	57.0	0	68	198	67	65
28	4.162	0.150	0.056	0.99	79	-5.47	101	57.1	0.1	68	195	67	65
29	4.310	0.148	0.056	0.96	79	-5.47	100	57.0	-0.1	68	192	67	65
30	4.458	0.148	0.056	0.96	79	-5.47	100	57.1	0.1	68	189	67	65
31	4.607	0.149	0.056	0.98	80	-5.47	100	57.0	-0.1	68	186	67	65

BOX A TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 4

Job #: 20-565
Tracking #: 69
Technician: AK
Date: 5/3/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
32	4.756	0.149	0.056	0.96	80	-5.47	100	57.6	0.6	68	183	67	65
33	4.905	0.149	0.056	0.93	80	-5.47	100	57.0	-0.6	68	181	67	65
34	5.054	0.149	0.056	0.99	80	-5.47	100	57.0	0	68	178	67	65
35	5.204	0.150	0.056	0.98	80	-5.47	101	56.9	-0.1	68	176	67	65
36	5.353	0.149	0.056	0.93	80	-5.47	100	57.1	0.2	68	173	67	65
37	5.502	0.149	0.056	0.83	81	-5.47	100	57.1	0	68	171	67	65
38	5.651	0.149	0.056	0.97	81	-5.47	100	56.9	-0.2	67	169	67	65
39	5.799	0.148	0.056	0.91	81	-5.47	99	57.0	0.1	67	167	67	65
40	5.948	0.149	0.056	0.97	81	-5.47	100	57.1	0.1	67	166	67	65
41	6.097	0.149	0.056	0.83	81	-5.47	100	57.0	-0.1	67	163	67	65
42	6.246	0.149	0.056	0.90	81	-5.47	100	57.0	0	67	162	67	65
43	6.395	0.149	0.056	0.94	81	-5.47	100	57.0	0	67	160	67	65
44	6.545	0.150	0.056	0.97	82	-5.47	101	56.9	-0.1	67	158	67	65
45	6.694	0.149	0.056	0.92	82	-5.47	100	56.8	-0.1	67	157	67	65
46	6.843	0.149	0.056	0.94	82	-5.47	100	57.4	0.6	67	155	67	65
47	6.992	0.149	0.056	0.94	82	-5.47	100	57.0	-0.4	67	154	67	65
48	7.140	0.148	0.056	0.89	82	-5.47	99	57.3	0.3	67	152	67	65
49	7.288	0.148	0.056	0.93	82	-5.47	99	57.0	-0.3	67	150	67	65
50	7.437	0.149	0.056	0.95	83	-5.47	100	56.9	-0.1	67	149	67	65
51	7.586	0.149	0.056	0.93	83	-5.47	100	56.9	0	67	148	66	65
52	7.735	0.149	0.056	0.92	83	-5.47	100	57.0	0.1	67	147	66	65
53	7.884	0.149	0.056	1.00	83	-5.47	100	57.1	0.1	67	145	66	65
54	8.035	0.151	0.056	1.01	83	-5.47	101	57.0	-0.1	67	143	67	65
55	8.189	0.154	0.056	0.94	83	-5.47	103	57.0	0	67	142	68	65
56	8.340	0.151	0.056	0.95	83	-5.47	101	57.1	0.1	67	141	67	65
57	8.490	0.150	0.056	0.95	83	-5.47	100	57.1	0	67	140	67	65
58	8.641	0.151	0.056	0.97	84	-5.47	101	57.0	-0.1	67	139	67	65
59	8.791	0.150	0.056	0.95	84	-5.47	100	57.2	0.2	67	138	67	65
60	8.941	0.150	0.056	1.05	84	-5.47	100	57.0	-0.2	67	137	67	65
61	9.090	0.149	0.056	1.12	84	-5.47	100	56.7	-0.3	67	136	67	65
62	9.240	0.150	0.056	0.94	84	-5.47	100	57.3	0.6	67	135	67	65
63	9.390	0.150	0.056	0.93	84	-5.47	100	57.0	-0.3	67	133	67	65

BOX A TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 4

Job #: 20-565
Tracking #: 69
Technician: AK
Date: 5/3/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
64	9.540	0.150	0.056	1.00	84	-5.47	100	56.8	-0.2	67	133	67	65
65	9.691	0.151	0.056	0.99	85	-5.47	101	56.8	0	67	132	67	65
66	9.841	0.150	0.056	0.94	85	-5.47	100	57.2	0.4	67	131	67	65
67	9.992	0.151	0.056	0.94	85	-5.47	101	57.1	-0.1	67	129	67	65
68	10.140	0.148	0.056	1.00	85	-5.47	99	57.0	-0.1	67	128	67	65
69	10.291	0.151	0.056	0.90	85	-5.47	101	55.9	-1.1	67	128	67	65
70	10.441	0.150	0.056	0.99	85	-5.47	100	57.0	1.1	67	127	67	65
71	10.592	0.151	0.056	1.04	85	-5.47	101	56.9	-0.1	67	126	67	65
72	10.742	0.150	0.056	0.97	85	-5.47	101	56.9	0	81	168	67	65
73	10.892	0.150	0.056	0.95	85	-5.47	101	56.1	-0.8	78	196	67	65
74	11.041	0.149	0.056	0.94	86	-5.47	100	56.0	-0.1	80	208	67	65
75	11.189	0.148	0.056	0.92	86	-5.47	100	54.8	-1.2	81	218	67	65
76	11.339	0.150	0.056	1.06	86	-5.47	101	55.0	0.2	82	226	67	65
77	11.488	0.149	0.056	0.94	86	-5.47	101	53.9	-1.1	83	234	67	65
78	11.638	0.150	0.056	0.91	86	-5.47	101	53.0	-0.9	83	240	67	65
79	11.787	0.149	0.056	1.00	86	-5.47	101	51.7	-1.3	84	247	68	65
80	11.937	0.150	0.056	1.06	86	-5.47	102	51.9	0.2	84	252	68	65
81	12.086	0.149	0.056	0.91	86	-5.47	101	51.2	-0.7	85	257	68	66
82	12.235	0.149	0.056	0.92	86	-5.47	101	50.7	-0.5	86	261	68	65
83	12.383	0.148	0.056	0.96	86	-5.47	100	50.0	-0.7	86	264	68	65
84	12.532	0.149	0.056	0.92	86	-5.47	101	49.7	-0.3	87	267	68	65
85	12.682	0.150	0.056	0.92	87	-5.47	102	48.4	-1.3	87	270	68	65
86	12.831	0.149	0.056	0.93	87	-5.47	101	49.8	1.4	87	272	68	65
87	12.980	0.149	0.056	0.92	87	-5.47	101	46.9	-2.9	87	274	68	66
88	13.130	0.150	0.056	0.93	87	-5.47	102	45.9	-1	88	276	68	65
89	13.279	0.149	0.056	0.93	87	-5.47	101	45.9	0	88	278	68	66
90	13.429	0.150	0.056	1.05	87	-5.47	102	44.9	-1	88	280	69	66
91	13.577	0.148	0.056	0.99	87	-5.47	100	45.0	0.1	88	282	69	65
92	13.725	0.148	0.056	0.89	87	-5.47	100	43.6	-1.4	88	283	69	65
93	13.875	0.150	0.056	0.95	87	-5.47	102	42.8	-0.8	89	285	69	66
94	14.023	0.148	0.056	0.93	87	-5.47	100	42.3	-0.5	89	287	69	66
95	14.173	0.150	0.056	0.93	87	-5.47	102	41.8	-0.5	89	289	69	66

BOX A TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 4

Job #: 20-565
Tracking #: 69
Technician: AK
Date: 5/3/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
96	14.321	0.148	0.056	0.92	87	-5.47	100	40.9	-0.9	89	290	69	66
97	14.471	0.150	0.056	0.92	88	-5.47	102	41.4	0.5	89	292	69	66
98	14.620	0.149	0.056	1.11	88	-5.47	101	39.9	-1.5	90	294	69	66
99	14.769	0.149	0.056	0.91	88	-5.47	101	38.7	-1.2	90	296	69	66
100	14.917	0.148	0.056	0.98	88	-5.47	99	38.6	-0.1	73	272	69	66
101	15.066	0.149	0.056	0.94	88	-5.47	99	37.9	-0.7	71	257	69	66
102	15.216	0.150	0.056	0.97	88	-5.47	100	37.9	0	70	244	69	66
103	15.366	0.150	0.056	1.13	88	-5.47	100	37.8	-0.1	70	235	69	66
104	15.516	0.150	0.056	0.93	88	-5.47	100	36.9	-0.9	70	227	69	66
105	15.666	0.150	0.056	0.96	88	-5.47	100	37.0	0.1	69	220	69	66
106	15.816	0.150	0.056	1.03	88	-5.47	100	36.8	-0.2	69	215	69	66
107	15.966	0.150	0.056	0.93	88	-5.47	100	36.8	0	69	210	69	66
108	16.114	0.148	0.056	0.94	88	-5.47	98	36.8	0	69	205	69	66
109	16.263	0.149	0.056	0.92	88	-5.47	99	36.8	0	69	201	69	66
110	16.413	0.150	0.056	0.96	88	-5.47	100	35.7	-1.1	69	197	69	66
111	16.564	0.151	0.056	0.86	88	-5.47	100	35.7	0	69	194	69	66
112	16.714	0.150	0.056	0.97	88	-5.47	100	36.4	0.7	69	190	69	66
113	16.864	0.150	0.056	0.98	88	-5.47	100	35.7	-0.7	69	187	69	66
114	17.014	0.150	0.056	0.95	89	-5.47	100	35.9	0.2	69	184	68	66
115	17.163	0.149	0.056	0.95	89	-5.47	99	35.6	-0.3	69	182	68	66
116	17.313	0.150	0.056	0.95	89	-5.47	100	35.8	0.2	69	179	68	66
117	17.463	0.150	0.056	0.93	89	-5.47	100	36.9	1.1	69	177	68	66
118	17.614	0.151	0.056	0.97	89	-5.47	100	35.9	-1	69	174	68	66
119	17.766	0.152	0.056	0.96	89	-5.47	101	35.0	-0.9	69	172	68	66
120	17.915	0.149	0.056	0.99	89	-5.47	99	35.9	0.9	69	170	68	66
121	18.064	0.149	0.056	0.95	89	-5.47	99	35.9	0	69	168	68	66
122	18.213	0.149	0.056	0.99	89	-5.47	99	36.0	0.1	69	166	68	66
123	18.364	0.151	0.056	1.00	89	-5.47	100	35.7	-0.3	69	164	68	66
124	18.514	0.150	0.056	0.94	89	-5.47	100	36.8	1.1	69	163	68	66
125	18.664	0.150	0.056	0.94	89	-5.47	100	35.8	-1	69	161	68	66
126	18.815	0.151	0.056	0.99	89	-5.47	100	35.8	0	69	159	68	66
127	18.966	0.151	0.056	1.13	89	-5.47	100	35.8	0	69	157	68	66

BOX A TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 4

Job #: 20-565
Tracking #: 69
Technician: AK
Date: 5/3/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
128	19.114	0.148	0.056	0.93	89	-5.47	98	35.1	-0.7	69	156	68	66
129	19.264	0.150	0.056	0.93	89	-5.47	100	35.5	0.4	69	154	68	66
130	19.414	0.150	0.056	0.90	89	-5.47	100	35.8	0.3	69	153	68	66
131	19.564	0.150	0.056	0.97	89	-5.47	100	35.8	0	69	152	68	66
132	19.715	0.151	0.056	1.13	89	-5.47	100	35.8	0	69	150	68	66
133	19.865	0.150	0.056	1.01	89	-5.47	100	35.8	0	69	148	68	66
134	20.015	0.150	0.056	0.93	89	-5.47	100	35.8	0	69	147	68	66
135	20.165	0.150	0.056	0.95	89	-5.47	100	35.8	0	69	146	68	66
136	20.315	0.150	0.056	0.97	89	-5.47	100	36.0	0.2	69	145	68	66
137	20.465	0.150	0.056	0.94	89	-5.47	100	36.0	0	69	143	68	66
138	20.616	0.151	0.056	0.93	90	-5.47	100	36.1	0.1	69	142	68	66
139	20.767	0.151	0.056	0.96	90	-5.47	100	35.7	-0.4	69	141	68	66
140	20.917	0.150	0.056	0.99	90	-5.47	99	35.8	0.1	69	139	68	66
141	21.066	0.149	0.056	1.07	90	-5.47	99	35.6	-0.2	69	139	68	66
142	21.215	0.149	0.056	0.95	90	-5.47	99	35.3	-0.3	69	138	68	66
143	21.365	0.150	0.056	0.98	90	-5.47	99	35.8	0.5	69	136	68	66
144	21.516	0.151	0.056	0.97	90	-5.47	100	35.8	0	69	135	68	66
145	21.667	0.151	0.056	0.96	90	-5.47	100	35.8	0	69	135	68	66
146	21.817	0.150	0.056	1.00	90	-5.47	99	35.6	-0.2	69	134	68	66
147	21.968	0.151	0.056	0.99	90	-5.47	100	36.0	0.4	69	133	68	66
148	22.117	0.149	0.056	0.96	90	-5.47	99	36.1	0.1	69	132	68	66
149	22.268	0.151	0.056	0.97	90	-5.47	100	35.7	-0.4	69	131	67	66
150	22.419	0.151	0.056	0.99	90	-5.47	100	35.6	-0.1	69	130	68	66
151	22.569	0.150	0.056	0.93	90	-5.47	99	35.9	0.3	69	129	67	66
152	22.721	0.152	0.056	0.96	90	-5.47	101	35.8	-0.1	69	128	67	66
153	22.871	0.150	0.056	0.98	90	-5.47	99	35.7	-0.1	69	127	67	66
154	23.020	0.149	0.056	0.94	90	-5.47	99	35.8	0.1	69	126	67	66
155	23.171	0.151	0.056	0.90	90	-5.47	100	35.8	0	69	125	67	66
156	23.321	0.150	0.056	0.99	90	-5.47	99	35.8	0	69	124	67	66
157	23.472	0.151	0.056	0.93	90	-5.47	100	35.7	-0.1	69	124	67	66
158	23.623	0.151	0.056	0.87	90	-5.47	100	35.7	0	69	123	67	66
159	23.774	0.151	0.056	0.91	90	-5.47	100	35.8	0.1	69	123	67	66

BOX A TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 4

Job #: 20-565
Tracking #: 69
Technician: AK
Date: 5/3/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
160	23.923	0.149	0.056	0.96	90	-5.47	99	35.8	0	69	122	67	66
161	24.073	0.150	0.056	0.93	90	-5.47	99	36.1	0.3	69	121	67	66
162	24.223	0.150	0.056	0.95	90	-5.47	99	35.8	-0.3	69	121	67	66
163	24.373	0.150	0.056	1.01	90	-5.47	100	35.7	-0.1	81	171	68	66
164	24.524	0.151	0.056	0.95	90	-5.47	101	36.1	0.4	79	195	68	66
165	24.673	0.149	0.056	0.99	90	-5.47	100	35.5	-0.6	81	207	68	66
166	24.823	0.150	0.056	0.96	90	-5.47	100	35.4	-0.1	81	216	68	66
167	24.971	0.148	0.056	0.89	90	-5.47	99	34.1	-1.3	83	224	68	66
168	25.120	0.149	0.056	0.94	90	-5.47	100	32.5	-1.6	83	231	68	66
169	25.270	0.150	0.056	0.92	90	-5.47	101	32.7	0.2	84	238	68	66
170	25.419	0.149	0.056	0.92	90	-5.47	100	30.0	-2.7	84	243	68	66
171	25.569	0.150	0.056	0.95	90	-5.47	101	30.9	0.9	85	248	68	66
172	25.719	0.150	0.056	0.91	90	-5.47	101	30.7	-0.2	85	253	68	66
173	25.869	0.150	0.056	0.98	90	-5.47	101	29.9	-0.8	86	257	69	66
174	26.019	0.150	0.056	0.98	90	-5.47	101	28.6	-1.3	86	261	69	66
175	26.167	0.148	0.056	0.94	90	-5.47	100	28.7	0.1	86	265	69	66
176	26.316	0.149	0.056	0.95	90	-5.47	100	27.8	-0.9	87	268	69	66
177	26.465	0.149	0.056	0.97	91	-5.47	100	25.9	-1.9	87	271	69	66
178	26.615	0.150	0.056	0.99	91	-5.47	101	26.7	0.8	87	274	69	66
179	26.764	0.149	0.056	0.98	91	-5.47	100	26.3	-0.4	88	277	69	66
180	26.914	0.150	0.056	0.94	91	-5.47	101	26.1	-0.2	88	279	69	66
181	27.064	0.150	0.056	0.97	91	-5.47	101	24.7	-1.4	88	281	69	66
182	27.213	0.149	0.056	0.93	91	-5.47	100	24.8	0.1	89	283	69	66
183	27.362	0.149	0.056	0.92	91	-5.47	100	23.7	-1.1	89	286	69	66
184	27.510	0.148	0.056	1.00	91	-5.47	100	23.8	0.1	89	288	69	66
185	27.659	0.149	0.056	0.94	91	-5.47	100	23.0	-0.8	89	289	70	66
186	27.808	0.149	0.056	0.93	91	-5.47	100	22.1	-0.9	89	291	70	66
187	27.957	0.149	0.056	0.89	91	-5.47	100	20.5	-1.6	90	293	70	67
188	28.107	0.150	0.056	0.92	91	-5.47	100	20.9	0.4	75	275	70	66
189	28.258	0.151	0.056	0.92	91	-5.47	100	20.9	0	73	257	70	66
190	28.408	0.150	0.056	1.08	91	-5.47	99	20.6	-0.3	72	244	70	66
191	28.557	0.149	0.056	0.95	91	-5.47	99	20.9	0.3	71	233	69	66

BOX A TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 4

Job #: 20-565
Tracking #: 69
Technician: AK
Date: 5/3/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
192	28.706	0.149	0.056	1.02	91	-5.47	99	20.4	-0.5	71	225	69	67
193	28.857	0.151	0.056	1.01	91	-5.47	100	19.9	-0.5	70	218	69	67
194	29.007	0.150	0.056	1.07	91	-5.47	99	19.9	0	70	212	69	66
195	29.157	0.150	0.056	0.93	91	-5.47	99	20.1	0.2	70	207	69	66
196	29.307	0.150	0.056	0.99	91	-5.47	99	19.8	-0.3	70	203	69	66
197	29.458	0.151	0.056	0.93	91	-5.47	100	19.9	0.1	70	198	69	66
198	29.607	0.149	0.056	0.96	91	-5.47	99	19.8	-0.1	70	195	69	66
199	29.756	0.149	0.056	0.90	91	-5.47	99	19.5	-0.3	70	191	69	67
200	29.906	0.150	0.056	0.93	91	-5.47	99	19.8	0.3	70	188	69	67
201	30.056	0.150	0.056	0.95	91	-5.47	99	20.0	0.2	70	185	69	67
202	30.206	0.150	0.056	1.05	91	-5.47	99	20.6	0.6	70	182	69	67
203	30.356	0.150	0.056	0.97	91	-5.47	99	19.4	-1.2	69	179	69	66
204	30.506	0.150	0.056	0.96	91	-5.47	99	19.8	0.4	69	177	69	66
205	30.655	0.149	0.056	1.02	91	-5.47	99	18.8	-1	69	174	69	66
206	30.804	0.149	0.056	0.89	91	-5.47	99	19.8	1	69	172	69	66
207	30.954	0.150	0.056	0.94	91	-5.47	99	18.8	-1	69	170	69	67
208	31.104	0.150	0.056	0.92	91	-5.47	99	20.1	1.3	69	168	69	66
209	31.254	0.150	0.056	0.99	91	-5.47	99	19.6	-0.5	69	166	69	66
210	31.405	0.151	0.056	0.86	91	-5.47	100	19.9	0.3	69	164	69	67
211	31.555	0.150	0.056	0.94	91	-5.47	99	19.8	-0.1	69	162	69	66
212	31.704	0.149	0.056	0.98	91	-5.47	99	20.0	0.2	69	160	69	67
213	31.853	0.149	0.056	0.87	91	-5.47	99	19.8	-0.2	69	158	68	66
214	32.004	0.151	0.056	0.93	91	-5.47	100	18.9	-0.9	69	157	68	66
215	32.154	0.150	0.056	0.99	91	-5.47	99	18.9	0	69	155	68	66
216	32.304	0.150	0.056	0.92	91	-5.47	99	18.7	-0.2	69	153	68	66
217	32.455	0.151	0.056	0.95	91	-5.47	100	19.8	1.1	69	152	68	66
218	32.606	0.151	0.056	0.98	91	-5.47	100	19.8	0	69	151	68	67
219	32.755	0.149	0.056	0.97	91	-5.47	99	19.8	0	69	149	68	66
220	32.905	0.150	0.056	0.99	91	-5.47	99	19.9	0.1	69	148	68	67
221	33.055	0.150	0.056	0.99	91	-5.47	99	20.1	0.2	69	146	68	66
222	33.205	0.150	0.056	0.91	91	-5.47	99	19.0	-1.1	69	145	68	66
223	33.356	0.151	0.056	1.00	91	-5.47	100	19.9	0.9	69	144	68	67

BOX A TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 4

Job #: 20-565
Tracking #: 69
Technician: AK
Date: 5/3/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
224	33.506	0.150	0.056	0.94	91	-5.47	99	19.5	-0.4	69	142	68	67
225	33.655	0.149	0.056	0.96	91	-5.47	99	18.9	-0.6	69	141	68	67
226	33.805	0.150	0.056	0.95	91	-5.47	99	20.0	1.1	69	140	68	67
227	33.955	0.150	0.056	0.92	91	-5.47	99	19.9	-0.1	69	139	68	67
228	34.105	0.150	0.056	0.80	91	-5.47	99	19.2	-0.7	69	138	68	67
229	34.255	0.150	0.056	0.96	91	-5.47	99	20.2	1	69	137	68	67
230	34.405	0.150	0.056	0.94	91	-5.47	99	20.3	0.1	69	136	68	67
231	34.556	0.151	0.056	0.96	91	-5.47	100	19.8	-0.5	69	135	68	66
232	34.705	0.149	0.056	1.04	91	-5.47	99	20.1	0.3	69	133	68	67
233	34.855	0.150	0.056	0.94	91	-5.47	99	19.6	-0.5	69	132	68	67
234	35.005	0.150	0.056	0.97	91	-5.47	99	19.8	0.2	69	132	68	67
235	35.155	0.150	0.056	0.96	91	-5.47	99	19.7	-0.1	69	131	68	67
236	35.306	0.151	0.056	0.92	91	-5.47	100	19.9	0.2	69	130	68	67
237	35.456	0.150	0.056	0.97	91	-5.47	99	20.3	0.4	69	129	68	66
238	35.607	0.151	0.056	0.98	91	-5.47	100	19.7	-0.6	69	128	68	67
239	35.756	0.149	0.056	0.93	91	-5.47	99	20.0	0.3	69	128	68	67
240	35.906	0.150	0.056	0.99	91	-5.47	99	19.6	-0.4	69	127	68	67
241	36.056	0.150	0.056	0.97	91	-5.47	99	19.1	-0.5	69	126	68	67
242	36.206	0.150	0.056	0.95	91	-5.47	99	19.9	0.8	69	125	68	67
243	36.357	0.151	0.056	1.02	91	-5.47	100	19.7	-0.2	69	124	68	67
244	36.507	0.150	0.056	0.93	91	-5.47	99	20.0	0.3	69	123	68	67
245	36.657	0.150	0.056	0.94	91	-5.47	99	19.9	-0.1	69	122	68	67
246	36.806	0.149	0.056	0.90	91	-5.47	99	19.7	-0.2	69	122	68	67
247	36.956	0.150	0.056	0.96	91	-5.47	99	20.0	0.3	69	121	68	67
248	37.106	0.150	0.056	0.92	91	-5.47	99	19.9	-0.1	69	120	68	67
249	37.256	0.150	0.056	0.91	91	-5.47	99	19.9	0	69	120	68	67
250	37.407	0.151	0.056	0.96	91	-5.47	100	20.0	0.1	69	119	68	67
251	37.558	0.151	0.056	0.93	91	-5.47	100	19.4	-0.6	69	119	68	67
252	37.708	0.150	0.056	0.98	91	-5.47	99	20.2	0.8	69	118	68	67
253	37.857	0.149	0.056	0.95	91	-5.47	99	20.1	-0.1	79	171	68	67
254	38.006	0.149	0.056	0.58	91	-5.47	100	18.9	-1.2	80	195	68	67
255	38.156	0.150	0.056	0.88	91	-5.47	100	19.2	0.3	81	206	68	67

BOX A TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 4

Job #: 20-565
Tracking #: 69
Technician: AK
Date: 5/3/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
256	38.306	0.150	0.056	1.10	91	-5.47	100	19.0	-0.2	82	214	68	67
257	38.457	0.151	0.056	0.96	91	-5.47	101	17.9	-1.1	83	221	68	67
258	38.606	0.149	0.056	0.97	91	-5.47	100	17.9	0	84	227	68	67
259	38.757	0.151	0.056	0.93	91	-5.47	101	17.8	-0.1	84	231	69	67
260	38.906	0.149	0.056	0.99	91	-5.47	100	17.1	-0.7	85	235	69	67
261	39.055	0.149	0.056	0.94	91	-5.47	100	16.9	-0.2	85	238	69	67
262	39.204	0.149	0.056	0.94	91	-5.47	100	17.0	0.1	85	241	69	67
263	39.354	0.150	0.056	0.95	91	-5.47	101	16.1	-0.9	86	245	69	67
264	39.504	0.150	0.056	0.92	91	-5.47	101	16.0	-0.1	86	248	69	67
265	39.653	0.149	0.056	1.00	91	-5.47	100	15.9	-0.1	86	251	69	67
266	39.803	0.150	0.056	0.98	91	-5.47	101	14.9	-1	87	254	69	67
267	39.952	0.149	0.056	0.94	91	-5.47	100	14.9	0	87	256	69	67
268	40.100	0.148	0.056	0.92	91	-5.47	100	14.9	0	87	258	69	67
269	40.249	0.149	0.056	0.96	91	-5.47	100	13.9	-1	87	261	69	67
270	40.399	0.150	0.056	0.91	91	-5.47	101	13.9	0	88	263	70	67
271	40.548	0.149	0.056	0.92	91	-5.47	100	13.0	-0.9	88	265	70	67
272	40.697	0.149	0.056	1.04	91	-5.47	100	13.0	0	88	266	70	67
273	40.847	0.150	0.056	0.95	91	-5.47	101	12.0	-1	88	268	70	67
274	40.997	0.150	0.056	0.97	91	-5.47	101	12.1	0.1	89	270	70	67
275	41.146	0.149	0.056	0.96	91	-5.47	100	11.0	-1.1	89	272	70	67
276	41.294	0.148	0.056	1.01	91	-5.47	100	11.0	0	89	274	70	67
277	41.443	0.149	0.056	0.92	91	-5.47	100	10.1	-0.9	89	276	70	67
278	41.592	0.149	0.056	0.95	91	-5.47	100	9.3	-0.8	89	277	70	67
279	41.738	0.146	0.056	0.95	91	-5.47	98	9.7	0.4	89	278	70	67
280	41.891	0.153	0.056	0.94	91	-5.47	103	9.0	-0.7	89	275	70	67
281	42.040	0.149	0.056	0.89	91	-5.47	100	8.0	-1	89	280	70	67
282	42.190	0.150	0.056	0.96	91	-5.47	100	9.4	1.4	74	261	70	67
283	42.340	0.150	0.056	0.94	91	-5.47	99	8.1	-1.3	72	246	70	67
284	42.490	0.150	0.056	0.97	91	-5.47	99	8.0	-0.1	72	235	70	67
285	42.638	0.148	0.056	1.03	91	-5.47	98	8.1	0.1	71	226	70	67
286	42.788	0.150	0.056	0.90	91	-5.47	99	8.0	-0.1	71	219	70	67
287	42.938	0.150	0.056	0.92	91	-5.47	99	8.0	0	71	213	70	67

BOX A TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 4

Job #: 20-565
Tracking #: 69
Technician: AK
Date: 5/3/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
288	43.088	0.150	0.056	1.02	91	-5.47	99	8.1	0.1	70	207	70	67
289	43.239	0.151	0.056	1.07	91	-5.47	100	8.2	0.1	70	202	70	67
290	43.388	0.149	0.056	0.93	91	-5.47	99	7.5	-0.7	70	198	70	67
291	43.538	0.150	0.056	0.86	91	-5.47	99	7.8	0.3	70	194	70	67
292	43.687	0.149	0.056	0.92	91	-5.47	99	8.2	0.4	70	191	70	67
293	43.836	0.149	0.056	0.94	91	-5.47	99	8.0	-0.2	70	188	70	67
294	43.986	0.150	0.056	1.26	91	-5.47	99	8.2	0.2	70	184	70	67
295	44.136	0.150	0.056	0.95	91	-5.47	99	8.3	0.1	70	181	69	67
296	44.286	0.150	0.056	0.96	91	-5.47	99	6.7	-1.6	70	179	69	67
297	44.436	0.150	0.056	0.94	91	-5.47	99	8.4	1.7	70	176	69	67
298	44.587	0.151	0.056	0.91	91	-5.47	100	7.7	-0.7	70	174	69	67
299	44.735	0.148	0.056	0.95	91	-5.47	98	8.2	0.5	70	172	69	67
300	44.884	0.149	0.056	0.94	91	-5.47	99	7.0	-1.2	70	169	69	67
301	45.034	0.150	0.056	0.95	91	-5.47	99	6.6	-0.4	70	167	69	67
302	45.183	0.149	0.056	0.96	91	-5.47	99	7.0	0.4	70	165	69	67
303	45.333	0.150	0.056	0.93	91	-5.47	99	8.0	1	70	163	69	67
304	45.484	0.151	0.056	0.99	91	-5.47	100	7.0	-1	70	162	69	67
305	45.634	0.150	0.056	0.98	91	-5.47	99	7.2	0.2	70	160	69	67
306	45.783	0.149	0.056	0.93	91	-5.47	99	7.1	-0.1	70	158	69	67
307	45.932	0.149	0.056	0.84	91	-5.47	99	7.7	0.6	70	156	69	67
308	46.082	0.150	0.056	0.92	91	-5.47	99	8.2	0.5	70	155	69	67
309	46.232	0.150	0.056	0.97	91	-5.47	99	8.0	-0.2	70	153	69	67
310	46.382	0.150	0.056	0.96	91	-5.47	99	7.1	-0.9	70	152	69	67
311	46.532	0.150	0.056	0.98	91	-5.47	99	7.1	0	70	150	69	67
312	46.682	0.150	0.056	1.00	91	-5.47	99	8.3	1.2	70	149	69	67
313	46.832	0.150	0.056	0.98	91	-5.47	99	6.9	-1.4	70	148	69	67
314	46.980	0.148	0.056	0.94	91	-5.47	98	7.2	0.3	70	146	69	67
315	47.131	0.151	0.056	0.80	91	-5.47	100	7.2	0	70	145	69	67
316	47.280	0.149	0.056	0.98	91	-5.47	99	8.3	1.1	70	144	69	67
317	47.430	0.150	0.056	0.91	91	-5.47	99	8.3	0	70	143	69	67
318	47.581	0.151	0.056	0.96	91	-5.47	100	7.1	-1.2	70	141	69	67
319	47.731	0.150	0.056	0.96	91	-5.47	99	7.9	0.8	70	140	69	67

BOX A TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 4

Job #: 20-565
Tracking #: 69
Technician: AK
Date: 5/3/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
320	47.882	0.151	0.056	0.91	91	-5.47	100	7.0	-0.9	70	139	69	67
321	48.030	0.148	0.056	1.09	91	-5.47	98	8.1	1.1	70	138	69	67
322	48.180	0.150	0.056	0.92	91	-5.47	99	8.0	-0.1	70	137	69	67
323	48.329	0.149	0.056	0.95	91	-5.47	99	7.1	-0.9	70	136	69	67
324	48.480	0.151	0.056	0.94	91	-5.47	100	7.0	-0.1	70	135	69	67
325	48.629	0.149	0.056	0.94	91	-5.47	99	8.0	1	70	134	69	67
326	48.780	0.151	0.056	0.90	91	-5.47	100	7.9	-0.1	70	132	68	67
327	48.930	0.150	0.056	1.00	91	-5.47	99	7.8	-0.1	70	132	68	67
328	49.079	0.149	0.056	0.89	91	-5.47	99	7.2	-0.6	70	131	68	67
329	49.229	0.150	0.056	0.96	91	-5.47	99	6.9	-0.3	70	130	69	67
330	49.379	0.150	0.056	0.96	91	-5.47	99	6.8	-0.1	70	130	69	67
331	49.529	0.150	0.056	0.96	91	-5.47	99	6.7	-0.1	70	129	68	67
332	49.678	0.149	0.056	0.95	91	-5.47	99	7.2	0.5	70	128	68	67
333	49.829	0.151	0.056	0.95	91	-5.47	100	8.5	1.3	70	127	68	67
334	49.979	0.150	0.056	0.93	91	-5.47	99	7.0	-1.5	70	126	68	67
335	50.128	0.149	0.056	0.98	91	-5.47	99	8.0	1	70	125	68	67
336	50.277	0.149	0.056	0.93	91	-5.47	99	7.9	-0.1	70	124	68	67
337	50.427	0.150	0.056	0.96	91	-5.47	99	8.0	0.1	70	124	68	67
338	50.576	0.149	0.056	1.01	91	-5.47	99	7.0	-1	70	123	68	67
339	50.726	0.150	0.056	0.97	91	-5.47	99	8.4	1.4	70	122	68	67
340	50.877	0.151	0.056	0.94	91	-5.47	100	8.3	-0.1	70	121	68	67
341	51.026	0.149	0.056	0.95	91	-5.47	99	8.0	-0.3	70	121	68	67
342	51.176	0.150	0.056	0.97	91	-5.47	99	8.3	0.3	70	120	68	67
343	51.325	0.149	0.056	0.94	91	-5.47	99	7.7	-0.6	78	156	69	67
344	51.474	0.149	0.056	0.97	91	-5.47	100	7.5	-0.2	80	192	69	67
345	51.624	0.150	0.056	0.97	91	-5.47	100	7.0	-0.5	82	205	69	67
346	51.775	0.151	0.056	0.98	91	-5.47	101	6.5	-0.5	83	213	69	67
347	51.923	0.148	0.056	0.91	91	-5.47	99	7.4	0.9	84	218	69	67
348	52.073	0.150	0.056	0.95	91	-5.47	101	7.0	-0.4	84	222	69	67
349	52.223	0.150	0.056	0.94	91	-5.47	101	6.0	-1	85	227	69	67
350	52.372	0.149	0.056	0.94	91	-5.47	100	5.6	-0.4	85	230	69	67
351	52.520	0.148	0.056	0.92	91	-5.47	99	5.9	0.3	86	233	69	67

BOX A TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 4

Job #: 20-565
Tracking #: 69
Technician: AK
Date: 5/3/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
352	52.670	0.150	0.056	0.94	91	-5.47	101	6.6	0.7	87	235	69	67
353	52.819	0.149	0.056	0.95	91	-5.47	100	5.0	-1.6	87	238	69	67
354	52.969	0.150	0.056	0.93	91	-5.47	101	4.9	-0.1	87	240	69	67
355	53.118	0.149	0.056	0.94	91	-5.47	100	5.0	0.1	87	242	70	67
356	53.268	0.150	0.056	0.94	91	-5.47	101	5.0	0	88	245	70	67
357	53.417	0.149	0.056	0.93	91	-5.47	100	5.2	0.2	88	246	70	68
358	53.566	0.149	0.056	0.94	91	-5.47	100	4.1	-1.1	88	247	70	67
359	53.715	0.149	0.056	0.97	91	-5.47	100	4.0	-0.1	88	248	70	67
360	53.864	0.149	0.056	0.93	91	-5.47	100	4.0	0	88	250	70	67
361	54.013	0.149	0.056	0.96	91	-5.47	100	3.4	-0.6	88	251	70	67
362	54.162	0.149	0.056	0.92	91	-5.47	100	3.0	-0.4	89	252	70	67
363	54.311	0.149	0.056	0.78	91	-5.47	100	3.0	0	89	253	70	67
364	54.461	0.150	0.056	0.88	91	-5.47	101	3.0	0	89	254	70	67
365	54.610	0.149	0.056	0.99	91	-5.47	100	2.9	-0.1	89	254	70	67
366	54.759	0.149	0.056	0.98	91	-5.47	100	3.3	0.4	89	255	70	67
367	54.908	0.149	0.056	1.01	91	-5.47	100	1.9	-1.4	89	255	70	67
368	55.056	0.148	0.056	0.92	91	-5.47	100	2.6	0.7	90	255	70	67
369	55.205	0.149	0.056	0.94	91	-5.47	100	2.3	-0.3	90	256	71	68
370	55.354	0.149	0.056	0.93	91	-5.47	100	2.3	0	90	256	71	67
371	55.504	0.150	0.056	0.94	91	-5.47	101	1.9	-0.4	90	256	71	67
372	55.653	0.149	0.056	0.94	91	-5.47	100	1.5	-0.4	90	256	71	67
373	55.802	0.149	0.056	0.93	91	-5.47	100	1.8	0.3	90	255	71	67
374	55.951	0.149	0.056	0.97	91	-5.47	100	2.0	0.2	90	255	71	67
375	56.100	0.149	0.056	0.94	91	-5.47	100	2.1	0.1	90	255	71	67
376	56.249	0.149	0.056	1.01	91	-5.47	100	1.9	-0.2	90	255	71	67
377	56.397	0.148	0.056	0.91	91	-5.47	100	0.6	-1.3	91	255	71	67
378	56.546	0.149	0.056	0.95	91	-5.47	100	1.0	0.4	90	255	71	67
379	56.695	0.149	0.056	0.92	91	-5.47	101	1.0	0	91	254	71	67
380	56.843	0.148	0.056	0.95	91	-5.47	100	1.0	0	91	254	71	68
381	56.993	0.150	0.056	1.00	91	-5.47	101	1.4	0.4	91	254	71	68
382	57.142	0.149	0.056	0.94	91	-5.47	101	0.4	-1	91	253	71	68
383	57.291	0.149	0.056	0.96	91	-5.47	101	1.7	1.3	91	253	71	67

BOX A TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 4

Job #: 20-565
Tracking #: 69
Technician: AK
Date: 5/3/2020

	Particulate Sampling Data							Fuel Weight (lb)		Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Dilution Tunnel dP (in H_2O)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
384	57.440	0.149	0.056	0.93	91	-5.47	100	0.1	-1.6	90	252	71	68
385	57.590	0.150	0.056	1.04	91	-5.47	101	0.2	0.1	91	252	71	68
386	57.738	0.148	0.056	0.95	91	-5.47	100	0.1	-0.1	90	252	71	68
387	57.887	0.149	0.056	0.94	91	-5.47	99	0.0	-0.1	77	244	71	68

BOX B TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 4

Job #: 20-565
Tracking #: 69
Technician: AK
Date: 5/3/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
0	0.000		0.00	79	-1		68	2.000	6.39	0.49
1	0.134	0.134	1.56	78	-0.96	88	68	2.220	12.15	0.34
2	0.290	0.156	1.68	78	-0.9	103	68	2.210	11.70	0.12
3	0.446	0.156	1.42	78	-0.99	103	69	2.180	12.25	0.08
4	0.602	0.156	0.82	78	-1.18	103	69	2.200	12.53	0.09
5	0.755	0.153	1.51	78	-0.96	101	69	2.200	12.69	0.12
6	0.909	0.154	1.51	78	-0.98	102	69	2.210	13.06	0.12
7	1.065	0.156	0.30	78	-1.32	103	69	2.200	13.65	0.14
8	1.220	0.155	0.33	78	-1.3	102	69	2.220	13.16	0.12
9	1.375	0.155	1.41	78	-0.99	102	69	2.200	12.64	0.13
10	1.532	0.157	1.60	78	-0.92	104	69	2.200	12.30	0.10
11	1.685	0.153	0.81	78	-1.16	101	69	2.200	11.80	0.08
12	1.839	0.154	1.59	78	-0.92	102	70	2.200	11.77	0.14
13	1.995	0.156	1.42	78	-0.98	103	70	2.200	11.92	0.09
14	2.152	0.157	1.37	78	-0.98	104	70	2.210	12.61	0.12
15	2.305	0.153	0.54	78	-1.22	101	70	2.200	11.92	0.14
16	2.460	0.155	1.64	78	-0.91	101	70	2.220	8.48	0.12
17	2.614	0.154	0.69	78	-1.2	100	69	2.220	2.15	0.08
18	2.768	0.154	1.02	78	-1.09	100	69	2.220	1.28	0.11
19	2.922	0.154	1.26	78	-1.09	100	69	2.220	0.81	0.11
20	3.074	0.152	0.44	78	-1.31	98	69	2.220	0.74	0.07
21	3.227	0.153	1.34	79	-1	99	69	2.220	0.64	0.14
22	3.382	0.155	1.43	79	-0.97	100	69	2.220	0.57	0.13
23	3.536	0.154	0.78	79	-1.17	100	69	2.220	0.52	0.18
24	3.692	0.156	1.52	79	-0.95	101	69	2.220	0.56	0.18
25	3.844	0.152	0.91	79	-1.13	98	69	2.220	0.50	0.12
26	3.997	0.153	1.41	79	-0.98	99	69	2.220	0.19	0.07
27	4.150	0.153	0.65	79	-1.2	99	69	2.250	0.16	0.05
28	4.303	0.153	1.01	80	-1.09	99	69	2.220	0.14	0.07
29	4.458	0.155	1.78	80	-0.91	100	69	2.220	0.09	0.02
30	4.613	0.155	0.73	80	-1.18	100	69	2.230	0.16	0.10
31	4.766	0.153	0.98	80	-1.12	99	69	2.220	0.07	0.03

