Hearth & Home Technologies

Project # 22-823 Model: P42i-TC Type: Pellet-Fired Room Heater December 12, 2022 Revised February 27, 2023

ASTM E2779 Standard Test Method for Determining Particulate Matter Emissions from Pellet Heaters (EPA ALT-146)

Contact: Mr. Corie Podschelne 352 Mountain House Road Halifax, PA 17032 PodschelneC@hearthnhome.com 610-506-7338

Prepared by: Aaron Kravitz, Testing Supervisor



11785 SE Highway 212 – Suite 305 Clackamas, OR 97015-9050 (503) 650-0088 WWW.PFSTECO.COM

Revision History:

Date: December 12, 2022 – Original Issue

Date: February 27, 2023 – Added EASY Touch Control manual for touch screen air and burn controls. Also updated owner's manual to include statement about CO monitors, see Appendix B.

Contents

Revision History:	2
Affidavit	4
Introduction	5
Notes	5
Pellet Heater Identification and Testing	6
Test Procedures and Equipment	7
Results	8
Summary Table	8
Test Run Narrative Run 1	8 8
Test Conditions Summary	9
Appliance Operation and Test Settings	9
Settings & Run Notes	9
Appliance Description	10
Appliance Dimensions	10
Test Fuel Properties	13
Pellet Fuel Analysis	14
Sampling Locations and Descriptions	15
Sampling Methods	16
Analytical Methods Description	16
Calibration, Quality Control and Assurances	16
Appliance Sealing and Storage	16
Sealing Label	16
Sealed Unit	17
List of Appendices	

Affidavit

PFS-TECO was contracted by Hearth & Home Technologies to provide testing services for the P42i-TC Pellet-Fired Room Heater per ASTM E2779, *Determining PM Emissions from Pellet Heaters*. All testing and associated procedures were conducted at PFS-TECO's Portland Laboratory on 10/5/2022. PFS-TECO's Portland Laboratory is located at 11785 SE Highway 212 – Suite 305, Clackamas, Oregon 97015. Testing procedures followed EPA ALT-146 / ASTM E2779. 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

Hearth & Home Technologies of Halifax, PA, contracted with PFS-TECO to perform EPA certification testing on P42i-TC Pellet-Fired Room Heater. All testing was performed at PFS-TECO's Portland Laboratory. Testing was performed by Mr. Aaron Kravitz.

Notes

- Prior to start of testing, 50 hours of conditioning was performed by the manufacturer at a medium heat setting, per ASTM E2779
- 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 after the test began.
- A single test was performed in accordance with EPA ALT-146 burn rate settings:
 - o 1 Hour at Maximum Burn Setting
 - 2 Hours at Medium Burn Setting (less than the mid-point of the high and low rates)
 - o 3 Hours at Minimum Burn Setting

Pellet Heater Identification and Testing

- Appliance Tested: P42i-TC
- Serial Number: N/A Prototype Unit; PFS Tracking #0125
- Manufacturer: Hearth & Home Technologies
- Catalyst: No
- Heat exchange blower: Integral
- Type: Pellet Stove
- Style: Free Standing
- Date Received: Monday, October 03, 2022
- Testing Period Start: Tuesday, October 18, 2022 Finish: Tuesday, October 18, 2022
- Test Location: *PFS-TECO Portland Laboratory, 11785 SE HWY 212 Suite* 305, Clackamas, OR 97015
- Elevation: ≈131 Feet above sea level
- Test Technician(s): Aaron Kravitz
- Observers: N/A

Test Procedures and Equipment

All Sampling and analytical procedures were performed by Aaron Kravitz. All procedures used are directly from ASTM E2779 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
189	Mettler Toledo 3'x3' floor scale w/digital weight indicator
053	APEX XC-60 Digital Emissions Sampling Box A
054	APEX XC-60 Digital Emissions Sampling Box B
203	APEX XC-50-DIR Digital Emissions Sampling Box C
055	APEX Ambient sampling box
057	California Analytical ZRE CO2/CO/O2 IR ANALYZER
202	Digital Barometer
109A/B	Troemner 100mg/200mg Audit Weights
107	Sartorius Analytical Balance
097	10 lb audit weight
095	Anemometer
111	Microtector
CC106574	Gas Analyzer Calibration Span Gas
CC139173	Gas Analyzer Calibration Mid Gas

Results

The integrated test run emission rate for test Run 1 was measured to be **1.0 g/hr** with a Higher Heating Values efficiency of **79%** and a CO emission rate of **0.31 g/min**. The calculated first hour particulate emission rate was **1.7 g/hr**. The Hearth & Home Technologies Model P42i-TC Pellet-Fired Room Heater meets the 2020 PM emission standard of \leq 2.0 g/hr per CFR 40 part 60, §60.532 (b).

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

Summary Table

EPA Application Table											
Run Number	Date	Segments		Run Time (min)	Heat Output (BTU/hr)	1st Hr Emissions (g/hr)	Integrated Total (g/hr)	CO Emissions (g/min)	Overall CO Emissions	Heating Efficiency (%HHV)	Overall Heating Efficiency
		Setting	BR						(g/mm)		(% ППV)
1	10/18/2022	OA	0.89	360	13157	1.7	1.0	0.31	0.31	79%	79%
		Н	2.23	60	32782			1.11		78%	
		Μ	0.98	120	14336			0.17		79%	
		L	0.39	180	5637			0.14		76%	

Test Run Narrative

Run 1

Run 1 was performed on 10/18/2022 as an attempted integrated test run per EPA ALT-146/ ASTM E2779. The overall test duration was 360 minutes. The particulate emissions rate for the integrated test run was 1.0 g/hr. The run had an overall HHV efficiency of 79%. A separate filter train C was run for the first hour of the run only. All test results were appropriate and valid and the burn rate requirement for the integrated test run were achieved. There were no anomalies and all criteria were met.

Test Conditions Summary

Testing conditions for all runs fell within allowable specifications of ASTM E2779 and ASTM E2515. A summary of facility conditions, fuel burned, and run times is listed below.

Runs	Ambie	ent (°F)	Relative Humidity (%)		Average Barometric Pressure	Preburn Fuel Weight	Test Fuel Weight (Ibs)	Test Fuel Moisture (%DB)	Test Run Time (Min)
	Pre	Post	Pre	Post	(In. Hg.)	(lbs)			
1	67	73	45.4	41.1	30.05	5.0	12.5	5.54	360

Appliance Operation and Test Settings

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

Settings & Run Notes

	Pre-Burn	Test Run			
Run 1	Temp Control: 7 Feed Rate: 77% Distribution Bower: 100% Combustion Blower Max: 2700 Combustion Blower Min: 2200	Maximum Segment Temp Control: 7 Feed Rate: 77% Distribution Bower: 100% Comb. Blower Max: 2700 Comb. Blower Min: 2200	Medium Segment Temp Control: 4 Feed Rate: 36% Distribution Bower: 100% Comb. Blower Max: 2300 Comb. Blower Min: 1800	Minimum Segment Temp Control: 1 Feed Rate: 25% Distribution Bower: 100% Comb. Blower Max: 2300 Comb. Blower Min: 1700	

Appliance Description

Model(s): P42i-TC

Appliance Type: Pellet-Fired Fireplace Insert Room Heater

Air Introduction System: A variable speed combustion fan forces air into the firebox through holes in the bottom of the firepot.

Combustion Control: A control panel on the hopper door is used to select burn rates, which are varied by automatic modulation of the combustion fan and feed system. An automatically controlled distribution bower is also installed.

Fueling System: An inclined auger driven by a gear motor, meters pellets through a drop tube (over feed) to a fire pot in the firebox.

Baffles: N/A

Flue Outlet: Venting is through a 4" diameter steel pipe, which exits through the back of the unit. The venting system is to be 4" nominal diameter listed type L or type PL vent pipe with all the joints sealed.

Appliance Dimensions

P42I-TC Dimensions							
Height	Width	Depth	Firebox Volume	Weight			
31"	42"	28"	N/A – Pellet Stove	250 lbs			

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

Appliance Front



Appliance Left



Appliance Right



Appliance Rear

Test Fuel Properties



Test fuel used was Energex Wood Pellet Fuel, a PFI Certified Premium Pellet Brand. A sample of pellets was sent to Twin Ports Testing for analysis, see report below.

Pellet Fuel Analysis



	Twin Ports Testing, Inc.
	Superior, WI 54880
	p: 715-392-7114
	p: 800-373-2562
	f: 715-392-7163
	www.twinportstesting.com
	Report No: USR:W222-0678-01
	Issue No: 1
_	
	Signed:

Analytical Test Report

Client: PFS-TECO 11785 SE Hwy 212 Ste 305 Clackamas, OR 97015	i	Signed:	Amb lockeron	
Attention: Sebastian Button			Amber Anderson	
20.11			Chemist	
PO No:		Date of Issue:	10/20/2022	N.FUL
Demonte Detelle		THE DOUBLER OF L		
Sample Details		0.00		
Sample Log No: W222-0678-01		Sample Date:		
Sample Designation: P421		Sample Time:	10/17/2022	
Sample Recognized As: Biomass		Arrival Date:	10/11/2022	
Test Results				
			MOISTURE	AS
	METHOD	UNITS	FREE	RECEIVED
Moisture Total	ASTM E871	wt. %		5.25
Ash	ASTM D1102	wt. %	0.53	0.50
Volatile Matter	ASTM D3175	wt. %		
Fixed Carbon by Difference	ASTM D3172	wt. %		
Sulfur	ASTM D4239	wt. %	0.011	0.010
SO ₂	Calculated	lb/mmbtu		0.025
Net Cal. Value at Const. Pressure	ISO 1928	GJ/tonne	18.45	17.35
Gross Cal. Value at Const. Vol.	ASTM E711	Btu/lb	8486	8041
Carbon	ASTM D5373	wt. %	43.58	41.29
Hydrogen*	ASTM D5373	wt. %	5.91	5.60
Nitrogen	ASTM D5373	wt. %	1.11	1.05
Oxygen*	ASTM D3176	wt. %	48.86	46.29
*Note: As received values do not include hydrog	en and oxygen in the	total moisture.		
Chlorine	ASTM D6721	mg/kg		
Fluorine	ASTM D3761	mg/kg		
Mercury	ASTM D6722	mg/kg		
Bulk Density	ASTM E873	lbs/ft ³		
Fines (Less than 1/8")	TPT CH-P-06	wt.%		
Durability Index	Kansas State	PDI		
Sample Above 1.50"	TPT CH-P-06	Wt.%		
Naximum Length (Single Pellet)	TPT CH-P-06	inch		4.
Diameter, Range	TPT CH-P-05	inch		10
Diameter, Average	TPT CH-P-05	Inch		
Stated Bag Weight	TPT CH-P-01	IDS		
	1F1 CH-F-01	IDS		

Comments:



Results issued on this report only reflect the analysis of the sample submitted. Our reports and letters are for the exclusive and confidential use of our clients and may not be reproduced, except in their entirety, without the written approval of Twin Ports Testing. Twin Ports Testing Laboratory is accredited to the ISO/IEC 17025:2017 standard by PJLA.

Accreditation #60243

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).







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.

Analytical Methods Description

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

Calibration, Quality Control and Assurances

Calibration procedures and results were conducted per EPA Method 28R, ASTM E2515-11 and ASTM E2780-10. 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: 352 Mountain House Road, Halifax, PA 17032 for archival.

Sealing Label

ATTENTION:

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

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

REPORT #____

DATE SEALED

MANUFACTURER_____

MODEL #_____

Sealed Unit



List of Appendices

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

- Appendix A Test Run Data, Technician Notes, and Sample Analysis
- Appendix B Labels and Manuals
- Appendix C Equipment Calibration Records
- Appendix D Design Drawings (CBI Report Only)
- Appendix E Manufacturer QAP (CBI Report Only)

PELLET TEST DATA PACKET ASTM E2779/E2515



Client: HHT Model: P42i Job #: 22-823 Tracking #: 125 Test Date: 10/18/2022

Techician Signature

12/12/2022 Date

TEST RESULTS - ASTM E2779 / ASTM E2515

Client:	HHT
Model:	P42i

Run #: 1

Job #: <u>22-823</u> Tracking #: <u>125</u> Technician: <u>AK</u> Date: 10/18/2022

Burn Rate Summary	
High Burn Rate (dry kg/hr)	2.23
Medium Burn Rate (dry kg/hr)	0.98
Low Burn Rate (dry kg/hr)	0.39
Overall Burn Rate (dry kg/hr)	0.89

Medium Burn Rate Target: < 1.31 dry kg/hr

	Ambient Sample	Sample Train A	Sample Train B	1st Hour Filter
Total Sample Volume (ft ³)	50.264	53.832	53.632	8.645
Average Gas Velocity in Dilution Tunnel (ft/sec)		9.0		
Average Gas Flow Rate in Dilution Tunnel (dscf/hr)		24501	.6	
Average Gas Meter Temperature (°F)	68.9	93.2	93.4	78.3
Total Sample Volume (dscf)	51.774	51.853	51.639	8.546
Average Tunnel Temperature (°F)	77.5			
Total Time of Test (min)	360			
Total Particulate Catch (mg)	0.0	2.1	2.2	0.6
Particulate Concentration, dry-standard (g/dscf)	0.0000000	0.0000405	0.0000426	0.0000702
Total PM Emissions (g)	0.00	5.95	6.26	1.72
Particulate Emission Rate (g/hr)	0.00	0.99	1.04	1.72
Emissions Factor (g/kg)	-	1.11	1.17	0.77
Difference from Average Total Particulate Emissions (g)	-	0.15	0.15	-
Difference from Average Total Particulate Emissions (%)	-	2.5%	2.5%	-
Difference from Average Emissions Factor (g/kg)	-	0.03	0.03	-

Final Average Results					
Total Particulate Emissions (g)	6.11				
Particulate Emission Rate (g/hr)	1.0				
Emissions Factor (g/kg)	1.14				
HHV Efficiency (%)	78.6%				
LHV Efficiency (%)	84.0%				
CO Emissions (g/min)	0.31				

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	ОК
Filter Temps	<90 °F	76.1	ОК
Face Velocity	< 30 ft/min	8.3	ОК
Leakage Rate	Less than 4% of average sample rate	0.001 cfm	ОК
Ambient Temp	55-90 °F	65.1 / 72.6	ОК
Negative Probe Weight Evaluation	<5% of Total Catch	Probe Catch Not Negative	ОК
Pro-Rate Variation	90% of readings between 90-110%; none greater than 120% or less than 80%	See Data Tabs	ОК
Medium Burn Rate	< midpoint of the high and low burn rates	0.98	OK

Overall Pellet Test Efficiency Results

Manufacturer: HHT Model: P42i Date: 10/18/22 Run: 1 Control #: 22-823 Test Duration: 360 Output Category: Integrated

Test Results in Accordance with CSA B415.1-09

	HHV Basis	LHV Basis
Overall Efficiency	78.6%	84.0%
Combustion Efficiency	99.4%	99.4%
Heat Transfer Efficiency	79.0%	84.5%

Output Rate (kJ/h)	13,870	13,157	(Btu/h)
Burn Rate (kg/h)	0.89	1.97	(lb/h)
Input (kJ/h)	17,652	16,745	(Btu/h)