BOX B TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 4

Job #: 20-565
Tracking #: 69
Technician: AK
Date: 5/3/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
32	4.917	0.151	1.53	80	-0.94	97	69	2.260	0.09	0.05
33	5.070	0.153	1.59	81	-0.92	98	68	2.230	0.06	0.03
34	5.224	0.154	1.52	81	-0.94	99	68	2.230	0.28	0.08
35	5.377	0.153	1.52	81	-0.93	98	68	2.230	0.03	0.07
36	5.529	0.152	1.60	81	-0.92	98	68	2.230	0.03	0.05
37	5.683	0.154	0.64	81	-1.21	99	68	2.230	(0.01)	0.08
38	5.835	0.152	0.36	81	-1.28	98	68	2.230	0.15	0.15
39	5.990	0.155	1.57	82	-0.92	100	68	2.230	0.15	(0.01)
40	6.142	0.152	1.42	82	-0.97	98	68	2.230	0.11	0.04
41	6.297	0.155	1.62	82	-0.9	100	68	2.270	0.10	0.05
42	6.451	0.154	1.02	82	-1.1	99	68	2.230	0.08	0.08
43	6.604	0.153	1.30	82	-1.02	98	68	2.230	0.06	0.03
44	6.759	0.155	1.48	82	-0.96	100	68	2.230	0.14	0.04
45	6.910	0.151	1.25	83	-1.02	97	68	2.230	0.11	0.05
46	7.062	0.152	1.40	83	-0.98	97	68	2.230	(0.01)	(0.02)
47	7.215	0.153	0.61	83	-1.22	98	68	2.230	0.20	0.05
48	7.366	0.151	1.55	83	-0.93	97	68	2.230	0.08	0.05
49	7.519	0.153	1.61	83	-0.91	98	68	2.230	0.08	0.06
50	7.673	0.154	1.06	83	-0.98	99	68	2.230	0.06	0.06
51	7.828	0.155	0.33	84	-1.3	99	68	2.230	0.03	0.06
52	7.980	0.152	0.73	84	-1.18	97	68	2.230	0.03	0.04
53	8.135	0.155	0.75	84	-1.18	99	68	2.220	0.05	0.05
54	8.288	0.153	0.52	84	-1.29	98	68	2.230	0.01	0.03
55	8.441	0.153	1.56	84	-0.92	98	68	2.230	0.11	0.05
56	8.592	0.151	0.51	84	-1.24	97	68	2.230	0.09	0.03
57	8.745	0.153	0.31	85	-1.3	98	68	2.230	0.01	0.04
58	8.897	0.152	1.24	85	-1.04	97	68	2.230	0.01	0.02
59	9.052	0.155	1.37	85	-0.98	99	68	2.230	0.07	0.04
60	9.205	0.153	1.37	85	-0.93	98	68	2.230	(0.18)	0.00
61	9.360	0.155	1.40	85	-0.98	99	68	2.230	0.03	0.05
62	9.513	0.153	1.63	85	-0.91	98	68	2.230	0.01	0.12
63	9.665	0.152	0.29	85	-1.32	97	68	2.230	0.09	0.08

BOX B TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 4

Job #: 20-565
Tracking #: 69
Technician: AK
Date: 5/3/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
64	9.819	0.154	1.64	86	-0.9	98	68	2.230	0.09	0.04
65	9.971	0.152	1.35	86	-0.91	97	68	2.230	(0.06)	0.00
66	10.125	0.154	0.52	86	-1.24	98	68	2.230	0.03	0.06
67	10.279	0.154	1.28	86	-1.03	98	68	2.230	0.01	0.04
68	10.432	0.153	0.85	86	-1.15	98	68	2.240	0.03	0.00
69	10.585	0.153	0.75	86	-1.22	98	68	2.230	0.06	0.06
70	10.738	0.153	0.39	86	-1.28	98	68	2.230	0.07	0.03
71	10.891	0.153	0.34	86	-1.29	98	68	2.230	0.01	0.05
72	11.045	0.154	0.45	86	-1.23	99	68	2.210	0.50	4.38
73	11.198	0.153	1.61	87	-0.9	98	68	2.210	3.44	0.45
74	11.351	0.153	1.58	87	-0.91	99	68	2.210	7.83	0.03
75	11.503	0.152	1.50	87	-0.95	98	68	2.210	10.47	0.16
76	11.655	0.152	0.29	87	-1.31	98	68	2.210	11.50	0.01
77	11.807	0.152	1.52	87	-0.92	98	68	2.220	11.90	0.08
78	11.961	0.154	1.30	87	-1.01	99	69	2.210	12.39	0.04
79	12.112	0.151	0.32	87	-1.3	98	69	2.210	13.20	0.10
80	12.265	0.153	0.87	87	-1.15	99	69	2.210	12.87	0.09
81	12.418	0.153	1.49	87	-0.95	99	69	2.210	12.42	0.12
82	12.570	0.152	1.60	88	-0.91	98	69	2.210	12.36	0.07
83	12.723	0.153	0.89	88	-1.13	99	69	2.210	12.22	0.09
84	12.876	0.153	1.41	88	-0.97	99	69	2.200	11.99	0.09
85	13.029	0.153	0.89	88	-1.14	99	69	2.210	11.90	0.06
86	13.183	0.154	0.88	88	-1.14	100	69	2.220	11.99	0.06
87	13.337	0.154	1.39	88	-1.04	100	70	2.210	11.97	0.08
88	13.489	0.152	2.24	88	-0.9	98	70	2.210	12.04	0.05
89	13.642	0.153	1.29	88	-1.01	99	70	2.220	12.10	0.06
90	13.795	0.153	1.06	88	-1.04	99	70	2.190	12.07	0.09
91	13.947	0.152	1.54	88	-0.92	98	70	2.210	11.97	0.12
92	14.098	0.151	1.38	88	-0.98	98	70	2.210	11.95	0.15
93	14.252	0.154	0.62	88	-1.22	100	70	2.210	12.05	0.02
94	14.404	0.152	1.28	89	-1.01	98	70	2.210	12.55	0.10
95	14.557	0.153	1.79	89	-0.9	99	70	2.210	12.85	0.08

BOX B TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 4

Job #: 20-565
Tracking #: 69
Technician: AK
Date: 5/3/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
96	14.707	0.150	1.12	89	-1.08	97	71	2.210	13.21	0.13
97	14.862	0.155	1.65	89	-0.92	100	71	2.210	13.44	0.11
98	15.013	0.151	0.67	89	-1.19	98	71	2.210	13.67	0.12
99	15.166	0.153	0.31	89	-1.3	99	71	2.210	13.74	0.08
100	15.319	0.153	1.33	89	-1	98	70	2.220	9.54	0.48
101	15.472	0.153	0.30	89	-1.31	97	70	2.230	2.93	0.33
102	15.628	0.156	1.56	89	-0.91	99	70	2.220	1.99	0.39
103	15.781	0.153	1.64	89	-0.93	97	70	2.220	1.01	0.25
104	15.933	0.152	1.09	89	-1.07	97	70	2.220	0.78	0.22
105	16.088	0.155	0.64	89	-1.21	98	70	2.220	0.71	0.21
106	16.242	0.154	1.39	89	-0.98	98	70	2.200	0.53	(0.01)
107	16.395	0.153	1.48	89	-0.95	97	70	2.220	0.55	0.22
108	16.549	0.154	1.63	89	-0.9	98	70	2.220	0.41	0.12
109	16.703	0.154	1.62	90	-0.9	98	70	2.220	0.60	0.18
110	16.856	0.153	1.31	90	-0.99	97	70	2.220	0.46	0.21
111	17.007	0.151	0.38	90	-1.28	96	70	2.220	0.47	0.16
112	17.159	0.152	1.30	90	-1.01	96	70	2.230	0.35	0.15
113	17.313	0.154	1.02	90	-0.92	98	70	2.230	0.43	0.13
114	17.468	0.155	0.84	90	-1.12	98	70	2.230	0.35	0.12
115	17.623	0.155	1.68	90	-0.9	98	70	2.220	0.24	0.11
116	17.776	0.153	1.45	90	-0.97	97	70	2.220	0.38	0.13
117	17.930	0.154	1.28	90	-1.03	98	70	2.230	0.24	0.13
118	18.084	0.154	0.27	90	-1.31	98	69	2.230	0.26	0.31
119	18.236	0.152	1.30	90	-1	96	69	2.230	0.31	0.16
120	18.389	0.153	0.74	90	-1.2	97	69	2.230	0.33	0.14
121	18.549	0.160	0.79	90	-1.18	101	69	2.210	0.35	0.12
122	18.706	0.157	0.77	90	-1.19	100	69	2.220	0.28	0.12
123	18.862	0.156	1.51	90	-0.96	99	69	2.230	0.29	0.13
124	19.018	0.156	0.31	90	-1.31	99	69	2.230	0.26	0.11
125	19.177	0.159	1.80	90	-0.92	101	69	2.230	0.26	0.15
126	19.335	0.158	0.72	90	-1.2	100	69	2.220	0.23	0.09
127	19.491	0.156	0.51	90	-1.26	99	69	2.230	0.26	0.05

BOX B TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 4

Job #: 20-565
Tracking #: 69
Technician: AK
Date: 5/3/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
128	19.648	0.157	1.56	90	-0.95	100	69	2.230	0.24	0.05
129	19.808	0.160	1.02	90	-1.13	101	69	2.230	0.17	0.07
130	19.965	0.157	1.66	90	-0.91	100	69	2.230	0.10	0.08
131	20.122	0.157	0.68	90	-1.27	100	69	2.210	0.15	0.07
132	20.281	0.159	0.37	91	-1.31	101	69	2.230	0.10	0.08
133	20.439	0.158	1.68	91	-0.91	100	69	2.230	0.13	0.11
134	20.595	0.156	0.93	91	-1.15	99	69	2.230	0.14	0.04
135	20.754	0.159	0.56	91	-1.25	101	69	2.230	0.19	0.09
136	20.913	0.159	1.57	91	-0.94	101	69	2.230	0.18	0.11
137	21.067	0.154	0.60	91	-1.23	97	69	2.230	0.22	0.13
138	21.226	0.159	0.50	91	-1.26	101	69	2.230	0.02	0.07
139	21.385	0.159	0.86	91	-1.16	101	69	2.230	0.09	0.08
140	21.543	0.158	1.29	91	-0.96	100	69	2.240	0.10	0.09
141	21.701	0.158	1.34	91	-0.99	100	69	2.230	0.26	0.13
142	21.861	0.160	0.78	91	-1.18	101	69	2.230	0.08	0.10
143	22.019	0.158	1.24	91	-1.12	100	69	2.230	0.06	0.12
144	22.177	0.158	0.42	91	-1.3	100	69	2.240	0.09	0.06
145	22.336	0.159	0.95	91	-1.14	101	69	2.230	0.16	0.09
146	22.494	0.158	0.40	91	-1.3	100	69	2.230	0.05	0.07
147	22.650	0.156	0.75	91	-1.2	99	69	2.230	0.11	0.05
148	22.807	0.157	1.68	91	-0.92	99	69	2.240	0.13	0.00
149	22.968	0.161	1.50	91	-0.97	102	69	2.230	0.07	0.07
150	23.126	0.158	0.81	91	-1.29	100	69	2.240	0.23	0.05
151	23.284	0.158	0.38	91	-1.3	100	69	2.230	0.15	0.09
152	23.443	0.159	1.50	91	-0.97	101	69	2.230	0.06	0.04
153	23.602	0.159	1.70	91	-0.9	101	69	2.230	(0.03)	0.02
154	23.760	0.158	0.87	91	-1.17	100	69	2.240	0.16	0.14
155	23.917	0.157	1.44	91	-0.98	99	69	2.230	(0.22)	0.02
156	24.077	0.160	1.69	91	-0.9	101	69	2.230	0.08	0.04
157	24.234	0.157	1.60	91	-0.92	99	69	2.240	0.15	0.09
158	24.391	0.157	1.64	91	-0.92	99	69	2.180	0.07	0.08
159	24.551	0.160	0.76	91	-1.19	101	69	2.220	0.14	0.05

BOX B TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 4

Job #: 20-565
Tracking #: 69
Technician: AK
Date: 5/3/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
160	24.707	0.156	1.72	91	-0.9	99	69	2.230	0.15	0.13
161	24.864	0.157	0.53	91	-1.25	99	69	2.240	0.26	0.06
162	25.024	0.160	0.37	91	-1.3	101	69	2.240	0.01	0.02
163	25.180	0.156	0.01	91	-1.28	100	69	2.210	6.07	2.00
164	25.337	0.157	0.51	91	-1.26	100	69	2.210	5.01	0.75
165	25.495	0.158	0.34	91	-1.31	101	69	2.210	7.96	0.10
166	25.654	0.159	0.45	92	-1.29	102	69	2.220	9.95	0.11
167	25.814	0.160	1.47	92	-0.97	102	69	2.220	11.88	0.15
168	25.972	0.158	0.40	92	-1.29	101	69	2.210	13.08	0.18
169	26.128	0.156	0.54	92	-1.25	100	70	2.210	13.39	0.28
170	26.286	0.158	0.80	92	-1.18	101	70	2.210	13.46	0.43
171	26.441	0.155	1.18	92	-1.06	99	70	2.210	13.62	0.53
172	26.598	0.157	1.66	92	-0.91	101	70	2.210	13.77	0.53
173	26.758	0.160	0.61	92	-1.24	103	70	2.210	13.77	0.24
174	26.915	0.157	1.02	92	-1.16	101	70	2.210	13.85	0.32
175	27.072	0.157	0.82	92	-1.18	101	70	2.210	13.93	0.36
176	27.230	0.158	0.31	92	-1.32	101	70	2.210	13.87	0.21
177	27.388	0.158	1.54	92	-0.95	101	70	2.210	13.43	0.12
178	27.545	0.157	1.45	92	-0.91	101	70	2.210	12.88	0.08
179	27.701	0.156	1.26	92	-1.06	100	71	2.220	12.96	0.08
180	27.858	0.157	1.48	92	-0.96	101	71	2.210	12.97	0.11
181	28.016	0.158	0.71	92	-1.27	102	71	2.210	12.96	0.11
182	28.173	0.157	0.34	92	-1.31	101	71	2.230	13.08	0.10
183	28.331	0.158	1.62	92	-0.92	102	71	2.210	12.89	0.10
184	28.489	0.158	0.32	92	-1.32	102	71	2.210	12.88	0.14
185	28.646	0.157	1.64	92	-0.92	101	71	2.210	13.07	0.13
186	28.801	0.155	0.79	92	-1.02	100	71	2.210	13.11	0.11
187	28.957	0.156	0.76	92	-1.23	100	71	2.190	12.91	0.10
188	29.116	0.159	1.57	92	-0.93	101	71	2.220	11.71	0.12
189	29.272	0.156	1.37	92	-0.97	99	71	2.220	3.49	0.08
190	29.430	0.158	1.57	92	-0.95	100	71	2.210	1.92	0.13
191	29.590	0.160	0.41	92	-1.29	101	71	2.220	1.44	0.23

BOX B TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 4

Job #: 20-565
Tracking #: 69
Technician: AK
Date: 5/3/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
192	29.747	0.157	0.36	92	-1.31	99	71	2.220	1.48	0.28
193	29.904	0.157	1.51	92	-0.95	99	71	2.220	1.61	0.36
194	30.061	0.157	1.37	92	-1.02	99	71	2.220	1.46	0.37
195	30.218	0.157	0.40	92	-1.29	99	71	2.230	1.55	0.46
196	30.375	0.157	0.62	92	-1.31	99	71	2.230	1.40	0.50
197	30.532	0.157	1.45	92	-0.97	99	71	2.220	1.46	0.49
198	30.689	0.157	1.31	92	-1.04	99	71	2.230	1.15	0.39
199	30.846	0.157	0.49	92	-1.31	99	70	2.220	1.37	0.45
200	31.004	0.158	0.42	92	-1.29	100	70	2.230	1.29	0.44
201	31.162	0.158	0.94	92	-1.14	100	70	2.230	1.16	0.39
202	31.321	0.159	1.41	92	-0.99	101	70	2.230	1.02	0.30
203	31.478	0.157	0.81	92	-1.18	99	70	2.230	1.00	0.31
204	31.637	0.159	0.62	92	-1.24	100	70	2.230	0.79	0.27
205	31.798	0.161	1.64	92	-0.92	102	70	2.230	0.70	0.25
206	31.952	0.154	1.64	92	-0.91	97	70	2.230	0.70	0.31
207	32.112	0.160	0.33	92	-1.31	101	70	2.230	0.68	0.25
208	32.271	0.159	1.45	92	-0.97	100	70	2.230	0.56	0.24
209	32.427	0.156	1.61	92	-0.92	99	70	2.230	0.49	0.19
210	32.585	0.158	0.51	92	-1.27	100	70	2.230	0.59	0.22
211	32.743	0.158	0.54	92	-1.26	100	70	2.230	0.56	0.21
212	32.901	0.158	0.40	92	-1.3	100	70	2.230	0.41	0.18
213	33.061	0.160	1.44	92	-0.99	101	70	2.230	0.46	0.19
214	33.222	0.161	0.53	92	-1.26	102	70	2.230	0.49	0.17
215	33.383	0.161	1.48	92	-0.97	102	70	2.230	0.42	0.11
216	33.541	0.158	0.72	92	-1.2	100	70	2.230	0.56	0.20
217	33.699	0.158	1.45	92	-0.98	100	70	2.230	0.37	0.15
218	33.858	0.159	1.62	92	-0.92	100	70	2.230	0.33	0.13
219	34.016	0.158	0.52	92	-1.26	100	70	2.230	0.42	0.12
220	34.177	0.161	0.38	92	-1.3	102	70	2.230	0.41	0.17
221	34.336	0.159	1.66	92	-0.91	100	69	2.230	0.31	0.13
222	34.493	0.157	1.69	92	-0.9	99	69	2.210	0.39	0.14
223	34.654	0.161	1.63	92	-0.91	102	69	2.230	0.50	0.17

BOX B TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 4

Job #: 20-565
Tracking #: 69
Technician: AK
Date: 5/3/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
224	34.812	0.158	0.49	92	-1.26	100	69	2.240	0.31	0.15
225	34.971	0.159	0.71	92	-1.19	100	69	2.230	0.45	0.17
226	35.128	0.157	0.74	92	-1.2	99	69	2.240	0.52	0.18
227	35.285	0.157	1.16	92	-1.08	99	69	2.240	0.48	0.16
228	35.444	0.159	1.52	92	-0.96	100	69	2.240	0.43	0.13
229	35.600	0.156	1.41	92	-0.99	99	69	2.230	0.57	0.23
230	35.758	0.158	0.71	92	-1.2	100	69	2.250	0.39	0.15
231	35.917	0.159	1.36	92	-1	100	69	2.230	0.29	0.08
232	36.073	0.156	1.71	92	-0.9	99	69	2.260	0.40	0.11
233	36.234	0.161	1.56	92	-0.94	102	69	2.230	0.30	0.15
234	36.393	0.159	0.85	92	-1.26	100	69	2.230	0.41	0.15
235	36.551	0.158	1.53	92	-0.94	100	69	2.240	0.43	0.15
236	36.711	0.160	1.63	92	-0.91	101	69	2.230	0.47	0.17
237	36.869	0.158	0.80	92	-1.18	100	69	2.230	0.28	0.12
238	37.028	0.159	0.86	92	-1.17	100	69	2.230	0.36	0.12
239	37.184	0.156	0.40	92	-1.29	99	69	2.230	0.47	0.13
240	37.343	0.159	1.50	92	-0.9	100	69	2.230	0.43	0.12
241	37.501	0.158	0.42	92	-1.3	100	69	2.270	0.44	0.13
242	37.658	0.157	1.66	92	-0.91	99	69	2.230	0.42	0.17
243	37.818	0.160	0.51	92	-1.24	101	69	2.230	0.40	0.19
244	37.977	0.159	1.49	92	-0.98	100	69	2.230	0.36	0.05
245	38.133	0.156	1.74	92	-0.97	99	69	2.240	0.38	0.18
246	38.292	0.159	1.66	92	-0.91	100	69	2.240	0.32	0.11
247	38.452	0.160	0.15	92	-1.26	101	69	2.230	0.36	0.12
248	38.612	0.160	0.37	92	-1.29	101	69	2.230	0.32	0.09
249	38.770	0.158	0.55	92	-1.3	100	69	2.220	0.32	0.11
250	38.930	0.160	1.37	92	-1.01	101	69	2.230	0.33	0.07
251	39.089	0.159	1.19	92	-1.07	100	69	2.230	0.27	0.15
252	39.247	0.158	1.37	92	-1.01	100	69	2.230	0.39	0.08
253	39.407	0.160	1.64	92	-0.91	102	70	2.220	6.39	1.47
254	39.566	0.159	1.43	92	-0.98	101	69	2.160	3.88	0.72
255	39.720	0.154	0.82	92	-1.17	98	69	2.220	6.71	0.54

BOX B TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 4

Job #: 20-565
Tracking #: 69
Technician: AK
Date: 5/3/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
256	39.879	0.159	1.56	92	-0.98	102	70	2.210	7.69	0.34
257	40.037	0.158	1.65	92	-0.91	101	70	2.210	7.65	0.53
258	40.194	0.157	1.62	92	-0.92	101	70	2.220	8.16	0.34
259	40.351	0.157	0.55	92	-1.24	101	70	2.220	8.58	0.37
260	40.511	0.160	0.33	92	-1.3	103	70	2.220	8.47	0.35
261	40.669	0.158	1.68	92	-0.9	101	70	2.220	9.03	0.24
262	40.827	0.158	0.73	92	-1.2	101	70	2.220	9.30	0.19
263	40.985	0.158	1.44	92	-0.98	101	70	2.220	9.51	0.18
264	41.144	0.159	1.30	92	-1.03	102	71	2.210	9.66	0.16
265	41.299	0.155	1.42	92	-0.99	99	71	2.210	9.82	0.21
266	41.457	0.158	0.36	92	-1.3	101	71	2.210	9.90	0.18
267	41.616	0.159	0.36	92	-1.31	102	71	2.210	9.91	0.13
268	41.774	0.158	1.63	92	-0.92	101	71	2.220	9.87	0.14
269	41.929	0.155	1.64	92	-0.91	100	71	2.220	10.02	0.17
270	42.088	0.159	0.41	92	-1.29	102	71	2.210	10.58	0.18
271	42.246	0.158	1.69	92	-0.9	102	71	2.210	10.86	0.12
272	42.404	0.158	0.48	92	-1.28	102	71	2.210	10.92	0.07
273	42.562	0.158	1.02	92	-1.12	102	71	2.210	11.08	0.11
274	42.720	0.158	0.86	92	-1.16	102	72	2.230	10.97	0.15
275	42.877	0.157	0.61	92	-1.21	101	72	2.210	10.91	0.15
276	43.035	0.158	1.65	92	-0.91	102	72	2.210	10.97	0.19
277	43.195	0.160	1.44	92	-0.98	103	72	2.200	11.45	0.18
278	43.352	0.157	0.73	92	-1.21	101	72	2.210	11.39	0.14
279	43.507	0.155	1.42	92	-0.99	100	72	2.210	11.75	0.15
280	43.667	0.160	0.83	92	-1.17	103	72	2.210	11.23	0.21
281	43.825	0.158	0.45	92	-1.26	102	72	2.210	10.71	0.17
282	43.983	0.158	1.08	92	-1.09	100	72	2.220	6.86	0.05
283	44.140	0.157	0.35	92	-1.31	99	72	2.230	2.30	0.05
284	44.299	0.159	1.44	92	-0.98	101	72	2.230	1.52	0.11
285	44.459	0.160	1.01	92	-1.11	101	71	2.220	1.22	0.16
286	44.618	0.159	1.19	92	-1.07	101	71	2.220	1.07	0.21
287	44.777	0.159	1.62	92	-0.91	101	71	2.230	1.12	0.25

BOX B TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 4

Job #: 20-565
Tracking #: 69
Technician: AK
Date: 5/3/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
288	44.935	0.158	1.62	92	-0.92	100	71	2.230	1.03	0.24
289	45.094	0.159	1.46	92	-0.97	101	71	2.220	1.14	0.32
290	45.253	0.159	1.46	92	-0.97	101	71	2.210	1.08	0.39
291	45.411	0.158	1.62	92	-0.92	100	71	2.230	1.27	0.39
292	45.570	0.159	1.61	92	-0.93	101	71	2.230	0.98	0.37
293	45.727	0.157	0.34	92	-1.31	99	71	2.240	0.93	0.35
294	45.886	0.159	1.64	92	-0.91	101	71	2.230	0.81	0.31
295	46.044	0.158	1.39	92	-1.01	100	71	2.230	0.83	0.23
296	46.199	0.155	1.62	92	-0.92	98	71	2.230	0.76	0.32
297	46.360	0.161	0.52	92	-1.3	102	71	2.230	0.76	0.26
298	46.519	0.159	1.46	92	-0.98	101	71	2.230	0.65	0.25
299	46.677	0.158	0.96	92	-1.14	100	71	2.230	0.58	0.19
300	46.835	0.158	0.78	92	-1.18	100	71	2.200	0.69	0.28
301	46.995	0.160	1.33	92	-1.02	101	71	2.240	0.73	0.27
302	47.153	0.158	1.44	92	-0.92	100	71	2.230	0.75	0.27
303	47.310	0.157	1.38	92	-1.01	99	70	2.230	0.83	0.24
304	47.469	0.159	1.26	92	-1.04	101	70	2.230	0.62	0.25
305	47.629	0.160	0.44	92	-1.28	101	70	2.230	0.64	0.24
306	47.786	0.157	0.79	92	-1.18	99	70	2.210	0.58	0.23
307	47.942	0.156	0.37	92	-1.3	99	70	2.230	0.42	0.20
308	48.101	0.159	0.43	92	-1.29	101	70	2.230	0.54	0.22
309	48.259	0.158	1.69	92	-0.9	100	70	2.230	0.43	0.16
310	48.419	0.160	0.71	92	-1.21	101	70	2.230	0.58	0.19
311	48.580	0.161	1.55	92	-0.99	102	70	2.230	0.51	0.18
312	48.739	0.159	1.46	92	-0.98	101	70	2.230	0.34	0.15
313	48.896	0.157	0.37	92	-1.3	99	70	2.230	0.44	0.17
314	49.055	0.159	0.74	92	-1.2	101	70	2.230	0.41	0.14
315	49.213	0.158	0.73	92	-1.2	100	70	2.240	0.45	0.18
316	49.369	0.156	1.35	92	-1.02	99	70	2.230	0.44	0.16
317	49.528	0.159	1.67	92	-0.91	101	70	2.230	0.62	0.17
318	49.685	0.157	1.17	92	-1.08	99	70	2.230	0.51	0.21
319	49.842	0.157	1.43	92	-0.99	99	70	2.230	0.39	0.17

BOX B TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 4

Job #: 20-565
Tracking #: 69
Technician: AK
Date: 5/3/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
320	50.001	0.159	0.32	92	-1.32	101	70	2.260	0.43	0.16
321	50.160	0.159	0.29	92	-1.3	101	70	2.230	0.36	0.20
322	50.317	0.157	0.61	92	-1.19	99	70	2.230	0.37	0.12
323	50.475	0.158	1.17	92	-1.07	100	70	2.230	0.33	0.16
324	50.635	0.160	1.64	92	-0.92	101	70	2.230	0.20	0.13
325	50.792	0.157	0.40	92	-1.31	99	70	2.230	0.41	0.23
326	50.949	0.157	0.67	92	-1.2	99	70	2.230	0.36	0.13
327	51.106	0.157	1.43	92	-0.99	99	70	2.230	0.37	0.18
328	51.267	0.161	0.33	92	-1.32	102	70	2.230	0.36	0.15
329	51.424	0.157	0.33	92	-1.32	99	70	2.230	0.34	0.11
330	51.582	0.158	1.50	92	-0.95	100	70	2.230	0.33	0.15
331	51.743	0.161	0.63	92	-1.23	102	70	2.230	0.18	0.17
332	51.899	0.156	1.80	92	-0.9	99	70	2.230	0.34	0.15
333	52.058	0.159	1.12	92	-1.08	101	70	2.230	0.28	0.12
334	52.216	0.158	1.30	92	-1.09	100	70	2.240	0.33	0.16
335	52.374	0.158	1.59	92	-0.93	100	70	2.230	0.32	0.11
336	52.533	0.159	1.62	92	-0.92	101	70	2.230	0.22	0.10
337	52.695	0.162	1.54	92	-0.95	102	70	2.240	0.29	0.14
338	52.854	0.159	0.77	92	-1.19	101	70	2.240	0.30	0.09
339	53.011	0.157	0.35	92	-1.31	99	70	2.290	0.31	0.12
340	53.171	0.160	1.64	92	-0.92	101	70	2.240	0.18	0.09
341	53.331	0.160	1.60	92	-0.94	101	70	2.240	0.32	0.12
342	53.487	0.156	1.61	92	-0.93	99	70	2.240	0.32	0.11
343	53.647	0.160	1.40	92	-1	102	70	2.220	6.55	2.11
344	53.807	0.160	0.90	92	-1.15	102	70	2.210	3.66	0.88
345	53.965	0.158	1.43	92	-0.98	101	70	2.230	5.54	0.81
346	54.124	0.159	1.24	92	-1.04	102	70	2.220	5.91	0.81
347	54.284	0.160	0.20	92	-1.31	102	70	2.220	5.82	0.76
348	54.442	0.158	0.45	92	-1.21	101	70	2.250	6.03	0.84
349	54.601	0.159	0.68	92	-1.21	102	70	2.210	6.38	0.85
350	54.762	0.161	0.77	92	-1.15	103	71	2.210	6.32	0.81
351	54.918	0.156	0.68	92	-1.21	100	71	2.210	6.27	0.78

BOX B TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 4

Job #: 20-565
Tracking #: 69
Technician: AK
Date: 5/3/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
352	55.076	0.158	1.32	92	-0.98	101	71	2.220	6.29	0.76
353	55.237	0.161	1.12	92	-1.13	103	71	2.220	6.26	0.79
354	55.397	0.160	1.63	92	-0.92	103	71	2.220	6.50	0.78
355	55.555	0.158	1.64	92	-0.92	101	71	2.210	6.33	0.74
356	55.713	0.158	1.46	92	-0.97	102	71	2.220	6.52	0.81
357	55.876	0.163	1.52	92	-0.91	105	71	2.210	6.59	0.81
358	56.033	0.157	0.96	92	-1.14	101	71	2.210	6.57	0.74
359	56.191	0.158	0.40	92	-1.29	102	72	2.210	7.00	0.67
360	56.350	0.159	1.42	92	-0.98	102	72	2.210	6.62	0.69
361	56.510	0.160	1.26	92	-1.01	103	72	2.210	6.33	0.68
362	56.667	0.157	1.39	92	-1	101	72	2.210	5.95	0.66
363	56.824	0.157	0.23	92	-1.25	101	72	2.210	5.65	0.65
364	56.983	0.159	0.62	92	-1.25	102	72	2.210	5.44	0.67
365	57.140	0.157	1.64	92	-0.92	101	72	2.210	5.19	0.66
366	57.295	0.155	1.33	92	-1.02	100	72	2.250	4.93	0.67
367	57.453	0.158	1.66	92	-0.91	102	72	2.210	4.71	0.68
368	57.612	0.159	1.64	92	-0.92	102	72	2.210	4.69	0.80
369	57.769	0.157	1.31	92	-1.02	101	72	2.210	4.54	0.86
370	57.926	0.157	0.32	92	-1.32	101	72	2.220	4.29	0.81
371	58.086	0.160	1.67	92	-0.91	103	73	2.230	4.25	0.83
372	58.245	0.159	1.68	92	-0.9	102	73	2.210	4.12	0.83
373	58.402	0.157	1.57	92	-0.96	101	73	2.210	4.02	0.85
374	58.561	0.159	0.66	92	-1.25	102	73	2.210	3.93	0.80
375	58.720	0.159	1.55	92	-0.94	102	73	2.170	3.84	0.88
376	58.878	0.158	1.62	92	-0.93	102	73	2.210	3.79	0.82
377	59.036	0.158	1.48	92	-0.97	102	73	2.210	3.64	0.68
378	59.196	0.160	1.61	92	-0.93	103	73	2.210	3.70	0.72
379	59.353	0.157	1.43	92	-0.98	101	73	2.210	3.58	0.72
380	59.511	0.158	1.63	92	-0.91	102	73	2.210	3.56	0.72
381	59.669	0.158	1.32	92	-0.99	102	73	2.210	3.33	0.77
382	59.826	0.157	1.48	92	-1.02	101	73	2.210	3.33	0.70
383	59.986	0.160	0.69	92	-1.17	103	73	2.200	3.27	0.68

BOX B TEST DATA - ASTM E2618 / ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 4

Job #: 20-565
Tracking #: 69
Technician: AK
Date: 5/3/2020

	Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft^3)	Sample Rate (cfm)	Orifice dH (in H_2O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H_2O)	CO_2 (%)	CO (%)
384	60.140	0.154	1.44	92	-0.97	99	73	2.210	4.00	0.91
385	60.298	0.158	0.36	92	-1.3	102	73	2.210	3.80	0.99
386	60.456	0.158	1.66	92	-0.9	102	73	2.220	3.58	0.92
387	60.614	0.158	1.53	92	-0.95	101	73	2.220	3.22	0.78

WATER FLOW AND TEMPERATURE DATA - ASTM E2618

Client: Greentech
Model: RS7200E
Run #: 4

Job #: 20-565
Tracking #: 69
Technician: AK
Date: 5/3/2020

	Flow (GPM)		Temperature Data (°F)						
Elapsed Time (min)	Load Side Flow	Appliance Flow (optional)	HEX Load In	HEX Load Out	HEX Supply In	HEX Supply Out	Specific Heat of Inlet Water (BTU/lb-°F)	Mass Flow Rate of Inlet Water (lb/min)	Heat Output (Btu)
0	0.73	0.66	45.06	172.28	171	164	1.00	6.08	
1	0.64	0.58	45.34	172.99	172	165	1.00	5.36	684
2	0.74	0.66	45.62	173.64	172	165	1.00	6.14	787
3	0.75	0.67	45.89	174.16	173	165	1.00	6.23	800
4	0.82	0.74	46.08	174.82	173	166	1.00	6.83	880
5	0.84	0.75	46.21	175.48	174	166	1.00	6.97	902
6	0.83	0.75	46.40	176.14	174	167	1.00	6.96	904
7	0.80	0.72	46.54	176.76	175	168	1.00	6.68	871
8	0.79	0.71	46.72	177.56	176	168	1.00	6.62	867
9	0.83	0.75	46.91	178.42	177	169	1.00	6.95	916
10	0.84	0.75	47.09	179.36	178	170	1.00	6.97	923
11	0.85	0.77	47.28	180.12	179	171	1.00	7.11	946
12	0.82	0.73	47.51	181.12	180	172	1.00	6.81	911
13	0.85	0.77	47.65	181.97	180	172	1.00	7.11	956
14	0.85	0.77	47.78	182.73	181	173	1.00	7.10	960
15	0.81	0.72	47.88	183.72	182	175	1.00	6.72	914
16	0.85	0.77	47.97	184.76	183	175	1.00	7.11	974
17	0.87	0.78	48.01	185.52	183	175	1.00	7.25	998
18	0.83	0.75	48.11	185.75	184	176	1.00	6.96	959
19	0.83	0.75	48.20	186.04	184	176	1.00	6.95	960
20	0.85	0.77	48.29	186.04	184	176	1.00	7.11	981
21	0.85	0.77	48.39	186.13	184	176	1.00	7.10	979
22	0.85	0.77	48.48	186.08	184	176	1.00	7.10	978
23	0.80	0.72	48.52	186.04	184	176	1.00	6.67	918
24	0.83	0.75	48.62	185.89	183	175	1.00	6.96	957
25	0.89	0.80	48.66	185.80	183	175	1.00	7.40	1016
26	0.85	0.77	48.66	185.57	183	175	1.00	7.11	975
27	0.80	0.72	48.66	185.42	183	175	1.00	6.67	913
28	0.84	0.75	48.62	185.19	183	175	1.00	7.00	957
29	0.85	0.76	48.57	184.95	183	174	1.00	7.06	964
30	0.82	0.74	48.52	184.67	183	174	1.00	6.82	929
31	0.80	0.72	48.43	184.43	182	174	1.00	6.67	908
32	0.78	0.70	48.39	184.15	182	174	1.00	6.52	887
33	0.76	0.69	48.34	183.86	182	173	1.00	6.37	865
34	0.83	0.75	48.29	183.63	182	173	1.00	6.96	943
35	0.87	0.78	48.29	183.30	181	173	1.00	7.24	978
36	0.82	0.74	48.20	183.01	181	172	1.00	6.83	922
37	0.82	0.74	48.20	182.68	181	172	1.00	6.82	918
38	0.85	0.77	48.15	182.35	180	172	1.00	7.11	955
39	0.89	0.80	48.15	182.02	180	172	1.00	7.42	994
40	0.85	0.77	48.11	181.68	180	171	1.00	7.12	952
41	0.77	0.69	48.11	181.40	179	171	1.00	6.38	852
42	0.83	0.75	48.11	181.02	179	171	1.00	6.96	926
43	0.82	0.74	48.11	180.74	179	170	1.00	6.87	912
44	0.82	0.74	48.15	180.31	178	170	1.00	6.82	902
45	0.84	0.75	48.15	180.03	178	170	1.00	6.97	920
46	0.87	0.78	48.15	179.65	178	170	1.00	7.27	957
47	0.82	0.74	48.15	179.32	177	169	1.00	6.82	895

WATER FLOW AND TEMPERATURE DATA - ASTM E2618

Client: Greentech
Model: RS7200E
Run #: 4

Job #: 20-565
Tracking #: 69
Technician: AK
Date: 5/3/2020

	Flow (GPM)		Temperature Data (°F)						
Elapsed Time (min)	Load Side Flow	Appliance Flow (optional)	HEX Load In	HEX Load Out	HEX Supply In	HEX Supply Out	Specific Heat of Inlet Water (BTU/lb-°F)	Mass Flow Rate of Inlet Water (lb/min)	Heat Output (Btu)
48	0.85	0.77	48.20	178.98	177	169	1.00	7.13	933
49	0.82	0.73	48.20	178.60	177	168	1.00	6.81	889
50	0.78	0.70	48.20	178.32	176	168	1.00	6.52	849
51	0.80	0.72	48.20	177.94	176	168	1.00	6.68	867
52	0.82	0.74	48.20	177.56	176	167	1.00	6.83	884
53	0.82	0.74	48.20	177.23	175	167	1.00	6.82	881
54	0.80	0.72	48.15	176.85	175	167	1.00	6.68	860
55	0.85	0.77	48.15	176.47	174	166	1.00	7.11	914
56	0.84	0.76	48.15	176.14	174	166	1.00	7.02	900
57	0.80	0.72	48.15	175.76	174	166	1.00	6.68	853
58	0.91	0.81	48.11	175.39	173	165	1.00	7.55	963
59	0.82	0.74	48.11	175.01	173	165	1.00	6.83	867
60	0.82	0.73	48.15	174.63	173	165	1.00	6.81	862
61	0.82	0.74	48.15	174.35	172	164	1.00	6.82	861
62	0.81	0.73	48.15	173.97	172	164	1.00	6.73	848
63	0.80	0.72	48.15	173.55	172	164	1.00	6.67	837
64	0.80	0.72	48.15	173.22	171	163	1.00	6.67	835
65	0.84	0.75	48.15	172.84	171	163	1.00	6.97	870
66	0.78	0.70	48.15	172.47	170	163	1.00	6.52	812
67	0.78	0.71	48.15	172.09	170	162	1.00	6.54	812
68	0.80	0.72	48.15	171.71	170	162	1.00	6.67	825
69	0.89	0.80	48.15	171.38	169	162	1.00	7.40	913
70	0.84	0.75	48.15	170.96	169	161	1.00	6.97	857
71	0.84	0.75	48.15	170.63	169	161	1.00	6.97	854
72	0.82	0.74	48.11	170.20	168	160	1.00	6.82	833
73	0.76	0.69	48.11	169.83	168	160	1.00	6.37	777
74	0.84	0.75	48.11	169.45	168	160	1.00	6.97	847
75	0.80	0.72	48.11	169.26	168	160	1.00	6.68	810
76	0.80	0.72	48.15	169.21	168	160	1.00	6.71	813
77	0.80	0.72	48.11	169.21	168	160	1.00	6.67	808
78	0.80	0.72	48.11	169.36	168	160	1.00	6.67	809
79	0.80	0.72	48.06	169.55	168	161	1.00	6.67	811
80	0.85	0.77	48.06	170.01	168	161	1.00	7.12	869
81	0.85	0.77	48.06	170.30	169	161	1.00	7.11	870
82	0.83	0.75	48.06	170.96	169	162	1.00	6.96	856
83	0.79	0.71	48.06	171.62	170	163	1.00	6.57	813
84	0.81	0.73	48.11	172.14	170	163	1.00	6.74	836
85	0.83	0.75	48.11	172.80	171	164	1.00	6.96	869
86	0.83	0.75	48.11	173.55	172	165	1.00	6.95	873
87	0.87	0.78	48.11	174.12	172	165	1.00	7.25	915
88	0.89	0.80	48.11	174.73	173	166	1.00	7.40	939
89	0.80	0.72	48.15	175.53	174	167	1.00	6.68	852
90	0.80	0.72	48.15	176.47	175	167	1.00	6.71	862
91	0.85	0.76	48.15	177.04	175	168	1.00	7.07	912
92	0.83	0.75	48.15	177.90	176	169	1.00	6.95	903
93	0.83	0.75	48.15	178.75	177	170	1.00	6.96	910
94	0.81	0.73	48.20	179.55	178	170	1.00	6.80	894
95	0.82	0.73	48.20	180.40	179	171	1.00	6.80	900

WATER FLOW AND TEMPERATURE DATA - ASTM E2618

Client: Greentech
Model: RS7200E
Run #: 4

Job #: 20-565
Tracking #: 69
Technician: AK
Date: 5/3/2020

	Flow (GPM)		Temperature Data (°F)						
Elapsed Time (min)	Load Side Flow	Appliance Flow (optional)	HEX Load In	HEX Load Out	HEX Supply In	HEX Supply Out	Specific Heat of Inlet Water (BTU/lb-°F)	Mass Flow Rate of Inlet Water (lb/min)	Heat Output (Btu)
96	0.85	0.76	48.25	181.21	180	172	1.00	7.09	944
97	0.82	0.74	48.25	182.25	181	173	1.00	6.83	917
98	0.82	0.73	48.25	183.06	181	174	1.00	6.81	919
99	0.85	0.77	48.29	183.91	183	175	1.00	7.10	963
100	0.82	0.73	48.29	185.19	184	176	1.00	6.81	933
101	0.80	0.72	48.34	185.89	184	176	1.00	6.65	916
102	0.83	0.75	48.34	186.37	184	176	1.00	6.95	961
103	0.80	0.72	48.34	186.51	184	176	1.00	6.66	921
104	0.81	0.73	48.34	186.70	184	177	1.00	6.80	941
105	0.80	0.72	48.34	186.79	184	177	1.00	6.64	921
106	0.78	0.70	48.34	186.84	185	177	1.00	6.52	904
107	0.80	0.72	48.34	186.88	185	177	1.00	6.64	922
108	0.82	0.73	48.39	186.84	184	177	1.00	6.80	943
109	0.78	0.70	48.34	186.70	184	176	1.00	6.50	901
110	0.87	0.78	48.34	186.60	184	176	1.00	7.23	1001
111	0.88	0.79	48.39	186.41	184	176	1.00	7.34	1014
112	0.82	0.73	48.34	186.32	184	176	1.00	6.80	940
113	0.80	0.72	48.34	186.08	184	176	1.00	6.64	916
114	0.83	0.75	48.39	185.89	184	175	1.00	6.94	955
115	0.87	0.78	48.39	185.71	184	175	1.00	7.25	997
116	0.85	0.77	48.39	185.52	183	175	1.00	7.10	974
117	0.78	0.70	48.39	185.28	183	175	1.00	6.51	892
118	0.80	0.72	48.34	185.05	183	175	1.00	6.69	916
119	0.81	0.73	48.34	184.76	183	174	1.00	6.79	927
120	0.76	0.69	48.39	184.57	182	174	1.00	6.37	868
121	0.80	0.72	48.39	184.24	182	174	1.00	6.64	904
122	0.87	0.78	48.39	184.00	182	174	1.00	7.24	983
123	0.80	0.72	48.39	183.77	182	173	1.00	6.64	901
124	0.83	0.75	48.39	183.48	181	173	1.00	6.94	938
125	0.82	0.74	48.39	183.15	181	173	1.00	6.84	923
126	0.83	0.75	48.34	182.87	181	173	1.00	6.95	935
127	0.80	0.72	48.34	182.54	181	172	1.00	6.64	893
128	0.85	0.77	48.34	182.25	180	172	1.00	7.10	951
129	0.81	0.73	48.34	181.92	180	172	1.00	6.80	909
130	0.82	0.73	48.34	181.68	180	171	1.00	6.80	908
131	0.84	0.75	48.34	181.35	179	171	1.00	6.97	928
132	0.81	0.73	48.34	181.02	179	171	1.00	6.73	894
133	0.83	0.75	48.34	180.69	179	170	1.00	6.95	921
134	0.80	0.72	48.34	180.31	178	170	1.00	6.65	879
135	0.80	0.72	48.34	180.03	178	170	1.00	6.65	877
136	0.81	0.73	48.34	179.65	178	169	1.00	6.80	893
137	0.82	0.73	48.34	179.32	177	169	1.00	6.81	893
138	0.80	0.72	48.39	179.03	177	169	1.00	6.67	872
139	0.83	0.74	48.39	178.65	177	169	1.00	6.89	899
140	0.80	0.72	48.39	178.32	176	168	1.00	6.65	865
141	0.78	0.70	48.39	177.99	176	168	1.00	6.50	844
142	0.85	0.76	48.34	177.66	176	168	1.00	7.09	918
143	0.83	0.75	48.34	177.28	175	167	1.00	6.95	897

WATER FLOW AND TEMPERATURE DATA - ASTM E2618

Client: Greentech
Model: RS7200E
Run #: 4

Job #: 20-565
Tracking #: 69
Technician: AK
Date: 5/3/2020

	Flow (GPM)		Temperature Data (°F)						
Elapsed Time (min)	Load Side Flow	Appliance Flow (optional)	HEX Load In	HEX Load Out	HEX Supply In	HEX Supply Out	Specific Heat of Inlet Water (BTU/lb-°F)	Mass Flow Rate of Inlet Water (lb/min)	Heat Output (Btu)
144	0.80	0.72	48.34	176.95	175	167	1.00	6.65	857
145	0.83	0.75	48.34	176.57	175	167	1.00	6.93	890
146	0.90	0.81	48.34	176.24	174	166	1.00	7.55	966
147	0.83	0.75	48.39	175.86	174	166	1.00	6.95	886
148	0.78	0.70	48.34	175.53	173	166	1.00	6.51	829
149	0.74	0.67	48.34	175.15	173	165	1.00	6.21	788
150	0.82	0.73	48.34	174.77	173	165	1.00	6.80	861
151	0.76	0.69	48.34	174.44	172	165	1.00	6.36	803
152	0.87	0.78	48.34	174.07	172	164	1.00	7.23	910
153	0.83	0.74	48.34	173.79	172	164	1.00	6.89	866
154	0.78	0.70	48.29	173.36	171	164	1.00	6.51	815
155	0.85	0.76	48.29	173.03	171	163	1.00	7.09	885
156	0.87	0.78	48.29	172.65	171	163	1.00	7.25	903
157	0.87	0.78	48.29	172.32	170	163	1.00	7.25	900
158	0.83	0.75	48.29	171.95	170	162	1.00	6.94	859
159	0.83	0.75	48.29	171.62	170	162	1.00	6.95	859
160	0.83	0.75	48.29	171.19	169	162	1.00	6.95	855
161	0.78	0.70	48.29	170.86	169	161	1.00	6.51	799
162	0.85	0.77	48.29	170.49	168	161	1.00	7.10	869
163	0.76	0.69	48.29	170.11	168	160	1.00	6.35	775
164	0.76	0.69	48.29	169.73	168	160	1.00	6.35	772
165	0.85	0.77	48.25	169.31	168	160	1.00	7.10	860
166	0.83	0.75	48.25	169.12	168	160	1.00	6.95	841
167	0.80	0.72	48.25	169.12	167	160	1.00	6.70	811
168	0.85	0.77	48.25	169.12	167	160	1.00	7.10	860
169	0.83	0.75	48.25	169.26	168	160	1.00	6.95	841
170	0.73	0.65	48.25	169.64	168	161	1.00	6.05	736
171	0.82	0.73	48.25	170.06	168	161	1.00	6.80	830
172	0.85	0.77	48.25	170.58	169	162	1.00	7.10	869
173	0.80	0.72	48.20	171.10	170	162	1.00	6.66	820
174	0.84	0.76	48.20	171.76	170	163	1.00	7.01	867
175	0.85	0.77	48.20	172.32	171	164	1.00	7.10	882
176	0.87	0.78	48.20	173.08	171	164	1.00	7.23	904
177	0.80	0.72	48.20	173.88	173	165	1.00	6.65	837
178	0.81	0.73	48.20	174.92	173	166	1.00	6.80	862
179	0.81	0.73	48.20	175.67	174	167	1.00	6.80	867
180	0.79	0.71	48.20	176.47	175	168	1.00	6.62	851
181	0.80	0.72	48.20	177.47	176	169	1.00	6.64	859
182	0.80	0.72	48.20	178.60	177	170	1.00	6.66	870
183	0.83	0.75	48.20	179.41	178	170	1.00	6.94	911
184	0.81	0.73	48.25	180.40	179	171	1.00	6.79	898
185	0.83	0.75	48.25	181.54	180	172	1.00	6.94	926
186	0.92	0.83	48.25	182.49	181	174	1.00	7.67	1031
187	0.82	0.73	48.29	183.53	182	174	1.00	6.80	921
188	0.81	0.73	48.29	184.57	184	176	1.00	6.80	927
189	0.81	0.73	48.34	185.66	184	176	1.00	6.80	934
190	0.78	0.70	48.34	186.46	184	176	1.00	6.50	899
191	0.80	0.72	48.34	186.65	185	177	1.00	6.64	919

WATER FLOW AND TEMPERATURE DATA - ASTM E2618

Client: Greentech
Model: RS7200E
Run #: 4

Job #: 20-565
Tracking #: 69
Technician: AK
Date: 5/3/2020

	Flow (GPM)		Temperature Data (°F)						
Elapsed Time (min)	Load Side Flow	Appliance Flow (optional)	HEX Load In	HEX Load Out	HEX Supply In	HEX Supply Out	Specific Heat of Inlet Water (BTU/lb-°F)	Mass Flow Rate of Inlet Water (lb/min)	Heat Output (Btu)
192	0.83	0.75	48.34	187.03	185	177	1.00	6.94	963
193	0.80	0.72	48.39	187.12	185	177	1.00	6.65	924
194	0.80	0.72	48.39	187.26	185	177	1.00	6.65	925
195	0.81	0.73	48.39	187.26	185	177	1.00	6.78	943
196	0.78	0.70	48.39	187.17	185	177	1.00	6.49	902
197	0.80	0.72	48.39	187.21	185	177	1.00	6.64	923
198	0.81	0.73	48.39	187.12	185	177	1.00	6.79	943
199	0.78	0.70	48.39	186.93	185	177	1.00	6.49	900
200	0.81	0.73	48.39	186.84	185	176	1.00	6.79	941
201	0.82	0.74	48.39	186.70	184	176	1.00	6.82	944
202	0.81	0.73	48.39	186.46	184	176	1.00	6.79	938
203	0.81	0.73	48.39	186.37	184	176	1.00	6.79	938
204	0.80	0.72	48.39	186.08	184	176	1.00	6.64	915
205	0.81	0.73	48.34	185.94	184	175	1.00	6.78	934
206	0.76	0.69	48.34	185.66	184	175	1.00	6.35	873
207	0.81	0.73	48.34	185.42	183	175	1.00	6.80	933
208	0.84	0.76	48.34	185.24	183	175	1.00	7.03	963
209	0.78	0.70	48.34	185.00	183	174	1.00	6.50	890
210	0.81	0.73	48.34	184.67	183	174	1.00	6.79	926
211	0.85	0.76	48.34	184.43	182	174	1.00	7.08	965
212	0.80	0.72	48.34	184.10	182	174	1.00	6.64	902
213	0.83	0.75	48.34	183.86	182	173	1.00	6.94	941
214	0.77	0.69	48.34	183.58	182	173	1.00	6.42	869
215	0.83	0.74	48.34	183.30	181	173	1.00	6.90	932
216	0.81	0.73	48.34	182.96	181	173	1.00	6.79	915
217	0.81	0.73	48.34	182.68	181	172	1.00	6.79	913
218	0.76	0.68	48.34	182.40	180	172	1.00	6.34	851
219	0.80	0.72	48.34	182.11	180	172	1.00	6.65	891
220	0.90	0.81	48.34	181.73	180	171	1.00	7.52	1004
221	0.80	0.72	48.29	181.40	179	171	1.00	6.64	885
222	0.82	0.74	48.29	181.12	179	171	1.00	6.83	909
223	0.81	0.73	48.29	180.83	179	171	1.00	6.80	902
224	0.81	0.73	48.29	180.45	178	170	1.00	6.79	898
225	0.80	0.72	48.25	180.12	178	170	1.00	6.64	877
226	0.83	0.75	48.25	179.84	178	170	1.00	6.94	914
227	0.81	0.73	48.25	179.50	177	169	1.00	6.80	893
228	0.78	0.70	48.25	179.13	177	169	1.00	6.51	853
229	0.82	0.74	48.25	178.75	177	169	1.00	6.88	899
230	0.74	0.67	48.29	178.46	176	168	1.00	6.21	809
231	0.81	0.73	48.25	178.13	176	168	1.00	6.79	883
232	0.81	0.73	48.25	177.75	176	168	1.00	6.80	881
233	0.83	0.75	48.25	177.42	175	167	1.00	6.94	897
234	0.85	0.76	48.25	177.04	175	167	1.00	7.09	914
235	0.83	0.75	48.25	176.71	175	167	1.00	6.92	889
236	0.83	0.75	48.25	176.33	174	166	1.00	6.92	888
237	0.81	0.73	48.25	176.00	174	166	1.00	6.79	868
238	0.78	0.70	48.25	175.62	174	166	1.00	6.51	830
239	0.80	0.72	48.25	175.29	173	165	1.00	6.64	844

WATER FLOW AND TEMPERATURE DATA - ASTM E2618

Client: Greentech
Model: RS7200E
Run #: 4

Job #: 20-565
Tracking #: 69
Technician: AK
Date: 5/3/2020

	Flow (GPM)		Temperature Data (°F)						
Elapsed Time (min)	Load Side Flow	Appliance Flow (optional)	HEX Load In	HEX Load Out	HEX Supply In	HEX Supply Out	Specific Heat of Inlet Water (BTU/lb-°F)	Mass Flow Rate of Inlet Water (lb/min)	Heat Output (Btu)
240	0.80	0.72	48.29	174.92	173	165	1.00	6.64	842
241	0.83	0.75	48.29	174.59	172	165	1.00	6.93	876
242	0.84	0.75	48.29	174.21	172	164	1.00	6.99	881
243	0.74	0.67	48.29	173.83	172	164	1.00	6.20	780
244	0.81	0.73	48.34	173.50	171	164	1.00	6.79	851
245	0.83	0.75	48.29	173.13	171	163	1.00	6.94	867
246	0.80	0.72	48.34	172.75	171	163	1.00	6.64	827
247	0.76	0.69	48.34	172.37	170	163	1.00	6.35	789
248	0.83	0.75	48.34	172.04	170	162	1.00	6.92	857
249	0.80	0.72	48.34	171.71	170	162	1.00	6.64	820
250	0.80	0.72	48.34	171.33	169	162	1.00	6.64	818
251	0.83	0.75	48.34	170.96	169	161	1.00	6.94	852
252	0.85	0.76	48.34	170.53	168	161	1.00	7.09	867
253	0.80	0.72	48.29	170.25	168	160	1.00	6.64	810
254	0.78	0.70	48.34	169.83	168	160	1.00	6.52	793
255	0.75	0.68	48.29	169.50	168	160	1.00	6.28	763
256	0.81	0.73	48.34	169.31	168	160	1.00	6.79	822
257	0.81	0.73	48.34	169.21	167	160	1.00	6.80	822
258	0.83	0.75	48.34	169.21	167	160	1.00	6.94	840
259	0.87	0.78	48.34	169.26	167	160	1.00	7.25	878
260	0.83	0.75	48.34	169.40	168	160	1.00	6.95	842
261	0.78	0.70	48.34	169.73	168	161	1.00	6.50	790
262	0.84	0.75	48.34	169.97	168	161	1.00	7.00	852
263	0.89	0.80	48.34	170.39	169	162	1.00	7.39	903
264	0.81	0.73	48.39	170.91	169	162	1.00	6.80	834
265	0.83	0.75	48.39	171.33	170	163	1.00	6.94	854
266	0.78	0.70	48.39	171.99	170	163	1.00	6.49	804
267	0.81	0.73	48.39	172.61	171	164	1.00	6.80	845
268	0.83	0.75	48.43	173.31	171	164	1.00	6.94	867
269	0.80	0.72	48.43	173.93	172	165	1.00	6.70	842
270	0.81	0.73	48.43	174.63	173	166	1.00	6.79	859
271	0.76	0.69	48.43	175.58	174	167	1.00	6.35	809
272	0.81	0.73	48.43	176.28	175	167	1.00	6.79	870
273	0.85	0.77	48.43	177.09	176	168	1.00	7.10	914
274	0.80	0.72	48.43	178.18	176	169	1.00	6.64	862
275	0.82	0.74	48.43	178.75	177	170	1.00	6.86	894
276	0.78	0.70	48.43	179.74	178	171	1.00	6.49	854
277	0.81	0.73	48.43	180.74	179	172	1.00	6.79	899
278	0.81	0.73	48.43	181.54	180	173	1.00	6.79	906
279	0.80	0.72	48.39	182.54	181	173	1.00	6.64	893
280	0.82	0.73	48.39	183.48	182	174	1.00	6.80	920
281	0.80	0.72	48.39	184.53	183	175	1.00	6.64	905
282	0.81	0.73	48.39	185.61	184	176	1.00	6.80	934
283	0.80	0.72	48.34	186.41	185	177	1.00	6.64	918
284	0.85	0.76	48.34	186.98	185	177	1.00	7.07	982
285	0.81	0.73	48.34	187.21	185	177	1.00	6.80	945
286	0.80	0.72	48.34	187.36	185	177	1.00	6.64	924
287	0.80	0.72	48.34	187.40	185	177	1.00	6.66	927

WATER FLOW AND TEMPERATURE DATA - ASTM E2618

Client: Greentech
Model: RS7200E
Run #: 4

Job #: 20-565
Tracking #: 69
Technician: AK
Date: 5/3/2020

	Flow (GPM)		Temperature Data (°F)						
Elapsed Time (min)	Load Side Flow	Appliance Flow (optional)	HEX Load In	HEX Load Out	HEX Supply In	HEX Supply Out	Specific Heat of Inlet Water (BTU/lb-°F)	Mass Flow Rate of Inlet Water (lb/min)	Heat Output (Btu)
288	0.78	0.71	48.34	187.45	185	177	1.00	6.54	911
289	0.81	0.73	48.34	187.40	185	177	1.00	6.77	942
290	0.80	0.72	48.34	187.31	185	177	1.00	6.64	924
291	0.79	0.72	48.34	187.26	185	177	1.00	6.63	922
292	0.85	0.76	48.34	187.17	185	177	1.00	7.08	984
293	0.81	0.73	48.34	186.98	185	177	1.00	6.78	941
294	0.81	0.73	48.34	186.84	185	176	1.00	6.78	940
295	0.79	0.71	48.34	186.70	184	176	1.00	6.62	917
296	0.81	0.73	48.34	186.41	184	176	1.00	6.78	937
297	0.83	0.75	48.34	186.18	184	176	1.00	6.93	956
298	0.83	0.75	48.34	185.94	184	176	1.00	6.93	955
299	0.85	0.76	48.29	185.71	184	175	1.00	7.07	973
300	0.83	0.75	48.29	185.42	183	175	1.00	6.95	954
301	0.78	0.70	48.29	185.19	183	175	1.00	6.50	891
302	0.86	0.78	48.29	184.90	183	174	1.00	7.21	986
303	0.78	0.70	48.29	184.62	183	174	1.00	6.49	887
304	0.85	0.76	48.34	184.34	182	174	1.00	7.08	964
305	0.87	0.78	48.34	184.00	182	174	1.00	7.24	983
306	0.80	0.72	48.34	183.67	182	173	1.00	6.64	900
307	0.80	0.72	48.34	183.39	181	173	1.00	6.64	897
308	0.85	0.77	48.39	183.10	181	173	1.00	7.10	958
309	0.80	0.72	48.39	182.73	181	172	1.00	6.69	900
310	0.76	0.68	48.34	182.44	180	172	1.00	6.34	851
311	0.80	0.72	48.34	182.11	180	172	1.00	6.64	890
312	0.81	0.73	48.34	181.73	180	171	1.00	6.79	907
313	0.80	0.72	48.39	181.40	179	171	1.00	6.64	884
314	0.85	0.76	48.39	181.07	179	171	1.00	7.08	941
315	0.83	0.75	48.39	180.74	179	170	1.00	6.91	915
316	0.81	0.73	48.39	180.36	178	170	1.00	6.75	892
317	0.78	0.70	48.39	179.98	178	170	1.00	6.50	857
318	0.81	0.73	48.39	179.65	178	169	1.00	6.79	892
319	0.85	0.76	48.39	179.32	177	169	1.00	7.09	929
320	0.83	0.75	48.39	178.94	177	169	1.00	6.92	905
321	0.80	0.72	48.43	178.60	176	168	1.00	6.64	866
322	0.78	0.71	48.43	178.23	176	168	1.00	6.54	850
323	0.81	0.73	48.43	177.90	176	168	1.00	6.78	879
324	0.83	0.75	48.39	177.52	175	167	1.00	6.94	897
325	0.81	0.73	48.39	177.14	175	167	1.00	6.79	875
326	0.81	0.73	48.39	176.76	175	167	1.00	6.78	871
327	0.80	0.72	48.39	176.38	174	166	1.00	6.64	851
328	0.81	0.73	48.39	176.00	174	166	1.00	6.77	865
329	0.80	0.72	48.39	175.67	174	166	1.00	6.64	847
330	0.82	0.74	48.39	175.29	173	165	1.00	6.86	871
331	0.81	0.73	48.39	174.92	173	165	1.00	6.79	860
332	0.80	0.72	48.39	174.54	172	165	1.00	6.64	838
333	0.83	0.75	48.39	174.21	172	164	1.00	6.93	873
334	0.83	0.75	48.39	173.83	172	164	1.00	6.94	871
335	0.78	0.70	48.34	173.36	171	164	1.00	6.49	812

WATER FLOW AND TEMPERATURE DATA - ASTM E2618

Client: Greentech
Model: RS7200E
Run #: 4

Job #: 20-565
Tracking #: 69
Technician: AK
Date: 5/3/2020

	Flow (GPM)		Temperature Data (°F)						
Elapsed Time (min)	Load Side Flow	Appliance Flow (optional)	HEX Load In	HEX Load Out	HEX Supply In	HEX Supply Out	Specific Heat of Inlet Water (BTU/lb-°F)	Mass Flow Rate of Inlet Water (lb/min)	Heat Output (Btu)
336	0.79	0.71	48.34	172.99	171	163	1.00	6.61	826
337	0.81	0.73	48.34	172.61	171	163	1.00	6.78	844
338	0.81	0.73	48.34	172.28	170	163	1.00	6.78	841
339	0.85	0.76	48.34	171.85	170	162	1.00	7.07	875
340	0.83	0.75	48.34	171.48	169	162	1.00	6.94	855
341	0.80	0.72	48.34	171.15	169	162	1.00	6.64	817
342	0.83	0.75	48.34	170.72	169	161	1.00	6.93	849
343	0.80	0.72	48.34	170.39	168	161	1.00	6.64	812
344	0.85	0.77	48.34	169.97	168	160	1.00	7.10	864
345	0.80	0.72	48.39	169.69	168	160	1.00	6.64	806
346	0.78	0.70	48.39	169.45	168	160	1.00	6.49	786
347	0.80	0.72	48.39	169.36	168	160	1.00	6.64	804
348	0.83	0.75	48.39	169.36	168	160	1.00	6.93	839
349	0.80	0.72	48.39	169.40	168	160	1.00	6.64	805
350	0.85	0.76	48.48	169.64	168	160	1.00	7.09	860
351	0.83	0.75	48.48	169.69	168	161	1.00	6.92	840
352	0.81	0.73	48.48	169.92	168	161	1.00	6.77	823
353	0.79	0.71	48.43	170.16	168	161	1.00	6.55	799
354	0.85	0.76	48.43	170.58	169	162	1.00	7.07	865
355	0.80	0.72	48.43	170.91	169	162	1.00	6.65	816
356	0.78	0.70	48.48	171.29	169	162	1.00	6.49	799
357	0.85	0.77	48.48	171.81	170	163	1.00	7.10	876
358	0.81	0.73	48.43	172.32	170	163	1.00	6.79	843
359	0.82	0.74	48.43	172.80	171	164	1.00	6.86	854
360	0.78	0.70	48.43	173.36	172	164	1.00	6.49	811
361	0.78	0.70	48.39	173.93	172	165	1.00	6.51	818
362	0.81	0.73	48.39	174.59	173	166	1.00	6.79	858
363	0.81	0.73	48.39	175.20	173	166	1.00	6.78	861
364	0.83	0.75	48.34	175.72	174	167	1.00	6.93	884
365	0.85	0.76	48.29	176.33	174	167	1.00	7.07	906
366	0.81	0.73	48.29	176.85	175	168	1.00	6.78	873
367	0.85	0.76	48.25	177.37	176	168	1.00	7.08	915
368	0.85	0.76	48.25	177.94	176	169	1.00	7.07	917
369	0.76	0.68	48.25	178.42	177	169	1.00	6.34	827
370	0.80	0.72	48.20	178.98	177	170	1.00	6.64	869
371	0.83	0.75	48.20	179.41	178	170	1.00	6.94	911
372	0.78	0.70	48.11	179.93	178	170	1.00	6.49	856
373	0.80	0.72	48.11	180.31	178	171	1.00	6.65	880
374	0.79	0.71	48.11	180.69	179	171	1.00	6.62	879
375	0.80	0.72	48.11	181.07	179	172	1.00	6.64	884
376	0.85	0.76	48.11	181.54	179	172	1.00	7.07	945
377	0.78	0.70	48.06	181.92	180	172	1.00	6.49	869
378	0.83	0.75	48.11	182.25	180	173	1.00	6.94	932
379	0.78	0.70	48.06	182.58	180	173	1.00	6.49	875
380	0.76	0.68	48.06	182.87	181	173	1.00	6.33	854
381	0.80	0.72	48.01	183.25	181	174	1.00	6.65	901
382	0.79	0.72	48.06	183.53	181	174	1.00	6.63	899
383	0.83	0.75	48.01	183.82	182	174	1.00	6.95	944

WATER FLOW AND TEMPERATURE DATA - ASTM E2618

Client: Greentech
Model: RS7200E
Run #: 4

Job #: 20-565
Tracking #: 69
Technician: AK
Date: 5/3/2020

	Flow (GPM)		Temperature Data (°F)						
Elapsed Time (min)	Load Side Flow	Appliance Flow (optional)	HEX Load In	HEX Load Out	HEX Supply In	HEX Supply Out	Specific Heat of Inlet Water (BTU/lb-°F)	Mass Flow Rate of Inlet Water (lb/min)	Heat Output (Btu)
384	0.81	0.73	48.06	184.05	182	174	1.00	6.79	924
385	0.81	0.73	48.11	184.38	182	175	1.00	6.78	925
386	0.80	0.72	48.11	184.57	182	175	1.00	6.66	910
387	0.81	0.73	48.11	184.76	183	175	1.00	6.75	924

WATER FLOW AND TEMPERATURE DATA - ASTM E2618

Client: Greentech
Model: RS7200E
Run #: 4

Job #: 20-565
Tracking #: 69
Technician: AK
Date: 5/3/2020

	Flow (GPM)		Temperature Data (°F)						
Elapsed Time (min)	Load Side Flow	Appliance Flow (optional)	HEX Load In	HEX Load Out	HEX Supply In	HEX Supply Out	Specific Heat of Inlet Water (BTU/lb-°F)	Mass Flow Rate of Inlet Water (lb/min)	Heat Output (Btu)
Average	1	1	48	179	177	169	1	7	888
								TOTAL:	**343701**

LAB SAMPLE DATA - ASTM E2515

Client: Greentech
Model: RS7200E
Run #: 4

Job #: 20-565
Tracking #: 69
Technician: AK
Date: 5/3/2020

	Sample ID	Tare, mg	Total, mg	Final, mg	Catch, mg
Train A Filters - First Hour	3784	120.8	120.8	121.0	0.2
Train A Filters - Remainder	A007	118.9	237.7	241.9	4.2
	3785	118.8			
Train A Probe	1A	115627.9	115627.9	115628.0	0.1
Train A O-Rings	1A	3566.8	3566.8	3565.8	0.0*
Train B Filters	3786	118.4	238.9	242.2	3.3
	3787	120.5			
Train B Probe	1B	115900.4	115900.4	115901.2	0.8
Train B O-Rings	1B	3555.0	3555.0	3554.6	0.0*
Background Filter	A008	118.9	118.9	119.0	0.1

**Negative value corrected to zero*

Placed in Dessicator on:	5/7/2020

Train A Filters - First Hour	121.0		121.0					
Train A Filters - Remainder	242.1		241.9					
Train A Probe	115628.1				115628.0			
Train A O-Rings	3565.4		3565.8		3565.8			
Train B Filters	242.1		242.2					
Train B Probe	115901.4				115901.2			
Train B O-Rings	3554.2		3554.7		3554.6			
Background Filter	118.8		119.0					

1st hour Sub-Total, mg:	0.2
Remainder Sub-Total, mg:	4.3
Train 1 Aggregate, mg:	**4.5**
Train 2 Aggregate, mg:	**4.1**
Ambient Aggregate, mg:	0.1

ASTM E2618 Hydronic Heater Run Sheets

Client: Greentech Job Number: 20-565 Tracking #: 69
Model: RS7200E Run Number: 4 Test Date: 5/3/2020

Wood Heater Run Notes

Pre-Test Notes
Pre-Test Start Time: 06:18
Target Load (BTU/hr): 125,000

Time	Notes
0 min	Began preburn
60 min	End PB

Test Notes
Test Burn Start Time: 07:18
Target Load (BTU/hr): 43,750 (Category 3)

Time	Notes
0 min	Loaded test fuel within 60 seconds, door closed immediately
60 min	Changed 1st hour filter
387 min	End of Test

Test Burn End Time: 13:45

Flue Gas Concentration Measurement

Calibration Gas Values: Span Gas CO_2 (%): 15.30 CO (%): 4.98

Calibration Results:

	Pre Test			Post Test		
	Zero		Span	Zero		Span
Time	6:31		5/3 6:33	13:55		14:00
CO_2	-0.19		15.10	-0.03		15.21
CO	0.003		4.888	-0.001		4.871

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

Technician Signature: Date: 5/10/2020

ASTM E2515 - Glass Filters

Sample	Weight 1	Weight 2	Weigth 3	Weight 4	Initial	Project	Run
3721	120.9	120.7	-	-	JB	19-551	#4
3722	120.8	120.7	-	-	JB	↓	↓
3723	119.9	119.9	-	-	JB	↓	↓
3724	118.7	118.8	-	-	JB	—	—
3725	120.7	120.6	-	-	JB	20-568	#1
3726	120.5	120.6	-	-	JB	↓	↓
3727	119.4	119.5	-	-	JB	↓	↓
3728	118.4	118.6	-	-	JB	↓	↓
3729	123.0	122.8	-	-	JB	↓	↓
3730	121.7	121.5	-	-	JB	↓	↓
3731	119.8	119.8	-	-	JB	20-585	Sample
3732	119.5	119.5	-	-	JB	↓	Blank
3733	119.0	118.9	-	-	JB	20-585	#1
3734	118.3	118.3	-	-	JB	↓	↓
3735	119.4	119.2	-	-	JB	↓	↓
3736	119.2	119.2	-	-	JB	↓	↓
3737	117.7	117.5	-	-	JB	↓	↓
3738	119.8	119.6	-	-	JB	20-585	#2

Weight 1 Date/Time:
12/5 - 9:00
Weight 2 Date/Time:
12/6 - 10:30
Weight 3 Date/Time:
Weight 4 Date/Time:

Sample	Weight 1	Weight 2	Weigth 3	Weight 4	Initial	Project	Run
3739	119.1	119.1	-	-	A	20-585	#2
3740	119.2	119.1	-	-	A	↓	↓
3741	118.8	118.9	-	-	A	↓	↓
3742	118.7	118.7	-	-	A	↓	↓
3743	118.4	118.6	-	-	A	20-585	#3
3744	119.3	119.4	-	-	A	↓	↓
3745	119.4	119.5	-	-	A	↓	↓
3746	119.6	119.8	-	-	A	↓	↓
3747	119.2	119.2	-	-	A	↓	↓
3748	118.5	118.7	-	-	A	20-592	#1
3749	119.2	119.4	-	-	A	↓	↓
3750	119.0	119.0	-	-	A	↓	↓
3751	118.7	118.7	-	-	A	↓	↓
3752	119.2	119.1	-	-	A	↓	↓
3753	118.3	118.2	-	-	A	↓	↓
3754	118.4	118.3	-	-	A	↓	#2
3755	119.0	119.0	-	-	A	↓	↓
3756	119.5	119.5	-	-	A	↓	↓

Weight 1 Date/Time:
1/8/19 0845
Weight 2 Date/Time:
1/8/19 - 0815
Weight 3 Date/Time:
Weight 4 Date/Time:

ASTM E2515 - Glass Filters

Sample	Weight 1	Weight 2	Weigth 3	Weight 4	Initial	Project	Run
3757	118.7	118.9	-	-	A	20-597	#2
3758	120.5	120.3	-	-	A	↓	↓
3759	119.1	119.2	-	-	A		
3760	119.84	119.2	-	-	A		#3
3761	119.7	119.8	-	-	A		↓
3762	119.1	119.3	-	-	A		
3763	118.4	118.6	-	-	A		
3764	119.1	119.3	-	-	A		
3765	118.7	118.7	-	-	A		↓
3766	119.3	119.4	-	-	A		#4
3767	120.3	120.2	-	-	A		↓
3768	117.9	118.0	-	-	A		
3769	119.3	119.4	-	-	A		
3770	120.0	119.9	-	-	A		
3771	~~238.6~~	119.8	119.7	-	A	↓	↓
3772	119.5	119.7	-	-	A	20-565	#1
3773	119.4	119.3	-	-	A	↓	↓
3774	118.9	118.9	-	-	A		

Weight 1 Date/Time:
4/24 15:30
Weight 2 Date/Time:
4/25 12:30
Weight 3 Date/Time:
Weight 4 Date/Time:

Sample	Weight 1	Weight 2	Weigth 3	Weight 4	Initial	Project	Run
3775	118.1	118.2	-	-	A	20-565	#1
3776	119.5	119.6	-	-	A	↓	#2
3777	119.3	119.2	-	-	A		↓
3778	119.1	119.0	-	-	A		
3779	119.2	119.2	-	-	A		↓
3780	120.4	120.1	120.2	-	A		#3
3781	121.7	121.4	121.5	-	A		↓
3782	119.8	119.2	119.4	-	A		
3783	120.1	120.1	-	-	A		↓
3784	121.0	120.8	-	-	A		#4
3785	119.0	118.8	-	-	A		↓
3786	118.6	118.4	-	-	A		
3787	120.6	120.5	-	-	A	↓	↓
3788	120.9	120.8	-	-	A		
3789	119.1	119.1	-	-	A		
3790	119.0	119.0	-	-	A		
3791	121.5	121.4	-	-	A		
3792	121.3	121.4	-	-	A		

Weight 1 Date/Time:
4/24 15:30
Weight 2 Date/Time:
4/25 12:30
Weight 3 Date/Time:
4/26 0845
Weight 4 Date/Time:

ASTM E2515 - Glass Filters

Sample	Weight 1	Weight 2	Weigth 3	Weight 4	Initial	Project	Run
A001	118.3	118.1	—	—	SB	20-565	#1
A002	119.3	119.1	—	—	SB	↓	↓
A003	119.4	119.5	—	—	SB		#2
A004	118.3	118.2	—	—	SB		↓
A005	119.5	119.6	—	—	SB		#3
A006	119.6	119.7	—	—	SB		↓
A007	119.0	118.9	—	—	SB		#4
A008	118.8	118.9	—	—	SB	↓	↓
A009	119.4	119.5	—	—	SB	20-606	#1
A010	118.8	118.7	—	—	SB	↓	↓
A011	119.5	119.3	—	—	SB		
A012	120.3	120.3	—	—	SB		
A013	120.6	120.5	—	—	SB		
A014	120.5	120.6	—	—	SB	20-606	#2
A015	120.5	120.5	—	—	SB	↓	↓
A016	120.0	120.0	—	—	SB		
A017	119.6	119.8	—	—	SB		
A018	121.2	121.4	—	—	SB	↓	↓

Weight 1 Date/Time:
4/27 - 13:00
Weight 2 Date/Time:
4/28 - 8:00
Weight 3 Date/Time:
Weight 4 Date/Time:

Sample	Weight 1	Weight 2	Weigth 3	Weight 4	Initial	Project	Run
A019	118.6	118.5	—	—	SB	20-606	#3
A020	119.9	119.7	—	—	SB	↓	↓
A021	120.4	120.3	—	—	SB		
A022	119.0	119.0	—	—	SB		
A023	119.5	119.4	—	—	SB		
A024	119.7	119.5	—	—	SB	20-606	#4
A025	120.2	120.3	—	—	SB	↓	↓
A026	118.6	118.5	—	—	SB		
A027	118.5	118.5	—	—	SB		
A028	119.6	119.7	—	—	SB		
A029	119.9	120.0	—	—	SB	20-606	#5
A030	118.4	118.3	—	—	SB	↓	↓
A031	119.6	119.5	—	—	SB		
A032	119.7	119.6	—	—	SB		
A033	119.5	119.7	—	—	SB		
A034	117.4	117.5	—	—	SB		
A035	121.1	121.0	—	—	SB		
A036	119.2	119.3	—	—	SB		

Weight 1 Date/Time:
4/27 13:00
Weight 2 Date/Time:
4/28 - 8:00
Weight 3 Date/Time:
Weight 4 Date/Time:

ASTM E2515 - TX Filters

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

Weight 1 Date/Time:
3/16 - 15:00
Weight 2 Date/Time:
3/20 15:00
Weight 3 Date/Time:
Weight 4 Date/Time:

Sample	Weight 1	Weight 2	Weigth 3	Weight 4	Initial	Project	Run
T449	94.6	94.8	-	-		19-471	#2
T450	94.3	94.3	-	-			~~#1~~ #1
T451	94.1	94.1	-	-			~~#2~~ #2
T452	93.8	93.9	-	-			#2
T453	94.2	94.2	-	-			#2
T454	94.0	14.2	-	-			#2
T455	96.6	96.7	-	-		19-471	#3
T456	97.4	97.5	-	-			#3
T457	96.9	97.0	-	-			#3
T458	97.6	97.4	-	-			#3
T459	96.8	96.9	-	-			#3
T460	96.7	96.6	-	-			#3
T461	96.9	96.9	-	-			#3
T462	96.8	96.8	-	-			#3
T463	94.9	94.7	-	-		20-601	#1
T464	94.7	94.7	-	-			
T465	95.2	15.1	-	-			
T466	95.3	95.3	-	-			

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

ASTM E2515 - TX Filters

Sample	Weight 1	Weight 2	Weigth 3	Weight 4	Initial	Project	Run
T467	96.5	96.5	–	–	SB	20-601	#1
T468	94.9	95.0	–	–	SB	20-601	#2
T469	94.3	94.4	–	–	SB	↓	↓
T470	94.2	94.3	–	–	SB	↓	↓
T471	93.9	93.9	–	–	SB	↓	↓
T472	93.8	93.9	–	–	SB	↓	↓
T473	94.0	94.0	–	–	SB	20-601	#3
T474	93.6	93.8	–	–	SB	↓	↓
T475	93.5	93.5	–	–	SB	↓	↓
T476	94.1	94.1	–	–	SB	↓	↓
T477	94.1	94.1	–	–	SB	↓	↓
T478	94.1	94.1	–	–	SB		
T479	94.2	94.1	–	–	SB		
T480	96.7	96.6	–	–	SB		
T481	96.4	96.2	–	–	SB		
T482	96.4	96.2	–	–	SB		
T483	96.1	96.2	–	–	SB		
T484	96.5	96.5	–	–	SB		

Weight 1 Date/Time:
5/6 - 14:00
Weight 2 Date/Time:
5/14 - 13:00
Weight 3 Date/Time:
Weight 4 Date/Time:

Sample	Weight 1	Weight 2	Weigth 3	Weight 4	Initial	Project	Run
T485							
T486							
T487							
T488							
T489							
T490							
T491							
T492							
T493							
T494							
T495							
T496							
T497							
T498							
T499							
T500							
T501							
T502							

Weight 1 Date/Time:
Weight 2 Date/Time:
Weight 3 Date/Time:
Weight 4 Date/Time:

ASTM E2515 - O-Rings

Sample	Weight 1	Weight 2	Weigth 3	Weight 4	Initial	Project	Run
1A	~~3574.~~	3566.2	3566.7	3566.8	A	20-565	#4
1B	3554.6	3554.6	3555.0	-	A		
2A	3552.4	3552.5	-	-	A	20-601	#1
2B	3571.5	3571.6	-	-	A		
3A	3579.4	3579.8	-	-	A	20-601	#2
3B	3568.0	3568.2	-	-	A		
4A	3622.1	3623.6	3623.8	-	A	20-601	#3
4B	3579.9	3580.2	3580.4	-	A		
5A	3534.1	3534.9	3535.0	-	A		
5B	3530.6	3531.4	3531.5	-	A		

Weight 1 Date/Time: 4/23 16:00
Weight 2 Date/Time: 4/24 0830
Weight 3 Date/Time: 4/25 12:00
Weight 4 Date/Time:

Sample	Weight 1	Weight 2	Weigth 3	Weight 4	Initial	Project	Run
6A							
6B							
7A							
7B							
8A							
8B							
9A							
9B							
10A							
10B							