Test Load Weight (dry kg)	5.37	11.83	dry lb
MC wet (%)	5.25		
MC dry (%)	5.54		
Particulate (g)	6.11		
CO (g)	111		
Test Duration (h)	6.00		

Emissions	Particulate	CO
g/MJ Output	0.07	1.34
g/kg Dry Fuel	1.14	20.72
g/h	1.02	18.54
g/min	0.02	0.31
lb/MM Btu Output	0.17	3.11

Air/Fuel Ratio (A/F	28.73
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2.2

VERSION:

Max Burn Rate Segment Efficiency Results

Manufacturer: HHT Model: P42i Date: 10/18/22 Run: 1 Control #: 22-823 Test Duration: 60 Output Category: Maximum

Test Results in Accordance with CSA B415.1-09

	HHV Basis	LHV Basis
Overall Efficiency	78.4%	83.8%
Combustion Efficiency	98.1%	98.1%
Heat Transfer Efficiency	79.9%	85.4%

Output Rate (kJ/h)	34,558	32,782	(Btu/h)
Burn Rate (kg/h)	2.24	4.93	(lb/h)
Input (kJ/h)	44,095	41,829	(Btu/h)

Test Load Weight (dry kg)	2.24	4.93	dry lb
MC wet (%)	5.25		
MC dry (%)	5.54		
Particulate (g)	N/A		
CO (g)	67		
Test Duration (h)	1.00		

Emissions	Particulate	СО
g/MJ Output	N/A	1.93
g/kg Dry Fuel	N/A	29.79
g/h	N/A	66.61
g/min	N/A	1.11
Ib/MM Btu Output	N/A	4.48
		.

|--|

VERSION:

2.2

Medium Burn Rate Segment Efficiency Results

Manufacturer: HHT Model: P42i Date: 10/18/22 Run: 1 Control #: 22-823 Test Duration: 120 Output Category: Medium

Test Results in Accordance with CSA B415.1-09

	HHV Basis	LHV Basis
Overall Efficiency	78.5%	83.9%
Combustion Efficiency	99.5%	99.5%
Heat Transfer Efficiency	78.9%	84.4%

Output Rate (kJ/h)	15,113	14,336	(Btu/h)
Burn Rate (kg/h)	0.98	2.15	(lb/h)
Input (kJ/h)	19,249	18,260	(Btu/h)

Test Load Weight (dry kg)	1.95	4.30	dry lb
MC wet (%)	5.25		
MC dry (%)	5.54		
Particulate (g)	N/A		
CO (g)	21		
Test Duration (h)	2.00		

Emissions	Particulate	CO
g/MJ Output	N/A	0.69
g/kg Dry Fuel	N/A	10.61
g/h	N/A	10.36
g/min	N/A	0.17
Ib/MM Btu Output	N/A	1.59

Air/Fuel Ratio (A/F) 25.13

VERSION:

2.2

Minimum Burn Rate Segment Efficiency Results

Manufacturer: HHT Model: P42i Date: 10/18/22 Run: 1 Control #: 22-823 Test Duration: 180 Output Category: Minimum

Test Results in Accordance with CSA B415.1-09

	HHV Basis	LHV Basis
Overall Efficiency	76.5%	81.7%
Combustion Efficiency	99.5%	99.5%
Heat Transfer Efficiency	76.8%	82.1%

Output Rate (kJ/h)	5,943	5,637	(Btu/h)
Burn Rate (kg/h)	0.39	0.87	(lb/h)
Input (kJ/h)	7,773	7,374	(Btu/h)

Test Load Weight (dry kg)	1.18	2.61	dry lb
MC wet (%)	5.25		
MC dry (%)	5.54		
Particulate (g)	N/A		
CO (g)	26		
Test Duration (h)	3.00		

Emissions	Particulate	CO
g/MJ Output	N/A	1.43
g/kg Dry Fuel	N/A	21.60
g/h	N/A	8.51
g/min	N/A	0.14
Ib/MM Btu Output	N/A	3.33

Air/Fuel Ratio (A/F) 60.04

2.2

VERSION:

DILUTION TUNNEL & MISC. DATA - ASTM E2779 / E2515

Client: HHT		Job #:	22-823				
Model: P42i		Tracking #:	125				
Run #: 1		Technician:	AK				
Test Start Time: 9:44		Date:	10/18/2022	2			
High Burn End Time (min):	60						
Medium Burn End Time (min):	180			_	Pre-Test	Post Test	Avg.
Total Sampling Time (min):	360	Baron	netric Press	sure (in. Hg)	30.07	30.02	30.05
Recording Interval (min):	1		Relative H	lumidity (%)	45.4	41.1	
		Ro	om Air Vel	ocity (ft/min)	0	0	
Meter Box γ Factor:	1	(A)	Scal	e Audit (Ibs)	10.0	10.0	
Meter Box γ Factor:	1.000	(B)	Ai	mbient Samp	le Volume:	50.264	ft ³
Meter Box γ Factor:	0.999	(C)					
Meter Box γ Factor:	1.028	(Ambient)	S	Sample Trair	n Post-Test	Leak Checks	5
Induced Draft Check (in. H ₂ O):	0		(A)	0.000	cfm @	-5	in. Hg
Smoke Capture Check (%):	100%		(B)	0.001	cfm @	-7	in. Hg
Date Flue Pipe Last Cleaned:	10/17/2022		(C)	0.000	cfm @	-4	in. Hg
-			(Ambient)	0.000	cfm @	-12	in. Hg

DILUTION TUNNEL FLOW

Traverse Data		
Point	dP (in H₂O)	Temp (°F)
1	0.010	85
2	0.018	84
3	0.018	84
4	0.016	84
5	0.016	84
6	0.012	84
7	0.020	84
8	0.060	84
9	0.018	84
10	0.018	84
11	0.016	84
12	0.010	84
Center	0.016	84

Dilution Tunnel H ₂ O:	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} :	9.016	ft/sec
V _{scent} :	8.489	ft/sec
F _p :	1.062	[ratio]
Initial Tunnel Flow:	405.8	scf/min

Static Pressure: -

-0.070 in. H₂O

TEST FUEL PROPERTIES

Def	ault Fuel Va	lues	Actua	I Fuel Used Properties
Fuel Type:	D. Fir	Oak	Pellet Brand:	Energex
HHV (kJ/kg)	19,810	19,887	Pellet Fuel Grade:	PFI Premium
%C	48.73	50	HHV (BTU/lb)	8486
%Н	6.87	6.6	%C	43.58
%O	43.9	42.9	%Н	5.91
%Ash	0.5	0.5	%O	49.98
			%Ash	0.53
			MC (%WB)	5.25

PELLET STOVE PREBURN DATA - ASTM E2779

Client:	HHT
Model:	P42i
Dun #1	4

Job #: 22-823

Tracking #: 125

Run #: 1

Technician: AK

Date: 10/18/2022

Recording Interval (min): 1 Run Time (min): 60

· · ·		Average:	-0.069	346	66
Elapsed Time (min)	Scale Reading (Ibs)	Weight Change (Ibs)	Flue Draft (in H ₂ O)	Flue (°F)	Ambient (°F)
0	40.9	-	-0.012	86	65
1	40.8	-0.03	-0.017	96	65
2	40.8	-0.04	-0.022	116	65
3	40.7	-0.06	-0.027	139	65
4	40.7	-0.05	-0.032	153	65
5	40.6	-0.05	-0.038	167	65
6	40.6	-0.06	-0.039	183	65
7	40.5	-0.06	-0.044	200	65
8	40.4	-0.09	-0.048	219	65
9	40.3	-0.1	-0.054	242	65
10	40.2	-0.09	-0.055	258	65
11	40.1	-0.08	-0.059	273	65
12	40.0	-0.1	-0.062	289	65
13	40.0	-0.09	-0.065	303	65
14	39.9	-0.1	-0.065	314	65
15	39.8	-0.09	-0.068	325	65
16	39.7	-0.11	-0.070	336	65
17	39.6	-0.1	-0.070	345	65
18	39.5	-0.1	-0.073	355	65
19	39.3	-0.12	-0.074	364	65
20	39.2	-0.12	-0.076	371	65
21	39.1	-0.08	-0.075	374	65
22	39.0	-0.09	-0.077	375	65
23	39.0	-0.08	-0.076	377	65
24	38.9	-0.08	-0.075	380	66
25	38.8	-0.08	-0.073	381	66
26	38.7	-0.09	-0.077	382	66
27	38.6	-0.09	-0.075	384	66
28	38.5	-0.08	-0.077	386	66
29	38.5	-0.08	-0.077	388	66
30	38.4	-0.09	-0.078	389	66
31	38.3	-0.09	-0.078	391	66
32	38.2	-0.09	-0.077	393	66
33	38.1	-0.09	-0.080	395	66
34	38.0	-0.1	-0.079	398	66
35	37.9	-0.09	-0.078	401	66
36	37.8	-0.09	-0.079	402	66
37	37.7	-0.08	-0.077	402	66
38	37.7	-0.09	-0.079	404	66
39	37.6	-0.1	-0.078	406	66
40	37.5	-0.08	-0.078	405	66
41	37.4	-0.08	-0.080	405	66
42	37.3	-0.09	-0.079	406	66
43	37.2	-0.09	-0.080	406	67
44	37.1	-0.08	-0.079	407	67
45	37.1	-0.07	-0.079	406	67
46	37.0	-0.08	-0.079	404	67

PELLET STOVE PREBURN DATA - ASTM E2779

Client:	ННТ		Job #:	± <u>22-823</u>			
Model:	P42i		Tracking #:	125			
Run #:	1		Technician:	AK			
			Date:	10/18/2022			
47	36.9	-0.08	-0.077	404	67		
48	36.8	-0.09	-0.080	407	67		
49	36.7	-0.08	-0.078	406	67		
50	36.6	-0.09	-0.079	407	67		
51	36.6	-0.09	-0.078	408	67		
52	36.5	-0.08	-0.079	409	67		
53	36.4	-0.09	-0.076	409	67		
54	36.3	-0.09	-0.078	410	67		
55	36.2	-0.09	-0.078	410	67		
56	36.1	-0.09	-0.079	412	67		
57	36.0	-0.09	-0.081	413	67		
58	35.9	-0.08	-0.078	412	67		
59	35.9	-0.09	-0.080	413	67		
60	35.8	-0.09	-0.078	415	67		

Client: HHT

Model: P42i

Run #: 1

Job #: 22-823

Tracking #: 125

Technician: AK

			Particula	ate Sampli	ng Data			Fuel We	ight (lb)	ht (lb) Temperature Data (°F			F)
Elapsed Time (min)	Gas Meter (ft ³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
0	0.000		0.016	1.41	71.2	0.61		12.5		82	415	66	66.7
1	0.135	0.135	0.016	1.96	71.2	0.72	94	12.4	-0.1	82	417	67	66.3
2	0.275	0.140	0.016	1.96	71.3	0.74	98	12.3	-0.1	82	418	67	65.6
3	0.413	0.138	0.017	1.98	71.4	0.67	94	12.2	-0.1	82	418	68	65.2
4	0.552	0.139	0.016	1.97	71.6	0.7	97	12.1	-0.1	82	419	68	65.1
5	0.693	0.141	0.016	1.99	71.7	0.75	99	12.1	-0.1	82	420	68	65.8
6	0.830	0.137	0.015	1.99	71.8	0.76	99	12.0	-0.1	82	419	68	66.6
7	0.972	0.142	0.016	2.00	71.8	0.74	99	11.9	-0.1	82	420	68	67
8	1.110	0.138	0.016	1.98	71.9	0.73	96	11.8	-0.1	82	417	68	66.9
9	1.250	0.140	0.016	2.00	72	0.73	98	11.7	-0.1	83	417	68	67.1
10	1.392	0.142	0.016	2.02	72.2	0.76	99	11.6	-0.1	83	418	68	67.1
11	1.531	0.139	0.016	2.03	72.5	0.76	97	11.5	-0.1	83	418	68	67.1
12	1.674	0.143	0.016	2.01	72.7	0.74	100	11.5	-0.1	83	418	69	67.2
13	1.813	0.139	0.016	2.04	72.9	0.76	97	11.4	-0.1	83	417	69	67.4
14	1.956	0.143	0.016	2.03	73.2	0.78	100	11.3	-0.1	83	419	69	67.6
15	2.096	0.140	0.015	2.03	73.4	0.75	101	11.2	-0.1	83	419	69	67.4
16	2.238	0.142	0.016	2.05	73.7	0.75	99	11.1	-0.1	83	420	69	67.5
17	2.382	0.144	0.016	2.04	74	0.77	100	11.0	-0.1	83	421	69	67.6
18	2.520	0.138	0.016	2.05	74.3	0.75	96	10.9	-0.1	83	420	69	67.7
19	2.667	0.147	0.016	2.06	74.6	0.74	102	10.8	-0.1	83	420	70	67.5
20	2.807	0.140	0.016	2.07	74.9	0.77	97	10.8	-0.1	83	419	70	67.7
21	2.949	0.142	0.016	2.06	75.2	0.76	99	10.7	-0.1	83	418	70	67.7
22	3.093	0.144	0.016	2.07	75.5	0.78	100	10.6	-0.1	83	417	70	67.6
23	3.236	0.143	0.016	2.08	75.8	0.77	99	10.5	-0.1	83	419	70	67.8
24	3.382	0.146	0.016	2.08	76.2	0.78	101	10.4	-0.1	83	419	70	68.1
25	3.521	0.139	0.016	2.08	76.6	0.77	96	10.3	-0.1	83	419	70	67.9
26	3.668	0.147	0.017	2.09	76.9	0.79	99	10.2	-0.1	83	418	70	68
27	3.811	0.143	0.016	2.11	77.3	0.8	99	10.1	-0.1	83	417	70	67.6
28	3.957	0.146	0.017	2.11	77.7	0.76	98	10.1	-0.1	83	418	70	67.8
29	4.099	0.142	0.016	2.11	78	0.8	98	10.0	-0.1	83	419	70	67.7
30	4.244	0.145	0.016	2.11	78.4	0.77	100	9.9	-0.1	84	420	70	67.8
31	4.390	0.146	0.016	2.13	78.8	0.8	101	9.8	-0.1	84	420	70	67.8
32	4.534	0.144	0.016	2.13	79.1	0.8	99	9.7	-0.1	84	421	71	67.6