Weight 1 Date/Time:
Weight 2 Date/Time:
Weight 3 Date/Time:
Weight 4 Date/Time:

Sample	Weight 1	Weight 2	Weigth 3	Weight 4	Initial	Project	Run
11A							
11B							
12A							
12B							
13A							
13B							
14A							
14B							
15A							
15B							

Weight 1 Date/Time:
Weight 2 Date/Time:
Weight 3 Date/Time:
Weight 4 Date/Time:

Sample	Weight 1	Weight 2	Weigth 3	Weight 4	Initial	Project	Run
16A							
16B							
17A							
17B							
18A							
18B							
19A							
19B							
20A							
20B							

Weight 1 Date/Time:
Weight 2 Date/Time:
Weight 3 Date/Time:
Weight 4 Date/Time:

ASTM E2515 - O-Rings

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

Weight 1 Date/Time:
2/28 - 8:00

Weight 2 Date/Time:
2/28 - 15:30

Weight 3 Date/Time:
3/26 - 15:00

Weight 4 Date/Time:

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

Weight 1 Date/Time:
3/26 - 15:00

Weight 2 Date/Time:
3/31 - 15:00

Weight 3 Date/Time:
4/2 - 9:00

Weight 4 Date/Time:

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

Weight 1 Date/Time:
4/20 17:00

Weight 2 Date/Time:
4/21 16:30

Weight 3 Date/Time:

Weight 4 Date/Time:

Sample	Weight 1	Weight 2	Weigth 3	Weight 4	Initial	Project	Run
16A	3573.0	3573.1	-	-	[illegible]	20-597	#3
16B	3638.9	3638.8	-	-	[illegible]		
17A	3612.1	3612.2	-	-	[illegible]	20-597	#4
17B	3568.4	3568.5	-	-	[illegible]		
18A	3395.9	3396.1	-	-	[illegible]	20-565	#1
18B	3367.5	3367.7	-	-	[illegible]		
19A	3365.8	3366.0	-	-	[illegible]	20-565	#2
19B	3438.6	3438.8	-	-	[illegible]		
20A	3392.2	3392.4	-	-	[illegible]	20-565	#3
20B	3425.2	3425.4	-	-	[illegible]		

Weight 1 Date/Time:
4/20 17:00

Weight 2 Date/Time:
4/21 16:30

Weight 3 Date/Time:

Weight 4 Date/Time:

ASTM E2515 - Probes

Sample	Weight 1	Weight 2	Weigth 3	Weight 4	Initial	Project	Run
1A	115628.0	115627.9	-	-	A	20-565	#4
1B	115900.6	115900.4	-	-	L		
2A	116239.6	116238.5	-	-	A	20-601	#1
2B	116328.7	116328.5	-	-	L		
3A	116074.0	116073.9	-	-	A	20-601	#2
3B	116338.8	116338.9	-	-	L		
4A	116183.2	116182.0	[illegible]	116183.1	A	20-601	#3
4B	116366.4	116366.4	116366.6	-	L		
5A	116767.1	116766.8	116767.0	-	A		
5B	116874.9	116874.4	116874.6	-	L		

Weight 1 Date/Time:
4/23 17:00

Weight 2 Date/Time:
4/24 0830

Weight 3 Date/Time:
4/26 0930

Weight 4 Date/Time:

Sample	Weight 1	Weight 2	Weigth 3	Weight 4	Initial	Project	Run
6A							
6B							
7A							
7B							
8A							
8B							
9A							
9B							
10A							
10B							

Weight 1 Date/Time:

Weight 2 Date/Time:

Weight 3 Date/Time:

Weight 4 Date/Time:

Sample	Weight 1	Weight 2	Weigth 3	Weight 4	Initial	Project	Run
11A							
11B							
12A							
12B							
13A							
13B							
14A							
14B							
15A							
15B							

Weight 1 Date/Time:

Weight 2 Date/Time:

Weight 3 Date/Time:

Weight 4 Date/Time:

Sample	Weight 1	Weight 2	Weigth 3	Weight 4	Initial	Project	Run
16A							
16B							
17A							
17B							
18A							
18B							
19A							
19B							
20A							
20B							

Weight 1 Date/Time:

Weight 2 Date/Time:

Weight 3 Date/Time:

Weight 4 Date/Time:

ASTM E2515 - Probes

Sample	Weight 1	Weight 2	Weigth 3	Weight 4	Initial	Project	Run
1A	115627.7	115627.5	–	–	SB	20-585	sample blank
1B	115900.5	115900.5	–	–	SB		
2A	116239.8	116239.3	116239.5	–	SB	20-585	#1
2B	116329.0	116329.6	116328.8	–	SB		
3A	116074.3	116074.0	116074.1	–	SB	20-585	#2
3B	116339.5	116338.9	116339.1	–	SB		
4A	116183.2	116183.1	–	–	SB	20-585	#3
4B	116366.8	116366.5	116366.7	–	SB		
5A	116767.0	116766.5	116767.0	116766.9	SB	20-583	#1
5B	116874.7	116874.1	116879.9	–	SB		

Sample	Weight 1	Weight 2	Weigth 3	Weight 4	Initial	Project	Run
6A	116543.7	116543.6	–	–		20-583	#2
6B	116118.2	116118.1	–	–			
7A	116739.4	116739.3	–	–		20-583	#3
7B	117286.7	117286.5	–	–			
8A	116829.5	116289.6	–	–		20-592	#1
8B	116826.3	116826.3	–	–			
9A	116713.6	116713.8	–	–		20-592	#2
9B	117919.3	117919.3	–	–			
10A	116819.6	116819.6	–	–		20-592	#3
10B	117903.5	117903.6	–	–			

Sample	Weight 1	Weight 2	Weigth 3	Weight 4	Initial	Project	Run
11A	117035.6	117035.8	–	–		19-471	#1
11B	117489.5	117489.7	–	–			
12A	116889.1	116889.3	–	–		19-471	#2
12B	117941.5	117941.7	–	–			
13A	117455.8	117455.9	–	–		19-471	#3
13B	117054.9	117054.9	–	–			
14A	116818.0	116818.0	–	–		20-597	#1
14B	116771.9	116771.8	–	–			
15A	117418.0	117418.0	–	–		20-597	#2
15B	116904.8	116905.0	–	–			

Sample	Weight 1	Weight 2	Weigth 3	Weight 4	Initial	Project	Run
16A	116537.5	116537.3	–	–		20-597	#3
16B	116034.1	116034.0	–	–			
17A	116810.5	116810.5	–	–		20-597	#4
17B	117139.0	117138.9	–	–			
18A	117496.9	117496.5	–	–		20-565	#1
18B	117329.6	117329.5	–	–			
19A	117025.3	117025.1	–	–		20-565	#2
19B	117011.9	117011.7	–	–			
20A	115625.7	115625.5	–	–		20-565	#3
20B	115964.9	115964.7	–	–			

Weight 1 Date/Time:
2/27 - 15:30

Weight 2 Date/Time:
2/28 - 8:00

Weight 3 Date/Time:
2/28 - 15:30

Weight 4 Date/Time:
3/26 - 15:00

Weight 1 Date/Time:
3/26 - 15:00

Weight 2 Date/Time:
3/30 15:30

Weight 3 Date/Time:

Weight 4 Date/Time:

Weight 1 Date/Time:
4/20 17:00

Weight 2 Date/Time:
4/21 16:30

Weight 3 Date/Time:

Weight 4 Date/Time:

Weight 1 Date/Time:
4/22 17:00

Weight 2 Date/Time:
4/24 0830

Weight 3 Date/Time:

Weight 4 Date/Time:

Manufacturer: Greentech
Model: RS7200E
Date: 05/01/20
Run: 1
Control #: 20-565
Test Duration: 218 min

	HHV	LHV
Eff	91.02%	97.46%
Comb Eff	97.79%	97.79%
HT Eff	93.08%	99.65%
Output	124,303	kJ/h
Burn Rate	6.95	kg/h
Grams CO	537	g
Input	136,564	kJ/h
MC wet	18.20	

Note: In the "Input data", "Calc. % O_2", "Fuel Properties", and "Mass Balance" columns, [e], [d], [g], [a], [b], [c], [h], [u], [w], [j], and [k] refer to their respective variables in Clauses 13.7.3 to 13.7.5.

Ultimate CO_2
$CO_{2\,ult}$ 20.23
F_0 1.030

Overall Heating Efficiency: 91.02%
Combustion Efficiency: 97.79%
Heat Transfer Efficiency: 93.08%

Air Fuel Ratio (A/F)		
Dry Molecular Weight (M_d)	29.78	%HC
Dry Moles Exhaust Gas (N_t):	510.90	0.88
Air Fuel Ratio (A/F)	9.80	

Heat Output: 117,915 Btu/h 124,303 kJ/h
Heat Input: 129,545 Btu/h 136,564 kJ/h
Burn Duration: 3.63 h
Burn Rate: 15.31 lb/h 6.946 kg/h
Stack Temp: 259.9 Deg. F 126.6 Deg. C

Combustion Efficiency: 97.79%
Total Input (kJ): 496,181 470,604 (Btu)
Total Output (kJ): 451,634 428,353 (Btu)
Efficiency: 91.02%
Total CO (g): 536.61

Moisture of Wood (wet basis): 18.1989
Initial Dry Weight Wt_{do} (kg): 25.24
Moisture Content Dry 22.25

Moisture Content M_{Cwb}: 18.19888
Dry kg : 25.24
CA: 51
HY: 6
OX: 41.99

Load Weight (kg): 30.85
Fuel Heating Value in kj/kg - CV: HHV 19,660 LHV 18,362
Btu/lb HHV 8458.0 LHV 7899.5

Elapsed Time	Weight Remaining (kg)	% CO [e]	% CO_2 [d]	Excess Air EA	Total O_2	Calc. % O_2 [g]	Flue Gas (°C)	Room Temp (°C)	Combust Eff %	Heat Transfer %	Net Eff %	Air Fuel Ratio	Wet Wt Now Wt	% Wet Consumed x	Dry Wt. Now Wt_{do}	% Dry Comsumed y	Total Input
Averages	0.32	8.00	20.32	20.65	12.49	126.70	21.56	100.9%	42.0%	#DIV/0!	158.51	11.79	61.79	10.25	59.38	525931	
0	30.85	0.54	6.01	208.9%	20.71	14.43	143.9	21.7	93.4%	76.1%	71.1%	18.7	30.85	0.00	25.24	0.00	0
1	30.76	0.19	12.00	66.0%	20.51	8.42	145.0	22.2	98.8%	82.7%	81.7%	10.2	30.76	0.29	25.16	0.29	1824
2	30.72	0.14	16.98	18.2%	20.34	3.29	144.4	22.2	99.3%	84.6%	84.1%	7.3	30.72	0.44	25.13	0.44	2189
3	30.49	0.08	14.42	39.5%	20.43	5.97	144.4	22.2	99.6%	83.8%	83.5%	8.6	30.49	1.18	24.94	1.18	2554
4	30.40	0.10	13.70	46.6%	20.46	6.71	145.6	22.2	99.5%	83.5%	83.1%	9.0	30.40	1.47	24.87	1.47	2919
5	30.13	0.07	13.60	48.0%	20.46	6.83	146.1	22.2	99.7%	83.4%	83.2%	9.1	30.13	2.35	24.64	2.35	7297
6	29.49	0.05	13.52	49.1%	20.47	6.92	146.7	22.2	99.8%	83.4%	83.2%	9.1	29.49	4.41	24.12	4.41	4743
7	29.54	0.11	13.67	46.8%	20.46	6.73	147.2	22.2	99.4%	83.4%	82.9%	9.0	29.54	4.26	24.16	4.26	2919
8	29.13	0.09	13.41	49.9%	20.47	7.01	147.2	21.7	99.6%	83.2%	82.9%	9.2	29.13	5.59	23.83	5.59	4378
[illegible]																	

Elapsed Time	Carbon /12= [a]	Hydrogen /1= [b]	Oxygen /16= [c]	Calorific Value	Mw Moisture Fuel Burnt	[h]	[u]	[w]	[j]	[k]	kg Wood per 100 mole dfp Nk	CO_2	O_2	CO	HC	N_2	H_2O	Moisture Present
Averages	4.22	6.02	2.62	19660.00	18.20	79.19	21.01	1.98	5.90	0.02	0.20	40.71	1106.77	3.32	-1.24	4344.29	33.00	12.36
0	4.22	6.02	2.62	19660.00	18.20	79.02	20.96	1.56	4.60	0.05	0.15	38.93	93.49	3.50	0.34	511.91	29.82	12.36
1	4.22	6.02	2.62	19660.00	18.20	79.39	21.06	2.89	8.68	0.01	0.29	42.06	29.51	0.67	0.05	278.29	30.42	12.36
2	4.22	6.02	2.62	19660.00	18.20	79.59	21.11	4.06	12.19	0.01	0.40	42.39	8.22	0.35	0.04	198.70	30.44	12.36
3	4.22	6.02	2.62	19660.00	18.20	79.53	21.09	3.44	10.34	0.00	0.34	42.54	17.62	0.24	0.01	234.58	30.50	12.36
4	4.22	6.02	2.62	19660.00	18.20	79.49	21.09	3.27	9.84	0.00	0.32	42.46	20.79	0.31	0.01	246.35	30.49	12.36
5	4.22	6.02	2.62	19660.00	18.20	79.50	21.09	3.24	9.75	0.00	0.32	42.56	21.37	0.22	0.00	248.80	30.52	12.36
6	4.22	6.02	2.62	19660.00	18.20	79.51	21.09	3.21	9.68	0.00	0.32	42.63	21.82	0.16	-0.01	250.71	30.54	12.36
7	4.22	6.02	2.62	19660.00	18.20	79.49	21.08	3.27	9.82	0.00	0.32	42.42	20.90	0.34	0.02	246.66	30.48	12.36
8	4.22	6.02	2.62	19660.00	18.20	79.49	21.08	3.20	9.63	0.00	0.32	42.49	22.22	0.29	0.01	251.84	30.50	12.36
[illegible]																		

Elapsed Time	Stack Temp K	CO_2	O_2	CO	N_2	CH_4	H_2O	Room Temp K	CO_2	O_2	CO	N_2	CH_4	H_2O Comb	H_2O Fuel MC	Total Loss Rate	Total Loss	Chemical Loss 1	Sensible and Latent Loss	Total Output	Chem Loss 2	CO (g)	HC (g)
Averages / Sums	399.85	4172.37	3146.89	3061.81	3027.52	4001.48	3664.48	294.71	37258.49	513477.96	207307.37	1977548.42	-243125.51	343473.89	128935.62	13538.25	47692.19	14089.70	33602.5	478238.4	10944.5	536.6	155.8
0	417.04	4872.01	3664.88	3563.41	3524.00	4693.69	4264.06	294.82	189.69	342.63	1002.32	1803.96	308.43	1438.43	596.16	5681.62	0.00	0	0.00	0	0	0.00	0.00
1	418.15	4897.12	3682.46	3580.18	3540.66	4720.76	4284.03	295.37	205.99	108.68	190.86	985.33	42.55	1467.70	596.40	3597.52	333.80	21	312.39	1490	21	1.73	0.07
2	417.59	4873.98	3665.49	3563.79	3524.42	4697.50	4264.45	295.37	206.62	30.13	100.16	700.29	32.36	1468.21	596.16	3133.93	348.95	15	334.35	1840	15	1.09	0.06
3	417.59	4873.98	3665.49	3563.79	3524.42	4697.50	4264.45	295.37	207.32	64.59	67.62	826.77	5.19	1471.14	596.16	3238.79	420.73	9	411.38	2133	9	0.86	0.01
4	418.71	4920.28	3699.43	3596.57	3556.89	4744.04	4303.61	295.37	208.90	76.91	88.81	876.22	10.06	1471.80	596.65	3329.35	494.27	15	479.77	2424	15	1.29	0.03
5	419.26	4943.44	3716.40	3612.97	3573.12	4767.34	4323.19	295.37	210.40	79.41	62.78	888.99	-2.10	1473.71	596.89	3310.09	1228.53	22	1206.30	6068	22	2.28	-0.01
6	419.82	4966.61	3733.38	3629.36	3589.36	4790.65	4342.77	295.37	211.73	81.48	45.19	899.88	-10.41	1475.21	597.13	3300.21	796.17	8	787.90	3947	8	1.06	-0.04
7	420.37	4989.79	3750.36	3645.76	3605.60	4813.98	4362.36	295.37	211.67	78.37	97.84	889.36	13.85	1473.19	597.37	3361.65	499.07	16	482.68	2420	16	1.42	0.04
8	420.37	5010.95	3766.71	3661.77	3621.41	4833.42	4381.55	294.82	212.90	83.70	81.74	912.00	4.99	1474.73	597.61	3367.67	749.94	19	730.87	3628	19	1.78	0.02
[illegible]																							

215	0.45	0.62	3.56	384.1%	20.79	16.92	130.0	21.1	88.2%	69.9%	#DIV/0!	29.0	0.45	98.53	0.43	98.29	0	4.22	6.02	2.62	19660.00	18.20	78.90	20.93	1.00	2.90	0.06	0.10	35.91
216	0.50	0.60	3.55	387.6%	20.80	16.95	129.4	21.1	88.6%	70.0%	#DIV/0!	29.3	0.50	98.38	0.47	98.12	0	4.22	6.02	2.62	19660.00	18.20	78.90	20.93	1.00	2.89	0.06	0.10	36.09
217	0.45	0.51	3.34	425.6%	20.81	17.21	129.4	21.1	89.7%	68.9%	61.8%	31.6	0.45	98.53	0.43	98.29	8887	4.22	6.02	2.62	19660.00	18.20	78.94	20.94	0.92	2.69	0.04	0.09	36.68
218	0.00	0.53	3.30	428.3%	20.81	17.24	128.9	21.1	89.2%	68.7%	61.3%	31.8	0.00	100.00	0.00	100.00	4232	4.22	6.02	2.62	19660.00	18.20	78.93	20.94	0.92	2.67	0.05	0.09	36.41

215	170.73	6.25	0.61	795.88	29.29	12.36	403.15	4317.71	3257.99	3170.27	3134.69	4137.62	3794.41	294.26	155.06	556.22	1789.78	2494.84	546.15	1399.01	590.35	7531.43	0.00	0.00	0.00	0	100	0.00	0.00
216	172.27	6.10	0.59	802.18	29.34	12.36	402.59	4294.81	3241.10	3153.93	3118.51	4114.82	3774.88	294.26	155.00	558.35	1745.46	2501.61	524.69	1400.73	590.11	7475.96	0.00	0.00	0.00	0	-97	0.00	0.00
217	189.03	5.60	0.49	867.03	29.53	12.36	402.59	4294.81	3241.10	3153.93	3118.51	4114.82	3774.88	294.26	157.55	612.67	1602.87	2703.83	439.30	1409.85	590.11	7516.18	3397.76	914.28	2483.48	5490	87	70.90	3.55
218	190.21	5.85	0.52	870.77	29.46	12.36	402.04	4271.92	3224.21	3137.59	3102.33	4092.04	3755.35	294.26	155.53	613.28	1673.04	2701.41	468.35	1406.17	589.87	7607.65	1637.76	456.58	1181.17	2595	913	35.25	1.80

Sample Calculations – ASTM E2780 & E2515

Client:	Greentech
Model:	RS7200E
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/ft^3

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

M_{Sdb} – Weight of test fuel spacers, dry basis, kg
ASTM E2780 equation (1)

$$M_{Sdb} = (M_{Swb})(100/(100 + FM_S))$$

Where,

FM_S = average fuel moisture of test fuel spacers, % dry basis

M_{Swb} = weight of test fuel spacers, wet basis, kg

Sample Calculation:

FM_S = ##### %

M_{Swb} = ##### lbs

0.4536 = Conversion factor from lbs to kg

M_{Sdb} = [(### x 0.4536) (100/(100 + ####)

M_{Sdb} = ##### kg

M_{Cdb}– Weight of test fuel crib, excluding nails and spacers, dry basis, kg
ASTM E2780 equation (2)

$$M_{Cdb} = \Sigma[(M_{CPnwb})(100/(100 + FM_{CPn}))]$$

Where,

M_{CPnwb} = weight of each test fuel piece n in fuel crib, excluding nails and spacers, wet basis, kg

FM_{CPn} = Average fuel moisture of test fuel n in fuel crib, % dry basis

Sample Calculation (test fuel piece 1):

MC_{Pnwb} = ####

FM_{CPn} = ####

= #### (100/(100+ ####)

= #### lbs

Total dry crib weight, excluding spacers = 57.26 lbs

M_{Cdb} = **25.97** kg

D_{Cdb} - Density of fuel crib, excluding spacers and nails, dry basis, lbs/ft^3
ASTM E2780 equation (3)

$$D_{Cdb} = M_{Cdb}/V_C$$

Where,

V_C = Volume of fuel crib, ft^3

Sample calculation:

V_C = #REF! in^3

1728 = conversion from in^3 to ft^3

D_{Cdb} = 57.26 / #REF! * 1728

= **#REF!** lbs/ft^3

M_{FTAdb} - Total weight of fuel crib excluding nails, dry basis, kg
ASTM E2780 equation (4)

$$M_{FTAdb} = M_{Sdb} + M_{Cdb}$$

Sample calculation:

$$M_{FTAdb} = \#\#\#\# + 25.97$$

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

BR – dry burn rate, kg/hr
ASTM E2780 equation (5)

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

Where,

θ = Total length of test run, min

Sample Calculation:

M_{Bdb} = ####### kg
θ = 218 min

$$BR = \frac{60 \times ####}{218}$$

BR = ####### kg/hr

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 H_2O
T_s	=	Absolute average gas temperature in the dilution tunnel, °R; (°R = °F + 460)
P_s	=	Absolute average gas static pressure in dilution tunnel, = P_{bar} + P_g , in Hg
P_{bar}	=	Barometric pressure at test site, in. Hg
P_g	=	Static pressure of tunnel, in. H_20; (in Hg = in H_20/13.6)
M_s	=	
		**The dilution tunnel wet molecular weight; M_s = 28.78 assuming a dry weight of 29 lb/lb-mole

Sample calculation:

$$Fp = \frac{13.25}{14.17} = 0.935$$

$$V_s = 0.935 \times 85.49 \times 0.99 \times 0.237 \times \left(\frac{88.1 + 460}{\left(28.47 + \frac{-0.16}{13.6}\right) \times 28.78} \right)^{1/2}$$

V_s = **15.32** ft/s

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

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

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

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

Where:

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

Sample calculation:

$$Q_{sd} = 3600 \times (1 - 0.02) \times 15.32 \times 0.7854 \times \frac{528}{88.1 + 460} \times \frac{28.47 + \frac{-0.16}{13.6}}{29.92}$$

Q_{sd} = **38885.8** dscf/hr

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

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

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_2O
T_m	=	Absolute average dry gas meter temperature, °R

Sample Calculation:

Using equation for Train 1:

$$V_{m(std)} = 17.64 \times 32.665 \times 0.992 \times \frac{\left(28.47 + \frac{0.94}{13.6}\right)}{(87.4 + 460)}$$

$V_{m(std)}$ = **29.796** dscf

Using equation for Train 2:

$$V_{m(std)} = 17.64 \times 35.220 \times 1.002 \times \frac{\left(28.47 + \frac{1.06}{13.6}\right)}{(88.3 + 460)}$$

$V_{m(std)}$ = **32.406** dscf

Using equation for ambient train:

$$V_{m(std)} = 17.64 \times 62.64 \times 0.996 \times \frac{\left(\underline{28.465} + \frac{0.00}{13.6}\right)}{(70.8 + 460)}$$

$V_{m(std)}$ = **59.018** dscf

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

$$m_n = m_p + m_f + m_g$$

Where:

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

Sample Calculation:

Using equation for Train A (first hour):

m_n = 0.0 + 0.0 + 0.0

m_n = **0.0** mg

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

m_n = 0.3 + 2.4 + 0.0

m_n = **2.7** mg

Train A aggregate:

m_n = 0.0 + 2.7
m_n = **2.7** mg

Using equation for Train B:

m_n = 0 + 1.5 + 0

m_n = **1.5** mg

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

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

Where:

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

Sample calculation:

For Train 1:

$$C_s = 0.001 \times \frac{2.7}{29.80}$$

C_s = **0.00009** g/dscf

For Train 2

$$C_s = 0.001 \times \frac{1.5}{32.41}$$

C_s = **0.00005** g/dscf

For Ambient Train

$$C_r = 0.001 \times \frac{0.0}{59.02}$$

C_r = **0.000000** g/dscf

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

$$E_T = (c_s - c_r) \times Q_{std} \times \theta$$

Where:

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

Sample calculation:

For Train 1

E_T = (0.000091 - 0.000000) x 38885.8 x 218 /60

E_T = **12.80** g

For Train 2

E_T = (0.000046 - 0.000000) x 38885.8 x 218 /60

E_T = **6.54** g

Average

E = **9.67** g

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

7.5% of the average =	**0.73**
Train 1 difference =	**3.13**
Train 2 difference =	**3.13**

PR - Proportional Rate Variation

ASTM E2515 equation (16)

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

Where:

θ = Total sampling time, min

θ_i = Length of recording interval, min

V_{mi} = Volume of gas sample measured by the dry gas meter during the “ith” time interval, dcf

V_m = Volume of gas sample as measured by dry gas meter, dcf

V_{si} = Average gas velocity in the dilution tunnel during the "ith" time interval, ft/sec

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

T_{mi} = Absolute average dry gas meter temperature during the "ith" time interval, ^oR

T_m = Absolute average dry gas meter temperature, ^oR

T_{si} = Absolute average gas temperature in the dilution tunnel during the "ith" time interval, ^oR

T_s = Absolute average gas temperature in the dilution tunnel, ^oR

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

$$PR = \left(\frac{218 \times 0.142 \times 15.32 \times (97.0 + 460) \times (87.4 + 460)}{1 \times 32.665 \times 15.44 \times (88.1 + 460) \times (72.0 + 460)} \right) \times 100$$

PR = **98** %

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 (Dual train average) = 9.67 g

θ = 218 min

$PM_R = 60 \times (9.67 / 218)$

PM_R = **2.66** 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:

E_T (Dual train average) = 9.67 g

M_{Bdb} = ###### kg

PM_F = 9.67 / ####

PM_F = ###### g/kg

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INTRODUCTION

Greentech Manufacturing would like to thank you for your recent purchase of a Crown Royal Stove. We sincerely appreciate the trust you have placed in us and we look forward to continuing to serve you. We know that you will be pleased with our continued commitment to your satisfaction while you enjoy the benefits of heating with a Crown Royal Stove. Crown Royal Stoves are manufactured with quality workmanship and designed to offer you value now and for years to come. We are so confident in the quality of our furnace each Crown Royal Stove comes with a 20 year limited warranty.

To ensure maximum benefits from your furnace, read the complete manual prior to using or installing your furnace.

Always keep this manual for future references.

Crown Royal Stoves – EPA 2020 Step 2 Certified
U.S. ENVIRONMENTAL PROTECTION AGENCY Certified to comply with the 2020 particulate emission standards using cord wood.

7200E: Tested to ASTM E2618-13, average emission rate .08 lbs/mmbtu, maximum emission rate 0.120 lbs/mmbtu.
7300E: Tested to ASTM E2618-13, average emission rate .08 lbs/mmbtu, maximum emission rate 0.118 lbs/mmbtu.
7400E: Tested to ASTM E2618-13, average emission rate .06 lbs/mmbtu, maximum emission rate 0.069 lbs/mmbtu.

The outdoor series furnaces are designed to be located next to your firewood storage for convenience and is normally filled once or twice a day, depending on the temperature outside. Our outdoor series furnaces are often used to heat residential home, garages, shops, barns, businesses, greenhouses, swimming pools, spas, domestic hot water, radiant in-floor heat, and snow melt applications.

Model	7200E	7300E	7400E
Estimated Btu's*	125,000	221,000	325,000
Heating Capacity**	2,000-3,000 sq ft	4,000 – 5,000 sq ft	8,000-10,000 sq ft
Dimensions (L X W X H)	70" x 47" x 71-1/2" plus chimney length	76" x 49" x 80-1/2" plus chimney length	84" x 53" x 86-1/2" plus chimney length
Approx Weight	1950 lbs	2650 lbs	2950 lbs
Firebox Length	28"	32"	36"
Wood Load Capacity	26"	30"	34"
Chimney Size	6"	6"	8"
Firebox Door Size (L X H)	18" x 18"	20" x 24"	22" x 26"
Supply/Return Size	1-1/4" (1 Each)	1-1/4" (2 Each)	1-1/4" (2 Each)
Water Capacity	180 Gallons	235 Gallons	290 Gallons
Electrical Rating	115 VAC/60HZ/1 PH	115 VAC/60HZ/1 PH	115 VAC/60HZ/1 PH

*Btu's are estimated and will vary with the type of wood burned.
**Ensure to properly size unit to buildings thermal demands.

Crown Royal High Efficiency Wood Gasification Furnaces are designed to burn only clean, dry wood. Clean wood means wood that has no paint, stains, or other type of coatings. It also includes wood that has not been treated with preservatives, including but not limited to, copper chromium arsenate, creosote or pentachlorophenol. Wood must be cured between 6-9 months and dried to 20% moisture or less.

Warranty will be voided if the furnace is used to burn materials for which the unit is not certified by the EPA and void if not operated according to the owner's manual. Burning any other material other than "Clean, Dry Wood" will VOID warranty.

For Outdoor Use Only!

This wood heater needs periodic inspection and repair for proper operation. It is against federal regulations to operate this wood heater in a manner inconsistent with operating instructing in this manual.

BEST BURN PRACTICES

Learn how to get the best burn possible from your Crown Royal Stove.

Instructions – Read and follow all operating instructions supplied by Greentech Manufacturing, Inc.

Fuels – Only burn clean wood, which is the only approved fuel in your Crown Royal Stove. Burning materials not recommended play a major role in visible emissions. Never burn: trash, plastics, gasoline, rubber, naphtha, household garbage, material treated with petroleum products, particle board, railroad ties, pressure treated wood, leaves, paper products and cardboard.

Loading of Fuels – Burning wood creates visible emissions. In order to complete the combustion process, there is a minimum amount of space needed. For instance, if a person were to load a relatively small firebox completely and load a larger firebox with the same amount of fuel, with all of the other factors being the same, the larger firebox would burn cleaner. In the smaller firebox, the combustion process does not have enough room to expand heat up and mix before exiting the firebox (insufficient time, temperature and turbulence). Just because a firebox is large does not mean that is should be filled completely. This large volume is used in part for what happens after it is loaded. Fireboxes should be loaded based on outdoor temperatures, and anticipated heat load required to maintain sufficient levels to ensure the fire doesn't go out before next fill.

Starting – Always start fire with wood kindling to eliminate unnecessary smoke. Never use gasoline, lighter fluids, chemicals, or oils.

Furnace Sizing – The size of a furnace should be large enough to provide sufficient heat without constant reloading. Targeted burn times are around 12 hours; an adequately sized furnace will provide enough heat for 90% of all heating days. Inadequate size of furnace will lead to unattended fires that leave colder fireboxes and relighting will be dirtier because the flame quenching on the cool firebox walls. A good rule to follow is that if the furnace cannot stay within 20% of its set temperature under regular reloading, then the unit is undersized and larger furnace is needed.

Operation – Improper combustion air can be associated with several factors. The air inlet and chimney may be restricted by debris (creosote, ash, etc). The blower starts and stops properly and runs at proper speed. The door seal is in satisfactory condition.

Maintenance – Excessive creosote buildup can be a result of restricted air flow from combustion fan, flame baffle or chimney blockage.

Local and State Regulations – Always remember to comply with all applicable state and local codes.

DANGER!!! Do not start fire with chemicals, volatile fluids, rubber, plastics or garbage. Some processed wood contain resins and should be avoided. Only competent persons with a sound understanding of this heating method should operate this furnace. Improper firing could result in personal injury and/or damage to unit, and void warranty. Do not burn garbage, gasoline, drain oil, naphtha, engine oil, railroad ties, particle board, leaves, cardboard, or any other flammable liquids.

ADDITIONAL INSTALLATION AND OPERATIONAL CONSIDERATIONS

Installation

Person (s) operating a Crown Royal Stove must comply with all applicable laws or other requirements, such as state laws or regulations and local ordinances. Person (s) is/are also responsible for operation in a manner that does not create a public or private nuisance condition. The distance and stack height Greentech Manufacturing recommends and the requirements in any applicable laws or other requirements may not always be adequate to prevent nuisance conditions due to terrain or other factors.

The EPA offers tips on how to properly use a moisture meter to test firewood before using in a wood-burning stove or fireplace. Wet wood can create excessive smoke which is wasted fuel.

The EPA's Burnwise Program
http://www.epa.gov/burnwise

How to Use a Moisture Meter Video
http://www.youtube.com/watch?v=jM2WGgRcnm0

The EPA offers four simple steps to properly dry firewood before using in a wood-burning stove or fireplace. Wet wood can create excessive smoke which is wasted fuel. Burning dry, seasoned firewood with a moisture content of 20% or less can save money and help reduce harmful air pollution.

Split, Stack, Cover and Store Video
http://www.youtube.com/watch?v=yo1--Zrh11s

This tri-fold brochure provides colorful illustrations of the four easy steps to dry firewood.

Wet Wood is a Waste Brochure
http://www.epa.gov/burnwise/pdfs/wetwoodwastebrochure.pdf

GUIDE TO BURNING WOOD

The quality of the firewood you burn can have a big effect on the overall performance and efficiency of your furnace. The main factors that affect the burning characteristic of firewood are moisture, tree species, and size. It is important that you understand and follow our guidelines when choosing wood as a fuel source.

Fresh cut wood will have a moisture content between 35 and 50 percent by weight. If you try to burn wet wood, it will not only be difficult to ignite but will hiss and sizzle in the firebox. Burning wet wood consumes energy that will normally be used to efficiently complete the combustion process. Properly seasoned wood will ignite easily and burn efficiently. Hardwoods like oak and maple dry more slowly than softer woods like spruce and poplar. Properly seasoned wood would have a moisture content of less than 20%. Firewood dries slowly and may take a full year or more to season.

Ways to tell if firewood is dry enough to burn:

- Test wood with a moisture meter. Moisture meters can be purchased at a local hardware store for around $25.00.
- Wood darkens with aging, from white or cream in color to yellow or gray.
- There are cracks in the end grain.
- Banging two pieces together, dry wood sounds hollow. While wet wood sounds dull.
- Split a piece and if the fresh surface feels damp and cool, the wood is wet. If it feels dry and warm it is seasoned.
- When you burn it, if it hisses, it is too wet.

Types of Wood:

Wood can be classified as softwood or hardwood. Pines, spruces and firs are common softwoods and oaks, elms, birches, and maples are hardwoods. Softwoods burn rapidly and are more resinous than the hardwoods; therefore, they will cause a greater creosote build-up. Hardwoods produce a long-lasting fire with uniform heat. Hardwoods are the most desirable and are used by the majority of wood burners.

Proper Wood Storage:

1. Cut the wood to the desired length. It should easily fit in your firebox.
2. Split your wood before stacking it – Splitting the wood in advance of stacking it increases exposure to air, which improves drying time.
3. Check the moisture content – Place the moisture meter tip into the longest side of a piece of split wood. (Goal is 20% moisture content)
4. Stack your wood in alternate directions – Spacing is needed to provide better circulation and helps in the drying process.
5. Store your wood off the ground – Store wood six inches or more off the ground to prevent moisture.
6. Cover wood, but leave the sides exposed – Use a tarp or best option is to build a structure that has a roof. If using a tarp, make sure your sides are open, so moisture is not trapped.
7. Properly seasoned wood could take up to 12 months or more to dry.
8. Storage of your wood must be in a debris free, dry environment that is at least sixty (60) inches from the front of the stove and thirty-six (36) inches from the sides or back of the stove.

Purchasing Wood:

A cord of wood is a ranked stack of logs 4’ x 4’ x 8’. Usually when you purchase firewood, it is sold by the “face cord”. A face cord is a ranked stack of logs 4 feet high, 16 inches deep and 8 feet long. Wood is sometimes sold by the ton; a ton of dry hardwood is equivalent to approximately ½ full cord. Whenever possible it is best to burn hardwood that has been split and air dried for one year.

SAFETY INSTRUCTIONS & PRECAUTIONS

- All installation and operation must follow federal, provincial, state, and local codes for wire plumbing, and installing a chimney.
- All work must be performed by qualified personnel only.
- Read and understand all precautions before operating the furnace.
- The furnace is not to be used as a standalone unit. It is recommended that a backup system be in place.
- Retain this manual for as long as you own your Crown Royal Stove. Carefully read and follow these directions.
- Regularly read over this manual to keep you informed.

DANGER!!! Do not start fire with chemicals, volatile fluids, rubber, plastics or garbage. Some processed wood can contain resins and should be avoided. Only competent persons with a sound understanding of this heating method should operate this furnace. Improper firing could result in personal injury and/or damage to unit, and void warranty. Do not burn garbage, gasoline, drain oil, naphtha, engine oil, railroad ties, particle board, leaves, cardboard, or any other flammable liquids.

WARNINGS!!

- All installations and operations of your furnace must follow STATE, PROVINCIAL and LOCAL LAWS pertaining to operations, wiring, plumbing, and building codes. The installation must be performed by a qualified installer.
- Only burn wood in this unit. (Check with provincial, state and local regulations that obtain to banned fuels in designated locations.)
- Only use wood with 20% or less moisture content.
- Do not install this unit on a combustible surface.
- All models operate at atmospheric pressure. DO NOT obstruct, block or plug the overflow vent tube in any way, which is located on top of the furnace.
- This unit cannot be hooked to a chimney that is already serving another appliance. When installing a chimney that is higher than twelve feet, guidelines must be used.
- This unit must never be pressurized.
- Do not use an automatic stoker with this unit.
- Risk of fire: Do not operate with fuel loading heat exchanger door or secondary combustion door open.
- Do not store fuel or other combustible materials within marked installation clearances.
- Inspect, clean flues and chimney regularly.
- All cover plates, enclosures, and guards must be always maintained in place, except during maintenance and servicing.

CAUTIONS!!!

- Hot Surfaces: Keep children away. Do not touch during operation.
- Do not start or operate furnace without checking heating fluid.
- Check for buried cables and utility lines before digging trench.
- For safety and proper temperature control, keep fuel door closed tightly during operation.
- Do not fire up furnace until filled with water.
- Do not start the unit during a prolonged power failure
- Load fuel carefully to avoid injury to hands, fingers and other body parts that may come in contact with the unit's loading door opening.
- Cleaning of the heat exchanger, flue pipe, chimney and combustion motor if used, is especially important at the end of the heating season to minimize corrosion during the summer months caused by accumulated ash.
- Do not open secondary combustion door while in operation. Doing so will result in fire hazard and/or severe burns.
- Always check for adequate water levels.

PRECAUTIONARY LABELING

Please read and follow these precautionary labels that are also found on the outdoor furnace.

INSTALLATION

ALL INSTALLATIONS AND OPERATIONS MUST FOLLOW FEDERAL, PROVINCIAL, STATE, AND LOCAL CODES FOR WIRING, PLUMBING AND INSTALLING THE CHIMNEY. ALL WORK MUST BE PERFORMED BY QUALIFIED PERSONNEL ONLY.

Location

When choosing the location of your furnace you should consider: prevailing wind direction, distance from home for refueling and storage, and give consideration for any effect on your neighbors. Check with your homeowner's insurance company to ensure they will approve the location relative to the distance from building and combustibles. We recommend a minimum of 25 feet from any building.

Minimum Clearances to Combustibles

Sides	Front	Back	Top	Chimney Connections
36 Inches	60 Inches	36 Inches	12 Inches	60 Inches

Adhere to minimal clearances to combustibles stated in manual and accordance with local, state, provincial, and federal building, and fire codes.

Prior to installation, contact your insurance provider to ensure that installation is in compliance to regulations and all terms have been met.

Storage of your solid fuel must be in a debris free, dry environment that is at least sixty (60) inches from the front of the stove and thirty-six (36) inches from the sides or back of the stove.

WARNING!!! Do not store fuel or other combustible materials within marked installation clearances.

When installing a furnace in a building, outside combustion air is needed. To prevent negative pressure, ensure that there is an adequate source of fresh air to offset the demand of the furnace and other appliances that will draw air from the area they are located. Follow the steps below to prevent negative pressure:

1. Determine the volume of space in the area. This can be calculated by Length (FT) x Width (FT) x Hight (FT) = Volume (CF) *Include all open areas not closed off by doors.
2. Determine the air input needs for all servicing appliances then add them together and rounding result to the nearest 1000 BTU per hour.
3. Divide the total volume by the total air input requirements and determine if you have a "Confined" or "Unconfined" area with the following results:
    a. Results of equal to or greater then 50CF/1000 BTU per Hour: "Unconfined"
    b. Results of less than 50CF/1000 BTU per Hour "Confined"

With results of "Confined" space additional source of air is required. On some installations of "Unconfined" spaces where building has unusually tight construction it might be necessary for additional source of air to also be required

Ground Rod Installation

A properly installed ground rod safe guard electrical equipment and prevent electrolysis in your outdoor furnace. Electrolysis is the decomposition of water into oxygen and hydrogen gasses when an electric current passes through the water. Free oxygen in the water tank will promote rust and over time cause leaks and furnace failure.

Installing a ground rod and connecting to furnace:

1. Near the furnace leg, drive 8' grounding rod into the ground until it is close to the surface.
2. Install a grounding terminal on the closest stove leg to the grounding rod with self-tapping screws.
3. Secure a ground rod clamp to the grounding rod.
4. Run a ground wire between these two terminals and secure the wire.

Foundation: Blocks or Concrete Pad

Inspect the ground conditions that you intend to install your furnace on. If the area is unstable or has a history of staying wet, you may have to improve the soil with gravel as well as raising the elevation. A cement pad of 4" – 6" inches should then be used. The furnace in most cases can be placed on four cement blocks and they should not be less than 24 inches wide, 24 inches long, 3 inches thick. Obtain the footprint of the model of furnace you have purchased. Place your blocks so that the legs will be in the center of them.

For a pad, the width need not be greater than the outside width of furnace. The length of pad should be as long as the outside length dimension and an added length is desirable as a work area at the loading door. A four-foot extension is most commonly used.

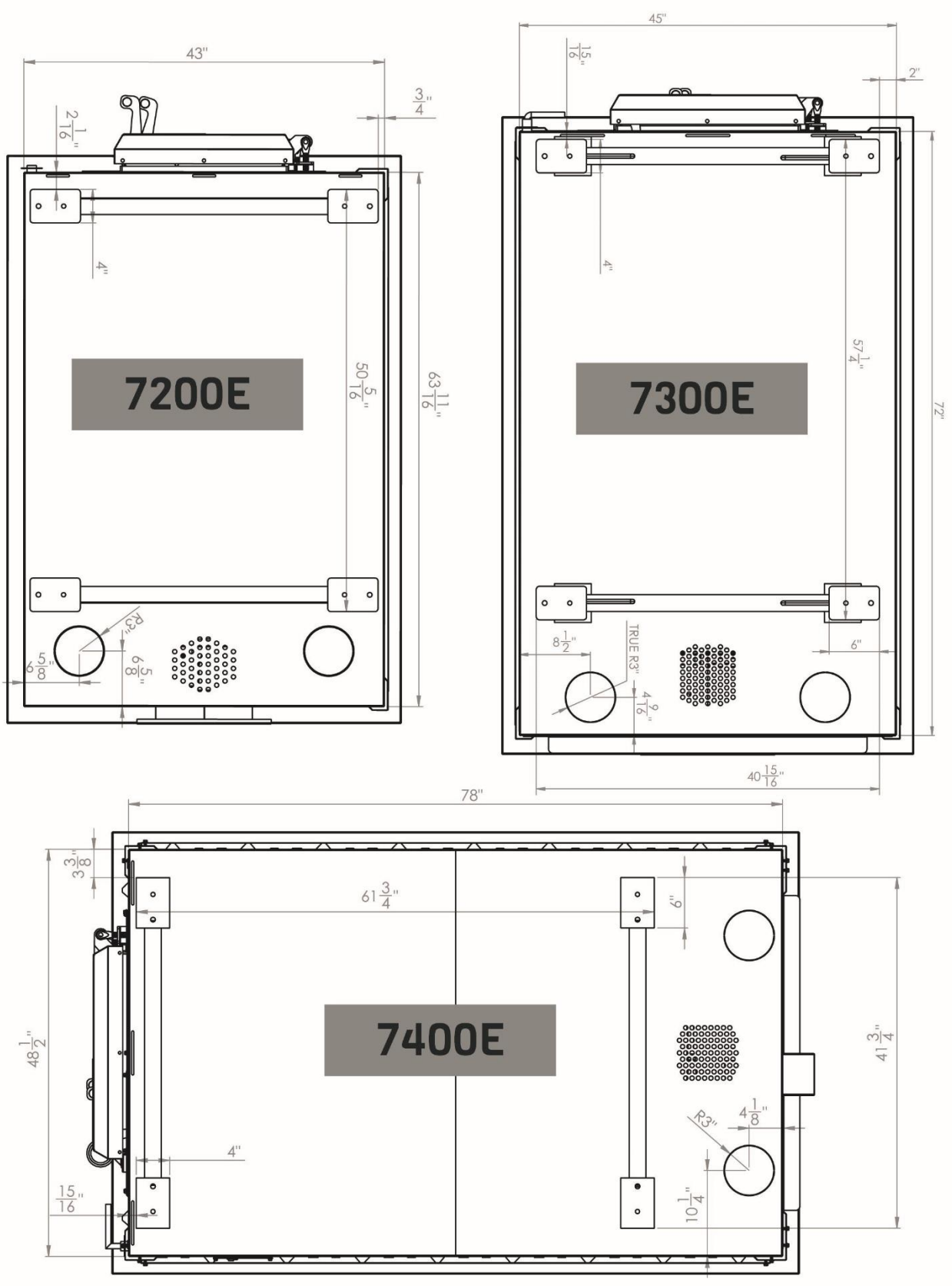
WARNING!!! Do not install this unit on a combustible surface.

MININUM CONCRETE PAD SIZE

Place rear stove legs 2" from the back edge of concreate this will allow a 12" overhang for your underground lines to come up.

Model	7200E	7300E	7400E
Length X Width	92" x 54"	100" X 61"	108" x 65"

FURNACE FLOOR PLANS



CHIMNEY REQUIREMENTS

ALL INSTALLATIONS AND OPERATIONS MUST FOLLOW FEDERAL, PROVINCIAL, STATE, AND LOCAL CODES FOR WIRING, PLUMBING AND INSTALLING THE CHIMNEY. ALL WORK MUST BE PERFORMED BY QUALIFIED PERSONNEL ONLY.

Chimneys

The size and height all depends on the unit you have purchased and where the unit will be located. Contact your local dealer or Greentech Manufacturing, Inc. for chimney purchase information.

- Adhere by local building codes and the National Fire Protection Association Rules No's 31,54 and 211.
- It is required to use Selkirk Chimney Systems; brand type is UT (Ultra Temp or Galva Temp)
- Selkirk Chimney Systems is a double insulated, stainless steel, Class A Chimney Systems that meets the requirements of UL103 and ULC-S629 and complies with the Chapter 11 of NFPA 211, Standard for Chimneys, Fireplaces, Vents and Solid Fuel Burning Appliances.
- Chimney termination caps are required; installation of spark arresters may be needed in high fire risk areas.
- Selkirk chimneys come in various lengths, spanning from eighteen (18) inches to forty-eight (48) inches. Install each section of piping by placing male and female sections together then twisting them to lock sections together. When installing your chimney piping, it is recommended by many chimney suppliers to brace every eight feet. Also recommended by the chimney manufacturer, that the height of the piping does not exceed a total of forty 40 ft.

WARNING!!! This unit cannot be hooked to a chimney already serving another appliance.

- When installing chimney, please refer to manufacturer's recommendations and requirements for adequate clearances.
- Furnaces come standard with the Selkirk brand anchor plate as well as an 12" chimney length.
- Additional Chimney components and lengths are available from your local dealer or can be purchased direct from Greentech Manufacturing Inc. (Toll Free 866-361-7355)
- Do not attempt to fabricate your own adapters.
- Do not mix Selkirk Chimney with other manufactured brands.
- Do not use existing chimney that already connects to another appliance.
- A major cause of chimney-related fires is failure to maintain required clearances (air spaces) to combustible material. It is of the utmost importance that the chimney be installed only in accordance with the manufacturers stated instructions. These instructions must be reviewed prior to installation of venting components.
- Inspections of chimneys need to be performed at least annually to ensure of any obstructions due to creosote buildup. When necessary, perform cleaning of chimney to prevent chimney fires.

WARNING!!! Risk of Fire: Do not operate with fuel loading door, heat exchanger door or secondary combustion door and/or ash removal doors open. Do not store fuel or other combustible materials within marked installation clearances. Inspect and clean flues and chimney regularly.

TRANSFER LINES

ALL INSTALLATIONS AND OPERATIONS MUST FOLLOW FEDERAL, PROVINCIAL, STATE, AND LOCAL CODES FOR WIRING, PLUMBING AND INSTALLING THE CHIMNEY. ALL WORK MUST BE PERFORMED BY QUALIFIED PERSONNEL ONLY.

Underground insulated pipe is a crucial part of your installation. It is designed to transfer hot water from your furnace to your home, garage or shop. Selecting the correct underground pipe depends on several factors such as climate and distance. Choosing a pipe with the least possible heat loss is the most effective way to ensure your furnaces efficiency.

- **Ridged Insulated Underground Tubing** - Ridged insulated pipe manufactured with the highest possible R value ratings.
- **Foam Filled Insulated Underground Tubing** – Designed to respond to intensive environments and climates. Insulated with high quality closed cell polyolfin or polyethylene foam and shelled in a virgin plastic corrugated tile.

Make sure your insulated underground tubing is equipped with at least one supply and one return pipe. This pipe should be at least one inch inside dimension; which is rated at 180 degrees F and 100 PSI continuous flow.

Insulated underground tubing must be without any splices, couplings and joints. Both tubing and piping inside should be one continuous run. Underground insulated tubing needs to be free of damages or punctures that would allow ground water or soil to come in contact with inside insulation and piping. Allowing such contact will cause moisture to seep through the insulated pipe and result in extreme heat loss. Insulated underground tubing must remain watertight or will be required to be replaced.

Installation Requirements:

- The trench must be 24” deep and 8”–12” wide. If possible, have a gradual slope in your trench to allow drainage away from lines and out of the trench bottom. Place electrical supply in bottom of trench and cover with 6” of gravel or dirt. At this point a water barrier is required. Several methods are possible, but the most important factor is; if ground water comes in contact with your heating lines, it will be the greatest heat loss to your system. A minimum of R10 insulation value is recommended, and a water-tight vapor barrier such as a continuous poly tube of plastic PVC pipe to encase your insulation is a must. NOTE: If you need to bury lines under an area where vehicles will cross, you should increase the depth of the trench to three feet or place planks over the trench in that area to spread the load and reduce the pressure generated on the lines.
- All wiring must conform to local codes. Use an electrical wire rated and approved for underground installations. This wiring can be placed in the same trench below the water lines. Use 12-2 UF wire with ground to provide power to the combustion blower, aquastat, night light, etc. at the furnace. This is satisfactory for most applications, but a state certified electrician must be consulted.
- The supply & return tubing and the power wire can be lowered in the trench, then brought through the buildings being heated, and extended a minimum of 36” out of the soil where the furnace is to be placed. Seal the openings around the tubing where it enters the building. Also Seal the tubing where it extends out of the ground at the location where the furnace is to be placed.
- Connections to the furnace are clearly marked. The installation of isolation valves at both ends of the pump is recommended as well as a valve at the return line. This will allow you to shut off the water supply for repair or if additional heating components are added to the system. It is recommended that piping used is able to withstand 100 PSI at 180 F, and is at least 1” (inch) in diameter. 1 ¼” (inch) piping is recommended for larger systems. A single junction box at the rear of the furnace is included for your power supply and should be connected by a qualified person.
- A hole large enough to accommodate two lines and insulation is required and attention to sealing this point of entry is very important. Be sure to bring pipes, insulation and vapor barrier completely through the wall and seal from both sides.

ALL INSTALLATIONS AND OPERATIONS MUST FOLLOW FEDERAL, PROVINCIAL, STATE, AND LOCAL CODES FOR WIRING, PLUMBING AND INSTALLING THE CHIMNEY. ALL WORK MUST BE PERFORMED BY QUALIFIED PERSONNEL ONLY.

Making Water and Electrical Connections at the Furnace

- After the furnace has been placed on the concrete or pads, remove the panel at the back of the stove.
- The return (cold water) pipe must be connected to the fitting at the upper position and the supply (hot water) at the fitting toward the bottom of the furnace. If multi-pole locations are to be heated, tees must be added on both the supply (hot) and return (cold). It is necessary to use **brass fittings** between the stainless and other metals.
- The furnace has been pre-wired at the factory; therefore, it is only necessary to connect the common from the wire from the trench to the common from the stove, neutral to neutral, ground to ground. Ensure that the connections are watertight.
- Return the panel to the back of the stove.

Piping Inside the Building

It is recommended that piping used is able to withstand 100 PSI at 180 F, and is at least 1" (inch) in diameter. 1 ¼" (inch) piping is recommended for larger systems.

- For each building, a circulation pump is needed. The pump can be located on the supply side (hot water).
- Before each pump, a filtering device must be installed. This filter will minimize the contaminants in the water and maximize the life of the circulation pump.
- If the central heating system in the building is a forced air furnace, it is important to select the appropriate water to air exchanger. Contact your heating contractor for proper size. The coil is to be installed in the furnace plenum. If there is an air conditioning evaporator coil in the plenum, install the water to air coil after the a/c coil.
- If the central heating system is a hot water boiler system, a water to water heat exchanger is needed. The water from an open system will contaminate the closed system if the waters are mixed together.
- It is advisable to install ball valves, isolation flanges, etc. to make the removal and the replacement components easier.

Wiring Inside the Building

- The electrical wiring must be done by a licensed electrician to ensure the system will operate as desired and is safe.
- It is recommended that the circulation pump or pumps run continuously.
- The existing forced air circulation blower needs to be wired through the circuit board to a 24 volt wall thermostat which is dedicated for this purpose. The other wall thermostat which is for the forced air (Oil, LP, NG or Electric) is left intact. The new 24 volt wall thermostat will cause the circulation blower to run without the burners coming on. A licensed electrician needs to perform the wiring.
- The electrical for a boiler system is more complicated because the existing boiler wall thermostat is used but the burners on the (Oil, LP, NG or Electric) boiler are not to operate when the water from the furnace is to provide heat. It is necessary to have a licensed electrician wire this configuration.
- If air conditioning is used, you must add a relay DPDT to prevent the condenser from turning on when the fan is energized.

Electrical Requirements

Electrical Rating: 120 AV Volts, 6 AMPS, 60 Hz. Wire must be rated and approved for direct burial if it is to be buried in the same trench as the water lines. Boiler power connection box is located at rear of boiler inside back cover. Minimum supply 15 AMPS. Maximum device 15 or 20 AMPS. **USE COPPER CONDUCTORS ONLY.**

EXISTING HOT WATER HEAT - INSTALLATION

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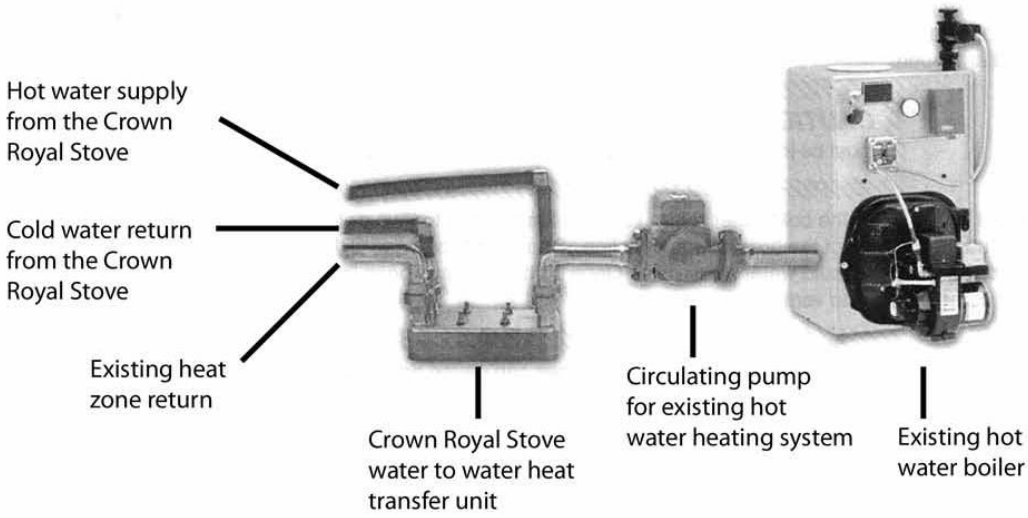
It is recommended that piping used is able to withstand 100 PSI at 180 F, and is at least 1" (inch) in diameter. 1 ¼" (inch) piping is recommended for larger systems.



The Crown Royal Stove shall be installed without interfering with normal delivery of heated water from the original boiler.

The Crown Royal Stove shall be installed without affecting the operation of the electrical and mechanical safety controls of the original boiler.

The Crown Royal Stove shall provide a changeover from one fuel to the other without requiring manual adjustment of any controls or components other than the thermostats.

The Crown Royal Stove shall have provisions for preventing, of adequate water capacity within the boiler to prevent damage from loss of circulation due to electrical power failure.

The Crown Royal Stove shall be installed without changing the function of the controls or rewiring the original boiler. A wiring interconnection is permitted. The electrical system of both boilers shall be powered from a single branch circuit without exception.

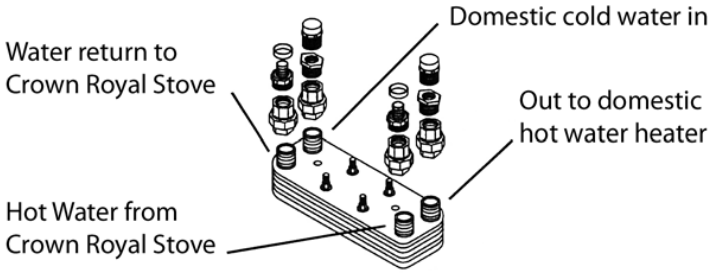
FOR UNITS USED IN CANADA THE FOLLOWING IS RECOMMENDED:

- Operate the existing boiler periodically to ensure that it will operate satisfactorily when needed.
- Do not relocate or bypass any of the safety controls in the existing boiler installation.
- The operation of the existing gas boiler must be verified for acceptable operation before and after installation of the Crown Royal Stove by a gas fitter who is recognized by the regulatory authority.
- Do not connect to any chimney or vent serving a gas appliance.
- Ensure the installation complies with the requirements of CAN/SCA-B365. Any changes to the installation should comply with CSA B139 (for oil-fire), C22.1 (for electric), or CAN/CGA-B149.1 or CAN/CGA-B149.2 (for gas-fired).

ALL INSTALLATIONS AND OPERATIONS MUST FOLLOW FEDERAL, PROVINCIAL, STATE, AND LOCAL CODES FOR WIRING, PLUMBING AND INSTALLING THE CHIMNEY. ALL WORK MUST BE PERFORMED BY QUALIFIED PERSONNEL ONLY.

DOMESTIC HOT WATER

The domestic hot water flat plate kit consists of a water to water heat transfer unit and the fittings needed to hook it up. The unit goes on top of the domestic hot water heater and is connected as shown below.



EXISTING FORCED AIR

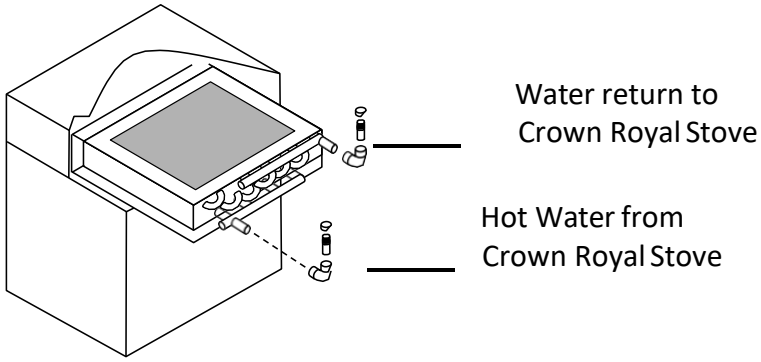
A water to air heat exchanger is inserted in the existing plenum. In most cases the heat exchanger is placed in a horizontal position, keeping all four sides level. The air must be forced through the finned area of the heat exchanger evenly. The hot water line coming from the hot-water tube enters the bottom fitting of the heat exchanger and exits the top fitting, which returns to the furnace. If the plenum is too large or too small, it must be altered to fit the heat exchanger properly.

After installation of the add-on water to air exchanger, the air flow may need to be increased.

Methods of doing so are:

BELT DRIVE SYSTEM: Blower pulleys and motor pulleys may be changed but the electric current flowing through the motor shall not exceed the nameplate rating. (A blower motor or larger power may be used.)

DIRECT DRIVE SYSTEM: The motor shall not be changed; however, the speed of the motor may be increased.



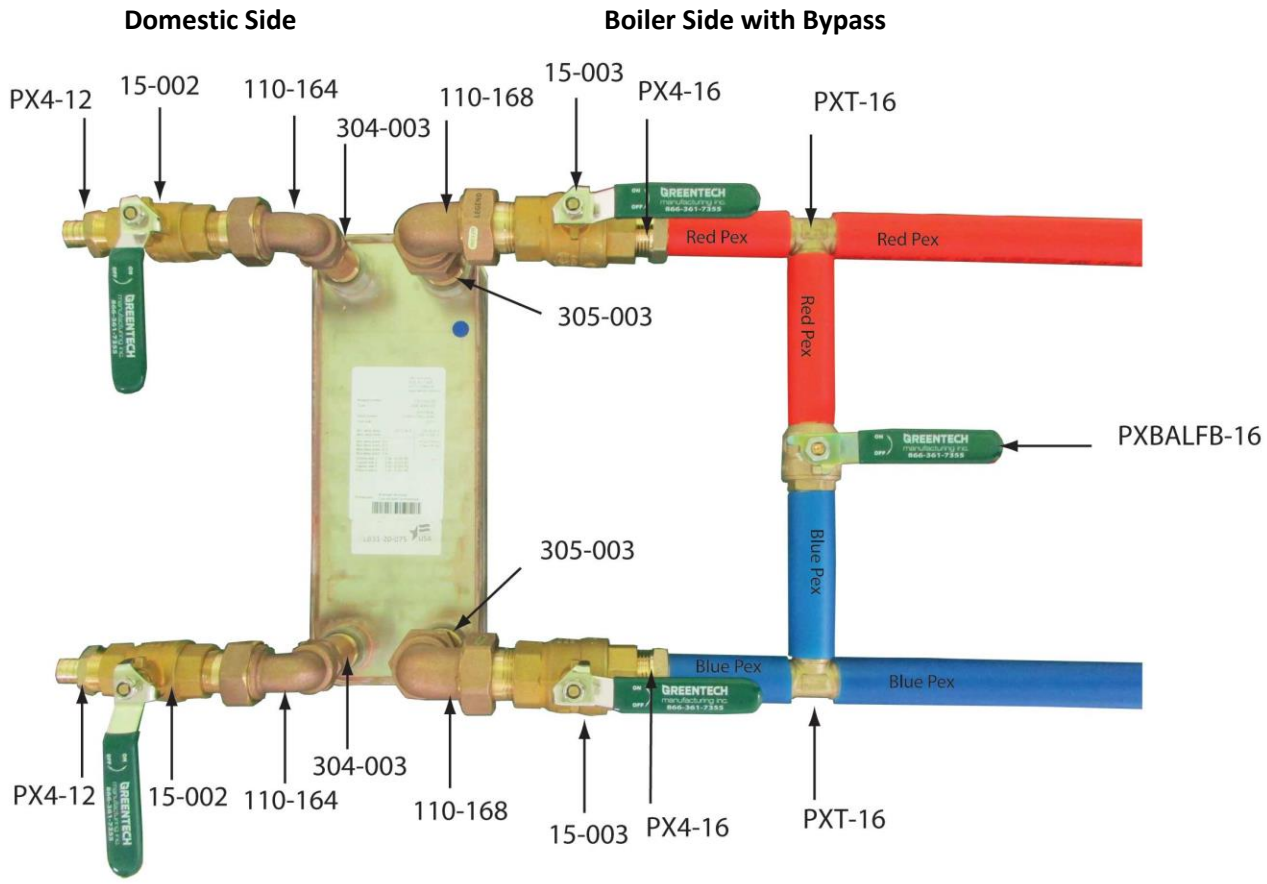
THE HEAT EXCHANGER: Air blows through the heat exchanger's grill taking the heat from the water heated grill and blowing it into your existing ductwork.

CAUTION!!! When installing heat exchangers do not tamper with existing controls. Wiring to existing blower can be done with a line voltage or low voltage thermostat.

NOTE: Wire thermostats according to directions provided by the manufacturer.

Brazed Plate Water to Water Exchanger

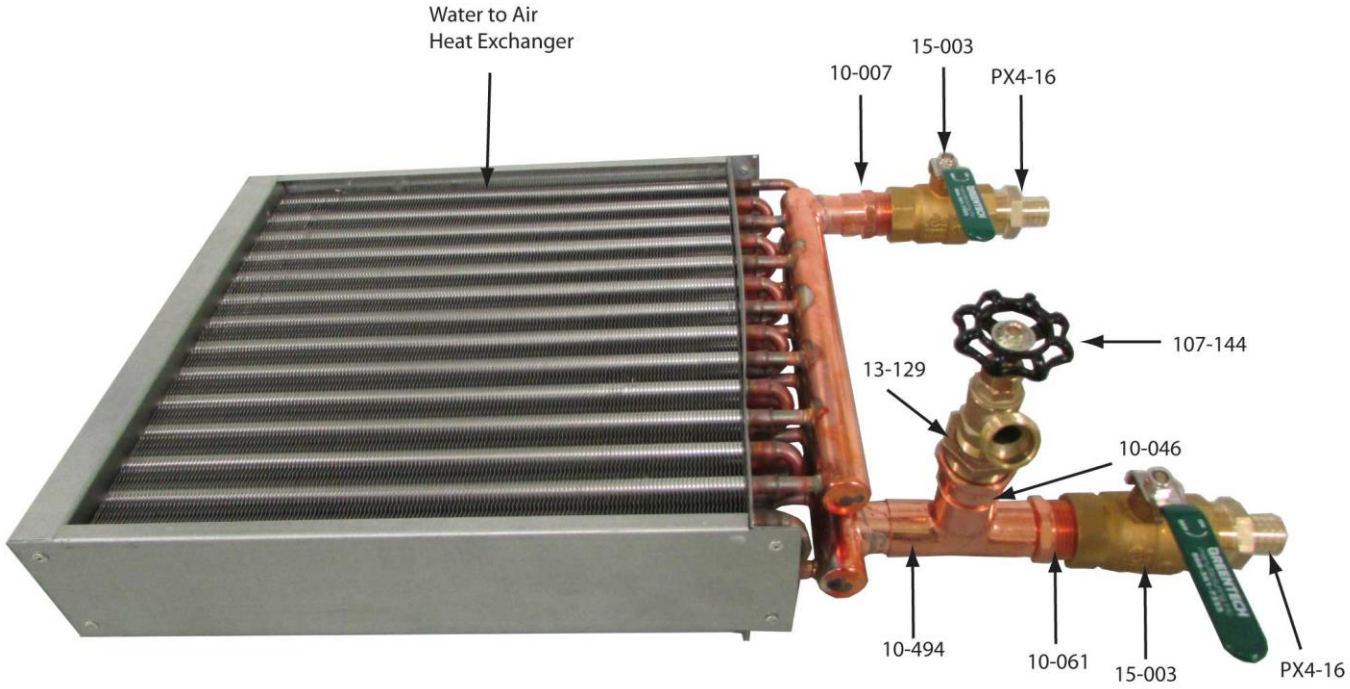
The brazed plate heat exchanger can be installed on either the cold side or the hot side of the hot water heater. If installed on the cold side, the hot water needs to be left on to maintain the temperature in the hot water heater. If installed on the hot side, the hot water heater needs to be turned off and the hot water heater is now a reservoir.



PART NUMBER	DESCRIPTION
PX4-12NL	¾” PEX X MALE ADAPTER (NO LEAD)
15-002	¾” BALL VALVE (NO LEAD) FIP X FIP
110-164	¾” UNION ELBOW IPS
304-003	¾” X 2-1/2” RED BRASS NIPPLE
110-168	1” UNION ELBOW IPS
305-003	1” X 2-1/2” RED BRASS NIPPLE
15-003	1” BALL VALVE (NO LEAD) FIP X FIP
PX4-16 NL	1” PEX X MALE ADAPTER (NO LEAD)
PXT-16 NL	1” PEX X 1” PEX X 1” PEX TEE (NO LEAD)
PXBAL-16 NL	1” PEX X 1” PEX BALL VALVE (NO LEAD)

WATER TO AIR SETUP - INSTALLATION

Water to Air Heat Exchangers are for use in your hot air plenum of your existing forced air furnace, to transfer heat into your existing forced air system.



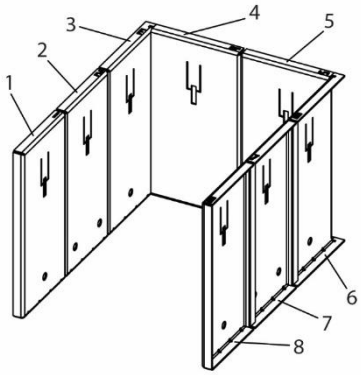
PART NUMBER	DESCRIPTION
10-007	1-1/4” COPPER ADAPTER C X FEMALE
15-003	1” BALL VALVE FIP X FIP
PX4-16	1” PEX X MALE ADAPTER
107-144	¾” MALE BOILER DRAIN MNPT
13-129	1” X ¾” BRASS HEX BUSHING
10-046	1” COPPER FITTING ADAPTER FTG X FEMALE
10-494	1” X 1” X 1” COPPER TEE
10-061	1” COPPER ADAPTER FTG X MALE
15-003	1” BALL VALVE FIP X FIP

STOVE COMPONENTS

A B C D E F G H I

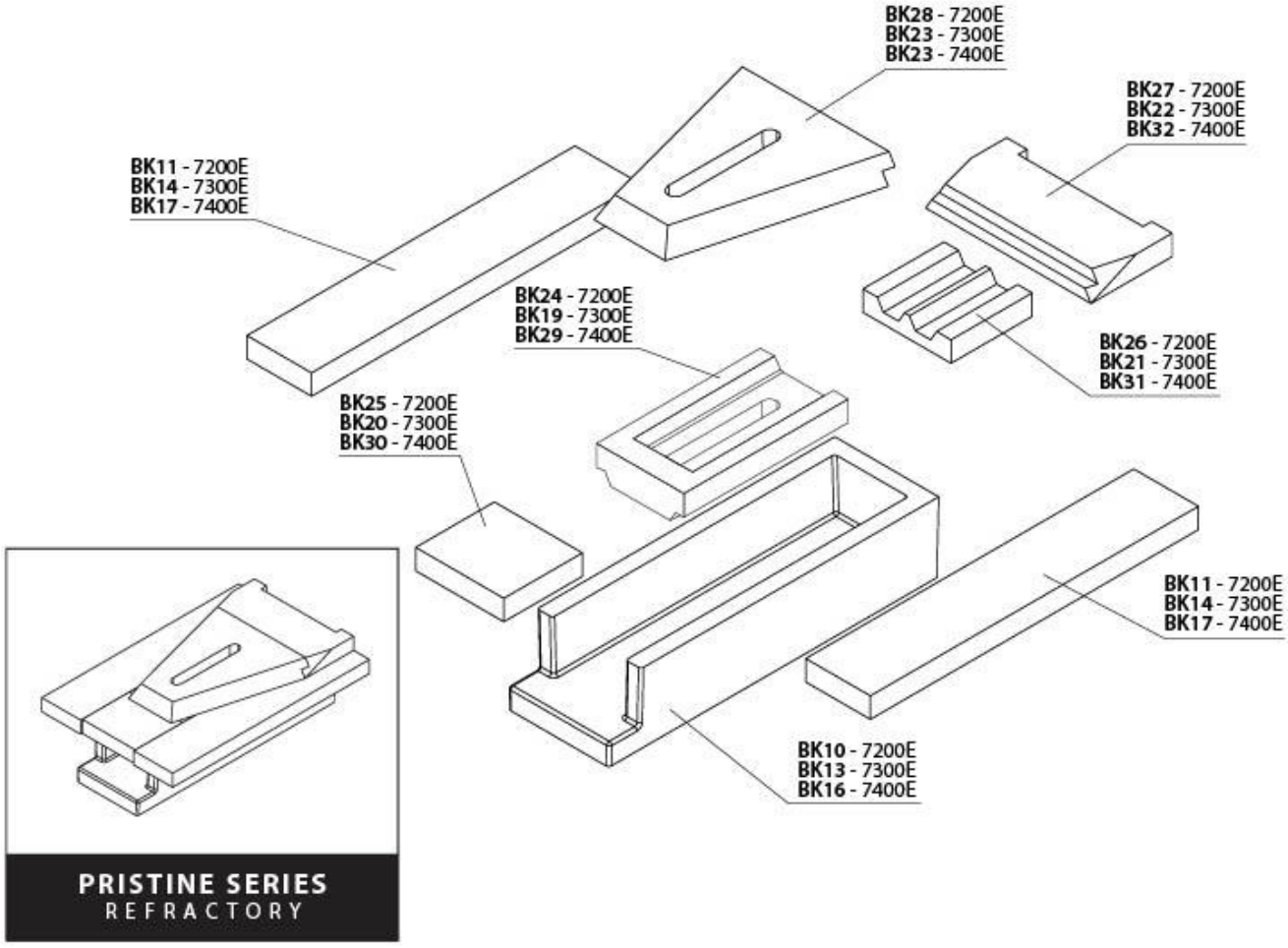
J K L M N O

	Description	Part Number
A	Auto Reset Snap Disk	50-035
B	Electronic Temperature Control	50-051
C	Solenoid	50-036
D	On-Off-On Switch	50-030
E	Thermowell	50-038
F	Fiberglass Silicone Door Rope – 1”	50-051
G	High Temp Silicone	50-050
H	Combustion Motor – 7300E & 7400E	50-020
I	Combustion Motor – 7200E	50-021
J	Ash Rake	60-007
K	Water Level Indicator	60-019
L	Red Push Button Switch	50-104
M	Encapsulated Timer Relay	50-105
N	Control Chemical & Test Bottles – 1 Gallon	Control Chemical



O	**Air Panels:**	**7200E**	**7300E**	**7400E**
#1	Front Side Left Air Panel	CRP1209	CRP1419	CRP1613
#2	Middle Side Left Air Panel	CRP1210	CRP1420	CRP1614
#3	Rear Side Left Air Panel	CRP1211	CRP1421	CRP1615
#4	Rear Left Air Panel	CRP1212	CRP1422	CRP1616
#5	Rear Right Air Panel	CRP1213	CRP1423	CRP1617
#6	Rear Side Right Air Panel	CRP1214	CRP1424	CRP1618
#7	Middle Side Right Air Panel	CRP1215	CRP1425	CRP1619
#8	Front Side Right Front Air Panel	CRP1216	CRP1426	CRP1620

Pristine Firebrick Refractory Part Numbers for All Models



CONTROL PANEL

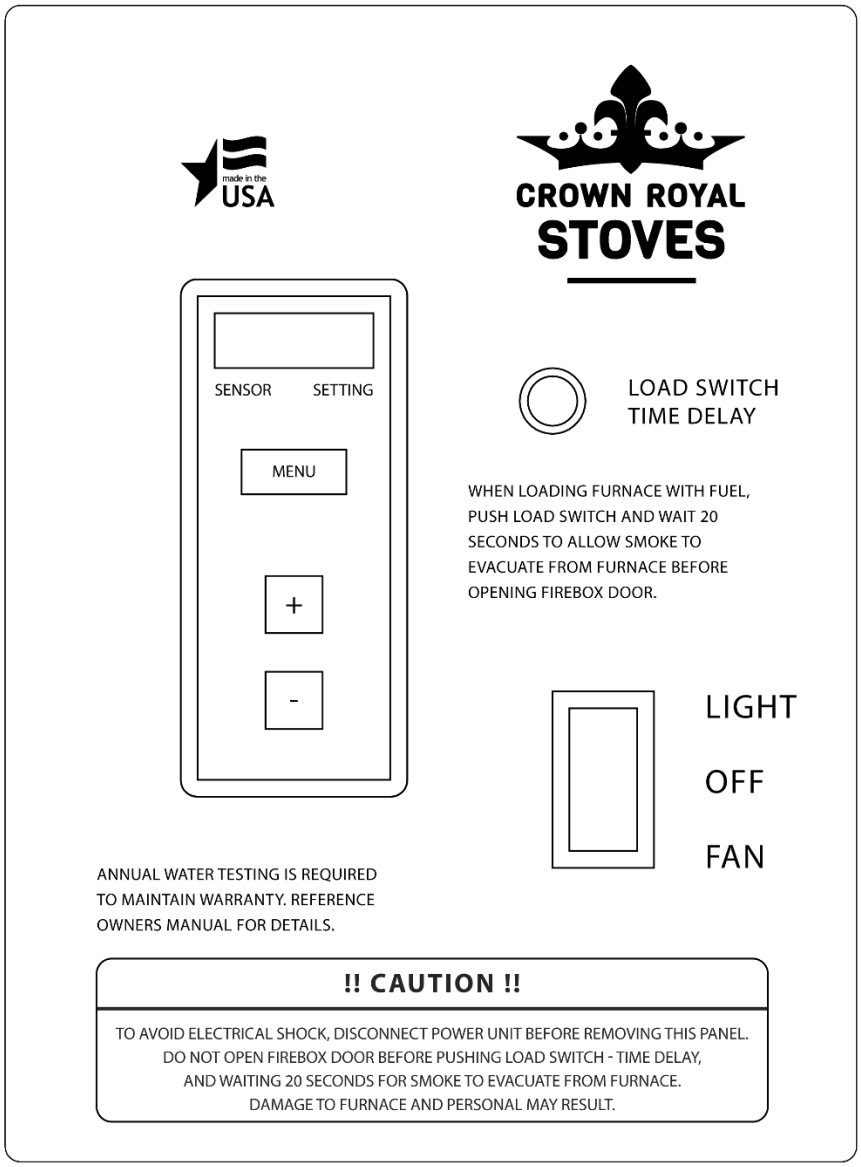
The aquastat powers the combustion blower to maintain the desired water temperature. The aquastat is set at 180°F at the factory, which means that combustion blower will run until the water in the jacket reaches 180°F. Only qualified personnel should be adjusting the temperature controls.

When filling the firebox place the fan/light switch to light off position and press the red load switch time delay button. Wait 20 seconds to allow the smoke to evacuate from the furnace before opening the firebox door. For night filling the fan/light switch can be in the light position while filling which will turn on the light above the firebox door.

Caution – Never open the firebox door before pushing load switch time delay and waiting 20 seconds for smoke to evacuate from furnace before opening firebox door. Damage to furnace and personal injury may result.

AQUASTAT

Controls the water temperature inside the water jacket. Factory set at 180°F with 10° differentials.



LOAD SWITCH

Turns the combustion blower on to allow smoke to evacuate from furnace for 100 seconds, then returns to normal operation.

FAN/LIGHT SWITCH

Controls both fan and light. Ensure switch is in the light position before opening fuel door. This shuts the fan off and turns on light. Always put the switch in the fan position after refueling.

FILLING THE WATER JACKET

Your outdoor furnace has a vent pipe that protrudes through the roof and is located in front of the lift hook. By placing a garden hose in this pipe you can fill your furnace to the proper water level. Because this furnace is an open-to –atmosphere system, it is normal that water will have to be added annually. Depending on circumstances, 5 or 10 gallons is not unusual. To make this procedure more convenient, a boiler drain valve (tap, faucet) can be installed into the return furnace line allowing you to connect a double female (automatic washing machine hose) between it and your domestic supply line.

On your initial filling of your furnace make sure to inspect all connections in your system for leaks. In your system a bleeder valve should have been installed at the highest point. This will allow you to remove any air from the system.

CAUTION, DO NOT FIRE FURNACE UNTIL IT IS FILLED WITH WATER. Allow furnace to run for two days and check water levels and fittings for leaks. If all is okay, you now should add the manufacturer's recommended water treatment.

FIRING THE FURNACE FOR THE FIRST TIME

Pristine Series furnaces are equipped with high temperature refractories. These refractories require curing upon first initial start-up. It is extremely important to heat the firebox up slowly to complete the curing process of the refractories or cracking will result.

Begin by building a fire with kindling-sized pieces of wood, kindling should be no larger than 2" in height by 2" in width by the length of the firebox in depth. Add small pieces of wood (no more than 5 pieces) to minimize temperature spikes. Keep the fire satisfied for the next 4-6 hours. The complete curing process requires attention, be sure to provide adequate time to allow refractories to properly cure.

After the 4-6 hours of kindling fire, add heavier fuel gradually until a suitable fire is achieved. The furnace will continue to feed an air supply to the fire until your aquastat shut off temperature is reached (180F). On this initial start up the water jacket will reach what is called the dew point. This creates sweat inside the firebox which may last a couple of days and is normal. Condensation will come out of all doors until the unit reaches operation temperature. Heating of the water will also cause it to come out of the fill pipe. All are normal occurrences.

Although everyone has different methods of firing, filling your furnace to capacity reduces the efficiency of the furnace. It is better to load twice a day with less wood than once a day filling to capacity. Smaller fuel loads burn hotter, cleaner and more thoroughly. By burning off more of the gases (smoke), which is wood broken down, you enhance the overall efficiency of your system by reducing creosote and increasing heat transfer to the water.

STARTING A WOOD FIRE WITHOUT A COAL BED

1. Check to see if both the rear clean-out doors and the secondary combustion door are closed and secure.
2. Before opening the firebox door, switch the light/fan switch to the fan position located on the control panel.
3. Open the firebox door and insert a few pieces of kindling over the nozzle in the firebox. Place crumpled paper on top of kindling and light. Do not use chemicals or fluids to start the fire.
4. When the kindling wood is well ignited, add larger pieces of wood. Let these pieces start to ignite.
5. Shut the firebox door.
6. When firing the stove, the first time of the season the water jacket will sweat as the fire warms the cold water. This could last for 48 hours and does not indicate the stove is leaking water.
7. Burning wood with a 20 % or higher moisture content will result with noticeable water in the firebox and secondary burn chamber.

DAILY FUELING & FIRING ROUTINE

Prior to opening fuel door, aggressively pull and push heat exchanger cleaning rod six to ten times which will ensure proper drafting. On the control panel located on the left side of the furnace remember to turn fan/light switch to either off or light position. Next press load switch time delay and wait 20 seconds to allow smoke to evacuate from the furnace. Open the fuel door slowly and stand behind the door ensuring the door is between you and the firebox. Failure to wait may cause an injury from a fire flare back.