Client: HHT

Model: P42i

Run #: 1

Job #: 22-823

Tracking #: 125

Technician: AK

	Particulate Sampling Data						Fuel Weight (lb) Temperature Data (°F)				F)		
Elapsed Time (min)	Gas Meter (ft ³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
33	4.682	0.148	0.016	2.13	79.5	0.79	102	9.6	-0.1	84	420	71	67.7
34	4.822	0.140	0.016	2.13	79.7	0.8	96	9.5	-0.1	84	419	70	67.7
35	4.971	0.149	0.016	2.13	80.1	0.8	103	9.4	-0.1	84	420	71	67.7
36	5.114	0.143	0.016	2.14	80.4	0.79	98	9.3	-0.1	84	420	71	67.5
37	5.264	0.150	0.016	2.14	80.6	0.78	103	9.3	-0.1	84	419	70	67.4
38	5.407	0.143	0.016	2.14	80.9	0.78	98	9.2	-0.1	84	420	70	67.4
39	5.555	0.148	0.016	2.14	81.2	0.8	102	9.1	-0.1	84	420	70	67.4
40	5.699	0.144	0.016	2.15	81.5	0.79	99	9.0	-0.1	84	419	70	67.4
41	5.845	0.146	0.015	2.15	81.8	0.82	104	8.9	-0.1	84	419	70	67.3
42	5.992	0.147	0.016	2.16	82	0.79	101	8.8	-0.1	84	419	70	67.4
43	6.137	0.145	0.016	2.16	82.3	0.82	99	8.7	-0.1	84	419	70	67.4
44	6.287	0.150	0.016	2.17	82.6	0.8	103	8.6	-0.1	84	418	70	67.5
45	6.431	0.144	0.016	2.16	82.9	0.8	99	8.6	-0.1	84	416	70	67.6
46	6.581	0.150	0.016	2.16	83.1	0.82	103	8.5	-0.1	84	416	70	67.6
47	6.725	0.144	0.016	2.16	83.4	0.79	99	8.4	-0.1	84	416	70	67.4
48	6.874	0.149	0.016	2.17	83.7	0.78	102	8.3	-0.1	84	418	70	67.7
49	7.018	0.144	0.016	2.17	83.9	0.81	99	8.2	-0.1	84	418	70	67.5
50	7.169	0.151	0.016	2.16	84.1	0.81	103	8.1	-0.1	84	416	70	67.4
51	7.313	0.144	0.016	2.16	84.3	0.79	98	8.1	-0.1	84	413	70	67.4
52	7.464	0.151	0.016	2.17	84.6	0.8	103	8.0	-0.1	84	414	70	67.4
53	7.610	0.146	0.016	2.17	84.9	0.8	100	7.9	-0.1	84	416	70	67.3
54	7.760	0.150	0.016	2.18	85.1	0.8	102	7.8	-0.1	84	415	70	67.4
55	7.905	0.145	0.016	2.18	85.3	0.81	99	7.7	-0.1	84	415	71	67.4
56	8.055	0.150	0.016	2.18	85.6	0.81	102	7.6	-0.1	84	415	71	67.5
57	8.201	0.146	0.016	2.18	85.7	0.83	100	7.6	-0.1	84	417	70	67.4
58	8.350	0.149	0.016	2.18	85.9	0.82	102	7.5	-0.1	84	417	71	67.6
59	8.497	0.147	0.016	2.18	86	0.83	100	7.4	-0.1	84	415	70	67.5
60	8.645	0.148	0.016	2.18	86.2	0.83	101	7.3	-0.1	84	409	70	67.6
61	8.793	0.148	0.016	2.19	86.4	0.85	101	7.2	-0.1	83	396	70	67.4
62	8.942	0.149	0.016	2.19	86.7	0.8	101	7.2	-0.1	83	386	70	67.6
63	9.091	0.149	0.016	2.19	86.9	0.82	101	7.1	0.0	82	376	70	67.6
64	9.239	0.148	0.016	2.20	87.1	0.81	100	7.1	0.0	82	364	70	67.7
65	9.388	0.149	0.016	2.20	87.3	0.82	101	7.1	0.0	82	353	70	67.8

Client: HHT

Model: P42i

Run #: 1

Job #: 22-823

Tracking #: 125

Technician: AK

	Particulate Sampling Data							Fuel Weight (lb) Temperature Data (°F)				F)	
Elapsed Time (min)	Gas Meter (ft ³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
66	9.536	0.148	0.016	2.19	87.5	0.82	100	7.1	0.0	81	343	70	67.7
67	9.687	0.151	0.016	2.19	87.6	0.79	102	7.1	0.0	81	332	70	67.5
68	9.834	0.147	0.016	2.19	87.8	0.8	100	7.1	0.0	80	320	70	67.2
69	9.985	0.151	0.016	2.20	88	0.79	102	7.0	0.0	80	311	70	67.3
70	10.132	0.147	0.016	2.20	88.2	0.82	99	7.0	0.0	80	303	70	67.4
71	10.284	0.152	0.016	2.21	88.4	0.78	103	7.0	0.0	80	296	70	67.1
72	10.430	0.146	0.016	2.20	88.6	0.84	99	7.0	0.0	79	290	70	67.1
73	10.581	0.151	0.016	2.22	88.7	0.82	102	7.0	0.0	79	283	70	67
74	10.728	0.147	0.016	2.21	88.9	0.81	99	7.0	0.0	79	278	70	67
75	10.880	0.152	0.016	2.21	89.1	0.82	103	6.9	0.0	79	274	70	67.1
76	11.027	0.147	0.016	2.21	89.2	0.81	99	6.9	0.0	78	271	70	67
77	11.179	0.152	0.016	2.21	89.3	0.82	102	6.9	0.0	78	270	70	66.8
78	11.326	0.147	0.015	2.21	89.5	0.78	102	6.8	0.0	78	270	70	66.9
79	11.478	0.152	0.016	2.21	89.6	0.82	102	6.8	0.0	78	268	70	66.6
80	11.625	0.147	0.016	2.23	89.7	0.77	99	6.8	0.0	78	267	70	66.7
81	11.777	0.152	0.016	2.22	89.9	0.8	102	6.7	0.0	78	267	70	66.7
82	11.924	0.147	0.016	2.22	90	0.83	99	6.7	0.0	77	266	70	66.6
83	12.077	0.153	0.016	2.21	90.1	0.81	103	6.7	0.0	77	267	70	66.6
84	12.224	0.147	0.016	2.22	90.2	0.81	99	6.6	0.0	77	268	70	66.4
85	12.376	0.152	0.016	2.22	90.3	0.79	102	6.6	0.0	77	267	69	66.3
86	12.523	0.147	0.016	2.22	90.4	0.82	99	6.5	0.0	77	267	69	66.5
87	12.676	0.153	0.016	2.23	90.6	0.8	103	6.5	0.0	77	266	69	66.5
88	12.823	0.147	0.016	2.22	90.7	0.83	99	6.5	0.0	77	265	69	66.4
89	12.976	0.153	0.016	2.23	90.8	0.84	103	6.5	0.0	77	264	69	66.5
90	13.123	0.147	0.016	2.22	90.9	0.82	99	6.4	-0.1	77	264	69	66.5
91	13.276	0.153	0.016	2.22	91	0.8	103	6.4	0.0	77	264	69	66.5
92	13.424	0.148	0.016	2.22	91.1	0.84	99	6.3	0.0	77	265	69	66.5
93	13.576	0.152	0.016	2.23	91.2	0.82	102	6.3	0.0	77	265	69	66.4
94	13.724	0.148	0.016	2.22	91.3	0.8	99	6.2	0.0	77	265	69	66.4
95	13.877	0.153	0.016	2.23	91.4	0.81	103	6.2	0.0	77	263	69	66.5
96	14.024	0.147	0.016	2.23	91.4	0.82	99	6.2	0.0	77	263	69	66.5
97	14.177	0.153	0.016	2.23	91.5	0.81	103	6.1	0.0	77	263	69	66.4
98	14.325	0.148	0.016	2.23	91.6	0.82	99	6.1	0.0	77	262	69	66.6

Client: HHT

Model: P42i

Run #: 1

Job #: 22-823

Tracking #: 125

Technician: AK

		Particulate Sampling Data					Fuel Weight (lb)			Temperature Data (°F)			
Elapsed Time (min)	Gas Meter (ft ³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
99	14.478	0.153	0.016	2.23	91.7	0.84	103	6.1	0.0	77	262	69	66.5
100	14.626	0.148	0.016	2.22	91.9	0.85	99	6.0	-0.1	77	263	69	66.6
101	14.779	0.153	0.016	2.22	92	0.85	102	6.0	0.0	77	264	69	66.6
102	14.927	0.148	0.016	2.22	92	0.84	99	5.9	-0.1	77	265	69	66.6
103	15.079	0.152	0.016	2.23	92.1	0.86	102	5.9	0.0	77	265	69	66.5
104	15.227	0.148	0.016	2.24	92.1	0.81	99	5.8	0.0	77	265	69	66.5
105	15.380	0.153	0.016	2.24	92.2	0.81	102	5.8	0.0	77	265	69	66.5
106	15.528	0.148	0.016	2.22	92.3	0.85	99	5.8	0.0	77	267	69	66.4
107	15.680	0.152	0.016	2.23	92.4	0.81	102	5.7	0.0	77	267	69	66.6
108	15.829	0.149	0.016	2.22	92.4	0.85	100	5.7	0.0	77	267	69	66.5
109	15.981	0.152	0.016	2.23	92.6	0.84	102	5.6	0.0	77	267	69	66.4
110	16.129	0.148	0.016	2.24	92.7	0.8	99	5.6	0.0	77	267	69	66.6
111	16.281	0.152	0.016	2.24	92.6	0.82	102	5.6	0.0	77	266	69	66.7
112	16.430	0.149	0.016	2.22	92.7	0.85	100	5.5	0.0	77	265	69	66.8
113	16.582	0.152	0.016	2.22	92.7	0.86	102	5.5	0.0	77	264	69	66.8
114	16.731	0.149	0.016	2.23	92.8	0.86	100	5.4	0.0	77	264	69	66.7
115	16.882	0.151	0.016	2.22	92.9	0.81	101	5.4	0.0	77	263	69	66.8
116	17.031	0.149	0.016	2.21	92.9	0.84	100	5.4	0.0	77	264	69	66.7
117	17.183	0.152	0.016	2.22	93	0.82	102	5.3	0.0	77	265	69	66.8
118	17.333	0.150	0.016	2.22	93.1	0.86	100	5.3	0.0	77	265	69	66.9
119	17.484	0.151	0.016	2.22	93.2	0.85	101	5.2	0.0	77	266	69	66.8
120	17.634	0.150	0.016	2.21	93.2	0.84	100	5.2	0.0	77	266	69	66.9
121	17.785	0.151	0.016	2.22	93.3	0.85	101	5.2	0.0	77	265	69	67.1
122	17.934	0.149	0.016	2.22	93.3	0.86	100	5.1	0.0	77	265	69	67
123	18.085	0.151	0.016	2.22	93.5	0.86	101	5.1	0.0	77	266	69	67
124	18.235	0.150	0.016	2.22	93.5	0.85	100	5.0	0.0	77	266	69	67.1
125	18.386	0.151	0.016	2.22	93.5	0.85	101	5.0	0.0	77	265	69	67
126	18.535	0.149	0.016	2.22	93.6	0.85	100	5.0	0.0	77	265	69	66.9
127	18.686	0.151	0.016	2.21	93.7	0.88	101	4.9	0.0	77	266	69	67
128	18.836	0.150	0.016	2.21	93.7	0.85	100	4.9	0.0	77	267	69	67
129	18.987	0.151	0.016	2.22	93.8	0.85	101	4.8	-0.1	77	267	69	67
130	19.137	0.150	0.016	2.21	93.8	0.84	100	4.8	0.0	77	266	69	67.1
131	19.288	0.151	0.016	2.22	93.9	0.86	101	4.7	0.0	77	267	69	67.2

Client: HHT

Model: P42i

Run #: 1

Job #: 22-823

Tracking #: 125

Technician: AK

		Particulate Sampling Data					Fuel Weight (It) Temperature Data (°F)			F)	
Elapsed Time (min)	Gas Meter (ft ³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
132	19.438	0.150	0.016	2.22	93.9	0.86	100	4.7	0.0	77	266	69	67.2
133	19.589	0.151	0.016	2.22	94	0.86	101	4.7	0.0	77	266	69	67.3
134	19.739	0.150	0.016	2.22	94	0.82	100	4.6	0.0	77	265	69	67.2
135	19.890	0.151	0.016	2.22	94.1	0.84	101	4.6	0.0	77	264	69	67.3
136	20.041	0.151	0.016	2.22	94.1	0.85	101	4.6	0.0	77	263	69	67.3
137	20.191	0.150	0.016	2.22	94.2	0.86	100	4.5	0.0	77	262	70	67.3
138	20.342	0.151	0.016	2.22	94.3	0.84	101	4.5	0.0	77	262	70	67.3
139	20.491	0.149	0.016	2.20	94.3	0.85	99	4.5	0.0	77	262	70	67.3
140	20.643	0.152	0.016	2.21	94.4	0.86	101	4.4	0.0	77	261	70	67.3
141	20.792	0.149	0.016	2.22	94.4	0.86	99	4.4	0.0	77	261	70	67.3
142	20.944	0.152	0.016	2.22	94.5	0.87	101	4.3	0.0	77	261	70	67.4
143	21.093	0.149	0.016	2.21	94.5	0.86	99	4.3	0.0	77	261	70	67.3
144	21.245	0.152	0.016	2.22	94.5	0.88	101	4.3	-0.1	77	262	70	67.3
145	21.394	0.149	0.016	2.22	94.6	0.85	99	4.2	-0.1	77	264	70	67.5
146	21.546	0.152	0.016	2.21	94.7	0.87	101	4.2	0.0	77	264	70	67.3
147	21.695	0.149	0.016	2.22	94.8	0.86	99	4.1	0.0	77	264	70	67.3
148	21.847	0.152	0.016	2.21	94.8	0.88	101	4.1	0.0	77	263	70	67.3
149	21.996	0.149	0.016	2.21	94.8	0.9	99	4.1	0.0	77	263	70	67.3
150	22.149	0.153	0.016	2.21	94.9	0.84	102	4.0	-0.1	77	263	70	67.3
151	22.297	0.148	0.016	2.21	95	0.85	99	4.0	0.0	77	264	70	67.4
152	22.450	0.153	0.016	2.21	95	0.88	102	3.9	0.0	77	265	70	67.4
153	22.598	0.148	0.016	2.22	95	0.87	99	3.9	-0.1	77	265	70	67.4
154	22.751	0.153	0.016	2.21	95	0.9	102	3.8	0.0	77	266	70	67.4
155	22.899	0.148	0.016	2.22	95.1	0.89	99	3.8	0.0	77	265	70	67.5
156	23.052	0.153	0.016	2.22	95.2	0.88	102	3.8	0.0	77	266	70	67.5
157	23.200	0.148	0.016	2.22	95.2	0.88	99	3.7	0.0	78	266	70	67.5
158	23.353	0.153	0.016	2.22	95.2	0.88	102	3.7	-0.1	78	266	70	67.5
159	23.500	0.147	0.016	2.21	95.2	0.89	98	3.6	0.0	78	267	70	67.5
160	23.653	0.153	0.016	2.21	95.2	0.88	102	3.6	-0.1	78	269	70	67.6
161	23.801	0.148	0.016	2.21	95.3	0.89	99	3.5	-0.1	78	270	70	67.7
162	23.954	0.153	0.016	2.21	95.3	0.86	102	3.5	0.0	78	270	70	67.7
163	24.102	0.148	0.016	2.21	95.3	0.87	99	3.4	0.0	78	269	70	67.6
164	24.256	0.154	0.016	2.22	95.4	0.86	103	3.4	-0.1	78	269	70	67.6

Client: HHT

Model: P42i

Run #: 1

Job #: 22-823

Tracking #: 125

Technician: AK

		Particulate Sampling Data					Fuel Weight (lb) Temperature Data (°F)				F)		
Elapsed Time (min)	Gas Meter (ft ³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
165	24.403	0.147	0.016	2.20	95.5	0.91	98	3.4	0.0	78	269	70	67.7
166	24.557	0.154	0.016	2.20	95.4	0.9	103	3.3	0.0	78	269	70	67.8
167	24.704	0.147	0.016	2.21	95.4	0.88	98	3.3	0.0	78	268	70	67.7
168	24.857	0.153	0.016	2.21	95.5	0.9	102	3.2	0.0	78	267	70	67.7
169	25.004	0.147	0.017	2.21	95.5	0.9	95	3.2	0.0	78	266	70	67.7
170	25.158	0.154	0.016	2.20	95.5	0.85	103	3.2	0.0	78	266	70	67.7
171	25.305	0.147	0.016	2.21	95.6	0.87	98	3.1	0.0	78	267	70	67.8
172	25.459	0.154	0.016	2.19	95.6	0.88	103	3.1	0.0	78	267	70	67.8
173	25.606	0.147	0.016	2.20	95.6	0.9	98	3.0	0.0	78	267	70	67.9
174	25.759	0.153	0.016	2.20	95.7	0.89	102	3.0	0.0	78	265	70	67.9
175	25.907	0.148	0.016	2.20	95.7	0.86	99	3.0	0.0	78	265	70	67.9
176	26.060	0.153	0.016	2.21	95.7	0.86	102	2.9	0.0	78	263	70	68
177	26.208	0.148	0.016	2.21	95.8	0.87	99	2.9	0.0	78	264	70	68
178	26.362	0.154	0.016	2.20	95.8	0.88	103	2.8	0.0	78	266	70	68
179	26.509	0.147	0.016	2.20	95.8	0.9	98	2.8	0.0	78	266	70	68
180	26.663	0.154	0.016	2.19	95.8	0.86	103	2.8	0.0	78	267	70	67.9
181	26.810	0.147	0.016	2.20	95.8	0.89	98	2.7	0.0	78	266	70	68.1
182	26.964	0.154	0.016	2.20	95.8	0.87	103	2.7	0.0	78	259	70	68
183	27.111	0.147	0.016	2.21	95.9	0.9	98	2.7	0.0	77	254	70	68.1
184	27.265	0.154	0.016	2.21	96	0.85	102	2.7	0.0	77	250	70	68.1
185	27.412	0.147	0.016	2.21	96	0.9	98	2.6	0.0	77	245	70	68.1
186	27.566	0.154	0.016	2.21	96	0.89	102	2.6	0.0	77	241	70	68.2
187	27.713	0.147	0.015	2.20	96	0.87	101	2.6	0.0	77	236	70	68.1
188	27.867	0.154	0.016	2.20	96	0.86	102	2.6	0.0	77	231	70	68.2
189	28.014	0.147	0.016	2.20	96.1	0.9	98	2.6	0.0	77	227	70	68.3
190	28.167	0.153	0.016	2.21	96.1	0.87	102	2.6	0.0	77	223	70	68.2
191	28.315	0.148	0.016	2.20	96.1	0.89	98	2.6	0.0	77	219	70	68.3
192	28.468	0.153	0.016	2.20	96.1	0.88	102	2.6	0.0	77	215	70	68.2
193	28.617	0.149	0.016	2.20	96.1	0.87	99	2.6	0.0	76	211	70	68.2
194	28.770	0.153	0.016	2.21	96.2	0.84	102	2.5	0.0	76	207	70	68.3
195	28.918	0.148	0.016	2.21	96.3	0.91	98	2.5	0.0	76	204	70	68.3
196	29.071	0.153	0.016	2.20	96.3	0.89	102	2.5	0.0	76	201	70	68.2
197	29.219	0.148	0.016	2.22	96.3	0.92	98	2.5	0.0	76	197	70	68.2

Client: HHT

Model: P42i

Run #: 1

Job #: 22-823

Tracking #: 125

Technician: AK

	Particulate Sampling Data							Fuel Weight (lb) Temperature Data (°F)				F)	
Elapsed Time (min)	Gas Meter (ft ³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
198	29.372	0.153	0.016	2.22	96.3	0.88	102	2.5	0.0	76	193	70	68.3
199	29.520	0.148	0.016	2.21	96.3	0.89	98	2.5	0.0	76	190	70	68.3
200	29.672	0.152	0.016	2.21	96.3	0.87	101	2.5	0.0	76	188	70	68.3
201	29.821	0.149	0.016	2.20	96.4	0.87	99	2.5	0.0	76	185	70	68.2
202	29.973	0.152	0.016	2.20	96.5	0.87	101	2.5	0.0	75	182	70	68.4
203	30.122	0.149	0.016	2.21	96.5	0.9	99	2.5	0.0	75	179	70	68.4
204	30.274	0.152	0.016	2.22	96.5	0.84	101	2.5	0.0	75	177	70	68.3
205	30.424	0.150	0.016	2.21	96.5	0.9	99	2.5	0.0	75	175	70	68.3
206	30.576	0.152	0.016	2.22	96.5	0.88	101	2.5	0.0	75	172	70	68.4
207	30.725	0.149	0.016	2.21	96.6	0.85	99	2.4	0.0	75	169	70	68.3
208	30.877	0.152	0.016	2.21	96.6	0.91	101	2.4	0.0	75	167	70	68.3
209	31.027	0.150	0.016	2.20	96.6	0.9	99	2.4	0.0	75	165	70	68.3
210	31.178	0.151	0.016	2.21	96.6	0.9	100	2.4	0.0	75	163	70	68.4
211	31.328	0.150	0.016	2.19	96.6	0.88	99	2.4	0.0	75	160	70	68.4
212	31.479	0.151	0.016	2.20	96.6	0.88	100	2.4	0.0	74	158	70	68.5
213	31.629	0.150	0.016	2.20	96.6	0.86	99	2.4	0.0	74	156	70	68.5
214	31.780	0.151	0.016	2.20	96.5	0.88	100	2.4	0.0	74	155	70	68.5
215	31.931	0.151	0.016	2.20	96.5	0.89	100	2.4	0.0	74	156	70	68.6
216	32.082	0.151	0.016	2.19	96.5	0.91	100	2.4	0.0	74	158	70	68.8
217	32.233	0.151	0.016	2.21	96.5	0.89	100	2.3	0.0	74	159	70	68.9
218	32.383	0.150	0.016	2.20	96.5	0.9	99	2.3	0.0	74	161	70	68.9
219	32.535	0.152	0.016	2.20	96.5	0.9	101	2.3	0.0	74	162	70	69
220	32.685	0.150	0.016	2.20	96.5	0.89	99	2.3	0.0	74	164	70	69.1
221	32.836	0.151	0.016	2.21	96.6	0.88	100	2.3	0.0	74	166	70	69.1
222	32.986	0.150	0.016	2.20	96.6	0.9	99	2.2	0.0	74	168	70	69.1
223	33.138	0.152	0.016	2.20	96.6	0.91	101	2.2	0.0	74	168	70	69.2
224	33.287	0.149	0.016	2.20	96.6	0.85	99	2.2	0.0	74	169	70	69.3
225	33.439	0.152	0.016	2.20	96.7	0.88	101	2.2	0.0	75	171	70	69.5
226	33.588	0.149	0.016	2.21	96.7	0.89	99	2.2	0.0	74	171	70	69.7
227	33.741	0.153	0.016	2.21	96.7	0.92	101	2.1	0.0	75	172	71	69.6
228	33.890	0.149	0.016	2.22	96.8	0.9	99	2.1	0.0	74	172	71	69.7
229	34.043	0.153	0.016	2.20	96.9	0.88	101	2.1	0.0	75	171	71	69.9
230	34.191	0.148	0.016	2.21	96.9	0.91	98	2.1	0.0	74	170	71	69.9

Client: HHT

Model: P42i

Run #: 1

Job #: 22-823

Tracking #: 125

Technician: AK

			Particula	ate Sampli	ng Data			Fuel We	ight (lb)	-	Temperat	ture Data (°	F)
Elapsed Time (min)	Gas Meter (ft ³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
231	34.344	0.153	0.016	2.21	96.9	0.89	101	2.1	0.0	74	170	71	70.2
232	34.492	0.148	0.016	2.20	97	0.91	98	2.1	0.0	74	169	71	70.1
233	34.645	0.153	0.016	2.22	97	0.92	101	2.1	0.0	75	168	71	70
234	34.792	0.147	0.016	2.21	97.1	0.88	97	2.0	0.0	75	167	71	70.1
235	34.946	0.154	0.016	2.20	97.1	0.91	102	2.0	0.0	75	166	71	70.1
236	35.094	0.148	0.016	2.21	97.2	0.87	98	2.0	0.0	75	165	71	70.1
237	35.248	0.154	0.016	2.21	97.2	0.9	102	2.0	0.0	74	164	71	70.2
238	35.395	0.147	0.016	2.21	97.2	0.88	97	2.0	0.0	74	164	71	70.2
239	35.549	0.154	0.016	2.21	97.4	0.92	102	2.0	0.0	75	165	71	70.3
240	35.697	0.148	0.016	2.20	97.4	0.93	98	2.0	0.0	75	166	71	70.5
241	35.850	0.153	0.016	2.21	97.4	0.88	101	1.9	0.0	74	166	71	70.4
242	35.998	0.148	0.016	2.20	97.5	0.91	98	1.9	0.0	75	167	71	70.6
243	36.152	0.154	0.016	2.21	97.5	0.88	102	1.9	0.0	75	169	71	70.5
244	36.299	0.147	0.016	2.20	97.6	0.92	97	1.9	0.0	75	170	71	70.5
245	36.453	0.154	0.016	2.19	97.6	0.9	102	1.8	0.0	75	170	71	70.6
246	36.601	0.148	0.016	2.19	97.6	0.91	98	1.8	0.0	75	171	71	70.5
247	36.755	0.154	0.016	2.20	97.7	0.91	102	1.8	0.0	75	172	71	70.6
248	36.903	0.148	0.016	2.19	97.8	0.89	98	1.8	0.0	75	173	71	70.7
249	37.057	0.154	0.016	2.20	97.8	0.9	102	1.8	0.0	75	173	71	70.7
250	37.204	0.147	0.016	2.21	97.9	0.88	97	1.7	0.0	75	172	71	70.7
251	37.359	0.155	0.016	2.20	97.9	0.91	103	1.7	0.0	75	171	71	70.7
252	37.506	0.147	0.016	2.21	98	0.88	97	1.7	0.0	75	170	71	70.7
253	37.660	0.154	0.016	2.20	98	0.89	102	1.7	0.0	75	168	71	70.7
254	37.808	0.148	0.016	2.20	98	0.91	98	1.7	0.0	75	167	71	70.7
255	37.962	0.154	0.016	2.20	98.1	0.88	102	1.7	0.0	75	165	72	70.8
256	38.110	0.148	0.016	2.21	98.2	0.92	98	1.7	0.0	75	164	72	71
257	38.263	0.153	0.016	2.21	98.2	0.9	101	1.7	0.0	75	162	72	70.9
258	38.412	0.149	0.016	2.21	98.2	0.92	98	1.7	0.0	75	162	72	71
259	38.565	0.153	0.016	2.21	98.2	0.88	101	1.6	0.0	75	163	72	71.1
260	38.713	0.148	0.016	2.22	98.3	0.94	98	1.6	0.0	75	164	72	70.9
261	38.866	0.153	0.016	2.21	98.4	0.95	101	1.6	0.0	75	166	72	70.9
262	39.014	0.148	0.017	2.20	98.4	0.91	95	1.6	0.0	75	167	72	70.9
263	39.167	0.153	0.016	2.20	98.4	0.92	101	1.5	0.0	75	167	72	71

Client: HHT

Model: P42i

Run #: 1

Job #: 22-823

Tracking #: 125

Technician: AK

			Particulate Sampling Data				Fuel We	ight (lb)	-	Temperat	ure Data (°	F)	
Elapsed Time (min)	Gas Meter (ft ³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
264	39.316	0.149	0.016	2.21	98.4	0.89	98	1.5	0.0	75	168	72	71.1
265	39.469	0.153	0.016	2.21	98.5	0.89	101	1.5	0.0	75	168	72	71.2
266	39.618	0.149	0.016	2.20	98.5	0.91	98	1.5	0.0	75	168	72	71.2
267	39.770	0.152	0.016	2.21	98.6	0.92	100	1.5	0.0	75	168	72	71.2
268	39.920	0.150	0.016	2.21	98.6	0.9	99	1.5	0.0	75	167	72	71.2
269	40.072	0.152	0.016	2.21	98.6	0.9	100	1.5	0.0	75	166	72	71.3
270	40.222	0.150	0.016	2.20	98.7	0.92	99	1.5	0.0	75	165	72	71.1
271	40.373	0.151	0.016	2.20	98.7	0.9	100	1.4	0.0	75	165	72	71.1
272	40.524	0.151	0.016	2.20	98.7	0.88	100	1.4	0.0	75	165	72	71.1
273	40.676	0.152	0.016	2.21	98.8	0.93	100	1.4	0.0	75	166	72	71.2
274	40.827	0.151	0.016	2.20	98.9	0.88	100	1.4	0.0	75	167	72	71.2
275	40.977	0.150	0.016	2.20	98.9	0.89	99	1.4	0.0	75	168	72	71.3
276	41.129	0.152	0.016	2.21	98.9	0.94	100	1.3	0.0	75	169	72	71.2
277	41.279	0.150	0.016	2.20	98.9	0.91	99	1.3	0.0	75	169	72	71.3
278	41.432	0.153	0.016	2.21	99	0.91	101	1.3	0.0	75	169	72	71.1
279	41.581	0.149	0.016	2.19	99	0.93	98	1.3	0.0	75	168	72	71.2
280	41.734	0.153	0.016	2.19	99	0.93	101	1.3	0.0	75	167	72	71.2
281	41.883	0.149	0.016	2.20	99.1	0.89	98	1.3	0.0	75	166	72	71.2
282	42.037	0.154	0.016	2.21	99.2	0.88	102	1.3	0.0	75	165	72	71.3
283	42.185	0.148	0.016	2.21	99.2	0.93	98	1.2	0.0	75	166	72	71.3
284	42.338	0.153	0.016	2.21	99.3	0.89	101	1.2	0.0	75	165	72	71.4
285	42.486	0.148	0.016	2.22	99.3	0.91	98	1.2	0.0	75	166	72	71.4
286	42.640	0.154	0.016	2.21	99.3	0.92	102	1.2	0.0	75	166	72	71.3
287	42.788	0.148	0.016	2.21	99.3	0.89	98	1.2	0.0	75	167	72	71.5
288	42.942	0.154	0.016	2.21	99.4	0.92	102	1.2	0.0	75	169	72	71.4
289	43.090	0.148	0.016	2.20	99.4	0.92	98	1.1	0.0	75	169	72	71.6
290	43.244	0.154	0.016	2.20	99.5	0.96	102	1.1	0.0	75	170	72	71.5
291	43.392	0.148	0.016	2.21	99.4	0.91	98	1.1	0.0	75	171	72	71.5
292	43.546	0.154	0.016	2.20	99.5	0.93	102	1.1	0.0	75	171	72	71.5
293	43.694	0.148	0.016	2.20	99.5	0.92	98	1.1	0.0	75	170	72	71.5
294	43.849	0.155	0.016	2.20	99.5	0.89	102	1.0	0.0	75	169	72	71.6
295	43.997	0.148	0.016	2.21	99.5	0.9	98	1.0	0.0	75	168	72	71.6
296	44.152	0.155	0.016	2.20	99.6	0.93	102	1.0	0.0	75	168	72	71.8
Client: HHT