Always check for adequate water using the water level indicator that is supplied with your stove. This indicator is placed in the fill tube and can be easily checked daily to ensure the proper water level. Based on the temperature of the stove, the water level will fluctuate.

Do not load the firebox more than seventy-five percent (75%) with wood. If additional fuel is added, you will not maintain a hot enough burn and your efficiency rate will deteriorate. Only add enough wood to provide heat until the next fueling time. Overfilling the firebox will cause the fire to smolder, which will create excessive creosote and result in more fuel being consumed.

PROPER DRAFTING

Maintaining a proper draft will ensure the complete process of gasification and will keep your furnace burning efficiently. Make sure all exhaust pathways are free and clear of debris. Remove any accumulated ash in the following areas: heat exchangers, secondary burn chamber, and chimney pipe. Regularly clean the fan wheel and finger guard located in the heat exchanger area. Make sure the fan wheel moves freely. Ensure that exhaust blower and solenoids are in good working order. Check the proper sealing of all furnace doors and replace door gaskets when necessary.

MAINTAINING COMBUSTION

A minimum of a 4” wood coal bed is required at all times to ensure good combustion at the lowest burn rate for which the furnace is warrantied.

SAFETY

Never open the firebox door without pressing the load switch time delay button, and waiting 20 seconds to allow the smoke to evacuate from the furnace. This button is located on the control panel. It is designed to turn on the combustion blower to evacuate all smoke from the unit. Failure to do so could result in damage to the furnace and cause personal injury.

Whenever the firebox door is to be opened, it should always be cracked slightly to allow oxygen to enter and burn off any combustion gases that are present before fully opening. Failure to do this could result in a sudden ignition of the unburned gases when the door is opened.

A stove should never be filled with excess wood so that the flue gas exit is blocked or impeded in any way. Burning wood generates carbon monoxide and if the flue gas exit is blocked the carbon monoxide can be forced into the area the stove is heating and have fatal consequences. If installed indoors a minimum of one carbon monoxide/smoke detector is required to be located in the room where the appliance is installed.

WARNING!!! Risk of Fire: Do not operate with fuel loading and / or secondary combustion doors open. Do not store fuel or other combustible materials within marked installation clearances. Inspect and clean flues and chimney regularly.

CAUTION!!! Hot Surfaces: Keep children away. Do not touch during operation.

STARTING DURING A PROLONGED POWER FAILURE

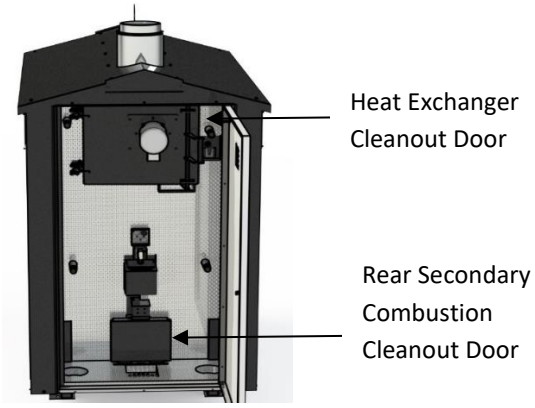
During a prolonged power failure, where no power is being sent to the furnace, do not load with new fuel or try to start a new fire. It is recommended that you contact your local dealer or Greentech Manufacturing, Inc. to find out what size of generator is needed to keep your furnace running. Once an approved generator is connected to the stove, the unit may be started normally.

CAUTION!!! Do not start the unit during a prolonged power failure.

WEEKLY MAINTENANCE

Weekly cleaning or the secondary combustion areas are extremely important for the complete process of gasification. **Use extreme CAUTION when opening and cleaning doors, these areas will still be hot and could cause personal injury.**

1. Fuel in firebox must be burned down to perform weekly maintenance.
2. Always check for adequate water using water level indicator that is supplied with your stove. This indicator is placed in the fill tube and can be easily checked daily to ensure proper water levels. Never fire the unit until adequate levels of water are satisfied. If unit is low fill immediately.
3. Always make sure light/fan switch on the control panel is in the off position before opening any access doors to perform weekly maintenance.
4. Heat exchanger door is equipped with a fan housing and wheel assembly; fan must be completely stopped before opening heat exchanger cleanout door.



HEAT EXCHANGER AREA CLEANING

Heat exchangers are in the back of the stove and run vertically which can be accessed from the back of the stove. Open the rear access door and open the top heat exchanger cleanout door. Weekly cleaning of the heat exchanger area will prevent the buildup of fly ash that can cause the stove to burn inefficiently. Clean off excess fly ash off the blades of the combustion fan. It is suggested you use an ash vac to ensure proper disposal of fly ash.

CAUTION!! Heat Exchanger door is equipped with a fan housing and wheel assembly. Never place hands or objects in blower assembly or personal injury may result.

WARNING!! Burning wood with a moisture content of 20% or higher will lead to excess creosote buildup on the Heat Exchangers.

SECONDARY BURN CHAMBER CLEANING

An ash rake will also be included with the stove; this will be used to clean the secondary burn chamber area. Stoves are equipped with a front and rear secondary combustion cleanout door. This area should be cleaned after cleaning the heat exchanger tubes. Simply use the rake (included) making a few sweeps through this area, it will prevent buildup of fine ashes. **Use extreme caution while cleaning firebrick.** Store all ash in a fire-retardant closed container that is placed on a non-combustible floor or ground, well away from all combustible materials until final disposal. Ashes should remain in fire-retardant closed container until completely cooled.

GENERAL MAINTENANCE

Usage of authorized Control chemical is required in all Crown Royal Stoves. To uphold your warranty annual water testing is necessary.

Do not allow moisture to come in contact with ashes the in the firebox. Do not rake coals into the secondary burn chamber. It is mandatory to have a rain cap on the termination of your chimney.

Frequently check for accumulated soot, creosote, and ash build-up until experience shows how often cleaning is necessary.

Check daily for creosote build-up until experience shows how often cleaning is necessary. Be aware that the hotter the fire, the less creosote is deposited. However if the firebox is building up with creosote, then the moisture content within the wood is too high. Weekly cleaning may be necessary in warmer weather, while monthly cleaning may be adequate in the coldest months. Have a clearly understood plan of how to handle a chimney fire. See (RUNAWAY CHIMNEY FIRE)

Daily Maintenance

- Check water level and add as necessary.
- Check for adequate fuel supply.
- Check for ash buildup in the firebox, secondary burn chamber and exchanger tubes. (Use a fire-retardant closed container to empty ashes into).
- Aggressively pull and push the heat exchanger cleaner six to seven times.

Weekly Maintenance

- Perform weekly maintenance to heat exchanger area, and secondary burn chamber areas to ensure proper draft.
- Check fan and solenoid to ensure proper air velocity is happening at ejection points.
- Remove any excess creosote from the firebox door and frame.

Monthly Maintenance

- Check the water level indicator and add water If low, until excess flows from the overflow pipe located in front of the chimney.
- Check chimney and connectors for creosote formation.

Annual Maintenance

- Lubricate solenoid shaft.
- Check combustion motor and solenoid to ensure proper air velocity is happening at ejection points.
- Check the door gasket and replace if needed.
- Clean out any ash buildup from firebox, heat exchanger area, and secondary burn areas.
- Check chimney: remove any creosote, soot or ash build-up that may have occurred.
- At the end of the season, thoroughly clean out all the ashes in the firebox, chimney, heat exchangers and secondary burn areas.
- Make sure chimney cap is in good condition to prevent rain from entering stove.

Remember: Your preventive maintenance program will give you years of trouble free service.

Off Season Maintenance

- At the end of the heating season, shut off the pump, clean the firebox, heat exchangers, and secondary burn chamber.
- Check the water level indicator and refill until the water is full, take a water sample to be sent in for testing, if the water treatment is needed turn on the circulation pump for at least four hours to mix the treatment thoroughly, check for leaks and then shut the pump off.

- Care for the exterior of your furnace is minimal. The unit may be washed using water and a mild non-abrasive cleaner suitable for painted surfaces. Avoid direct water pressure to electrical components and connections.

CAUTION!!! Make certain that all electrical power to the furnace and components are shut off before washing.

REPLACING DOOR ROPE GASKETS

To replace door rope gaskets, start with a 1" putty knife to scrap out old rope gasket; next clean out the gasket channel with wire brush, then fill cavity with high temp silicone 1" wide and ½" thick. Press new rope gasket in cavity making sure to embed rope into the silicone, fill in outside corners with silicone and troll flat with putty knife. Leave door the open for 24 hours.

AIR PANEL REPLACEMENT

Air panels are located inside your firebox. These panels are labeled for easy removal and replacement when needed. To remove apply force to the bottom of the air panel and lift off the hook. Air panels need to be removed in sequential order from front to rear. Air panels are labeled from left to right in numerical order from 1 to 8.

#1 – Side Front Left	#2 – Side Middle Left	#3 – Side Rear Left
#4 – Rear Left	#5 – Rear Right	
#6 – Side Rear Right	#7 – Side Middle Right	#8 – Side Front Right

ASH REMOVAL, ROTATION & DISPOSAL

CAUTION! Ashes should never be allowed to accumulate in secondary burn area and vertical heat exchangers. Ashes in contact with these areas act as an insulator, causing incomplete gasification. With an excessive ash buildup, primary combustion air is restricted, and the unit's output will be reduced. Damages will result to the unit if maintenance is not performed.

When cleaning the ash, place the ashes in a fire-retardant closed container, they then should be placed on a noncombustible floor or on the ground well away from all combustible materials until final disposal. Ashes should remain in the fire-retardant closed container until all cinders have cooled, in an area that is at least sixty (60) inches from the front of the stove and thirty-six (36) inches from the sides or back of the stove.

CAUTION: Hot coals can last for days. Disposing of them improperly or to soon can cause a fire.

WARNING!!! RISK OF FIRE

With the exception of the start-up and ash removal periods, the secondary combustion and loading doors should never be left open. This unit should never be left unattended with any of the doors left open.

CREOSOTE FORMATION & REMOVAL

When wood is burned organic vapors and tar combine with the expelled moisture forming creosote, which clings to the interiors of the stove. Creosote vapors condense in the relatively cool chimney of a slow burning fire; as a result, creosote accumulates on the flue lining. When creosote ignites it creates an extremely hot fire and can cause damage to the stove and /or persons. The chimney and its connectors should be inspected monthly, during the heating season to determine if a buildup is occurring. If creosote has accumulated it should be removed to reduce the risk of a chimney fire.

RUNAWAY CHIMNEY FIRE

To avoid a chimney fire; ensure that daily, weekly, month and annual maintenance techniques are being followed.

If a fire is to occur, close all doors including the firebox and heat exchanger doors, shut down the power to the unit. This will eliminate new oxygen from being introduced into the firing chamber, this will distinguish both chamber and chimney fires.

TROUBLESHOOTING

If the furnace fails to heat up:

1. Check fire.
2. Check combustion motor for operation.
3. Check solenoid damper is open to allow air velocity.
4. Check water level of furnace.
5. Check for creosote blockage at chimney and bypass trough.
6. Check temperature setting.
7. Check for power at furnace.
8. Check heat exchanger tubes and secondary combustion areas for blockage.
9. Check to make sure all doors are properly adjusted.

If furnace water is hot, but buildings do not have heat:

1. Check pumps and check for closed valves.
2. Check filter or Y-Strainer for flow blockage.
3. Check for air in system at exchanger by bleeding off.

If furnace boils:

1. Check that firebox door is closing properly and that the door gasket is completely sealed.
2. Check that the secondary combustion doors are properly closed and the gasket is completely sealed.
3. Check that the solenoid damper plate is opening and closing without hang-ups.
4. Check that the temperature settings and water levels are correct.

If furnace has shut down:

1. Check to ensure that the unit has power (does the outside light work).
2. Check the water temperature (furnace has a high temperature cut-out of 190 degrees ˚F). Furnace will need to drop 50 Degrees ˚F before it automatically resets.
3. If all the checks have not corrected the problem, have a qualified technician check the control panel.

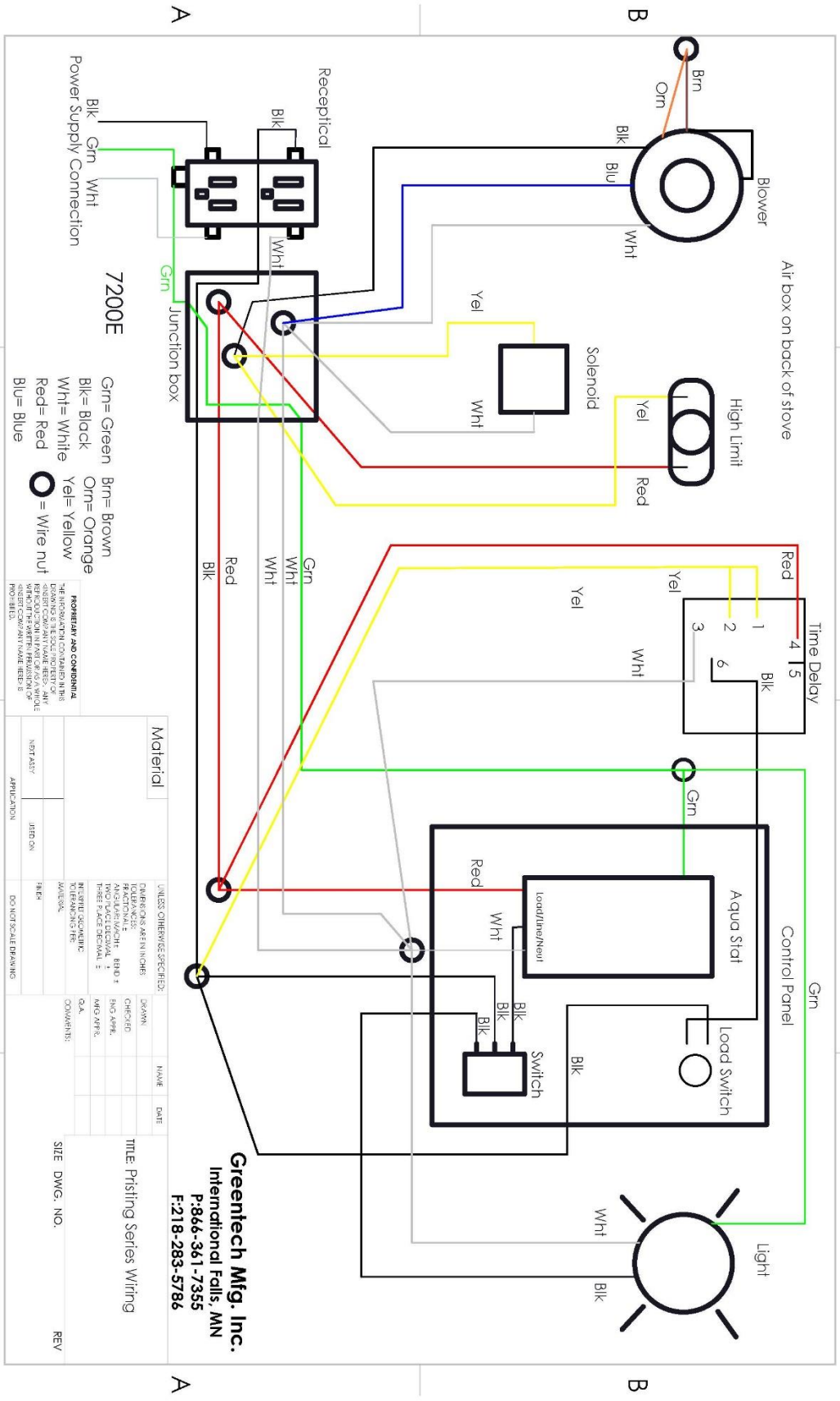
Blower will not come on:

1. Check to see if the high limit switches may be shut off because the water temperature is higher than aquastat setting.
2. Wait and allow water to cool down.

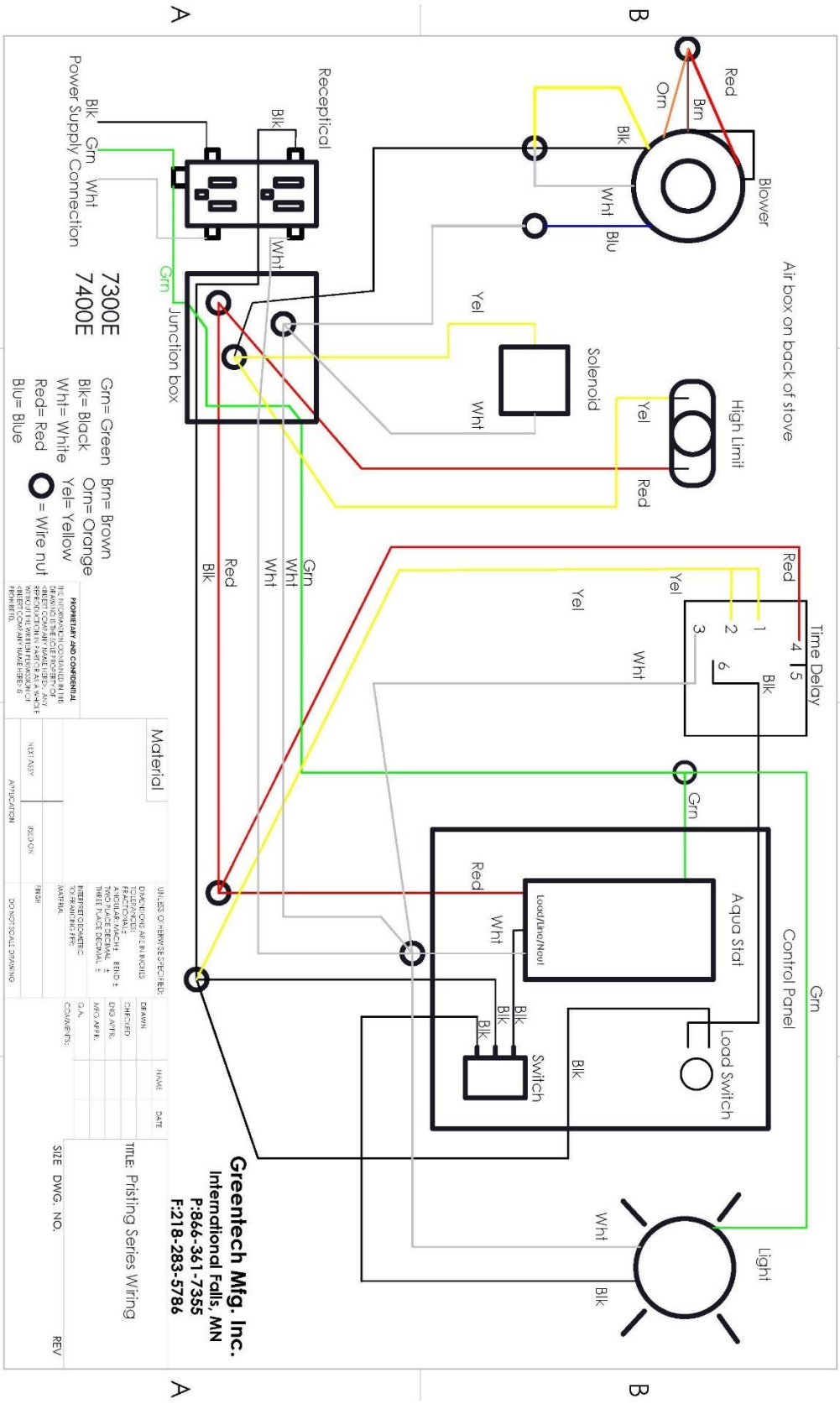
Abnormal creosote buildup in chimney and flue:

1. Check the moisture of your wood. Recommended moisture content is 20%.

7200E Electrical Wiring Diagram



7300E/7400E Electrical Wiring Diagram



April 2004

Smoke Troubleshooting Checklist For Outdoor Furnaces

I. Installation Issues (Improper Smoke Dispersal)
   A. Chimney height relative to nearest downwind neighbor
      1. If located 50 feet or less to any residence not served by the furnace, it is recommended that the stack be at least 2 feet higher than the eave line of that residence.
      2. If located more than 50 feet but no more than 100 feet to any residence, it is recommended that the stack be at least 75% of the height of the eave line of that residence, plus an additional 2 feet.
      3. If located more than 100 feet but no more than 150 feet to any residence, it is recommended that the stack be at least 50% of the eave line of that residence, plus an additional 2 feet.
      4. If located more than 150 feet but no more than 200 feet to any residence, it is recommended that the stack be at least 25% of the height of the eave line of that residence, plus an additional 2 feet.
   B. Furnace located in sheltered area; insufficient wind to disperse smoke.
   C. Furnace sizing. Similar to other heating appliances, furnace should be properly sized based on the estimated heat loss of the served structure.

II. Fueling Issues
   A. Burning less than optimal wood
      1. Moisture content: Optimal moisture content should be between 20% and 30% (seasoned wood)
      2. Species: Hardwoods generally tend to burn cleaner than softwoods
      3. Size: Larger pieces of wood tend to burn cleaner than smaller pieces
   B. Burning less than optimal fuel loads
      1. Loading: Firebox should be loaded based on outdoor temperature, anticipated heat load requirements and the manufacturer's instructions. Do not overload the chamber.
      2. Charging intervals: Firebox should be charged regularly at the intervals specified by the manufacturer's instructions. Optimally, the firebox will be charged "hot," i.e., the fire will not go out between chargings.
   C. Burning improper fuels
      1. Only burn fuels approved by the manufacturer
      2. Do not use volatile starters (such as lighter fuels, gasoline, chemicals) unless approved by the manufacturer
      3. Do not burn the following:
         a. Trash or household garbage
         b. Plastics

c. Gasoline
d. Rubber or tires
e. Naphtha
f. Material coated with petroleum products (e.g., particle board, railroad ties, pressure-treated wood)
g. Leaves
h. Paper products or cardboard

III. Operational Issues

A. Improper combustion air – Natural Draft Units (No Blower):

1. Air inlet not restricted by debris (creosote, ash, etc.)
2. Flame baffle/flue not restricted by debris
3. Chimney not restricted by debris
4. Door seal in satisfactory condition (provides air-tight seal when door is shut)
5. Air inlet (damper or flapper) operates properly (opens/shuts per manufacturer's instructions, provides air-tight seal when shut)
6. Door seal in satisfactory condition (provides air-tight seal when door is shut)

B. Improper combustion air – Forced Draft Units (Blower):

1. Verify combustion blower operates in accordance with the manufacturer's instructions
    a. Blower starts and stops properly
    b. Combustion blower wheel spins properly
    c. Blower runs at proper speed – verify voltage to blower motor
2. Combustion blower tube not restricted by debris (creosote, ash, etc.)
3. Flame baffle/flue not restricted by debris
4. Chimney not restricted by debris
5. Air inlet (damper or flapper) for blower operates properly (opens/shuts per manufacturer's instructions, provides air-tight seal when shut)
6. Door seal in satisfactory condition (provides air-tight seal when door is shut)

C. Verify controls operate in accordance with the manufacturer's instructions

1. Water temperature controls set properly
2. Draft controls set properly

IV. Maintenance Issues

A. Verify that the furnace is being maintained in accordance with the manufacturer's instructions. Specifically, inspect:

1. Excessive ash buildup
    a. Grates blocked, restricting air flow
    b. Combustion fan blocked, restricting air flow
2. Excessive creosote buildup
    a. Combustion fan blocked, restricting air flow
    b. Flame baffle blocked, restricting air flow
    c. Chimney blocked, restricting air flow

V. Discussion

Wood, like other fuels is made up of various amounts of carbon, hydrogen, and other elements. The burning of wood is a chemical reaction that depends on many factors. The essential factors to complete wood burning are time, temperature, and turbulence. Some other factors to take into consideration are: intake air; amount and placement, density and moisture content of the fuel, size of the firebox compared to the size of the wood load, and adequate room for the combustion process to take place.

The smoke that is seen coming out of a chimney is essentially a combination of unburned fuel (carbon and hydrogen) and moisture in the form of water vapor. The reason for the smoke is usually attributed to: (i) not enough time for complete combustion, (ii) not enough mixing (turbulence) to complete the chemical process, (iii) not enough temperature to get the fuel to that chemical conversion stage, or (iv) a combination of the above. In many cases, excessive smoke can be reduced by adopting practices that improve complete combustion, reducing visible emissions in the form of smoke.

A. Fuel

1. Moisture Content

Moisture content of the wood, either too high or too low, will affect the amount of visible smoke. Wood with a low moisture content (less than 10%) will burn relatively quicker, resulting in some of the fuel going up the chimney in the form of smoke, i.e., time was insufficient to complete the burn process. Wood with a moisture content too high (more than 35%) can quench the flame causing smoke, i.e., temperature was insufficient to burn completely.

Wood moisture in the 20% to 30% range can be the best of both scenarios. It is dry enough to burn without quenching the flame, yet the moisture is high enough to self-regulate the burn, giving it plenty of time to complete combustion.

2. Density

The density of wood plays a part in the combustion process in the same way as moisture content. Softwoods are by definition less dense and tend to burn more rapidly than hardwoods. Softwoods tend to create more smoke – due generally to insufficient time to complete the burn. Denser hardwoods will burn more slowly and evenly, allowing more time for the conversion of fuel to heat.

3. Size

The size of the wood can also be a factor in the amount of smoke produced. The surface area of a piece of wood is one of the factors that will affect burn rate. Larger diameter logs tend to burn slower than smaller logs, allowing for a more complete burn.

4. Improper Fuels

Burning materials not recommended by the manufacturer can play a major role in visible emissions. Materials such as plastics, garbage, rubber tires, and even wood products such as cardboard and paper that may be coated with petroleum products may emit excessive smoke. Fire starters such as gasoline, oil, and other chemicals can also make an ordinary wood fuel load seem very dirty once burned. If people who own outdoor furnaces start fires with some kindling and load with wood fuel as recommended above, they can eliminate a lot of the smoke that others see and the problems that go with it.

5. Loading

The amount of wood loaded into an outdoor furnace in relation to the firebox size also has an effect on visible emissions. For every size of wood load there is a minimum amount of space needed to complete the combustion process. For instance, if a person were to load a relatively small firebox completely and load a larger firebox with the same amount of wood, with all of the other factors being the same, the larger firebox would burn cleaner. In the smaller firebox, the combustion process does not have enough room to expand, heat up, and mix before exiting the firebox (insufficient time, temperature, and turbulence). Just because a firebox is large does not mean that it should be filled completely. This large volume is used in part for what happens AFTER it is loaded.

B. Furnace Size

The size of a furnace should be large enough to provide sufficient heat without constant reloading. If the target burn time is 12 hours, an adequately sized furnace will provide enough heat for 90% of all heating days. There will always be the extraordinarily cold days for which no one can plan. A small furnace that needs constant reloading will unavoidably be left unattended and will lose much of its available heat. In these situations, the firebox is left relatively cold and restarting will be dirtier because of flame quenching on the cool firebox walls. A good rule to follow is be that if the furnace cannot stay within 20% of its set point under regular reloading, then it is undersized and a larger furnace is needed.

C. Chimney Considerations

Although chimney height has little to do with overall emissions, it should be considered in ALL installations of outdoor furnaces. Installers and dealers should first take a look at the proposed location and take a few things into account. Location of nearby buildings, structures, and natural geography all affect the furnace's ability to draft. While higher is generally better, it is sometimes tough to convince the furnace owner to add length to the chimney because of the extra cost.

VI. Conclusions

The proper use of an outdoor furnace can significantly reduce the visible emissions that it produces. Simple fuel considerations with regard to moisture content, size, and amount help hinder the production of smoke and ultimately help improve efficiency. Other obvious ways to

help reduce smoke is to only burn fuels recommended by the manufacturer and to not overload the furnace. In addition, the furnace size should be properly matched to the heat load so that cold starts and overfilling are avoided. Chimney height should be in accordance with the state and local codes, as well as surroundings, including neighbors. These areas, along with the "Best Burn Practices for Outdoor Furnaces," can greatly help in providing clean, safe heat from all outdoor wood burning furnaces.

HPBA/JHGAdmin/102

AUTHORIZED FURNACE TREATMENT

Greentech Manufacturing, Inc. requires the usage of authorized furnace treatment to be used in all Crown Royal Stoves. Treatment is to be added to the furnace water upon initial startup and is required to remain at satisfactory levels throughout the life of the stove.

To ensure the maximum efficiency and longevity of your Crown Royal Stove, water treatment is crucial. Treating systems with authorized furnace treatment will prevent corrosion and scale buildup. Calcium and magnesium are commonly found in many water supplies. These impurities cause layers of scale that not only decrease heat transfer efficiency but cause pitting on the interior water jacket. Over time constant pitting will result in leaks. Once authorized treatment is added it creates the necessary barrier needed to prevent the breakdown of the metals. Premature corrosion is a result of not treating the water with correct corrosion resistant inhibitor or with the wrong dosage.

Water Treatment and Testing Required on all Crown Royal Stoves

All Crown Royal Stoves are required to be shipped with initial recommended gallon(s) of authorized treatment. Crown Royal Stoves are backed with a 20-year Limited Warranty. To retain warranty on Crown Royal Stoves it is required to use recommended treatment and submit annual samples for testing. Failure to maintain treatment at recommended levels and annual water testing will result in a voided warranty.

- Specifically designed for Crown Royal Stoves, closed-loop design.
- Helps protect system from scale, sludge and corrosion.
- Vapors help prevent corrosion throughout the furnace.
- Economical – one gallon/3.78 liters treats 300 gallons/1134 liters of system capacity.
- FREE Water Testing and sample bottles.

Sample Bottles

Two sample bottles and labels are found with each gallon of treatment. For additional bottles or labels please contact your local dealer or call 866-361-7355.

Warning

Read entire label located on treatment before opening or using this product. Keep out of the reach from children. Do not mix with any other chemicals. Contains Sodium Nitrate and Potassium Hydroxide. Avoid contact with skin, eyes and clothing. Undiluted product causes severe skin and eye irritations. Wash thoroughly after handling. Do not swallow. Swallowing may cause nausea, vomiting, weakness and lowered blood pressure. MADE IN U.S.A.

Storage

Keep fire-retardant closed container closed when not in use. When product is stored it may separate or thicken. This will not harm the performance. Before using, warm to room temperature and stir thoroughly. Keep from freezing.

Initial Start-up Procedure for Water Treatment

All Crown Royal Stove purchases are required to purchase authorized water treatment for initial start-up. With each gallon of treatment, you will be provided with two sample bottles and furnace information forms.

- Before adding treatment fill furnace with water and circulate for 48 hrs.
- Check for any leaks before adding treatment.
- Add initial dosages of treatment for the following model –
    - 7200E – Add 1 gallon
    - 7300E – Add 1 gallon
    - 7400E – Add 2 gallons
- Follow procedure for collecting water sample below.

Procedure for Collecting Water Sample

- Turn off furnace, and circulate for 24 hours to ensure complete mixture of water and treatment.
- Collection of sample can be done from drain line or other convenient location.
- Allow 30 seconds of drainage before collection of the sample.
- Use provided 4oz sample bottle to retrieve water sample.
- Fill out provided Furnace Information Form and attach to sample bottle.
- Mail water sample to designated testing facility found on provided Furnace Information Form.
- Testing facility analyzes the conductivity, PH and nitrate levels of water sample.
- Testing results are provided on all samples within 4-6 weeks.
- If testing results are unsatisfactory, recommendations of additional treatment will be given.
- These recommendations will need to be performed and a retest is required to maintain warranty.
    - Low levels – Additional treatment is to be added to system and a retest is required.
    - High levels – Water will need to be drained and replaced with fresh, untreated water and a retest is required.

When collecting water samples turn off the furnace and allow the water to reduce in temperature. When the water is reduced to a safe temperature, collect a sample.

WARNING!!! Hot water and surfaces may cause burns. Use extreme care with the collection of water sample.

Mailing Samples – Testing results are emailed to customers who provide emails on the Furnace Information form or mailed to the address give, within 4-6 weeks. It is owner's responsibility to ensure you receive testing results and follow recommendations. When mailing samples to testing facility, it is recommended to mail with tracking capabilities. If test results are not received within 4-6 weeks, please call 866-361-7355.

Additional Dosage Requirements

- If the system/furnace experiences a leak or requires water to be added, add treatment at the rate of ½ oz per gallon of water added.
- If the furnace system is drained for any reason, refer to initial startup procedure of Water Treatment.

IMPORTANT

Mandatory Yearly Maintenance Dosage and FREE Water Testing

It is required annually to add treatment and send a water sample to our authorized testing facility to retain warranty of furnace. Water testing is free to all Crown Royal Stove customers for the life of the stove. **Failure to maintain treatment recommendation levels and submit annual water samples will result in a voided warranty.**

- Annually add ¼ of the required amount of treatment, this will keep levels balanced.
- Follow directions for collecting of water sample and mail to facility for testing annually.

Purchasing Water Treatment

Water treatment is specially formulated for Crown Royal Stoves. To uphold warranty no other chemical may be substituted. We encourage customer to contact your local dealership or call 866-361-7355 to purchase additional water treatment when needed.

For additional free sample bottles and labels please contact your local dealer or call Greentech Mfg at 866-361-7355.

EMERGENCY FIRST AID PROCEDURES FOR FURNACE TREATMENT
EMERGENCY PHONE NUMBER
1-800-424-9300

INHALATION:

Remove from the area to fresh air. If not breathing, clear the airway and start mouth to mouth artificial respiration. GET IMMEDIATE MEDICAL ATTENTION.

EYE CONTACT:

Immediately rinse the eyes with water. Remove any contact lens and continue flushing for at least 15 minutes. Hold the eyelids apart to ensure rinsing of the entire surface of the eyes and lids with water.
GET IMMEDIATE MEDICAL ATTENTION

SKIN CONTACT:

Wash affected areas with large amounts of soap and water for 15 minutes. Remove contaminated clothing and shoes. GET IMMEDIATE MEDICAL ATTENTION.

INGESTION:

Give 3 to 4 glasses of water, but do not induce vomiting. If vomiting occurs, give fluids again. GET IMMEDIATE MEDICAL ATTENTION. DO NOT GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS OR CONVULSING PERSON.

NOTE TO PHYSICIAN:

Introduction into the body may lead to the formation of Methemoglobim which in sufficient concentration causes Cyanosis. Since reversion of the Methemoglobin to Hemoglobin occurs spontaneously after termination of exposure, moderate degrees of Cyanosis should be treated only by supportive measures such as bed rest and oxygen inhalation. Thorough cleansing of all contaminated areas of the body including scalp and nails is of utmost importance. If Cyanosis is severe, intravenous injection of Methylene blue, 1MG/KG of body weight may be of value. Cyanocobalamin (Vitamin B-12), 1 MG intramuscularly, will speed recovery. Intravenous fluids and blood transfusion may be indicated in very severe exposures.

20 YEAR LIMITED WARRANTY

Thank you for making the choice to purchase your new Crown Royal Stove. We are certain that you will find great satisfaction with your stove's ongoing reliability and performance.

Greentech Manufacturing, Inc. warrants this furnace, to the original owner, to be free of defects in material and workmanship for a period of twenty (20) years from the date of purchase.

One Year Warranty

- On Electrical Components - Parts Only— aquastats, thermostats, fans and pumps are guaranteed by the manufacturer for a period of one (1) year from the date of purchase. Parts will be replaced on an even exchange, excluding shipping charges and labor.
- The loading & heat exchanger door, ash pan, door gaskets and ceramic moldings are warranted for a period of one (1) year from date of purchase.

Five Year Warranty

- Shaker Grates - the cast iron rocker grates are warranted for five (5) years 100%. This warranty excludes any warping or deterioration from ash corrosion.

If there is a leak in the fire box, water jacket or heat exchanger on your Crown Royal Stove during the:

- First (1) year - Greentech Manufacturing, Inc. will replace the unit at no cost to the original owner. The owner is liable for the un-installation of the old unit and the installation of the replacement unit.
- Two to five (2 - 5) years—If the unit is unable to be repaired and must be replaced the customer shall pay the difference between the original purchase price of the old unit and the new purchase price of the replacement unit, plus freight and installation.
- Sixth (6) year— Greentech Manufacturing, Inc. will pay a percentage of the total repair cost of the fire box and outer drum. Our percentage paid is as follows: year 6 –70%, year 7 – 50%, years 8-9 – 30%, years 10-20 – 20%. After the twentieth (20) year, Greentech Manufacturing, Inc. will give 10% off the purchase of a new stove.

Not Warranted

- Greentech Manufacturing, Inc. does not warranty parts damaged by freezing, overheating, pressurization, warping and/or use of unauthorized fuels or abuse.
- Greentech Manufacturing, Inc. is not responsible for the cost of plumbing, replacement of antifreeze, shipping, labor or any other cost other than the replacement of the part or furnace.
- Greentech Manufacturing, Inc. is not liable for any damage or cost which may occur from or during the operation of the furnace, or damage incurred due to any heating system failure. These furnaces are not intended to be the only source of heat; therefore, it is recommended that a back-up system is in place to prevent damages caused by lack of heat.
- No unauthorized adjustments or repairs will be covered by warranty.
- Greentech Manufacturing, Inc. does not warrant exterior paint or finish, any damage caused by negligence and deterioration due to lack of proper ongoing maintenance, overheating, physical damage caused by abuse or freeze up, unauthorized work or modifications to the furnace, damage to the fire-box due to power surges or damage caused by burning unauthorized fuels.
- Ash corrosion on the inside fire drum in not warranted. To prevent ash corrosion, rotating or raking ashes forward must be done as described in the manual. The Crown Royal Stove is designed to be the least susceptible to corrosion; therefore, most corrosion is covered under this warranty.

The chimney must be covered when the unit is not in use. It is mandatory that a chimney cap be installed before operation of the unit. If an onsite repair is made, the customer is responsible for the transportation costs and labor. If the furnace needs to be repaired at the factory, it is the responsibility of the consumer to pay all shipping charges to and from the factory. Greentech Manufacturing, Inc. specifically disavows any other representation, warranty, or liability related to the condition or use of this product.

The purchaser assumes all responsibility for the care, maintenance and safe operation of the furnace including the monitoring and adding of an approved boiler treatment. All instructions must be followed in the operator's manual, Control Chemical utilized and water samples tested annually and the warranty registration must be on file at Greentech Manufacturing, Inc. Greentech Manufacturing, Inc. always has the right to decide if the stove will be repaired or replaced. To qualify & validate this warranty, registration must be completed within thirty (30) days of purchase date, dealer's invoice attached and mailed to:

Greentech Manufacturing, Inc. • P.O. Box 1237 • International Falls, MN 56649

Failure to use Control Chemical in your furnace and to send in annual water samples will void this warranty— NO EXCEPTIONS!

This Warranty is subject to change. For updated warranty information contact Greentech Mfg, Inc.

WARRANTY CLAIM FORM Date: _____

Distributor/Dealer Name: _____

Address: _____

City: _____ State: _____ Zip: _____

Phone: _____ Fax: _____

Customer's Name: _____

Address: _____

City: _____ State: _____ Zip: _____

Phone: _____ Fax: _____

Claim conditions apply and cannot exceed warranty statement and procedure policy!
Please send this form, bill of sale and pictures back to service@green-techmfg.com. Claim cannot be processed without pictures and/or video of leak. Pictures cannot be blurry. Take close-ups and farther away so we can tell where the leak is happening. Warranty work completed without prior authorization may be denied.

(Process from start to finish - When reviewing all information sent in by customer, we make sure the stove is registered in original owner name and verify that the mandatory chemical was added to the system and yearly test results were sent in and came back satisfactory. When approved you find a local welder to give an estimate to repair the stove, which we approve and tell you the percentage covered. This warranty is prorated so it will be covered by a percentage. After you pay the bill you submit a copy to us and a check is submitted back to you. Complete process usually takes 30 days. Under some circumstances, we may require furnace to be shipped back to our facility.)

Model: _____ S/N: _____

Purchase Date: _____ Install Date: _____

Description of Claim: _____

_____

_____

_____

_____

_____

_____

_____

_____

_____

Have you turned in a warranty claim before? Yes or No
If yes, is the leak in the same place? Yes or No

Additional Notes or Comments:

_____

_____

_____

_____

_____

_____

Repair Required:

_____

_____

_____

_____

_____

_____

PLEASE ATTACH PHOTOS OF AREA NEEDED REPAIR

EMERSON
Climate Technologies

16E09-101

Universal Electronic Temperature Control

INSTALLATION AND OPERATION INSTRUCTIONS

Save these instructions for future use!

DESCRIPTION

The 16E09-101 is a single stage electronic temperature control, with a Nema 1 rated enclosure, and can be used for most applications within the temperature control range of -40° to 220°F, (-40° to 104°C). The control has an SPDT (Single Pole Double Throw) output load relay.

The control has user options to control differential, anti-short cycle delay, set back, offset, alarms and more. It includes an NTC (Negative Temperature Coefficient) thermistor temperature sensor, and can be used with certain other NTC or PTC (Positive Temperature Coefficient) thermistors that meet the specified resistance vs. temperature specifications. See the tables on page 7.

The control can fit many applications, which range from refrigeration to heating due to the wide temperature range of the control stated above. Typical applications include walk-in freezers, beverage coolers, supermarket display cases for flowers, produce, meats, convenience store refrigerated cases, food warmers, boiler control, and certain industrial applications.