Model: P42i

Run #: 1

Job #: 22-823

Tracking #: 125

Technician: AK

	Particulate Sampling Data						Fuel Weight (lb)		Temperature Data (°F)				
Elapsed Time (min)	Gas Meter (ft ³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
297	44.300	0.148	0.016	2.21	99.6	0.93	98	1.0	0.0	75	167	73	71.8
298	44.454	0.154	0.016	2.21	99.6	0.91	102	1.0	0.0	75	166	73	71.7
299	44.602	0.148	0.016	2.21	99.6	0.9	98	1.0	0.0	75	165	73	71.7
300	44.756	0.154	0.016	2.20	99.6	0.92	102	1.0	0.0	75	165	73	71.9
301	44.905	0.149	0.016	2.19	99.7	0.89	98	0.9	0.0	75	166	73	71.9
302	45.059	0.154	0.016	2.20	99.8	0.9	102	0.9	0.0	75	167	73	71.8
303	45.207	0.148	0.016	2.21	99.7	0.92	98	0.9	0.0	75	167	73	71.7
304	45.360	0.153	0.016	2.20	99.8	0.91	101	0.9	0.0	76	168	73	71.7
305	45.509	0.149	0.016	2.21	99.8	0.88	98	0.9	0.0	76	168	73	71.8
306	45.662	0.153	0.016	2.20	99.8	0.92	101	0.9	0.0	76	167	73	71.8
307	45.811	0.149	0.016	2.19	99.9	0.91	98	0.9	0.0	76	167	73	71.9
308	45.964	0.153	0.016	2.21	99.9	0.92	101	0.8	0.0	76	167	73	71.9
309	46.114	0.150	0.016	2.20	99.9	0.91	99	0.8	0.0	76	167	73	72
310	46.266	0.152	0.016	2.20	99.9	0.93	100	0.8	0.0	76	168	73	71.9
311	46.416	0.150	0.016	2.20	99.9	0.91	99	0.8	0.0	76	169	73	71.9
312	46.567	0.151	0.016	2.20	100	0.94	100	0.8	0.0	76	170	73	71.9
313	46.718	0.151	0.016	2.20	100	0.91	100	0.7	0.0	76	170	73	71.9
314	46.870	0.152	0.016	2.21	100.1	0.93	100	0.7	0.0	76	170	73	71.8
315	47.022	0.152	0.016	2.21	100.1	0.92	100	0.7	0.0	76	169	73	71.9
316	47.172	0.150	0.016	2.20	100.1	0.94	99	0.7	0.0	76	168	73	72
317	47.324	0.152	0.016	2.20	100.1	0.91	100	0.7	0.0	76	168	73	71.9
318	47.475	0.151	0.016	2.21	100.2	0.93	100	0.7	0.0	76	166	73	71.9
319	47.627	0.152	0.016	2.21	100.2	0.91	100	0.7	0.0	76	166	73	72
320	47.777	0.150	0.016	2.20	100.2	0.94	99	0.6	0.0	76	166	73	71.9
321	47.930	0.153	0.016	2.21	100.2	0.9	101	0.6	0.0	76	166	73	72
322	48.080	0.150	0.016	2.20	100.2	0.92	99	0.6	0.0	76	166	73	72
323	48.233	0.153	0.016	2.21	100.3	0.91	101	0.6	0.0	76	166	73	72
324	48.381	0.148	0.016	2.21	100.3	0.9	98	0.6	0.0	76	167	73	72
325	48.535	0.154	0.016	2.21	100.4	0.89	101	0.6	0.0	76	167	73	72
326	48.683	0.148	0.016	2.20	100.4	0.92	98	0.5	0.0	76	169	73	71.9
327	48.837	0.154	0.016	2.20	100.4	0.94	101	0.5	0.0	76	169	73	72
328	48.985	0.148	0.016	2.21	100.4	0.93	98	0.5	0.0	76	169	73	71.9
329	49.139	0.154	0.016	2.20	100.5	0.94	101	0.5	0.0	76	170	73	72

Client: HHT

Model: P42i

Run #: 1

Job #: 22-823

Tracking #: 125

Technician: AK

			Particula	ate Sampli	ng Data			Fuel We	ight (lb)	-	Temperat	ture Data (°	F)
Elapsed Time (min)	Gas Meter (ft ³)	Sample Rate (cfm)	Dilution Tunnel dP (in H ₂ O)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Scale Reading	Weight Change	Dilution Tunnel	Flue	Filter	Ambient
330	49.287	0.148	0.016	2.20	100.5	0.94	98	0.5	0.0	76	170	73	72
331	49.442	0.155	0.016	2.19	100.4	0.91	102	0.4	0.0	76	170	73	72
332	49.590	0.148	0.016	2.21	100.5	0.91	98	0.4	0.0	76	170	73	72.1
333	49.744	0.154	0.016	2.20	100.5	0.89	101	0.4	0.0	76	169	73	72.1
334	49.893	0.149	0.016	2.20	100.5	0.9	98	0.4	0.0	76	168	73	72.2
335	50.047	0.154	0.016	2.20	100.6	0.92	101	0.4	0.0	76	167	73	72.3
336	50.196	0.149	0.016	2.21	100.6	0.91	98	0.4	0.0	76	166	73	72.2
337	50.350	0.154	0.016	2.21	100.6	0.9	101	0.4	0.0	76	165	73	72.2
338	50.499	0.149	0.016	2.21	100.6	0.91	98	0.4	0.0	76	166	73	72.2
339	50.653	0.154	0.016	2.21	100.6	0.89	101	0.3	0.0	76	166	73	72.3
340	50.802	0.149	0.016	2.22	100.7	0.93	98	0.3	0.0	76	166	73	72.3
341	50.956	0.154	0.016	2.21	100.6	0.94	101	0.3	0.0	76	167	73	72.3
342	51.105	0.149	0.016	2.21	100.7	0.95	98	0.3	0.0	76	167	73	72.4
343	51.257	0.152	0.016	2.21	100.7	0.93	100	0.3	0.0	76	167	73	72.3
344	51.406	0.149	0.016	2.20	100.8	0.92	98	0.3	0.0	76	168	73	72.4
345	51.560	0.154	0.016	2.20	100.7	0.91	101	0.2	0.0	76	169	73	72.4
346	51.710	0.150	0.016	2.21	100.8	0.91	99	0.2	0.0	76	169	73	72.4
347	51.862	0.152	0.016	2.21	100.8	0.94	100	0.2	0.0	76	169	73	72.4
348	52.012	0.150	0.016	2.20	100.8	0.95	99	0.2	0.0	76	168	73	72.5
349	52.164	0.152	0.016	2.20	100.8	0.93	100	0.2	0.0	76	168	73	72.4
350	52.316	0.152	0.016	2.21	100.8	0.93	100	0.2	0.0	76	167	73	72.5
351	52.468	0.152	0.016	2.21	100.9	0.93	100	0.2	0.0	76	166	73	72.5
352	52.620	0.152	0.016	2.20	100.9	0.93	100	0.1	0.0	76	166	73	72.5
353	52.771	0.151	0.016	2.21	100.9	0.9	99	0.1	0.0	76	167	73	72.5
354	52.923	0.152	0.016	2.22	100.9	0.95	100	0.1	0.0	76	167	73	72.4
355	53.073	0.150	0.016	2.20	101	0.96	99	0.1	0.0	76	166	73	72.4
356	53.227	0.154	0.016	2.21	101	0.9	101	0.1	0.0	76	166	73	72.4
357	53.377	0.150	0.016	2.21	101	0.95	99	0.1	0.0	76	167	73	72.5
358	53.530	0.153	0.016	2.21	101.1	0.91	101	0.0	0.0	76	167	74	72.5
359	53.678	0.148	0.016	2.22	101	0.93	97	0.0	0.0	76	168	73	72.5
360	53.832	0.154	0.016	2.21	101.1	0.94	101	0.0	0.0	76	169	74	72.6
Avg/Tot	53.832	0.150	0.016	2.19	93	0.86	100			77	248	71	69

Client:	ННТ
Model:	P42i
Run #:	1

Job #: 22-823

Tracking #: 125

Technician: AK

			Partic	culate Sampling	Data			I	Flue Gas Dat	а
Elapsed Time (min)	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
0	0.000		1.58	71.2	1.42		69	-0.080	9.72	0.26
1	0.140	0.140	2.18	71.2	1.4	98	70	-0.080	9.94	0.21
2	0.286	0.146	2.18	71.3	1.68	102	70	-0.082	10.33	0.27
3	0.426	0.140	2.18	71.4	1.66	95	71	-0.080	9.66	0.22
4	0.572	0.146	2.17	71.5	1.69	102	71	-0.081	9.89	0.26
5	0.714	0.142	2.18	71.5	1.64	100	71	-0.080	9.91	0.23
6	0.860	0.146	2.18	71.5	1.69	106	71	-0.081	8.94	0.12
7	1.003	0.143	2.18	71.7	1.64	100	71	-0.081	9.50	0.13
8	1.145	0.142	2.19	71.8	1.58	100	71	-0.081	8.64	0.10
9	1.291	0.146	2.19	71.9	1.62	102	71	-0.078	9.18	0.13
10	1.433	0.142	2.18	72	1.65	100	71	-0.080	9.70	0.32
11	1.581	0.148	2.19	72.1	1.61	104	72	-0.081	9.79	0.51
12	1.722	0.141	2.19	72.2	1.62	99	72	-0.079	9.47	0.42
13	1.869	0.147	2.18	72.5	1.54	103	72	-0.080	9.16	0.30
14	2.010	0.141	2.18	72.7	1.68	99	72	-0.079	9.96	0.30
15	2.157	0.147	2.19	72.9	1.58	106	72	-0.080	10.13	0.32
16	2.300	0.143	2.19	73.2	1.58	100	72	-0.080	9.87	0.18
17	2.446	0.146	2.19	73.5	1.58	102	72	-0.081	10.00	0.30
18	2.590	0.144	2.19	73.8	1.6	101	73	-0.081	9.82	0.45
19	2.734	0.144	2.19	74.2	1.58	101	73	-0.079	9.34	0.42
20	2.879	0.145	2.19	74.5	1.59	101	73	-0.080	9.14	0.20
21	3.023	0.144	2.19	74.8	1.57	101	73	-0.079	8.63	0.14
22	3.170	0.147	2.20	75.1	1.59	103	73	-0.080	8.66	0.18
23	3.314	0.144	2.20	75.4	1.6	100	73	-0.081	10.39	0.60
24	3.461	0.147	2.19	75.7	1.59	102	73	-0.081	9.66	0.28
25	3.604	0.143	2.20	76.2	1.59	100	73	-0.079	9.66	0.35
26	3.751	0.147	2.20	76.5	1.61	99	73	-0.080	8.94	0.21
27	3.894	0.143	2.19	77	1.6	99	74	-0.077	9.27	0.52
28	4.042	0.148	2.20	77.3	1.6	100	74	-0.078	9.71	0.60
29	4.186	0.144	2.20	77.6	1.58	100	74	-0.078	9.83	0.39
30	4.334	0.148	2.22	78.1	1.56	103	74	-0.081	10.03	0.45
31	4.479	0.145	2.21	78.4	1.58	101	74	-0.079	9.87	0.33

Client:	HHT	
Model:	P42i	
Run #:	1	

Job #: 22-823

Tracking #: 125

Technician: AK

			Partic	culate Sampling	Data			I	Flue Gas Dat	а
Elapsed Time (min)	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
32	4.626	0.147	2.21	78.7	1.62	102	74	-0.079	10.08	0.37
33	4.771	0.145	2.21	79.1	1.61	100	74	-0.079	9.61	0.34
34	4.917	0.146	2.21	79.4	1.6	101	74	-0.080	9.00	0.15
35	5.064	0.147	2.21	79.9	1.59	102	74	-0.080	10.01	0.20
36	5.209	0.145	2.21	80.2	1.61	100	74	-0.079	9.87	0.23
37	5.357	0.148	2.21	80.3	1.59	102	74	-0.078	9.47	0.14
38	5.502	0.145	2.21	80.6	1.6	100	74	-0.079	9.49	0.43
39	5.651	0.149	2.22	80.9	1.6	103	74	-0.080	10.07	0.60
40	5.796	0.145	2.22	81.3	1.61	100	74	-0.080	9.56	0.24
41	5.945	0.149	2.22	81.6	1.58	106	74	-0.079	8.95	0.20
42	6.091	0.146	2.23	81.8	1.59	101	74	-0.078	9.72	0.47
43	6.240	0.149	2.22	82.1	1.59	103	74	-0.079	9.43	0.24
44	6.385	0.145	2.22	82.5	1.56	100	74	-0.080	9.29	0.23
45	6.534	0.149	2.22	82.7	1.59	103	74	-0.078	8.66	0.19
46	6.679	0.145	2.23	83	1.54	100	74	-0.079	8.61	0.25
47	6.829	0.150	2.23	83.3	1.6	103	74	-0.080	8.73	0.14
48	6.974	0.145	2.23	83.6	1.6	100	74	-0.079	9.55	0.20
49	7.124	0.150	2.23	83.9	1.56	103	74	-0.080	9.07	0.27
50	7.269	0.145	2.23	84.1	1.59	100	74	-0.079	8.32	0.14
51	7.419	0.150	2.23	84.3	1.6	103	74	-0.080	8.35	0.14
52	7.564	0.145	2.23	84.7	1.57	100	74	-0.077	8.90	0.15
53	7.714	0.150	2.22	84.9	1.62	103	74	-0.079	9.97	0.42
54	7.860	0.146	2.22	85.1	1.6	100	74	-0.083	9.39	0.34
55	8.010	0.150	2.22	85.4	1.62	103	74	-0.081	9.38	0.14
56	8.156	0.146	2.23	85.6	1.66	100	74	-0.079	9.49	0.28
57	8.306	0.150	2.23	85.8	1.64	103	74	-0.080	9.96	0.34
58	8.453	0.147	2.23	86	1.6	101	74	-0.080	9.63	0.43
59	8.603	0.150	2.23	86.2	1.63	103	74	-0.078	8.96	0.24
60	8.749	0.146	2.23	86.4	1.63	100	74	-0.076	9.70	0.08
61	8.900	0.151	2.24	86.6	1.59	103	74	-0.072	9.41	0.31
62	9.046	0.146	2.24	87	1.54	100	74	-0.072	7.44	0.02
63	9.196	0.150	2.24	87.1	1.66	102	74	-0.073	5.55	0.02

Client:	HHT	
Model:	P42i	
Run #:	1	

Job #: 22-823

Tracking #: 125

Technician: AK

		Particulate Sampling Data						Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
64	9.342	0.146	2.24	87.4	1.55	99	74	-0.072	3.81	0.03
65	9.493	0.151	2.24	87.5	1.56	103	74	-0.069	3.24	0.02
66	9.639	0.146	2.24	87.8	1.6	99	74	-0.067	3.03	0.02
67	9.789	0.150	2.24	88	1.63	102	74	-0.064	2.22	0.10
68	9.936	0.147	2.24	88.2	1.6	100	74	-0.064	1.79	0.11
69	10.086	0.150	2.24	88.4	1.62	102	74	-0.060	2.04	0.09
70	10.233	0.147	2.24	88.5	1.61	100	74	-0.057	1.87	0.08
71	10.383	0.150	2.24	88.8	1.59	102	74	-0.060	2.19	0.04
72	10.530	0.147	2.24	88.9	1.61	100	74	-0.059	2.51	0.03
73	10.681	0.151	2.24	89.2	1.58	102	74	-0.056	2.25	0.04
74	10.828	0.147	2.24	89.3	1.59	100	74	-0.056	2.41	0.03
75	10.979	0.151	2.24	89.5	1.61	102	73	-0.055	2.58	0.02
76	11.126	0.147	2.25	89.6	1.6	99	73	-0.053	2.78	0.03
77	11.277	0.151	2.25	89.7	1.6	102	73	-0.055	3.80	0.03
78	11.424	0.147	2.25	89.9	1.59	103	73	-0.055	4.23	0.02
79	11.575	0.151	2.25	90.1	1.59	102	73	-0.052	3.91	0.03
80	11.722	0.147	2.25	90.2	1.62	99	73	-0.052	3.97	0.02
81	11.874	0.152	2.25	90.4	1.56	103	73	-0.054	4.00	0.02
82	12.021	0.147	2.25	90.5	1.55	99	73	-0.054	4.27	0.02
83	12.172	0.151	2.25	90.6	1.64	102	73	-0.053	5.00	0.03
84	12.319	0.147	2.25	90.7	1.58	99	73	-0.053	5.21	0.03
85	12.470	0.151	2.24	90.8	1.57	102	73	-0.054	4.75	0.03
86	12.617	0.147	2.25	90.9	1.62	99	73	-0.054	4.47	0.03
87	12.769	0.152	2.24	91.2	1.63	102	73	-0.053	4.46	0.03
88	12.916	0.147	2.24	91.3	1.64	99	73	-0.052	4.39	0.02
89	13.068	0.152	2.24	91.4	1.63	102	73	-0.054	4.19	0.03
90	13.215	0.147	2.25	91.5	1.55	99	73	-0.055	4.40	0.02
91	13.367	0.152	2.25	91.6	1.56	102	73	-0.053	4.64	0.03
92	13.515	0.148	2.25	91.7	1.68	100	73	-0.054	5.24	0.02
93	13.666	0.151	2.25	91.8	1.59	102	73	-0.055	5.13	0.02
94	13.814	0.148	2.25	91.9	1.62	100	73	-0.053	4.69	0.04
95	13.966	0.152	2.25	92	1.53	102	72	-0.054	4.42	0.03

Client:	HHT	
Model:	P42i	
Run #:	1	

Job #: 22-823

Tracking #: 125

Technician: AK

			Partic	culate Sampling	Data			I	Flue Gas Data	а
Elapsed Time (min)	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
96	14.113	0.147	2.25	92.1	1.67	99	72	-0.052	4.58	0.03
97	14.265	0.152	2.25	92.1	1.55	102	72	-0.051	4.67	0.03
98	14.412	0.147	2.25	92.3	1.57	99	72	-0.054	4.58	0.05
99	14.564	0.152	2.25	92.4	1.67	102	72	-0.052	4.76	0.03
100	14.712	0.148	2.25	92.5	1.65	99	72	-0.055	5.11	0.03
101	14.864	0.152	2.25	92.6	1.66	102	72	-0.053	5.33	0.03
102	15.011	0.147	2.25	92.7	1.56	99	72	-0.053	5.23	0.05
103	15.163	0.152	2.25	92.8	1.59	102	72	-0.054	5.16	0.03
104	15.310	0.147	2.25	92.8	1.56	99	72	-0.053	5.07	0.08
105	15.462	0.152	2.25	92.9	1.67	102	72	-0.055	5.29	0.09
106	15.609	0.147	2.26	92.9	1.62	99	72	-0.054	5.45	0.04
107	15.761	0.152	2.25	93	1.65	102	72	-0.054	5.06	0.03
108	15.908	0.147	2.25	93.1	1.68	99	72	-0.055	5.16	0.04
109	16.060	0.152	2.25	93.2	1.6	102	72	-0.054	5.31	0.04
110	16.208	0.148	2.25	93.3	1.57	99	72	-0.054	4.78	0.04
111	16.359	0.151	2.25	93.4	1.54	101	72	-0.053	4.57	0.03
112	16.507	0.148	2.25	93.4	1.58	99	72	-0.054	4.60	0.03
113	16.658	0.151	2.24	93.5	1.61	101	72	-0.055	4.41	0.03
114	16.806	0.148	2.24	93.5	1.61	99	72	-0.054	4.36	0.03
115	16.957	0.151	2.24	93.6	1.58	101	72	-0.053	4.66	0.03
116	17.106	0.149	2.24	93.7	1.66	100	72	-0.054	5.19	0.03
117	17.257	0.151	2.25	93.7	1.6	101	72	-0.053	5.13	0.03
118	17.406	0.149	2.24	93.8	1.61	100	73	-0.054	5.54	0.03
119	17.556	0.150	2.24	93.8	1.63	101	73	-0.056	5.25	0.04
120	17.706	0.150	2.24	93.9	1.62	101	73	-0.054	5.05	0.03
121	17.856	0.150	2.24	94	1.62	101	73	-0.054	4.58	0.04
122	18.005	0.149	2.24	94	1.61	100	73	-0.055	4.97	0.04
123	18.155	0.150	2.23	94.1	1.61	101	73	-0.053	5.54	0.05
124	18.305	0.150	2.24	94.2	1.64	101	73	-0.056	5.18	0.03
125	18.454	0.149	2.24	94.2	1.61	100	73	-0.053	4.96	0.03
126	18.604	0.150	2.23	94.2	1.6	101	73	-0.054	4.88	0.03
127	18.753	0.149	2.23	94.3	1.6	100	73	-0.055	5.11	0.03

Client:	HHT	
Model:	P42i	
Run #:	1	

Job #: 22-823

Tracking #: 125

Technician: AK

		Particulate Sampling Data							Flue Gas Data		
Elapsed Time (min)	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)	
128	18.904	0.151	2.24	94.4	1.64	101	73	-0.056	5.82	0.03	
129	19.052	0.148	2.24	94.5	1.63	99	73	-0.056	5.65	0.05	
130	19.203	0.151	2.24	94.5	1.63	101	73	-0.056	5.03	0.03	
131	19.351	0.148	2.24	94.5	1.61	99	73	-0.052	5.27	0.04	
132	19.502	0.151	2.24	94.5	1.6	101	73	-0.053	4.94	0.04	
133	19.650	0.148	2.24	94.6	1.63	99	73	-0.055	4.77	0.05	
134	19.801	0.151	2.24	94.7	1.61	101	73	-0.056	4.68	0.06	
135	19.949	0.148	2.24	94.7	1.62	99	73	-0.052	4.48	0.05	
136	20.100	0.151	2.24	94.8	1.6	101	73	-0.052	4.67	0.06	
137	20.248	0.148	2.24	94.8	1.63	99	73	-0.052	4.84	0.03	
138	20.399	0.151	2.23	94.9	1.62	101	73	-0.057	4.98	0.07	
139	20.547	0.148	2.23	94.9	1.63	99	73	-0.056	4.86	0.03	
140	20.698	0.151	2.23	94.9	1.61	101	73	-0.053	4.62	0.04	
141	20.846	0.148	2.23	95	1.64	99	73	-0.056	4.66	0.05	
142	20.997	0.151	2.22	95	1.63	101	73	-0.053	4.89	0.03	
143	21.145	0.148	2.23	95.1	1.61	99	73	-0.051	4.93	0.05	
144	21.297	0.152	2.23	95.1	1.63	102	73	-0.054	5.16	0.03	
145	21.444	0.147	2.24	95.1	1.62	98	73	-0.053	5.68	0.02	
146	21.597	0.153	2.23	95.2	1.56	102	73	-0.055	5.69	0.04	
147	21.744	0.147	2.23	95.2	1.69	98	73	-0.055	4.90	0.03	
148	21.896	0.152	2.23	95.2	1.59	102	73	-0.053	5.00	0.04	
149	22.043	0.147	2.23	95.3	1.58	98	73	-0.052	5.19	0.04	
150	22.195	0.152	2.23	95.4	1.67	102	73	-0.056	5.08	0.08	
151	22.343	0.148	2.24	95.4	1.67	99	73	-0.054	5.23	0.12	
152	22.494	0.151	2.23	95.5	1.57	101	73	-0.056	5.82	0.05	
153	22.642	0.148	2.23	95.4	1.69	99	73	-0.055	5.45	0.07	
154	22.794	0.152	2.23	95.5	1.66	102	73	-0.055	5.35	0.08	
155	22.941	0.147	2.23	95.5	1.68	98	73	-0.053	5.00	0.04	
156	23.093	0.152	2.24	95.6	1.66	102	73	-0.055	5.09	0.10	
157	23.241	0.148	2.23	95.5	1.63	99	73	-0.055	5.41	0.09	
158	23.392	0.151	2.23	95.6	1.61	101	73	-0.053	5.50	0.08	
159	23.539	0.147	2.23	95.6	1.61	98	73	-0.055	5.53	0.12	

Client:	HHT	
Model:	P42i	
Run #:	1	

Job #: 22-823

Tracking #: 125

Technician: AK

	Particulate Sampling Data							Flue Gas Data	a 	
Elapsed Time (min)	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
160	23.691	0.152	2.23	95.6	1.6	102	73	-0.055	5.91	0.06
161	23.838	0.147	2.23	95.7	1.6	98	73	-0.055	6.45	0.13
162	23.989	0.151	2.23	95.7	1.68	101	73	-0.055	5.63	0.08
163	24.137	0.148	2.23	95.7	1.67	99	73	-0.056	4.96	0.04
164	24.288	0.151	2.23	95.7	1.61	101	73	-0.057	5.38	0.07
165	24.436	0.148	2.23	95.8	1.67	99	73	-0.057	5.47	0.04
166	24.587	0.151	2.23	95.8	1.63	101	73	-0.055	5.31	0.08
167	24.735	0.148	2.23	95.9	1.66	99	73	-0.055	4.94	0.07
168	24.886	0.151	2.22	95.9	1.66	101	73	-0.053	4.90	0.12
169	25.034	0.148	2.22	95.9	1.68	96	73	-0.057	4.83	0.13
170	25.185	0.151	2.22	95.9	1.65	101	73	-0.055	4.99	0.18
171	25.333	0.148	2.21	95.9	1.67	99	73	-0.054	5.45	0.07
172	25.483	0.150	2.22	96	1.61	100	73	-0.057	5.35	0.13
173	25.632	0.149	2.22	96	1.62	100	73	-0.055	5.16	0.03
174	25.782	0.150	2.22	96.1	1.61	100	73	-0.057	4.81	0.05
175	25.931	0.149	2.22	96.1	1.61	100	73	-0.053	4.79	0.03
176	26.082	0.151	2.22	96.1	1.63	101	73	-0.053	4.50	0.04
177	26.231	0.149	2.22	96.1	1.6	100	73	-0.052	4.94	0.05
178	26.380	0.149	2.22	96.2	1.61	100	73	-0.055	5.47	0.04
179	26.530	0.150	2.22	96.1	1.7	100	73	-0.057	5.62	0.08
180	26.679	0.149	2.22	96.2	1.62	100	73	-0.057	5.66	0.03
181	26.829	0.150	2.22	96.2	1.64	100	73	-0.054	5.47	0.05
182	26.978	0.149	2.22	96.2	1.59	100	73	-0.053	4.47	0.04
183	27.128	0.150	2.22	96.3	1.67	100	73	-0.052	3.70	0.04
184	27.277	0.149	2.22	96.2	1.62	100	73	-0.050	3.06	0.05
185	27.427	0.150	2.22	96.3	1.67	100	73	-0.048	2.61	0.07
186	27.576	0.149	2.22	96.3	1.67	99	73	-0.049	2.49	0.06
187	27.726	0.150	2.22	96.3	1.63	103	73	-0.046	2.23	0.05
188	27.875	0.149	2.22	96.3	1.59	99	73	-0.047	1.94	0.05
189	28.026	0.151	2.23	96.4	1.7	101	73	-0.045	1.93	0.04
190	28.174	0.148	2.22	96.4	1.58	99	73	-0.046	1.91	0.03
191	28.324	0.150	2.22	96.4	1.57	100	73	-0.045	1.93	0.02

Client:	ННТ
Model:	P42i
Run #:	1

Job #: 22-823

Tracking #: 125

Technician: AK

			Flue Gas Data							
Elapsed Time (min)	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
192	28.472	0.148	2.23	96.4	1.63	99	73	-0.042	1.58	0.05
193	28.623	0.151	2.23	96.4	1.68	101	73	-0.041	1.48	0.03
194	28.771	0.148	2.23	96.5	1.66	99	73	-0.043	1.42	0.06
195	28.922	0.151	2.22	96.5	1.61	101	73	-0.039	1.62	0.04
196	29.070	0.148	2.22	96.5	1.57	99	73	-0.039	1.48	0.06
197	29.221	0.151	2.22	96.5	1.62	101	73	-0.041	1.24	0.05
198	29.369	0.148	2.23	96.6	1.63	99	73	-0.040	1.01	0.05
199	29.520	0.151	2.22	96.6	1.64	101	73	-0.039	1.12	0.05
200	29.668	0.148	2.22	96.7	1.58	99	73	-0.039	1.47	0.04
201	29.819	0.151	2.22	96.6	1.72	101	73	-0.037	1.25	0.08
202	29.967	0.148	2.22	96.7	1.67	99	73	-0.036	1.03	0.08
203	30.118	0.151	2.22	96.7	1.7	101	73	-0.031	0.97	0.10
204	30.266	0.148	2.21	96.7	1.59	99	73	-0.036	1.18	0.07
205	30.417	0.151	2.22	96.7	1.59	101	73	-0.031	1.26	0.09
206	30.565	0.148	2.22	96.7	1.71	99	73	-0.032	1.01	0.09
207	30.717	0.152	2.22	96.7	1.72	101	73	-0.033	0.82	0.09
208	30.865	0.148	2.22	96.7	1.72	99	73	-0.031	0.88	0.11
209	31.016	0.151	2.22	96.8	1.57	100	73	-0.029	0.96	0.07
210	31.164	0.148	2.22	96.8	1.58	98	73	-0.032	0.80	0.06
211	31.316	0.152	2.22	96.8	1.65	101	73	-0.031	0.64	0.06
212	31.463	0.147	2.22	96.8	1.7	98	73	-0.029	0.80	0.05
213	31.615	0.152	2.22	96.8	1.6	101	73	-0.029	0.71	0.07
214	31.762	0.147	2.22	96.8	1.62	98	73	-0.029	0.87	0.06
215	31.914	0.152	2.21	96.8	1.62	101	73	-0.029	1.36	0.05
216	32.061	0.147	2.22	96.8	1.6	98	73	-0.029	1.69	0.07
217	32.213	0.152	2.22	96.8	1.68	101	73	-0.030	1.90	0.04
218	32.361	0.148	2.22	96.9	1.68	98	73	-0.032	2.22	0.05
219	32.512	0.151	2.22	96.8	1.69	100	73	-0.032	2.46	0.04
220	32.660	0.148	2.22	96.9	1.68	98	73	-0.031	2.54	0.03
221	32.811	0.151	2.22	96.9	1.68	100	73	-0.032	2.83	0.03
222	32.958	0.147	2.22	96.9	1.63	98	73	-0.032	2.90	0.04
223	33.110	0.152	2.22	97	1.66	101	73	-0.035	2.61	0.04