PRECAUTIONS

⚠ WARNING

- **Failure to read and follow all instructions carefully before installing or operating this control could cause personal injury and/or property damage.**
- **To prevent electrical shock, personal injury and/or equipment damage, disconnect electric power to system at main fuse or circuit breaker box prior to installation or service.**
- **To prevent scald injury, do not use this control to heat water for bathing, washing, hot tub or similar applications.**
- **Where failure of this control may result in personal injury and/or property damage, additional alarms or limit controls must be installed.**
- **This control is a temperature control and is not to be used as a temperature limit control.**

CONTENTS

Basic Description 1
Precautions 1
Installation 2
Wiring 3
User Menu 4
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Specifications 7
Troubleshooting 8

16E09-101 Optional Accessories / Service Items:

Immerson Well F89-0286
Replacement 7.5' NTC Remote Sensor F136-0114
Well Heat Transfer Compound F145-0163

INSTALLATION

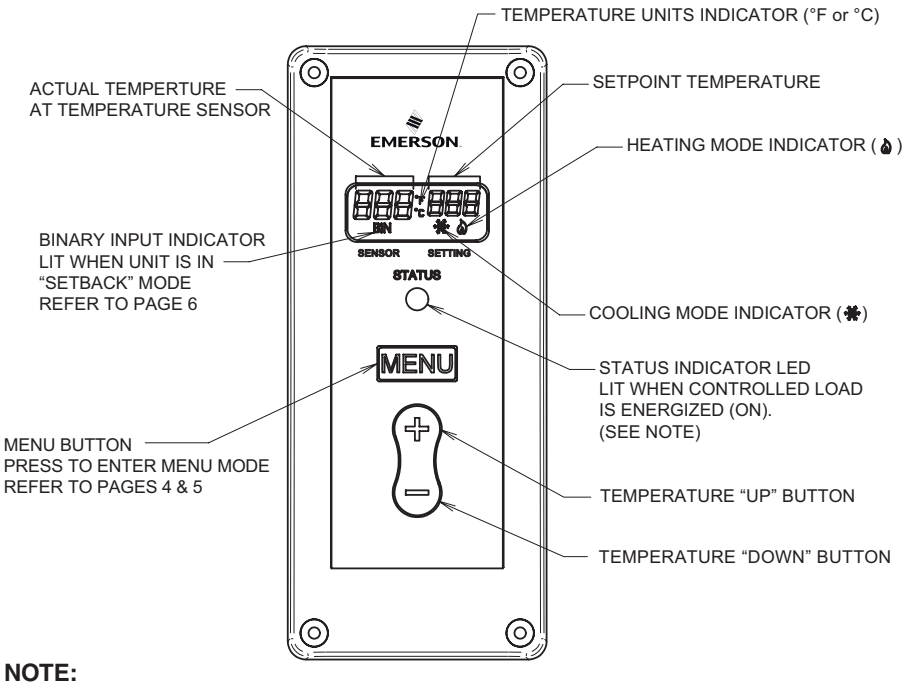
⚠ To prevent electrical shock and/or equipment damage, disconnect electric power to system at main fuse or circuit breaker box prior to installation or service.

⚠ Where failure of this control may result in personal injury and/or property damage, additional alarms or limit controls must be installed.

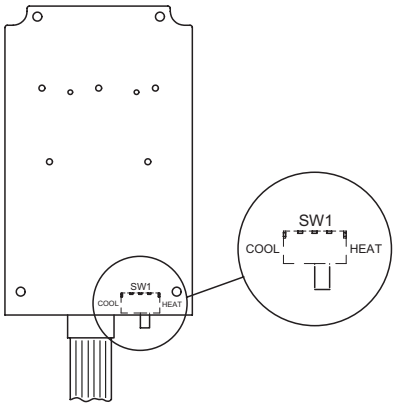
⚠ This control is a temperature control and is not to be used as a temperature limit control.

The control has a user selection for changing the setpoint to be either the Cut In or the Cut Out setting. The user must be careful to understand how this effects the “range” in which the control will operate when the differential value is entered. If entered values are incorrect, the control could operate outside the user’s intended settings due to set-up error. See section titled "Operation".

Fig. 1 Control Front View and Description



Circuit Board Inside Cover

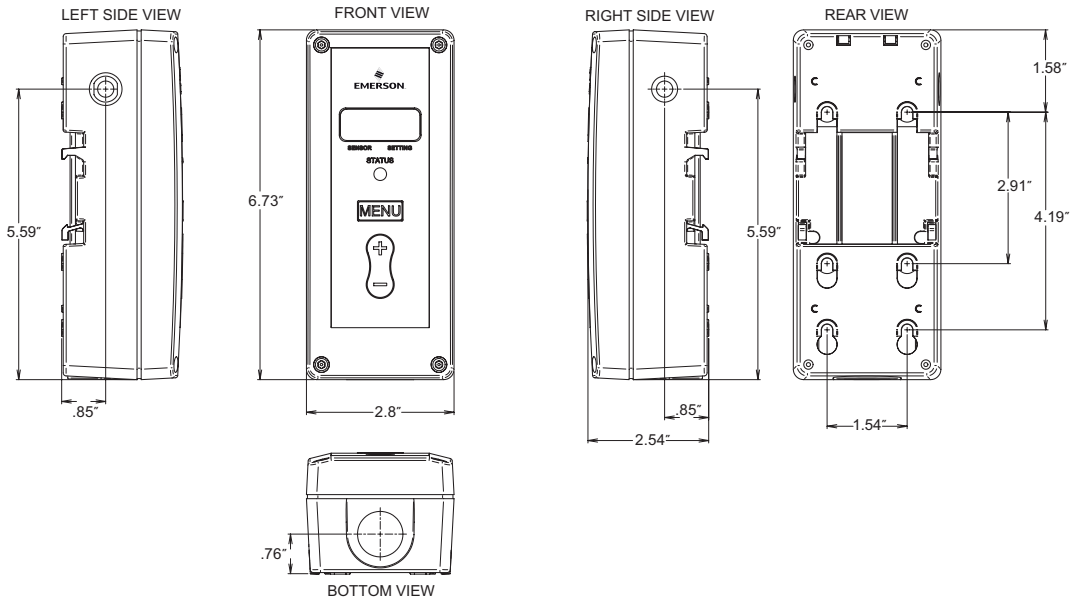


Switch SW1 must be set for system mode as shown:

	SW1
Refrigeration	Cool
Heating	Heat

NOTE:
Green Status Indicator LED and display backlight operation
It may be observed from time to time that the green status indicator LED and display back-light will briefly turn off during a call for heating or cooling. During this time, the control is performing a self-check lasting up to 15 seconds. This is normal operation of the control and the load power will be maintained

Fig. 2 Control Dimensions and Mounting Information



WIRING

Wiring Instruction Notes

Switch Settings
Switch SW2 must be set for applications as shown:

	SW2
Line Voltage (Power Stealing)	PS
Line Voltage (Non Power Stealing)	Non PS
24 VAC (Non Power Stealing)	Non PS

Power Stealing
Power Stealing is an electronic design within the control that can eliminate the need to connect a neutral line to power the control. The control receives power from the unit it is controlling. Power Stealing saves time and money by often eliminating the labor to run a neutral wire to the control for power. See compatibility chart below for certain limitations.

Power Stealing Compatibility Chart

Application	Power Stealing	Non-Power Stealing
Line Voltage, replacing existing control that has a common wire	Yes	Yes
Line Voltage, with load greater than 2.5 amps, without Defrost timer or other power interruption circuit, with or without alarm	Yes	Yes
Line Voltage, with load greater than 2.5 amps, with Defrost timer of other power interruption circuit, no alarm	See Note 1	Yes
Line Voltage with load greater than 2.5 amps, with Defrost timer or other power Interruption circuit, with alarm	No	Yes
Line Voltage with load less than 2.5 amps	No	Yes
24 VAC Application	No	Yes

NOTE 1: During defrost or time when load circuit is broke, display will be blank because power has been interrupted to the control. All menu settings and setpoint will be restored when power is returned.

Fig. 3 Line Voltage Application (Power Stealing)

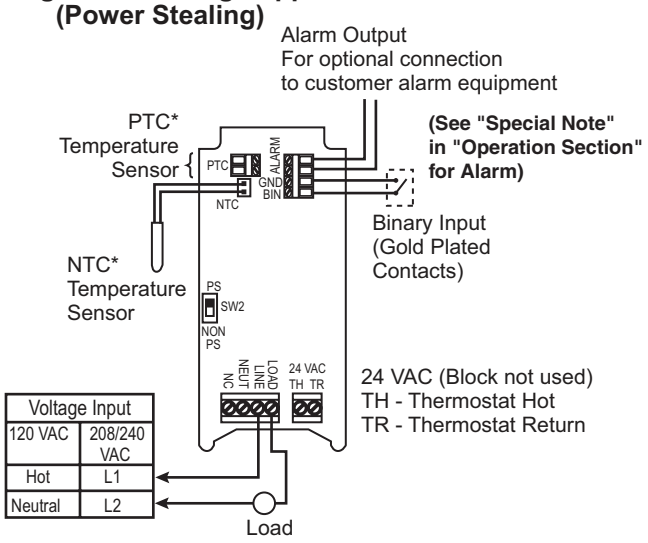


Fig. 4 Line Voltage Application (Non-Power Stealing)

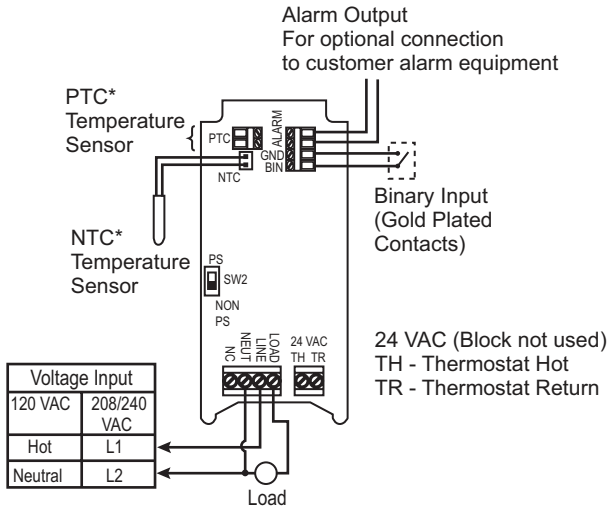
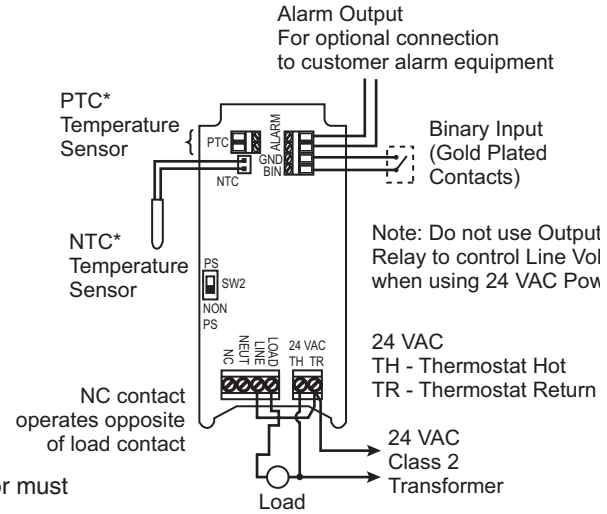


Fig. 5 24 VAC Applications (Non-Power Stealing)



* NTC – Negative Temperature Coefficient
PTC – Positive Temperature Coefficient

NOTE: Only one sensor (PTC or NTC) may be connected. Sensor must meet specific temperature vs. resistance specifications.

USER MENU

USER MENU OPERATION SETTINGS:
The control has user Menu settings that will determine how the control operates. The unit is shipped with factory default settings. The user must change any of the settings as required for the application. To reset all settings to factory defaults, press and hold all 3 buttons simultaneously (MENU, ✛, and ▭ buttons) for approximately 5 seconds.

To view Menu items, press and hold MENU for 5 seconds. The unit will display the first Menu item on the left side of the display. The right side of the display indicates the Menu item settings. To change the setting, momentarily press the ✛ or ▭ key.

A momentary press of the MENU key advances the display to the next Menu item, and continues, till the last menu item is displayed. Pressing the key one more time with the **last** menu item, (aL) displayed returns the control to the operating mode.

Each press of MENU results in forward movement to the next Menu item. If you need to change an item "passed", you must repeatedly press MENU, return to the operating mode, then press and hold MENU for 5 seconds to re-enter the Menu mode. Then repeatedly, momentarily press MENU until the desired Menu item is again displayed.

To store any changes made to any Menu items, the Menu must be exited by pressing MENU when the last item is displayed. If no buttons are pressed for ten minutes while in the menu, the control will return to operating mode and any changes that were made will be lost.

The following table shows the menu items, default settings and optional settings.

NOTE: The Heat/ Cool switch (SW1) MUST be in the proper position BEFORE setting options.

Menu Item	Description	Factory Default	Options Press ✛ or ▭ to select	Comments
CF	Temperature Scale	F	C or F	Selects temperature display in Fahrenheit or Celsius
dFF	Differential	5	1 to 30	Selects the range between Cut In and Cut Out.
SP	Set Point Mode Cool Heat	 CI CO	 CO or CI CI or CO	Selects how the set point temperature will operate the load terminal. CI indicates the setpoint temperature will be the Cut In temperature. CO indicates the temperature will be the Cut Out temperature. See Operation section.
SOF	Sensor Operation Failure Cool Heat	 1 0	 0 or 1 None	Cooling - Selects the operation of the Control Load relay in the event of a sensor failure in Cool mode. 1 (default) will cause the load contacts of the relay to close and remain closed if the sensor either opens or shorts. 0 causes the load contacts of the relay to open and remain open. Heating has no optional selection. Sensor failure in Heating will result in the relay contacts opening.
dL	Display Light	Off	On or Off	Selects the LCD display light Off or On. With this selected Off, the display light will illuminate any time a keypad button is pressed to provide better viewing in low lighting conditions, and go off after 10 seconds. If On is selected, the display light will be On continuously.
ASd	Anti Short-Cycle Delay	Cool 1 Heat 0	0 to 12	Selects the minimum time (in minutes) that the load contacts will remain open after a cycle before closing again. This will prevent the compressor or other load from being damaged by cycling too soon. A blinking Snowflake or Flame icon indicates that the control has a demand to energize the load, but is waiting for the delay time to elapse. A setting of 0 indicates no time and the feature is disabled. SW1 must be set to the proper position before checking this setting.
LP	Lock Front Panel Keypad	Off	On or Off	When selected Off, the keypad can be used as normal. When selected On, prevents unauthorized access to the control settings by locking out all keys. To unlock the control when it is locked, press and hold the Menu key for 5 seconds.
OFS	Ambient Temperature Offset	0	-4, -3, -2, -1, 0, 1, 2, 3, 4	This control is calibrated at the factory, but the "sensed" temperature may read different because of mounting/installation, or other factors. This item allows the displayed temperature to be shifted the number of degrees set to compensate for this difference

USER MENU

Menu Item	Description	Factory Default	Options Press ✚ or ▭ to select	Comments
bIn	Binary Input	Off	On or Off	The default setting of Off will have no affect on the operation of the thermostat. When set to On, it allows an external binary input (switch or relay) to start a temperature set back. See Set Back (Sb).
Sb	Set Back	0	0 to 50	Selects the number of degrees the thermostat will change the setpoint temperature when the external binary input signal is received. 0 will cause no temperature change to occur. See Binary Input (bin).
AL	Alarm	0	0 to 99	Selects the time delay (in minutes) before a Temperature Out of Range alarm output is sent. A setting of 0 disables the alarm relay.

OPERATION

⚠ **This control is a temperature control and is not to be used as a temperature limit control.**

⚠ **To prevent scald injury, do not use this control to heat water for bathing, washing, hot tub or similar applications.**

The factory default setpoint for this control is 45°F (7°C) for Cool and 120°F (49°C) for Heat. Setpoint temperature can be adjusted using the ✚ or ▭ keys. A power loss does not lose the settings. All menu item selections and setpoint setting are stored in a permanent memory.

The user determines the temperature operating range. To determine the temperature range, the user must select the Set Point (SP) as the Cut Out or Cut In temperature, Differential (dFF) and enter a set point temperature. Cut out is when the load is turned off and cut in is when the load is turned on.

NOTE: The Heat/ Cool switch (SW1) MUST be in the proper position BEFORE setting options.

COOL/REFRIGERATION

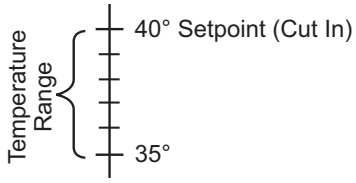
To use as a Cooling control, SW1 must be set to Cool. The snowflake (❄) icon will display.

If control is in Cool mode, and Set Point is selected as the Cut In:

Temperature Operating Range = Setpoint Temperature – (minus) Differential

Example:

SW1 = Cool
Set Point (SP) = Cut In
Differential = 5
Setpoint temperature = 40°

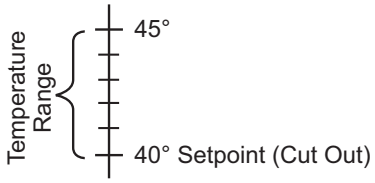


If control is in Cool mode, and Set Point is selected as the Cut Out:

Temperature Operating Range = Setpoint Temperature + (plus) Differential

Example:

SW1 = Cool
Set Point (SP) = Cut Out
Differential = 5
Setpoint temperature = 40°



HEAT

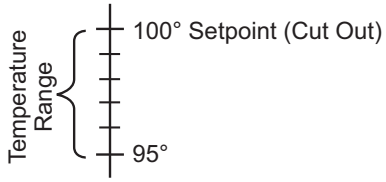
To use as a Heating control, SW1 must be set to Heat. The flame (🔥) icon will display.

If control is in Heat mode, and Set Point is selected as the Cut Out:

Temperature Operating Range = Setpoint Temperature – (minus) Differential

Example:

SW1 = Heat
Set Point (SP) = Cut Out
Differential = 5
Setpoint temperature = 100°

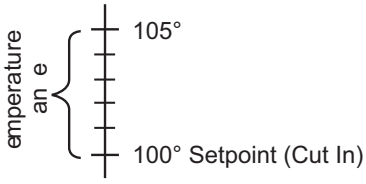


If control is in Heat mode, and Set Point is selected as the Cut In:

Temperature Operating Range = Setpoint Temperature + (plus) Differential

Example:

SW1 = Heat
Set Point (SP) = Cut In
Differential = 5
Setpoint temperature = 100°



OPERATION

Lock Panel (LP)

The keypad can be locked to prevent unwanted tampering with the control settings. In the User Menu, change the menu item LP selection to On. When the menu is exited and settings are stored, the ✣ or ▭, and MENU keys will be disabled from normal use.

To unlock the keypad, press and hold MENU for 5 seconds. The display will change to show LP On. Momentarily press ✣ or ▭ to change to Off and then momentarily press MENU. The control will return to normal operation and the keypad will be unlocked.

Binary Input (bIn) and Set Back (Sb)

Binary Input is an option to allow the setpoint temperature to set back to conserve energy or for other reasons as determined by the user. Set Back determines the number of degrees the setpoint temperature will be changed.

An external switch or N.O. relay can be connected to the BIN and GND terminals of the control. With bIn set to On, when the switch is closed, the control will change the setpoint temperature by the number of degrees set in Sb. In Heat mode, setpoint temperature will change lower or cooler. In Cool mode, setpoint temperature will change higher or warmer.

During the time that the switch is closed, bIn will appear in the lower left corner of the display. If an alarm is connected be sure that the alarm delay time is set long enough to allow for the temperature change to avoid a “false” alarm.

Alarm (AL)

SPECIAL NOTE

Using the Alarm Output and power stealing in combination – When using power stealing mode and the alarm output, it is important for the installer to review the wiring circuit of the installation to insure no device is present that could interrupt electrical power to the temperature control. Such a device could be a defrost timer, as one example, that may be used in some refrigeration applications.

If a device is in the system wiring that can periodically disrupt power to the load and the temperature control, the power stealing mode of the control cannot be used. A neutral wire must be connected to the control and select the non power stealing mode for the control. This keeps power to the control during power interruptions to the load and avoids a “false” alarm output.

This control has an alarm relay that will provide an output to alert of a malfunction. The alarm relay output must be connected to an external light, audible alarm or other device as needed by the user. If AL is set to 0, the alarm relay will not provide any alarm output. If AL is set to a value greater than 0, the alarm relay output provides indication of three error conditions: Temperature Out of Range, Power Loss and Sensor Operation Failure. Although AL must be set to a value greater than 0 for any alarm output to be provided, the value selected is the time delay, in minutes, before a Temperature Out of Range alarm is set. The alarm time delay does not apply to Power Loss or Sensor Operation Failure.

Temperature out of range – If the temperature is more than 5° from the setpoint, continuously for the length of time set in AL, the alarm relay output will close. The delay should be set to allow for conditions that will cause the temperature to vary, such as defrost cycle, opening door for stock removal or replacement or Set Back changes. When setting the AL time, consideration should be given to these events to prevent a false alarm.

If the control set back feature is used to change the setpoint, the delay period set in AL should consider the time it takes for the system to reach the set back temperature to avoid a false alarm.

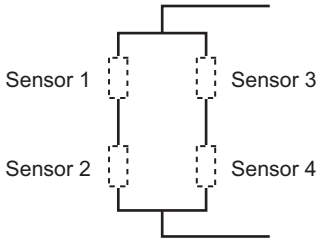
Power Loss – If the temperature control experiences an input power failure, the control will close the alarm relay before total power of the control is lost. The delay time is not used in this event, and the alarm relay will close within seconds of a power failure. In addition, the load relay contact change state per the Sensor Operation Failure (SOF) setting.

When power returns, the alarm contacts will open. The load relay will remain in the SOF position the length of time set in Anti Short-Cycle Delay (ASd) after power resumption. The display will blink the flame or snowflake icon for this time to indicate the load is “locked” out. This is to help protect the user’s equipment from damage by short cycle switching.

Sensor Operation Failure (SOF) – If in operation, the sensor wiring should become open or shorted, the temperature control will begin blinking SOF with SH for shorted or SO for sensor open. However, the control will wait approximately 1 minute before closing the alarm output relay - indicating sensor operation failure. If during the 1 minute, the sensor “resumes” normal operation, the time is reset and the control returns to normal display. The load relay will operate as selected in sensor operation failure (SOF).

Multiple Sensors

The 16E09 is normally operated with one sensor. If an average temperature of an area is required, 4 sensors may be used and wired in the method shown below. If 4 sensors are used, they must all be of the same model.



NOTE: When using multiple sensors, 4 sensors must be used. The control will not operate with 2 or 3 sensors.

SPECIFICATIONS

Load Output Relay:

	Ratings (Maximum): 120VAC	208VAC	240VAC
Full Load Amps NC & Load	16 A	9.2 A	8 A
Locked Rotor Amps NC & Load	96 A	55.2 A	48 A
Non-Inductive Amps NC & Load	16 A	16 A	16 A
Horsepower NC & Load	1 hp	1 hp	1 hp

24 VAC NC & Load 100 VA, 30 VAC Max (Class 2)
Pilot Duty NC & Load 125 VA, 24 to 240 VAC

- Minimum Load Rating: 1 Amp @ 24 VAC
- Note: the above minimum current/voltage is specified to assure proper operation.

NOTE: For use on single phase circuits only.

Alarm Relay Ratings (Maximum):
N.O. contact: 1 Amp, 5 to 24 V, AC or DC

Operating Ambient Ratings (Control Enclosure):
Operating Temperature: -29°F to 140°F (-34° to 60°C)

Storage Shipping Ambient Ratings:
Storage Temperature: -40°F to 185°F (-40° to 85°C)
Operating Humidity: 0 to 95% Relative Humidity, Non-Condensing
Maximum Dew Point: 85°F (29°C)

Temperature Set-Point Range:
Set-Point Range: -40° to 220°F (-40° to 104°C)
Differential Range: 1 to 30 (Degrees F or Degrees C)

Case:
NEMA 1 Enclosure, Flammability Rating: UL94VO

Temperature Probes:

NTC
The control is shipped with an NTC (Negative Temperature Coefficient) sensor, with a cable length of 7½ feet. Cable length can be extended up to 400 feet by appropriately splicing and adding additional cable (22 AWG or larger diameter) as needed – polarity is not important. When extending cable length, verify temperature accuracy and use the menu Ambient Temperature Offset (OFS) settings to compensate accordingly if required.

NTC TEMPERATURE VERSUS RESISTANCE TABLES

Temperature (°F)	(°C)	Resistance (KΩ)	Temperature (°F)	(°C)	Resistance (KΩ)	Temperature (°F)	(°C)	Resistance (KΩ)
-40	-40	328.29	50	10	19.82	140	60	2.49
-31	-35	236.83	59	15	15.67	149	65	2.09
-22	-30	172.90	68	20	12.48	158	70	1.76
-13	-25	127.65	77	25	10.00	167	75	1.48
-4	-20	95.23	86	30	8.07	176	80	1.26
5	-15	71.74	95	35	6.55	185	85	1.07
14	-10	54.56	104	40	5.34	194	90	0.92
23	-5	41.85	113	45	4.38	203	95	0.79
32	0	32.37	122	50	3.61	212	100	0.68
41	5	25.23	131	55	2.99	221	105	0.59

PTC
The control may be connected to an existing PTC (Positive Temperature Coefficient) sensor. Make sure the PTC sensor meets the specifications tables below. Failure to do so will result in temperature inaccuracies. The PTC input may not be extended more than 50 feet, and the wire gauge should be 18 AWG wire or larger diameter. Be sure the probe attached matches the resistance vs. temperature tables or temperature inaccuracies may occur.

PTC TEMPERATURE VERSUS RESISTANCE TABLES

Temperature (°F)	(°C)	Resistance (KΩ)	Temperature (°F)	(°C)	Resistance (KΩ)	Temperature (°F)	(°C)	Resistance (KΩ)
-40	-40	613	50	10	924	140	60	1323
-31	-35	640	59	15	960	149	65	1368
-22	-30	668	68	20	997	158	70	1413
-13	-25	697	77	25	1035	167	75	1459
-4	-20	727	86	30	1074	176	80	1506
5	-15	758	95	35	1113	185	85	1554
14	-10	789	104	40	1153	194	90	1602
23	-5	822	113	45	1194	203	95	1652
32	0	855	122	50	1236	212	100	1702
41	5	889	131	55	1279	221	105	1753

TROUBLESHOOTING

LCD display, display back-light and green status indicator LED turn off in Power Stealing mode:
This “off” condition is normal for the control in power stealing mode when wired with a defrost timer or other device that interrupts electrical power to the control.

No control settings will be lost during this time, however, the installer must ensure that applications requiring power stealing are suitable for the control to be off during these periods.

Please note: if the built-in alarm feature of the control is to be used on systems that may interrupt power to the control, the control must be wired with a neutral wire and set in non-power stealing mode. This will keep the control continuously powered unless there is an actual power interruption or loss. In this case, the control will be able to signal an alarm for system power loss.

Display indicates “CaL” on power up.
Control was not calibrated. Return control for replacement.

Unit does not turn on, (LCD does not display anything):
- Check that wiring is correct.
- Make sure power is turned on.
- Check that wiring is under terminal blocks correctly.
- Make sure both switches inside control are set to proper position.
- If in Power Steal mode,
  - Make sure the load draws a minimum of 2.5 amp AC. If not, wire per the Non-Power Stealing diagram.
  - Make sure nothing "breaks/opens the load line, such as a defrost timer or any other device, with the alarm feature enabled. This would cause a false alarm. If the alarm function is enabled, wire per the Non-Power Stealing diagram.

Temperature differential is wider than set:
- Temperature change of customer's unit is fast, and the Anti Short Cycle delay setting may be overriding the “call” to activate the heat or cool. Solution – lower Anti Short Cycle delay.

Installation and Power Up:
False alarm sounds, temperature has not yet reached setpoint setting. CUSTOMER must disable alarm (AL = 0), until setpoint temperature is reached, then set alarm delay time.
Customer Changes Setpoint Temperature:
False alarm sounds. CUSTOMER must disable alarm (AL = 0), while unit is adjusting to new temperature. CUSTOMER must then set the alarm delay time when temperature is reached.

Bin/Set Back
False alarm sounds. CUSTOMER must set the delay time with sufficient delay time to assure the Set Back temperature is reached before the alarm delay time has expired.

Note: If the Set Back temperature cannot be reached within 99 minutes (the maximum Alarm delay time), change the Set Back value to a lower number of degrees. If a lower set back can not be used, you may not be able to use the alarm feature.

Alarm Sounds, Reason Unknown:
CUSTOMER should make sure the Alarm (AL) delay time is great enough to cover other conditions when the unit temperature may not be able to stay within 5 degrees.
- Loading or unloading of stock and the doors are open. (Add sufficient delay time to the alarm delay).
- Power is lost to the control if the line is broken/open by a defrost timer or other device. (Wire control per the Non Power Stealing line voltage schematic and connect/add a neutral line connection).

TECH SUPPORT HELP LINE: 1-888-725-9797

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EMERSON
Climate Technologies

CROWN ROYAL STOVES

MODEL 7200E
CENTRAL/SUPPLEMENTARY BOILER

ELECTRICAL RATING: 115 V, 60 H, 15 AMPS

INSTALLATION: USE ONLY CHIMNEYS SUITABLE FOR SOLID FUEL. DO NOT CONNECT TO A CHIMNEY FLUE SERVING ANOTHER APPLIANCE. PLACE ONLY ON NON-COMBUSTIBLE FLOORING WITH ADEQUATE SUPPORT. MAINTAIN THE FOLLOWING CLEARANCES TO COMBUSTIBLES:

SIDES = 36 IN. FRONT = 60 IN. BACK = 36 IN. TOP = 12 IN. CHIM. CONN. = 60 IN.

THIS APPLIANCE MAY BE CONNECTED TO AN EXISTING BOILER SYSTEM. DO NOT RELOCATE OR BYPASS ANY OF THE SAFETY CONTROLS IN THE ORIGINAL BOILER INSTALLATION.

CAUTION: THIS EQUIPMENT MAY ONLY BE INSTALLED BY QUALIFIED PERSONNEL.

OPERATION: REFER TO OWNERS MANUAL SUPPLIED WITH THIS APPLIANCE. BURN APPROVED FUELS ONLY. LOAD FUEL CAREFULLY OR MAY RESULT IN DAMAGE. IN CASE OF A “RUN-AWAY” FIRE, DISCONNECT FROM ELECTRICAL SUPPLY AND BE SURE ALL DOORS ARE CLOSED TIGHTLY.

DANGER- RISK OF FIRE OR EXPLOSION: DO NOT USE CHEMICAL FLUIDS TO START THE FIRE. DO NOT BURN GARBAGE, GASOLINE, NAPHTHA, ENGINE OIL, OR OTHER INAPPROPRIATE MATERIALS. DO NOT STORE FUEL WITHIN THE ABOVE CLEARANCES. DO NOT OPERATE WITH FUEL DOOR, ASH REMOVAL DOOR, OR CLEAN-OUT DOORS OPEN. DO NOT OPERATE THIS APPLIANCE DURING AN ELECTRICAL POWER FAILURE. DISCONNECT ELECTRICAL POWER BEFORE SERVICING.

CAUTION- HOT SURFACES: KEEP CHILDREN AWAY. DO NOT TOUCH DURING OPERATION.

CAUTION- LOAD FUEL CAREFULLY OR DAMAGE MAY RESULT.

THE HEAT EXCHANGER, FLUE PIPE, AND CHIMNEY MUST BE CLEANED REGULARLY TO REMOVE ACCUMULATED CREOSOTE AND ASH. TO ENSURE THAT THE HEAT EXCHANGER, FLUE PIPE, DRAFT INDUCER, AND CHIMNEY ARE CLEANED AT THE END OF THE HEATING SEASON TO MINIMIZE CORROSION DURING THE SUMMER MONTHS. THE APPLIANCE, FLUE PIPE, AND CHIMNEY MUST BE IN GOOD CONDITION.

THIS APPLIANCE NEEDS PERIODIC INSPECTION AND REPAIR FOR PROPER OPERATION. CONSULT OWNER’S MANUAL FOR FURTHER INFORMATION.

IT IS AGAINST FEDERAL REGULATIONS TO OPERATE THIS APPLIANCE IN A MANNER INCONSISTENT WITH OPERATING INSTRUCTIONS IN THE OWNER’S MANUAL.

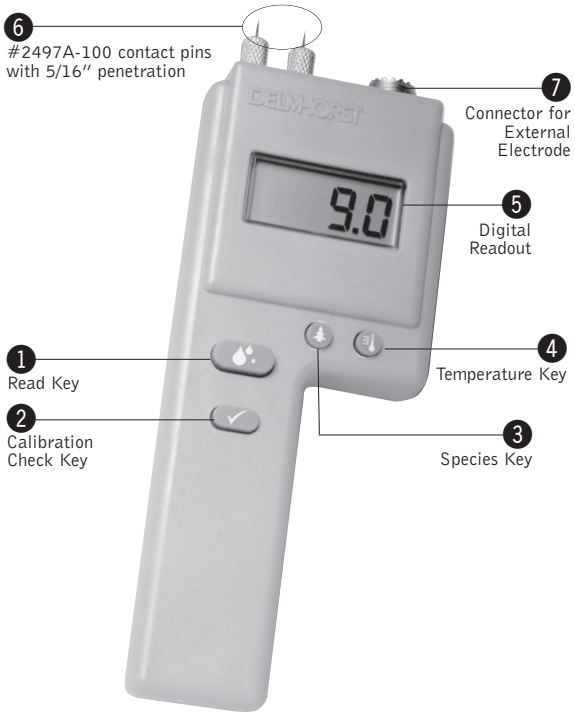
U.S. ENVIRONMENTAL PROTECTION AGENCY CERTIFIED TO COMPLY WITH THE 2020 PARTICULATE STANDARDS USING CORD WOOD.

TESTED TO ASTM E2618-13, AVERAGE EMISSION RATE .08 LBS/MMBTU, MAXIMUM EMISSION RATE 0.120 LBS/MMBTU.

ADD-ON BOILER DATE MANUFACTURED:

JAN ☐ FEB ☐ MAR ☐ APR ☐ MAY ☐ JUN ☐ JUL ☐ AUG ☐ SEP ☐ OCT ☐ NOV ☐ DEC ☐

MANUFACTURED BY GREENTECH MANUFACTURING INC. | PO BOX 1237/2716 CRESCENT DRIVE | INTERNATIONAL FALLS, MN 56649



J-2000 FEATURES

- ▶ Resistance technology recognized worldwide as the most accurate method for measuring wood MC
- ▶ 6% to 40% MC wood (Douglas Fir ref)
- ▶ 6% to 60% MC wood (J-2000/X)
- ▶ Averages up to 100 accumulated readings
- ▶ User-selectable corrections for 48 species
- ▶ Built-in temperature compensation (F/C)
- ▶ Proven microcontroller circuit
- ▶ Easy one-hand operation
- ▶ Includes (1) 9-Volt Battery
- ▶ Includes sturdy carrying case
- ▶ One-year warranty

BEFORE YOU BEGIN

Key Functions

❶ READ KEY - Press to read the %MC.

❷ CALIBRATION CHECK KEY - This key, (when pressed with the read key) checks the meter calibration. It also displays the number of readings in memory (up to 100), the average, and the highest stored reading. It also clears the memory.

❸ SPECIES KEY - Press to select the species code for the wood you are testing. Species are numbered from 1 to 48 and are listed on the Species Code Chart on page 5. To scroll forward through the species codes keep the species key pressed. To scroll backward press the species key, release it and immediately press the temperature key.

❹ TEMPERATURE KEY - Press to set the wood temperature. Press and immediately press the Calibration Check the temperature key ❷ to toggle between (F and C). To increase the temperature setting keep the temperature key pressed. To decrease the temperature, press the temperature key, release it and immediately press the species key.

CHECK CALIBRATION ✓

Press the calibration check key ❷ and read key ❶ simultaneously. Meter is in calibration if it displays 12% (+ or - 0.2).

If you check the calibration and the meter does not display 12% it is likely an indication of a low battery. If this occurs, replace the battery immediately with a new EverReady or Duracell brand 9V. Continued use with a low battery may cause the meter to go out of calibration. If you have a fresh battery and the instrument still does not indicate a proper calibration, return it to DELMHORST for service. See **Service for your Meter** section.

When the battery is removed and then reconnected, the meter displays its software version for one second and then turns itself off. After replacing the battery, you must reset the meter as described in **Resetting the Meter** section.

A hard Reset is required if, after changing the battery, the display is frozen. This is sometimes caused by the interruption of contact between the battery and battery lead wire. Resolve this as follows: Disconnect the battery. Press and hold the Read key for 15 seconds. Release the Read key. Press and hold the Check key for 15 seconds. Release the Check key. Connect a fresh battery to the lead wire in a single action, making sure to align the poles properly and without interrupting contact. If the display remains frozen, repeat the procedure. If this procedure does not solve the problem, refer to the Service for Your Meter section.

Meter Default Settings

Species - Douglas Fir
Temperature - 70°F
Pin/Electrode - 4-pin (non-insulated)
Each of these parameters is programmed into the meter and is user-selectable. Proper setting of each will insure the most accurate readings.

SET SPECIES

The J-2000 defaults to Species Code #1 - Douglas Fir - the USDA standard and basis for all Delmhorst calibrations. Because the electrical characteristics of different species vary, all species read differently at the same moisture content. For this reason you need to adjust for species. If you are working with a species other than Douglas Fir, set the species code using the species key 3, and the meter will make the necessary corrections.

- **To change species** press the species key 3. The meter will display the current species code for one second. Refer to the Species Code Chart on page 5. Call our customer service team at 877-DELMHORST (335-6467) or e-mail info@delmhorst.com for assistance with any species or wood-based material that is not included in the chart. It is always helpful if you have the scientific name as well as any common names for the species.

- **To scroll forward** through the species list hold the species key ❸ while the current species code is displayed and scroll to the species number desired.
- **To scroll backward** through the species list, press and release the species key ❸. Within one second, press and hold the temperature key ❹. Continue to hold the temperature button ❹ and the species number will decrease.
- **When scrolling in either direction**, release the key to stop at your desired species.

Species Code Chart

CODE	SPECIES	CODE	SPECIES
1	Fir, Douglas	25	Magnolia
2	Pine, Southern	26	Mahogany, African (also Khaya)
3	SPF	27	Mahogany, Honduras
4	Alder	28	Mahogany, Philippine
5	Apitong	29	Maple, Hard/Soft
6	Aspen	30	Meranti, Dark Red
7	Ash, White	31	Oak, Red
8	Basswood	32	Oak, White
9	Birch	33	Pecan
10	Cedar, Eastern Red	34	Pine, Longleaf
11	Cedar, Incense	35	Pine, Ponderosa
12	Cherry	36	Pine, Shortleaf
13	Cottonwood	37	Pine, Sugar
14	Cypress	38	Pine, White
15	Elm, American	39	Poplar, Yellow
16	Fir, Red	40	Ramin
17	Fir, White	41	Radiata Pine
18	Gum, Black	42	Redwood
19	Gum, Red	43	Spruce, Sitka
20	Hemlock, Western	44	SPF, COFI*
21	Hackberry	45	Teak
22	Hickory	46	Virola
23	Keruing	47	Walnut, Black
24	Larch	48	Western Hemlock - COFI*

*Species and temperature correction data for both Western Hemlock-COFI (code #48) and SPF-COFI (code #44) were developed by COFI.

When comparing readings between the model RDM-2/COFI or the RDM-2S/COFI, used with type 26-E electrode with insulated pins, and the J-2000, be sure both meters are set to 2-pin electrode (insulated pins).

SET TEMPERATURE

The J-2000 defaults to a temperature of 70°F. As wood temperature increases, its electrical resistance decreases and indicated moisture content rises. Lower wood temperatures result in lower indicated moisture content. A correction is necessary if the wood temperature is outside the range of 50°F (10°C) to 90°F (32°C). Set the temperature accordingly and the meter will make the correction.

- **To change temperature** press and release the temperature key 4. The meter will display the current temperature for one second.
- **To scroll forward** through the temperature settings, press and hold the temperature key 4 while the current temperature is displayed.
- **To scroll backward** press and release the temperature key 4. Within one second, press and hold the species key 3. Continue to hold the species key 3 and the temperature will decrease.
- **When scrolling in either direction**, release the button to stop at the desired temperature.

Set Temperature Mode

- **To change between Fahrenheit and Celsius modes** press the temperature key 4.
- **Press the calibration check key** 2 within one second and release when you are in the desired mode.
- **The meter will display the current temperature setting** in the new mode and will wait one more second until shutting off so that you may change the temperature value as described above.

If the meter is in Fahrenheit mode, the letter "F" will display in the left-hand corner. If it is in Celsius mode, no letter will appear in the display.

In the Fahrenheit mode, the temperature will change in increments of 5°F. In Celsius, the temperature will change in increments of either 2°C or 3°C depending on its conversion from Fahrenheit.

In the Fahrenheit mode, the temperature value will display in whole numbers. In the Celsius mode, positive values will display in whole numbers; negative values will display with a decimal point and a "minus" sign in the left-hand corner. (i.e.: -17.0)

SET PIN CALIBRATION

The basic factory calibration of the J-2000 is for use with non-insulated pins. Insulated pins read lower than non-insulated ones. The difference is small below 10% MC but increases as the moisture content increases above 10%. When using an electrode with insulated pins, such as the 26-ES hammer electrode, you can change the calibration to compensate for this difference.

- **To change the pin setting**, press and release the species key 3, then press the calibration check key 2 within one second.
- **The meter will display** the current pin calibration as either 222 for insulated or 444 for non-insulated pins.
- **If you continue to hold the calibration check key 2**, the meter will toggle between 222 and 444.

TAKING A READING

- **Remove the protective cover** to expose the pins. Check that the contact pins 6 are firmly hand tightened.
- **To take a reading**, align the contact pins 6 parallel to the grain and push them to their full penetration into the wood, if possible. Insulated pins read only at the tip and can be driven to the desired depth.
- **Press the read key 1** and read the moisture content on the meter scale. The meter displays the %MC for two seconds.
- **To add a reading** to the sum of all the previously stored readings, release the read key 1 within 2 seconds.