Client:	HHT	
Model:	P42i	
Run #:	1	

Job #: 22-823

Tracking #: 125

Technician: AK

			Partic	culate Sampling	Data			I	Flue Gas Dat	а
Elapsed Time (min)	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
224	33.257	0.147	2.22	97	1.62	98	73	-0.029	2.52	0.02
225	33.408	0.151	2.22	97.1	1.7	100	73	-0.034	2.62	0.03
226	33.556	0.148	2.22	97.2	1.74	98	73	-0.034	2.45	0.03
227	33.708	0.152	2.22	97.2	1.71	101	73	-0.033	2.45	0.04
228	33.856	0.148	2.22	97.2	1.7	98	73	-0.030	2.21	0.06
229	34.007	0.151	2.22	97.4	1.68	100	74	-0.031	2.11	0.06
230	34.155	0.148	2.21	97.3	1.61	98	73	-0.033	1.95	0.06
231	34.305	0.150	2.21	97.5	1.65	100	74	-0.034	1.89	0.06
232	34.454	0.149	2.21	97.4	1.6	99	74	-0.032	1.76	0.06
233	34.604	0.150	2.21	97.4	1.68	100	74	-0.031	1.53	0.05
234	34.753	0.149	2.22	97.5	1.64	99	74	-0.032	1.49	0.05
235	34.904	0.151	2.22	97.6	1.71	100	74	-0.032	1.45	0.05
236	35.053	0.149	2.22	97.6	1.69	99	74	-0.027	1.61	0.03
237	35.203	0.150	2.21	97.7	1.74	100	74	-0.032	1.49	0.07
238	35.353	0.150	2.22	97.6	1.6	100	74	-0.031	1.67	0.08
239	35.503	0.150	2.21	97.7	1.69	100	74	-0.034	1.91	0.07
240	35.653	0.150	2.22	97.9	1.59	100	74	-0.031	2.30	0.04
241	35.802	0.149	2.22	97.8	1.71	99	74	-0.031	2.20	0.03
242	35.952	0.150	2.21	97.9	1.62	100	74	-0.034	2.48	0.03
243	36.101	0.149	2.21	98	1.6	99	74	-0.034	2.68	0.02
244	36.252	0.151	2.21	98	1.65	100	74	-0.033	2.58	0.03
245	36.401	0.149	2.21	98	1.64	99	74	-0.032	2.38	0.06
246	36.552	0.151	2.22	98	1.65	100	74	-0.033	2.57	0.07
247	36.700	0.148	2.21	98.1	1.65	98	74	-0.035	2.80	0.04
248	36.850	0.150	2.22	98.1	1.67	100	74	-0.034	2.81	0.02
249	36.999	0.149	2.22	98.2	1.65	99	74	-0.034	2.57	0.03
250	37.149	0.150	2.22	98.2	1.67	100	74	-0.032	2.08	0.05
251	37.297	0.148	2.21	98.2	1.63	98	74	-0.032	1.67	0.10
252	37.448	0.151	2.22	98.2	1.65	100	74	-0.034	1.58	0.10
253	37.596	0.148	2.22	98.3	1.67	98	74	-0.032	1.41	0.10
254	37.748	0.152	2.22	98.3	1.67	101	74	-0.032	1.38	0.07
255	37.896	0.148	2.22	98.5	1.73	98	74	-0.031	1.22	0.09

Client:	HHT	
Model:	P42i	
Run #:	1	

Job #: 22-823

Tracking #: 125

Technician: AK

			Partic	culate Sampling	Data			F	Flue Gas Dat	ata			
Elapsed Time (min)	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)			
256	38.047	0.151	2.22	98.5	1.73	100	74	-0.033	1.25	0.08			
257	38.195	0.148	2.21	98.5	1.6	98	74	-0.030	1.17	0.10			
258	38.346	0.151	2.21	98.6	1.63	100	74	-0.032	1.31	0.09			
259	38.494	0.148	2.21	98.6	1.67	98	74	-0.030	1.86	0.05			
260	38.646	0.152	2.22	98.6	1.61	101	74	-0.034	2.33	0.03			
261	38.794	0.148	2.22	98.6	1.57	98	74	-0.032	2.52	0.03			
262	38.946	0.152	2.21	98.6	1.63	98	74	-0.031	2.65	0.02			
263	39.094	0.148	2.21	98.6	1.64	98	74	-0.032	2.37	0.04			
264	39.246	0.152	2.22	98.7	1.69	101	74	-0.031	2.36	0.03			
265	39.394	0.148	2.21	98.8	1.65	98	74	-0.032	2.28	0.03			
266	39.546	0.152	2.21	98.9	1.64	101	74	-0.030	2.18	0.05			
267	39.693	0.147	2.21	98.9	1.65	97	75	-0.032	1.78	0.05			
268	39.845	0.152	2.21	98.9	1.62	101	74	-0.031	1.82	0.06			
269	39.993	0.148	2.21	99	1.62	98	75	-0.030	1.62	0.05			
270	40.145	0.152	2.22	99	1.61	101	75	-0.035	1.60	0.05			
271	40.293	0.148	2.22	99	1.7	98	75	-0.032	1.53	0.09			
272	40.444	0.151	2.22	99.1	1.59	100	75	-0.030	2.02	0.04			
273	40.592	0.148	2.22	99.1	1.73	98	75	-0.032	2.09	0.02			
274	40.743	0.151	2.22	99.2	1.64	100	75	-0.033	2.12	0.01			
275	40.891	0.148	2.21	99.2	1.62	98	75	-0.030	2.42	0.02			
276	41.042	0.151	2.21	99.1	1.71	100	75	-0.034	2.40	0.02			
277	41.191	0.149	2.22	99.2	1.68	99	75	-0.033	2.40	0.01			
278	41.342	0.151	2.21	99.2	1.61	100	75	-0.030	1.85	0.03			
279	41.490	0.148	2.22	99.3	1.59	98	75	-0.034	1.80	0.04			
280	41.641	0.151	2.21	99.3	1.63	100	75	-0.033	1.92	0.03			
281	41.790	0.149	2.21	99.3	1.61	99	75	-0.033	1.59	0.07			
282	41.941	0.151	2.21	99.3	1.66	100	75	-0.032	1.50	0.08			
283	42.089	0.148	2.21	99.3	1.62	98	75	-0.032	1.81	0.05			
284	42.241	0.152	2.22	99.4	1.61	101	75	-0.031	1.64	0.04			
285	42.390	0.149	2.21	99.5	1.64	99	75	-0.029	1.99	0.04			
286	42.540	0.150	2.21	99.5	1.7	99	75	-0.031	2.11	0.02			
287	42.690	0.150	2.21	99.6	1.59	99	75	-0.030	2.35	0.02			

Client:	HHT	
Model:	P42i	
Run #:	1	

Job #: 22-823

Tracking #: 125

Technician: AK

			Partic		Flue Gas Data					
Elapsed Time (min)	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
288	42.840	0.150	2.21	99.6	1.57	99	75	-0.032	2.73	0.02
289	42.990	0.150	2.21	99.7	1.6	99	75	-0.033	2.41	0.02
290	43.140	0.150	2.21	99.7	1.62	99	75	-0.034	2.46	0.01
291	43.290	0.150	2.21	99.7	1.72	99	75	-0.035	2.67	0.02
292	43.440	0.150	2.21	99.7	1.7	99	75	-0.035	2.67	0.02
293	43.590	0.150	2.21	99.7	1.62	99	75	-0.032	2.15	0.02
294	43.739	0.149	2.21	99.7	1.64	99	75	-0.032	1.78	0.03
295	43.890	0.151	2.22	99.7	1.64	100	75	-0.029	1.71	0.03
296	44.038	0.148	2.21	99.8	1.68	98	75	-0.032	1.96	0.02
297	44.189	0.151	2.21	99.9	1.6	100	75	-0.031	1.42	0.08
298	44.337	0.148	2.22	99.8	1.64	98	75	-0.029	1.47	0.06
299	44.489	0.152	2.21	99.8	1.63	101	75	-0.031	1.51	0.05
300	44.637	0.148	2.21	100.1	1.63	98	75	-0.035	1.55	0.08
301	44.788	0.151	2.21	100	1.65	100	75	-0.030	2.11	0.02
302	44.936	0.148	2.21	100	1.61	98	75	-0.031	2.22	0.03
303	45.088	0.152	2.20	99.9	1.64	101	75	-0.032	2.23	0.02
304	45.236	0.148	2.20	100	1.62	98	75	-0.033	2.27	0.02
305	45.388	0.152	2.21	100.1	1.72	101	75	-0.032	2.16	0.02
306	45.536	0.148	2.21	100	1.65	98	75	-0.032	1.81	0.03
307	45.688	0.152	2.21	100.2	1.64	101	75	-0.032	1.77	0.04
308	45.836	0.148	2.21	100.2	1.65	98	75	-0.037	2.02	0.03
309	45.988	0.152	2.21	100.2	1.68	101	75	-0.032	2.16	0.02
310	46.135	0.147	2.21	100.2	1.65	97	75	-0.033	2.39	0.01
311	46.287	0.152	2.21	100.2	1.65	101	75	-0.032	2.43	0.01
312	46.435	0.148	2.21	100.2	1.7	98	75	-0.036	2.41	0.01
313	46.587	0.152	2.21	100.2	1.68	101	75	-0.032	2.29	0.01
314	46.735	0.148	2.21	100.3	1.66	98	76	-0.033	2.26	0.01
315	46.887	0.152	2.21	100.3	1.65	101	76	-0.032	2.20	0.01
316	47.035	0.148	2.21	100.4	1.64	98	76	-0.031	1.80	0.03
317	47.186	0.151	2.21	100.3	1.65	100	76	-0.030	1.47	0.07
318	47.334	0.148	2.21	100.4	1.63	98	76	-0.031	1.57	0.06
319	47.485	0.151	2.21	100.4	1.63	100	76	-0.032	1.47	0.07

Client:	ННТ
Model:	P42i
Run #:	1

Job #: 22-823

Tracking #: 125

Technician: AK

			Partic		Flue Gas Data					
Elapsed Time (min)	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
320	47.633	0.148	2.21	100.4	1.7	98	76	-0.034	1.96	0.07
321	47.785	0.152	2.21	100.4	1.69	101	76	-0.030	1.97	0.05
322	47.933	0.148	2.21	100.4	1.7	98	76	-0.033	1.79	0.05
323	48.085	0.152	2.21	100.5	1.68	101	76	-0.030	1.89	0.03
324	48.233	0.148	2.21	100.5	1.68	98	76	-0.031	2.08	0.02
325	48.384	0.151	2.20	100.4	1.64	100	76	-0.032	2.57	0.01
326	48.532	0.148	2.21	100.5	1.61	98	76	-0.031	2.87	0.01
327	48.683	0.151	2.21	100.5	1.64	100	76	-0.032	2.62	0.01
328	48.833	0.150	2.21	100.5	1.63	99	76	-0.030	2.40	0.01
329	48.984	0.151	2.21	100.6	1.69	100	76	-0.034	2.58	0.01
330	49.133	0.149	2.20	100.6	1.63	99	76	-0.033	2.28	0.01
331	49.284	0.151	2.21	100.6	1.63	100	76	-0.034	2.26	0.01
332	49.433	0.149	2.21	100.6	1.63	99	76	-0.034	2.07	0.01
333	49.583	0.150	2.21	100.7	1.69	99	76	-0.033	1.80	0.02
334	49.733	0.150	2.20	100.7	1.63	99	76	-0.030	1.73	0.02
335	49.883	0.150	2.21	100.7	1.63	99	76	-0.031	1.66	0.03
336	50.034	0.151	2.21	100.7	1.64	100	76	-0.030	1.49	0.06
337	50.183	0.149	2.21	100.7	1.64	99	76	-0.031	1.47	0.06
338	50.333	0.150	2.21	100.7	1.63	99	76	-0.030	1.94	0.04
339	50.482	0.149	2.21	100.7	1.75	99	76	-0.031	2.07	0.01
340	50.633	0.151	2.20	100.8	1.61	100	76	-0.029	1.97	0.02
341	50.781	0.148	2.21	100.8	1.62	98	76	-0.034	2.05	0.04
342	50.933	0.152	2.21	100.8	1.71	101	76	-0.034	2.27	0.01
343	51.081	0.148	2.21	100.8	1.7	98	76	-0.035	2.04	0.01
344	51.233	0.152	2.21	100.9	1.64	101	76	-0.032	1.98	0.01
345	51.380	0.147	2.21	100.9	1.68	97	76	-0.031	2.36	0.01
346	51.532	0.152	2.21	101	1.69	101	76	-0.032	2.41	0.01
347	51.680	0.148	2.21	100.9	1.68	98	76	-0.034	2.31	0.01
348	51.832	0.152	2.21	101	1.7	101	76	-0.032	1.82	0.03
349	51.981	0.149	2.21	101	1.66	99	76	-0.035	1.65	0.03
350	52.133	0.152	2.21	101.1	1.68	100	76	-0.029	1.83	0.02
351	52.280	0.147	2.21	101.1	1.59	97	76	-0.031	1.65	0.05

Client:	ННТ
Model:	P42i
Run #:	1

Job #: 22-823

Tracking #: 125

Technician: AK

			Partic	culate Sampling	Data			1	Flue Gas Dat	а
Elapsed Time (min)	Gas Meter (ft ³)	Sample Rate (cfm)	Orifice dH (in H ₂ O)	Meter Temp (°F)	Meter Vacuum (in Hg)	Pro. Rate (%)	Filter (°F)	Flue Draft (in H ₂ O)	CO ₂ (%)	CO (%)
352	52.433	0.153	2.21	101.1	1.68	101	76	-0.031	1.81	0.05
353	52.580	0.147	2.21	101.1	1.63	97	76	-0.032	2.00	0.02
354	52.733	0.153	2.21	101.1	1.57	101	76	-0.032	2.12	0.01
355	52.880	0.147	2.20	101.1	1.58	97	76	-0.035	1.64	0.05
356	53.033	0.153	2.21	101.1	1.7	101	76	-0.033	2.09	0.01
357	53.181	0.148	2.21	101.2	1.6	98	76	-0.031	2.08	0.01
358	53.333	0.152	2.21	101.2	1.71	100	76	-0.032	2.19	0.02
359	53.480	0.147	2.21	101.2	1.62	97	76	-0.033	2.38	0.01
360	53.632	0.152	2.21	101.3	1.73	100	76	-0.032	2.42	0.01
Avg/Tot	53.632	0.149	2.22	93	1.63	100			4.18	0.08

LAB SAMPLE DATA - ASTM E2515

Client: HHT

Model: P42i

Run #: 1

Job #: 22-823

Tracking #: <u>125</u> Technician: <u>AK</u>

Date: 10/18/2022

		Sample ID	Tare, mg	Total, mg	Final, mg	Catch, mg
Filters	Α	G00382	243.9	243.9	245.9	2.0
	В	G00383	243.7	243.7	245.6	1.9
	C - 1st Hour	G00384	244.3	244.3	244.9	0.6
	Amb	G00360	123.7	123.7	123.7	0.0
Probes	А	17A	116809.6	116809.6	116809.7	0.1
	В	17B	117139.6	117139.6	117139.7	0.1
	C - 1st Hour	17C	113141.1	113141.1	113141.1	0.0
O-rings	Α	17A	3613.3	3613.3	3613.3	0.0
	В	17B	3569.6	3569.6	3569.8	0.2
	C - 1st Hour	17C	3597.6	3597.6	3597.6	0.0