The non-insulated contact pins on the top of the meter penetrate max 5/16in. and may be used on wood up to 1-1/2 to 2in. thick. Push the pins into the wood to their full penetration for best accuracy. For thicker wood and hardwoods over 4/4, use the 26-ES hammer electrode with insulated pins. These pins (no. 496), may be used on wood up to 5-6in. thick. Connect the electrode to the input connector on the top of the meter 7. Contact our customer service team for more information on other available pins for your application.
Insulated pins offer the advantage of taking measurements at various depths since the reading is made at the point in the wood where only the non-insulated tips of the pins make contact. This is especially useful when drying lumber since reliable shell and core readings are essential to producing high quality lumber.

See the FAQ section of our website for helpful application info. www.delmhorst.com

INFORMATION ABOUT YOUR READINGS

Readings below 6% will be displayed as a numeric value, (-##.#), but will not be added to the accumulated readings in memory. Readings below 6% due to temperature and species adjustments will be shown as a numeric value with no minus sign. These readings will be added to the accumulated total in memory and included in the statistical calculations.

Readings above 40% are always displayed as 999 and are not added to the memory.

The meter will accumulate up to 100 readings. After all 100 readings are stored it will not add new readings until the memory has been cleared. It will also continue to display the average of all 100 readings as a reminder that the memory is full.

When taking and storing readings for a specific wood species, be sure to clear the meter's memory before moving on to the next species if you do not want to group all of the readings together.

TO CHECK ACCUMULATED READINGS

This feature allows you to view the total number of all accumulated readings, the average of those readings, and the highest stored reading.

- **To view the readings** press and release the calibration check key (2). The meter displays the number of accumulated readings for one second, then the average of those readings for two seconds. Then it displays the highest stored reading for two seconds. The total cycle time is five seconds.
- **To clear the memory** press and hold the calibration check key (2) down for 5 seconds. All accumulated readings will be erased and the meter will display "0".

TO RESET METER

- **Press and release** the calibration check key (2).
- **Within one second** press the species key (3).
- **The meter will reset itself** and display "170" to indicate the meter is reset to default: Species #1 (Douglas Fir) at 70°F, followed by 444 (pin setting). All of the readings in memory will be cleared.

CARE OF YOUR METER

To keep your meter in good working order:

- Store your meter in a clean, dry place. The protective carrying case provided is an ideal storage place when the meter is not in use.
- Change the 9-Volt battery as needed. Use only EverReady or Duracell brand batteries. Continued use with a low battery may cause the meter to go out of calibration.
- Change contact pins as needed. Keep contact pins hand tightened.
- Clean the meter and contact pins with any biodegradable cleaner. Use the cleaner sparingly and on external parts only. Keep cleaner out of the external connector (7).
- Remove the battery if the meter will not be used for one month or longer.

SERVICE FOR YOUR METER

If your meter is not working properly, replace the battery with a new one and check the calibration. If this does not resolve the problem please send your meter back to Delmhorst for repair.
Go to HYPERLINK "http://www.delmhorst.com" www.delmhorst.com and click on Support and then download the Return Form.
If you require further assistance please call 877-DELMHORST (335-6467) or 973-334-2557.
E-mail HYPERLINK "mailto:info@delmhorst.com" info@delmhorst.com

WARRANTY

Delmhorst Instrument Co., referred to hereafter as Delmhorst, guarantees its J-2000 meter for one year from date of purchase and any optional electrodes against defects in material or workmanship for 90 days. If, within the warranty period, you find any defect in material or workmanship return the meter following the instructions in the **Service for Your Meter** section. This limited warranty does not cover abuse, alteration, misuse, damage during shipment, improper service, unauthorized or unreasonable use of the meter or electrodes. This warranty does not cover batteries or contact pins. If the meter or any optional electrodes have been tampered with, the warranty shall be void. At our option we may replace or repair the meter.

Delmhorst shall not be liable for incidental or consequential damages for the breach of any express or implied warranty with respect to this product or its calibration. With proper care and maintenance the meter should stay in calibration; follow the instructions in the **Care of Your Meter** section.

UNDER NO CIRCUMSTANCES SHALL DELMHORST BE LIABLE FOR ANY INCIDENTAL, INDIRECT, SPECIAL, OR CONSEQUENTIAL DAMAGES OF ANY TYPE WHATSOEVER, INCLUDING, BUT NOT LIMITED TO, LOST PROFITS OR DOWNTIME ARISING OUT OF OR RELATED IN ANY RESPECT TO ITS METERS OR ELECTRODES AND NO OTHER WARRANTY, WRITTEN, ORAL OR IMPLIED APPLIES. DELMHORST SHALL IN NO EVENT BE LIABLE FOR ANY BREACH OF WARRANTY OR DEFECT IN THIS PRODUCT THAT EXCEEDS THE AMOUNT OF PURCHASE OF THIS PRODUCT.

The express warranty set forth above constitutes the entire warranty with respect to Delmhorst meters and electrodes and no other warranty, written, oral, or implied applies. This warranty is personal to the customer purchasing the product and is not transferable.

NOTES

For more than 65 years Delmhorst Instrument has been the leading manufacturer of high quality, US-made moisture meters and thermo-hygrometers. Today we offer a wide range of meters for applications including water damage restoration, construction, flooring, lumber/woodworking, paper, and agriculture.

DELMHORST®
INSTRUMENT CO.
WHEN ACCURACY IS THE POINT.™

51 Indian Lane East
Towaco, NJ 07082

(877)-DELMHORST
www.delmhorst.com
info@delmhorst.com

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510INS-0003 REV. 01/15

Established 1974

QUALITY CONTROL SERVICES

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ACCREDITED
CERTIFICATE #1550.01

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

Report Number: DIRI0182484A0912013i190610

A2LA ACCREDITED
CERTIFICATE OF CALIBRATION WITH DATA

INSTRUMENT INFORMATION

Item	Make	Model	Serial Number	Customer ID	Location
Scale	Digiweigh	DWP12i 400x.01	82484A0912013i	#050	Lab

Units	Readability	SOP	Cal Date	Last Cal Date	Cal Due Date
lbs	0.01	QC033	6/10/19	12/18/18	6/2020

FUNCTIONAL CHECKS

SHIFT TEST	LINEARITY	REPEATABILITY	ENVIRONMENTAL CONDITIONS
Test Wt: 50 Tol: 0.05	Test Wt: HB44 Tol: HB44	Test Wt: 50 Tol: 0.01	☐ Good ☑ Fair ☐ Poor
As-Found: Pass:☑ Fail:☐	As-Found: Pass:☑ Fail:☐	As-Found: Pass:☑ Fail:☐	Temperature: 20.7°C
As-Left: Pass:☑ Fail:☐	As-Left: Pass:☑ Fail:☐	As-Left: Pass:☑ Fail:☐	

CALIBRATION DATA

Standard	As-Found	As-Left	Expanded Uncertainty
400	399.96	399.96	0.058
300	299.98	299.98	0.058
200	199.98	199.98	0.058
100	99.98	99.98	0.012
50	50.00	50.00	0.012
20	20.00	20.00	0.012

CALIBRATION STANDARDS

Item	Make	Model	Serial Number	Cal Date	Cal Due Date	NIST ID
Avoirdupois Cast W	Rice Lake	25 and 50lb	PWO990-CA	11/24/17	11/2019	20172265

Permanent Information Concerning this Equipment:
12 month calibration cycle

Comments/Information Concerning this Calibration
6/19 RH = 47%.

Report prepared/reviewed by: ServiceTechJC **Date:** 6/11/19 **Technician:** J. Colacchio **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.

Dry Gas Meter Calibration

Meter Manufacturer:	Apex
Model:	XC-50-DIR
Lab ID #:	129
Serial #:	1906005
Calibration Date:	11/7/2019
Calibration Expiration:	5/7/2020
Barometric Pressure:	30.05 in. Hg

Reference Standard DGM	
Manufacturer:	Apex
Model:	SK25DA
Lab ID#:	47
Serial #:	1101001
Calibration Expiration Date:	3/13/2020
Calibration γ Factor:	0.998

Unit Under Test Previous Calibration	
Date	N/A
γ Factor:	0.998
Allowable Deviation (±5%):	0.0499
Actual Deviation:	0.01
Result:	PASS

Calibration Data	Run 1	Run 2	Run 3
Standard DGM Initial Volume (L)	0.000	0.000	0.000
Standard DGM Final Volume (L)	147.116	145.062	172.045
Standard DGM Temperature (°F)	73.0	74.0	78.0
Standard DGM Pressure (in H_2O)	0.00	0.00	0.0
DGM Initial Volume (ft^3)	0.000	0.000	0.000
DGM Final Volume (ft^3)	5.226	5.281	6.334
DGM Temperature (°F)	78.0	88.0	96.0
DGM Pressure (in H_2O)	2.00	1.00	0.5
Time (min)	22.0	34.0	66.0
Net Volume for Standard DGM (ft^3)	5.195	5.123	6.076
Net Volume for DGM (ft^3)	5.226	5.281	6.334

Dry Gas Meter γ Factor	0.997	0.991	0.988
γ Factor Deviation From Average	0.997	0.991	0.988

Average Gas Meter γ Factor: 0.992

Calculations:

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

Standard Reference Meter is calibrated to NIST traceable standards. Uncertainty of measurement is ±0.5%.

 *Technician:*_____

Pressure Gauge Calibration Work Sheet

Gauge Manufacturer:	Apex
Maximum Range (inH_2O):	3
Instrument ID #:	129 (dH)
Calibration Date:	11/12/2019
Calibration Expiration:	11/12/2020
Barometric Pressure:	30.16 in. Hg

Reference Standard Gauge	
Manufacturer:	Dwyer
Model:	477AV-1
Instrument ID#:	136
Calibration Expiration Date:	9/27/2020

Calibration Point (inH_2O)	Reference Gauge Reading (inH2O)	Pressure Gauge Reading (inH2O)	Difference (Reference - UUT)	% Error of Full Range
0.0 - 0.6	0.51	0.57	0.06	2.0%
0.6 - 1.2	0.97	1.03	0.06	2.0%
1.2 - 1.8	1.41	1.46	0.05	1.7%
1.8 - 2.4	1.87	1.94	0.07	2.3%
2.4 - 3.0	2.75	2.80	0.05	1.7%

Acceptable tolerance is 4%

Technican Signature: _____ Date: 11/12/2019

Uncertainty is 0.4 inH_2O, based on minumum uncertainity ration of 4:1 between standard reference meter and unit under test.

Pressure Gauge Calibration Work Sheet

Gauge Manufacturer:	Apex
Maximum Range (inH_2O):	0.5
Instrument ID #:	129 (dP)
Calibration Date:	11/12/2019
Calibration Expiration:	11/12/2020
Barometric Pressure:	30.16 in. Hg

Reference Standard Gauge	
Manufacturer:	Dwyer
Model:	475
Instrument ID#:	76
Calibration Expiration Date:	3/14/2020

Calibration Point (inH_2O)	Reference Gauge Reading (inH2O)	Pressure Gauge Reading (inH2O)	Difference (Reference - UUT)	% Error of Full Range
0.0 - 0.1	0.032	0.033	0.001	0.2%
0.1 - 0.2	0.163	0.161	0.002	0.4%
0.2 - 0.3	0.210	0.206	0.004	0.8%
0.3 - 0.4	0.324	0.316	0.008	1.6%
0.4 - 0.5	0.456	0.439	0.017	3.4%

Acceptable tolerance is 4%

Technican Signature: _____ Date: 11/12/2019

Uncertainty is 0.4 inH_2O, based on minumum uncertainity ration of 4:1 between standard reference meter and unit under test.

Emissions Sampling System Thermocouple Calibration Check

Calibration based on NIST Monograph 175 per ASTM E2515-11
All thermocouples are type "K"

Date: 7/26/2019 Sampling System ID Numbers: 129/130

Performed By: S. Button Calibration Instrument ID Number: 039

Reference Temperature (F)	Acceptable Error (F)	Thermocouple Location						
		FB Left	FB Right	FB Back	FB Top	FB Bottom	Catalyst Exit	Flue
0	± 4.0	0	0	0	0	0	0	0
200	± 4.0	199	199	199	199	199	199	199
400	± 4.0	398	398	398	398	398	398	398
600	± 4.5	599	599	600	599	599	599	600
800	± 6.0	800	800	800	800	800	800	800

Reference Temperature (F)	Acceptable Error (F)	Thermocouple Location					
		Ambient	Filter A	Filter B	Meter A	Meter B	Dilution Tunnel
0	± 4.0	0	0	0	0	-1	0
200	± 4.0	198	199	198	199	198	199
400	± 4.0	398	398	398	398	398	398
600	± 4.5	599	599	599	600	599	600
800	± 6.0	800	800	800	800	800	800

Technician Signature: Date: 12/17/2018

Dry Gas Meter Calibration

Meter Manufacturer:	Apex
Model:	XC-50-DIR
Lab ID #:	130
Serial #:	1906006
Calibration Date:	11/7/2019
Calibration Expiration:	5/7/2020
Barometric Pressure:	30.05 in. Hg

Reference Standard DGM	
Manufacturer:	Apex
Model:	SK25DA
Lab ID#:	47
Serial #:	1101001
Calibration Expiration Date:	3/13/2020
Calibration γ Factor:	0.998

Unit Under Test Previous Calibration	
Date	N/A
γ Factor:	1.000
Allowable Deviation (±5%):	0.05
Actual Deviation:	0.00
Result:	PASS

Calibration Data	Run 1	Run 2	Run 3
Standard DGM Initial Volume (L)	0.000	0.000	0.000
Standard DGM Final Volume (L)	350.400	174.679	145.366
Standard DGM Temperature (°F)	78.0	78.0	75.0
Standard DGM Pressure (in H_2O)	0.00	0.00	0.0
DGM Initial Volume (ft^3)	0.000	0.000	0.000
DGM Final Volume (ft^3)	12.680	6.344	5.174
DGM Temperature (°F)	98.0	98.0	80.0
DGM Pressure (in H_2O)	2.00	1.10	0.5
Time (min)	55.0	40.0	78.0
Net Volume for Standard DGM (ft^3)	12.374	6.169	5.134
Net Volume for DGM (ft^3)	12.680	6.344	5.174

Dry Gas Meter γ Factor	1.005	1.004	0.998
γ Factor Deviation From Average	1.005	1.004	0.998

Average Gas Meter γ Factor: 1.002

Calculations:

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

Standard Reference Meter is calibrated to NIST traceable standards. Uncertainty of measurement is ±0.5%.

 *Technician:*_____

Pressure Gauge Calibration Work Sheet

Gauge Manufacturer:	Apex
Maximum Range (inH_2O):	3
Instrument ID #:	130 (dH)
Calibration Date:	11/12/2019
Calibration Expiration:	11/12/2020
Barometric Pressure:	30.16 in. Hg

Reference Standard Gauge	
Manufacturer:	Dwyer
Model:	477AV-1
Instrument ID#:	136
Calibration Expiration Date:	9/27/2020

Calibration Point (inH_2O)	Reference Gauge Reading (inH2O)	Pressure Gauge Reading (inH2O)	Difference (Reference - UUT)	% Error of Full Range
0.0 - 0.6	0.49	0.48	0.01	0.3%
0.6 - 1.2	1.07	1.03	0.04	1.3%
1.2 - 1.8	1.35	1.31	0.04	1.3%
1.8 - 2.4	2.32	2.26	0.06	2.0%
2.4 - 3.0	2.69	2.76	0.07	2.3%

Acceptable tolerance is 4%

Technican Signature: _____ Date: 11/12/2019

Uncertainty is 0.4 inH_2O, based on minumum uncertainity ration of 4:1 between standard reference meter and unit under test.

Pressure Gauge Calibration Work Sheet

Gauge Manufacturer:	Apex
Maximum Range (inH_2O):	-1
Instrument ID #:	130 (dP)
Calibration Date:	11/12/2019
Calibration Expiration:	11/12/2020
Barometric Pressure:	30.16 in. Hg

Reference Standard Gauge	
Manufacturer:	Dwyer
Model:	475-000
Instrument ID#:	76
Calibration Expiration Date:	3/14/2020

Calibration Point (inH_2O)	Reference Gauge Reading (inH2O)	Pressure Gauge Reading (inH2O)	Difference (Reference - UUT)	% Error of Full Range
0.0 - -0.2	-0.15	-0.18	0.03	-3.0%
-0.2 - -0.4	-0.32	-0.34	0.02	-2.0%
-0.4 - -0.6	-0.56	-0.58	0.02	-2.0%
-0.6 - -0.8	-0.61	-0.64	0.03	-3.0%
-0.8 - -1.0	-0.90	-0.93	0.03	-3.0%

Acceptable tolerance is 4%

Technican Signature: _____ Date: 11/12/2019

Uncertainty is 0.4 inH_2O, based on minumum uncertainity ration of 4:1 between standard reference meter and unit under test.

Model 1430 Microtector® Electronic Point Gage

Installation and Operating Instructions

Model 1430 Microtector® Portable Electronic Point Gage combines modern, solid-state integrated circuit electronics with a time-proven point gage manometer to provide fast, accurate pressure measurements.

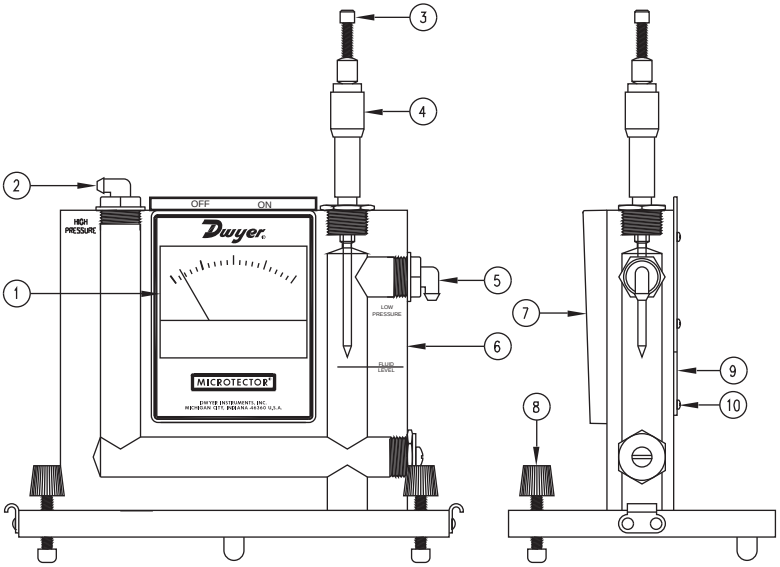
SPECIFICATIONS AND FEATURES

- Accurate and repeatable to ± .00025 inches water column
- Pressure range: 0 - 2″ w.c., positive, negative, or differential pressures
- Non-toxic and inexpensive gage fluid consists of distilled water mixed with a small amount of fluorescein green color concentrate
- Convenient, portable, lightweight and self-contained, the unit requires no external power connections and is operated by a 1.5 volt penlight cell
- A.C. detector current eliminates point plating, fouling and erosion
- Micrometers are manufactured in accordance with ASME B89.1.13-2001, and are traceable to a standard at the National Institute of Standards and Technology
- Three-point mounting, dual leveling adjustment, and circular level vial assure rapid setup
- Durablock® precision-machined acrylic plastic gage body
- Sensitive 0 - 50 microamp D.C. meter acts as a detector and also indicates battery and probe condition
- Heavy 2″ thick steel base plate provides steady mounting
- Top-quality glass epoxy circuit board and solid-state, integrated circuit electronics
- Electronic enclosure of tough, molded styrene acrylonitrile provides maximum protection to components yet allows easy access to battery compartment
- Rugged sheet steel cover and carrying case protects the entire unit when not in use
- Accessories included are (2) 3-foot lengths Tygon® tubing, (2) 1/8″ pipe thread adapters and 3/4 oz. bottle of fluorescein green color concentrate with wetting agent

Maximum pressure: 100 psig with optional pipe thread connections.

Tygon® is a registered trademark of Saint-Gobain Corporation

DWYER INSTRUMENTS, INC.
P.O. BOX 373
MICHIGAN CITY, INDIANA 46361,U.S.A
Phone: 219/879-8000
Fax: 219/872-9057
www.dwyer-inst.com
e-mail: info@dwyer-inst.com



Microtector® Gage

Precision Pressure Measurement

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

Principles of Operation

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

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

Locating and Opening

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

Fluid Level

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

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

Zeroing

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

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

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

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

Positive Pressure Measurement

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

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

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

Negative Pressure or Vacuum Measurement

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

Differential Pressure Measurement

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

Storage

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

Maintenance

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

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

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

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

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

CAUTION:

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

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

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

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Printed in U.S.A. 7/09 FR# 38-440190-00 Rev. 8

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Established 1974

QUALITY CONTROL SERVICES

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ACCREDITED

Calibration Services

Certificate Number: 1550.01

Laboratory code: 115953

Report of Calibration

Firm: Dirigo Laboratories
Address: 11785 SE Hwy 212, Ste 305
City/State/Zip: Clackamas, OR 97015

Test Completed: 03/21/17
Submitted By: John Steiner
Traceable Number: 20170468

Test Item: 200mg and 100mg Individual Weights
Serial No.: Listed in Table

Manufacturer: Troemner

Laboratory Environment at time of test

Temperature °C	Pressure mmHg	Humidity %RH
21.967	753.44	49.44

Conventional Mass Value

Nominal Value	As Found grams	As Found Correction* (mg)	Uncertainty (mg)	Tolerance (mg)
200mg SN 1000101395	0.2000061	0.0061	0.0026	0.01
100mg SN 1000126267	0.1000046	0.0046	0.0028	0.01

*Correction is the difference between the conventional mass value of a weight and its nominal value.

Comments: These weights were new from the manufacturer and were within ASTM Class 1 tolerances As Found. No adjustments or changes were made so As Found values should be considered to be As Left values.

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

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

Date: 03/21/17

Signature David S. Thompson

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A2LA ACCREDITED
CERTIFICATE #1550.01

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

Report Number: DIRI0134307497200110

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	1/10/20	6/10/19	6/2020

FUNCTIONAL CHECKS

ECCENTRICITY
Test Wt: 100 Tol: 0.0003
As-Found: Pass: ☑ Fail: ☐
As-Left: Pass: ☑ Fail: ☐

LINEARITY
Test Wt: 50 x 4 Tol: 0.0002
As-Found: Pass: ☑ Fail: ☐
As-Left: Pass: ☑ Fail: ☐

STANDARD DEVIATION
Test Wt: 100 Tol: 0.0001

1. 100.0001	5. 99.9999	9. 100.0000
2. 100.0000	6. 100.0000	10. 99.9999
3. 100.0000	7. 100.0001	**Result**
4. 100.0000	8. 100.0000	0.00006

ENVIRONMENTAL CONDITIONS
☐ Good ☑ Fair ☐ Poor
Temperature: 19.3°C

A2LA ACCREDITED SECTION OF REPORT

Standard	As-Found	As-Left	Expanded Uncertainty
200	199.9997	200.0000	0.00019
100	100.0000	100.0001	0.00018
50	49.9999	50.0001	0.00018
20	20.0001	20.0000	0.00017
1	0.9998	0.9999	0.00017
0.1	0.0999	0.1000	0.00017

CALIBRATION STANDARDS

Item	Make	Model	Serial Number	Cal Date	Cal Due Date	NIST ID
Weight Set	Rice Lake	20kg to 1mg	7133	4/19/19	4/2020	20190811

Permanent Information Concerning this Equipment:

Comments/Info Concerning this Calibration:
01/20 RH= 49% Adjusted span.

Report prepared/reviewed by: R.B. **Date:** 1-10-20 **Technician:** R. Butcher
Signature: R. Butcher

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.

Established 1974

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(503) 236-2712 • FAX (503) 235-2535 • www.qc-services.com

ACCREDITED
Calibration Services
Certificate Number: 1550.01
Laboratory code: 115953

Report of Calibration

Firm: Dirigo Laboratories
Address: 11785 SE Hwy 212, Ste 305
City/State/Zip: Clackamas, OR 97015

Test Completed: 01/15/16
Purchase Order: 1001
Traceable Number: 20152489

Test Item: 20lb and 10lb Individual Grip Handle Weights
Serial No.: Listed in Table

Manufacturer: Unknown

Laboratory Environment at time of test

Temperature °C	Pressure mmHg	Humidity %RH
21.448	760.64	44.58

Conventional Mass Value

Nominal Value	As Found pounds	As Found Correction* (mg)	Uncertainty (mg)	Tolerance (mg)
20lb #098	19.9995450	-206.4	6.4	910
10lb #097	10.0006510	295.3	5.1	450
10lb #051	10.0003421	155.2	5.1	450

*Correction is the difference between the conventional mass value of a weight and its nominal value.

Comments: These weights were received in good condition and were within NIST Handbook 105-1 Class F tolerances As Found. No adjustments or changes were made so As Found values should be considered to be As Left values.

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

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

Date: 01/15/16

Signature David S. Thompson

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Member: National Conference of Standards Laboratories and Weights & Measures

Certificate of Calibration

Certificate Number: **712600**

JJ Calibrations, Inc.
7724 SE Aspen Summit Drive
Portland, OR 97266-9217
Phone 503.786.3005
FAX 503.786.2994

0723.01
Calibration

PFS TECO
11785 SE Hwy 212
Suite 305
Clackamas, OR 97015

PO: **john.steinest.PFSTECO.co**
Order Date: 11/06/2019
Authorized By: **N/A**

Property #: **064**
User: **N/A**
Department: **N/A**
Make: **Control Company**
Model: **4198**
Serial #: **80531676**
Description: **Digital Temp. / Barometer**
Procedure: **404323**
Accuracy: **±1°C ±0.2362Hg(±8mb)**

Calibrated on: 11/15/2019
*Recommended Due: 11/15/2020
Environment: **21** °C **48** % RH
* As Received: **Within Tolerance**
* As Returned: **Within Tolerance**
Action Taken: **Calibrated**
Technician: **146**

Remarks: * Many factors may cause the unit to drift out of calibration before the recommended due date. Any reported error is the absolute value between the reference and the unit. Uncertainties include the effects of the unit.

Standards Used

Std ID	Manufacturer	Model	Nomenclature	Due Date	Trace ID
644A	Thunder Scientific	1200	Two Pressure Humidity Generator	10/14/2020	710583
847A	Fluke	RPM4	Reference Pressure Monitor	11/21/2019	688957

Measurement Data

Parameter / Measurement Description	Range Unit	Reference	Min	Max	kError	UUT	Uncertainty (Accredited = ✓)
Before/After							
Temperature							
	°C	20.00	19.0	21.0	0.1	20.1 °C	8.1E-02 ✓
	°C	30.00	29.0	31.0	0.8	29.2 °C	8.1E-02 ✓
	°C	40.00	39.0	41.0	0.2	39.8 °C	8.1E-02 ✓
Barometer							
	mbar	1010.70	1002.7	1018.7	0.7	1010.0 mbar	

This instrument has been calibrated in accordance with the JJ Calibrations Quality Assurance Manual and is traceable to either the SI or to National Institute of Standards and Technology (NIST). The quality system and this certificate are in compliance with ANSI/NCSL Z540-1-1994, ISO/IEC 17025-2017, ISO 10012-1, the ISO 9000 family and QS 9000. The expanded uncertainties of measurements for this calibration are based upon 95% (2 sigma) confidence limits. Unless stated in the comments, certificates reflect the "Simple Acceptance Rule" as specified by JCGM 106:2012. Unless otherwise stated, a test accuracy ration (TAR) of 4:1, if achievable, is maintained. The results reported herein apply only to the calibration of the item described above. This report may not be reproduced, except in full, without written approval of JJ Calibrations.

Reviewer

3 Issued 11/16/2019 Rev # 15

Inspector

Tape Measure Calibration

Rule Equipment ID: 101

Std. Gage Block ID: 146

Cal. Expiration Date: 1/7/2023

Std. Surface Plate ID: 147

Cal. Expiration Date: 1/3/2023

System: ☑ Imperial ☐ Metric

Date: 1/23/2020

Ambient (F): 70

Technician: AK

Visual Inspection

☑ Pass ☐ Fail

Full Length Operation Check

☑ Pass ☐ Fail

Tape in Tension

Tolerance: 0.1

Standard	Measured
1.0	1.0
6.0	6.0

Within Tolerance

Tape in Compression

Tolerance: 0.1

Standard	Measured
1.0	1.0
6.0	6.0

Within Tolerance

Body Length

Tolerance: 0.1

Standard	Measured
3.0	3.0

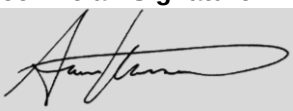
Within Tolerance

Calibration Due

1/23/2021

Notes

Technician Signature



Caliper Calibration

Caliper Equipment ID: 102

Std. Gage Block ID: 146
Cal. Expiration Date: 1/10/2023

Std. Surface Plate ID: 147
Cal. Expiration Date: 1/3/2023

System: ☑ Imperial ☐ Metric

Date: 1/23/2020
Ambient (F): 70
Technician: AK

Visual Inspection

☑ Pass ☐ Fail

Outside Jaws

Tolerance: 0.002

Standard	Measured
0.050	0.050
0.250	0.250
1.000	1.000
2.000	2.001
2.050	2.051
6.000	6.001

Within Tolerance

Inside Jaws

Tolerance: 0.005

Standard	Measured
0.050	0.051
0.250	0.249
1.000	1.003
2.000	2.004
2.050	2.053
6.000	6.004

Within Tolerance

Depth

Tolerance: 0.005

Standard	Measured
0.050	0.052
0.250	0.251
1.000	0.999
2.000	2.003
2.050	2.053
6.000	6.005

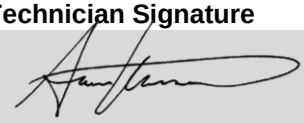
Within Tolerance

Calibration Due

1/17/2021

Notes

Technician Signature



CERTIFICATE OF CALIBRATION

CUSTOMER:	**PFS-TECO :** CLACKAMAS, OR	**CALIBRATION DATE:**	04/30/2020
PO NUMBER:	1016	**CALIBRATION DUE:**	04/30/2021
INST. MANUFACTURER:	DWYER	**PROCEDURE:**	T.O.33K6-4-1769-1
INST. DESCRIPTION:	VELOMETER	**CALIBRATION FLUID:**	AIR @ 14.7 PSIA 70°F
MODEL NUMBER:	471	**RECEIVED CONDITION:**	WITHIN MFG. SPECS.
SERIAL NUMBER:	CP288559 (ID# 095)	**LEFT CONDITION:**	WITHIN MFG. SPECS.
RATED UNCERTAINTY:	SEE NOTES BELOW.	**AMBIENT CONDITIONS:**	763mm HGA 46% RH 69°F
UNCERTAINTY GIVEN:	± 0.43% RD ; k=2	**CERTIFICATE FILE #:**	490265.2020

NOTES: ± 3% FS (0-500 / 0-1500) *** ± 4% F.S. (0-5000) ***± 5% F.S. (0-15000) *** ± 2 °F

NOTES CONT. : Q.MANUAL IM 1.5 REV 2017.1 DATED 7-18-2017

UUT INDICATED FT/MIN	DM.STD. ACTUAL FT/MIN	UUT INDICATED DEG. F	DM STD. ACTUAL DEG. F
55	56	0 TO 200°F	0 TO 200°F
128	130	43.9	43.2
219	223	71.4	70.7
499	509	99.0	98.4
542	546		
1019	1029		
1490	1510		
511	516		
3268	3308		
4995	5077		
6028	6137		
14519	14815		

STANDARDS USED:		
A263A: KURZ / DMC WIND TUNNEL LFE | 0 – 14000 FPM ± .122% RD. | TRACE# 1453296155,1329407628	DUE	06/08/2020
A24: HART SCIENTIFIC TEMP. STANDARD | ±.024 F | TRACE# 1520423238	DUE	03/04/2021

All instruments used in the performance of the shown calibration have traceability to the National Institute of Standards and Technology (NIST). The uncertainty ratio between the calibration standards (DM.STD.) used and the unit under test (UUT) is a minimum of 4:1, unless otherwise noted. Calibration has been performed per the shown procedure number, in accordance with ISO 10012:2003, ISO 17025:2005, ANSI/NCSL-Z-540.3, and/or MIL-STD-45662A. Test methods: API2530-92 & ASME MFC-3M-1989.

Dick Munns Company • 11133 Winners Circle • Los Alamitos, CA 90720
Phone (714) 827-1215 • Fax (714) 827-0823

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.

Date: 04/30/2020 Approved By: Calibration Technician: DC

Certificate of Analysis

OXARC
716 S. Oregon Ave.
Pasco WA, 99301
509-547-2494
SPECIALTY GAS DIVISION

Customer: Hearth & Home

Product: Spec Gas

Grade: Primary Standard

+/- 1%

Lot Number: 2170374

Serial #(s): EB0088221*

* Indicates Cylinder Analyzed For Batch

Component	Specification	Actual	Method
Carbon Monoxide	1%	1.00%	GOW MAC 580 TCD GC
Carbon Dioxide	10%	9.99%	GOW MAC 580 TCD GC
Nitrogen	Balance	Balance	GOW MAC 580 TCD GC

LDL - Lower Detection Limit

Authorized Signature: T. Agostinacci **Date:** 2/8/2017

Analyst: Tim Agostinacci

This is to certify the equipment/cylinders referenced have been calibrated/tested, and verified to meet the defined specifications. This analysis was performed using gases and equipment that is traceable through National Institute of Standards and Technology (NIST) to the International System of Units (SI). The basis of compliance stated is a comparison of the measurement parameters to the specified or required calibration process. The expanded uncertainties use a coverage factor of k=2 to approximate the 95% confidence level of the measurement, unless otherwise noted. This certificate of analysis applies only to the item described and shall not be reproduced other than in full, without written approval from the calibration facility. If not included, the uncertainty of calibrations is available upon request and was taken into account when determining pass or fail as defined in our work instructions. Unless stated above the certification of gases expires 5 years from date of analysis. By request, OXARC, Inc. Specialty Gas Laboratory can provide ISO/IEC 17025:2005 accredited products.

INSPECTION AND TEST RECORD

eSig DOCUMENT FAIRBANKS

Name: GreenTech Mfg

Street: 2716 Cresent Dr

City, State, Zip: International Falls, MN 56649

Page Number: 1

RSO No.: 1520629

Date: 12/9/2019

Inspected by: Jason D'Amico MN:984

Next Inspection due: 12/1/2020

Test equipment used:
1000lb blocks certified test weights x3

Procedure used:
Handbook 44

Final test results:
☐ **In tolerance**
☐ **Out of tolerance**

Location	Type Scale Make / Model	Serial No.	Scale Capacity	Test Load Used	Test Reading Corners				Total Test Load Reading	Recommendations and remarks
					1	2	3	4		
shop	Rice Lake IQ355	1864500049	10000x1lb	0					0	
	RL platform 5x6HP-10k	124699		1000	1000	1000	1000	1000	1000	
				2000					2000	
				3000					3000	In tolerance, no adjustments required

☐ Jason D'Amico
Calibrator's Signature

☐
Acceptor's Signature

This certification may not be reproduced except in full.

FAIRBANKS SERVICE

Fairbanks Service
2500 Cleveland Ave.N Suite C-No
St.Paul, Mn 55113

State License # 284

For Prompt Service Call: 800-229-2800

Calibrated On: 12.9.19
Next Calibration Date: 12/20
Tech: J.S.
LIC/ID#: 6649

Appendix F - Efficiency Measurement and Calculation Discussion

When hydronic heaters are tested to ASTM E2618, a discrepancy between efficiency results has been repeatedly observed.

Efficiency is calculated two ways. The first is delivered efficiency, which measures the flow rate and temperature of load water to determine energy output, and the weight, moisture content, and specific energy content of the fuel load to determine input.

The second is the stack loss method, which uses the same method to determine energy input. Output, however, is calculated by measuring energy lost up the flue rather than output energy directly.

Because the stack loss method (SLM) accounts only for energy lost in flue gasses, it does not account for energy lost through the jacket of the appliance or piping system. Delivered efficiency does account for these sources of loss, as it measures only the useful heat extracted from the heat exchanger. Therefore, if both methods are measured with perfect accuracy, SLM efficiency should always be higher than delivered efficiency. In testing, however, this is not always the case. In some instances, delivered efficiency has been measured as up to 5 percentage points higher than SLM.

This discrepancy is not well understood and may simply be due to the realities of measurement uncertainty and variability in testing. However, we have identified some issues with the test method that could contribute to systemic errors that may, alone or in combination, be the source of this discrepancy.

Moisture Content Readings

One possible cause of the issue is over-reporting of fuel moisture content. Fuel moisture measurement techniques are generally intended for use with dimensional lumber, and may not account for the more irregular properties of cordwood.

ASTM E2618 specifies that moisture meter electrode reading depth “shall be 1/4 the thickness of the fuel piece or 3/4 in. (19 mm), whichever is greater.” This language is pulled directly from EPA Method 28, a method that uses dimensional Douglas fir lumber. While this standard is appropriate for milled lumber with smooth, flat faces, it may not accurately account for moisture variation in the cross section of cordwood pieces, which, due to their irregular shape, can have a much higher ratio of surface area to volume.

Accurate moisture measurement for dimensional lumber has been studied extensively and is well understood. Research on measurement of cordwood pieces, however, is very limited. Therefore moisture measurement uncertainty cannot be definitively identified as the source of efficiency calculation discrepancy, but it cannot be ruled out. More study on this issue is recommended.

A brief explanation of why over-reported fuel moisture can cause a higher delivered efficiency result as compared for SLM efficiency:

Delivered efficiency calculation accounts for fuel moisture in determining total input. Higher fuel moisture readings mean lower dry fuel weight. Dry fuel weight is directly proportional to total BTU input. Therefore, any overstatement fuel moisture content will cause a proportional understatement of BTU input.

Fuel moisture is not used for determining output. Only heat exchanger load flow rate and temperature differential are used. Therefore total output is fixed with respect to fuel moisture content, and any error therein will not affect that side of the efficiency calculation. Lower input with a fixed output of course means higher efficiency result.

Stack loss method, conversely, accounts for fuel moisture on both sides of the efficiency equation. Input is calculated in the same way as in the delivered efficiency method. However, the output calculation uses that same fuel moisture data in its chemical balance to determine stack flow rate and energy content.

The two moisture terms do not fully cancel in the final efficiency calculation, but output will still scale with respect to moisture content, unlike with delivered efficiency. This dramatically reduces the effect of systemic error in moisture content readings.

Fuel Higher Heating Value

ASTM E2618 specifies that all fuel shall have an assumed BTU content of 8600 BTU/lb. While this may be an acceptable average value, actual BTU content can vary significantly.

Delivered efficiency results are directly proportional to the fuel HHV, so a 5% error in HHV value would translate to a 5% error in delivered efficiency result.

Like moisture content as described above, SLM calculations are significantly less sensitive to fuel HHV. For example, a 5% change to HHV results in less than 1% change in stack loss efficiency result

Appliance Heat Capacity

Another possible source of the discrepancy is assumptions made in calculating the energy stored in the appliance. ASTM E2618 specifies that the heat retained in the body of the appliance, for the purposes of efficiency calculation, is determined by multiplying the weight of the dry appliance, by the heat capacity of steel, by the average temperature of the input and output water.

This assumes that the entire appliance is constructed of steel and that its average temperature is equal to that of the water it contains. Both assumptions can cause an underreporting of delivered efficiency.

Modern appliances are not entirely steel- most notably, they can contain up to several hundred pounds of refractory material. Refractory material has a heat capacity approximately double that of steel. This means that the heat capacity of a given appliance may be substantially higher than the value used by the delivered efficiency calculation.

Compounding the issue is that refractory temperatures can be far, far higher than the temperature of the water. While water in a hydronic heater will not exceed 100C, when a modern downdraft heater is in an on-cycle, its refractory can exceed 800C.

Taken together, these factors mean that energy content stored in the body of the appliance can be substantially underreported. If the appliance is operating at a high temperature at the start of a run, this can cause delivered efficiency to be over-reported. This is because the large amount of “free,” un-accounted energy stored in the appliance will be transferred to the heat exchanger over the course of the run. Conversely, if the appliance starts the run at a low temperature and ends at a high temperature, this stored energy is not accounted for and delivered efficiency would therefore be under reported.

Stack Loss Method Interval Calculations

The stack loss method was not designed for cycling appliances. Its calculations make several assumptions that do not apply to hydronic heaters.

It should be noted that the efficiency discrepancy has been observed for maximum output runs, during which appliances do not cycle, so it is unlikely that these issues with the SLM account for the entirety of the issue. They are, however, a likely contributory factor. These include:

- That fuel moisture is constant until 43 minutes into the test run, and decays exponentially from there. This does not hold for a cycling appliance, for which test fuel moisture will only drop during on cycles. This means that actual fuel moisture (and therefore actual dry weight) will increasingly deviate from assumed moisture content over the course of the run, affecting mass balance and energy loss calculations.
- That combustion is continuous. Stack loss calculation requires a precise determination of stack flow, for which a mass balance based on weight loss and flue gas constituents are used. This breaks down, however, when an appliance is cycled off. SLM calculations are proportional to fuel mass loss for a given interval, so off-cycles are somewhat accounted for, but actual off cycles do not perfectly correspond with observed periods of zero weight loss. In fact, due to extreme changes in draft pressure, weight fluctuations (both up and down) unrelated to actual fuel combustion are frequently recorded during cycling behavior. These fluctuations do not simply “cancel out” as stack conditions would have to be held constant for all noise to be averaged out – when an appliance cycles, stack conditions of course change substantially.