Placed in Dessicator on: 10/18/202

10/18/2022

Filters A	246.1	10/20 9:50	245.9	10/24 10:25		
В	245.7	10/20 9:50	245.6	10/24 10:26		
C - 1st Hour	244.9	10/20 9:51	244.9	10/24 10:26		
Amb	123.8	10/20 9:51	123.7	10/24 10:26		
		10/5 14:53				
Probes A	116809.6	10/20 9:53	116809.7	10/24 10:26		
В	117139.6	10/20 9:53	117139.7	10/24 10:26		
C - 1st Hour	113141.2	10/20 9:53	113141.1	10/24 10:26		
O-Rings A	3613.3	10/20 9:52	3613.3	10/24 10:26		
В	3569.8	10/20 9:54	3569.8	10/24 10:27		
C - 1st Hour	3597.6	10/20 9:53	3597.6	10/24 10:27		

Train A Aggregate, mg:	2.1
Train B Aggregate, mg:	2.2
Train C Aggregate, mg:	0.6
Ambient Aggregate, mg:	0.0

ASTM E2779 Wood Heater Run Sheets

Client: HHT	Job Number: 22-823	_Tracking #:_ <u>125</u>
Model: P42i	Run Number: 1	Test Date: 10/18/2022

Pellet Heater Control Settings

High Burn Rate Settings:	Temp Control: 7 Feed Rate: 77% Distribution Bower: 100% Combustion Blower Max: 2700 Combustion Blower Min: 2200
Medium Burn Rate Settings:	Temp Control: 4 Feed Rate: 36% Distribution Bower: 100% Combustion Blower Max: 2300 Combustion Blower Min: 1800
Low Burn Rate Settings:	Temp Control: 1 Feed Rate: 25% Distribution Bower: 100% Combustion Blower Max: 2300 Combustion Blower Min: 1700
Droburn Notos	

Preburn Notes

Preburn Start Time: 8:44

Time	Notes
0:00	Began PB, high burn rate settings PB end
00.00	

Test Notes

Test Burn Start Time: 9:44

Time	Notes
60:00 180:00	Changed setting to Medium Changed setting to Low
360:00	Test end

Test Burn End Time: 15:44

Flue Gas Concentration Measurement

Calibration Gas Values:	Span Gas	CO ₂ (%): <u>17.00</u>	CO (%): <u>4.31</u>
	Mid Gas	CO ₂ (%): 10.09	CO (%): 2.53

Calibration Results:

		Pre Test		Post Test			
	Zero	Mid	Span	Zero	Mid	Span	
Time	9:06	9:10	9:08	15:52	15:48	15:50	
CO ₂	0.00	10.17	16.99	0.06	9.94	16.94	
CO	0.000	2.548	4.316	0.017	2.457	4.266	

Flue Gas Probe Leak Check:

Initial: 0

Final: 0

Technician Signature:

>

Date: 12/12/2022

ASTM E2515 - Glass Filters

Sample	Weight 1	Weight 2	Weigth 3	Weight 4	Initial	Project	Run	
G00325	123.2	123.4	-	-	SB	22-794	#2	Wei
G00326	123.6	123.4	1	-	5B	×	L	121
G00327	123.1	123.2	1	-	JB	22 - 794	#3	Wei
G00328	123.7	123.8	-	-	SB		1	12/
G00329	123.6	1236	-	ţ	58			Wei
G00330	123.5	123.5	-		SB	V	4	
G00331	122.9	122.8	-		SB	22-794	#U	Wei
G00332	123.8	123.7	-	_	SB			
G00333	121.9	122.1			SB			
G00334	123.7	123.9	-	-	SB	4	4	
G00335	122.8	122.9	-	-	SB	22-794	#5	
G00336	123.2	123.4	-	4	R	1	1	
G00337	123.8	123.6	-	-	SB			
G00338	123.0	122.3	-	-	JB	L	Y	
G00339	122.8	122.8	-	-	58	22-812	#1	
G00340	122.8	122.7	-	-	58	4	#2	
G00341	123.2	123.4	-		58	-	#3	
G00342	123.0	123.1	-	-	53	22-912	#14	

Wei	ght 1 Date/Time:
121	16 - 14:00
Wei	ght 2 Date/Time:
12/	20-9:00
Wei	ght 3 Date/Time:
Wei	ght 4 Date/Time:

Sample Weight 1 Weight 2 Weigth 3 Weight 4 Initial

Project

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	 _	-	-	

G00343	122.9	123.1		1	A	22-750	#
G00344	123.2	123.4	-	1	A	22-750	42
G00345	1242	124.3	1	-	A	22-826	#1
G00346	123.3	123.5	1 29 M	2	A		
G00347	123.0	123.1	1	-	4		
G00348	123.6	123.8	1	1	1		
G00349	123.2	123.4		-	1		
G00350	123.6	123.7		-	A		
G00351	123.4	123.6	1	N	A	4	
G00352	123.2	127.0			A	22-877	14
G00353	123.8	124.0	1	-	A		1
G00354	122.4	122.4			A		
G00355	123.1	123.1	-	-	Au		
G00356	123.0	123.0	+	-	t		
G00357	122.8	122.9	-		A		
G00358	123.9	124.1		-	A	4	4
G00359	122.5	122.6	-	-	A	22-827	#2
G00360	1235	127.7	1	-	11	22-823	#1

W	/eight 1 Date/Time:
1:	2/16-14:00
W	/eight 2 Date/Time:
	8/5/22 1400
W	/eight 3 Date/Time:
W	/eight 4 Date/Time:

Run

ASTM E2515 - Glass Filter Pairs

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Sample	Weight 1	Weight 2	Weigth 3	Weight 4	Initial	Project	Run
G00361	254.6	254.5	-	-	£	22-812	#1
G00362	253.4	253.4		-	A		
G00363	253.2	253.2	-		4	•	•
G00364	25.1.0	253.9	-	-	A	i i	#2
G00365	253.9	253.7	•	-	A		
G00366	254.5	254.6	1	-	*	•	0
G00367	254.7	254.8	-	-	A	1	#3
G00368	253.2	253.3	-	~	A		1
G00369	255.1	255.1		-	×	•	-
G00370	253.5	253.4	-		4	1	44
G00371	255.2	255.4			A		1
G00372	254.4	254.5	1	-	A	J	it
G00373	252.3	252.2	- 010	•	+	22-750	#1
G00374	249.0	249.1	•	•	A		41
G00375	242.8	242.7		-	6	Y	#1
G00376	243.4	243.6	-	-	A	22-760	\$2
G00377	243.1	243.2		-	A		#2
G00378	244.0	244.1		-	l	L.	#2

Weight	1 Date/Time:
8/3/22	10:00
Weight	2 Date/Time:
8/5/22	- 1400
Weight	3 Date/Time:
Weight -	4 Date/Time:

Sample	Weight 1	Weight 2	Weigth 3	Weight 4	Initial	Project	Run
G00379	245.4	245,4		~	A	22-827	#2
G00380	244,0	244.2	-	•	A		
G00381	243.6	243.7			A	4	4
G00382	243.8	243.9	-		A	22.623	#1
G00383	243.8	243.7	*	-	A		1
G00384	244.1	244.3	-	*	Å	4	4
G00385	244.9	244.8			A	22-831	1
G00386	246.3	246.4	-	-	K	J	V
G00387	246.6	246.7	4		A.	22-339	\$12
G00388	247.2	247.1	-		A	et	1
G00389	247.0	247.0		-	A	22-839	#13
G00390	247.7	247.5		-	K	L	#3
G00391	246.4	246.4	-	-	A	22-540	1/1
G00392	245.8	249.8	-	-	A	1	4
G00393	245.4	245.4		-	A	22-840	12
G00394	247.1	2473	1	-	A	r	L
G00395	246.0	246.1	-	-	1	28-840	# 3
G00396	2471	247.0		_	~	L	L

Weight 1 Date/Time:
10/8 0800
Weight 2 Date/Time:
10/10 0500
Weight 3 Date/Time:
Weight 4 Date/Time:

ASTM E2515 - O-Ring Samples 11-20

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Date:	8/3/22	8/5/22					
Time:	(030	(+00)					
	Weight 1	Weight 2	Weigth 3	Weight 4	Initial	Project	Run
11A	2424.7	3424.7	-	-	+		
11B	4234.3	4234-3		-	4	22-8/2	#4
11C	3589.4	3589.6		-	A		
12A	3587.0	3587.1	-		×	10.04	
12B	3551.3	3551.3	-	-	A	22-40	4
12C	3617.8	3617.7)	A		1000
13A	3596.9	3597.1	1212-	-	F		
13B	3643.2	3643.5	- 20 20-	-	4	22-790	#2
13C	4409.9	9410.1	-		1		
14A	3367.5	3367.5	-	-	A		
14B	3342.7	3342.8		-	A	22-826	#1
14C	3447.6	3447.8	-	-	¥		1
15A	3570.7	3570.7			A		
15B	3572.0	3572.1	-	-	N	22-827	#1
15C	3348.0	339 7.9			1		

~	Date:	10/6/22	10/7/12	11/7 8:30				
	Time:	15:00	0800	3130]		
		Weight 1	Weight 2	Weigth 3	Weight 4	Initial	Project	Run
	16A	3573,4	3573.4			4	100	
	16B	2639.3	26.29.3	1	-	A	22-827	#2
	16C	3602.0	36.62.1			A		
	17A	3613.91	36133	-	-	A		
[17B	3569.5	3569.6	-	1	A	22-823	#(
	17C	3597-5	3597.6			K		
114	18A	3603.0	-	3603.0	-	58	77 761	
13.00	18B	3546.2	-	3546.2	1	SR	LC-FUI	#I AI
PA I	18C	3528.8	_	3528.8	1	JB	22-741	#12 MP
Reallys	19A	3585.5		3585.6	-	SB	22-741	#2
	19B	3633.0	-	3633.1		JB		H-H
7	19C	3614.9	-	3615.1	1	SB	12-791	#3
	20A	3559.4	-	3559.5	-	SB		
	20B	3614.7	~	3614.9	-	SB	20-791	#4 NI-MRIE
2 A	20C	3611.1	<u> </u>	3611.3	-	JB	22-791	#5

ASTM E2515 - Probe Samples 11-20

Date:	8322	9/5/22	8/8/22				
Time:	1030	1400	6100				
	Weight 1	Weight 2	Weigth 3	Weight 4	Initial	Project	Run
11A	116865.2	116865.1	-	-	K		
11B	117339.4	17739.3	-	-	A	22-8/2	#4
11C	116185.4	116185.6			A		
12A	116705.6	116705.6	-	-	A		- 12-51
12B	117771.6	117771.8	-		A	22-250	#1
12C	117171.5	117171.9	1171715	117171.4	1		
13A	11734.5	117314.9	117314.5	117314.4	4		
13B	116441.1	116941.0	-	-	A	22-750	#2
13C	115650.6	115650.4	↔		A		
14A	116633.2	116633.5	11633.3	-	A		
14B	116618.7	116618.9	-	-	A	27.826	#
14C	116530.7	16531.0	116530.8	-	A	1.2.	1.1
15A	117239.6	117240.0	117 239.5	117239.4	A		
15B	116752.3	116752.6	116752.7	116752.3	A	22-827	#
15C	116847.6	116848.2	116847.6	116847.5	l		

Date:	10/6/22	10/222					
Time:	15.00	68 66					
	Weight 1	Weight 2	Weigth 3	Weight 4	Initial	Project	Run
16A	116379.3	111379.5	-	,	A		
16B	115860.2	115860.7	E State	-	4	12,072	#17
16C	114148.0	114148.1			1	-E. 001	HL
17A	11680 9.6	116809.6	*	-	Å		
17B	117139.7	117129.6			1	22-823	71
17C	113140.0	113141.1		4	N		
18A	117497.9		117418.0		SB	22-741	41
18B	117329.9		117330.1	1	R		Al-Mapic
18C	114335.0	1	114335.2)	SB	22-791	#2,
19A	117025.7	-	117025.9		R	22-701	#2 pmg
19B	117010.9	1	117011.1	1	R		40.11
19C	114228.9	1	114228.7	1	SB	22-741	#3 myle
20A	115625,7	-	115625.9	-	R	22704	++> (
20B	115965.1	1	115965.3	-	SR		AI. Myle
20C	11375.1)	13775.1	-	58	22-241	#5 ALMAN

1/14 14:00 -154 Fallis

Pre-Conditioning Data

Client: HHT			Job #: 22-823
Model:	P42i		Tracking #: 125
Date(s):	9/12/22 - 9/20)/22	Technician: AK
Elapsed Time (hrs)	Flue (°F)	Catalyst Exit (°F)	Notes: Indicate initial air setting and any changes in in setting during conditioning, as well as weight and average moisture content of all fuel additions.
0	322		+ 40 lb, Energex pellets
1	277		
2	265		
3	261		
4	261		
5	259		
6	259		
/	303		+ 40 lb, Energex pellets
0	320		
9	305		
11	303		
12	306		+ 40 lb Energex pellets
13	295		
14	260		
15	273		
16	270		
17	273		+ 40 lb, Energex pellets
18	282		
19	284		
20	283		
21	286		
22	284		
23	285		+ 40 lb, Energex pellets
24	282		
25	283		
26	283		
21	280		1 40 lb. Energey pollete
20	294		+ 40 lb, Energex penets
30	276		
31	284		
32	285		
33	287		+ 40 lb, Energex pellets
34	288		
35	288		
36	322		
37	271		
38	264		+ 40 lb, Energex pellets
39	265		
40	261		
41	262		
42	264		
43	310		1. 40 lb Energev pellete
44	283		I+ 40 ID, ⊏ITEIYEX PETELS
40	203		
40 47	205		
48	265		
49	302		+ 40 lb. Energex pellets
50	282		······································

Equations and Sample Calculations – ASTM E2779 & E2515

Client	HHT
Model:	P42i
Tracking #:	125
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_{Bdb} – Weight of test fuel burned during test run, dry basis, kg

 M_{BSidb} – Weight of test fuel burned during test run segment *i*, dry basis, kg

BR - Average dry burn rate over full integrated test run, kg/hr

- BR_{Si} Average dry burn rate over test run segment *i*, 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
- Cs 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 Average particulate emissions for full integrated test run, g/hr

PM_F – Average particulate emission factor for full integrated test run, g/dry kg of fuel burned

 M_{Bdb} – Weight of test fuel burned during test run, dry basis, kg ASTM E2779 equation (1)

 $M_{Bdb} = (M_{Swb} - M_{Ewb})(100/(100 + FM))$

Where,

FM	=	average fuel moisture of test fuel, % dry basis
M_{Swb}	=	weight of test fuel in hopper at start of test run, wet basis, kg
M_{Ewb}	=	weight of test fuel in hopper at end of test run, wet basis, kg

Sample Calculation:

FM = 5.54 % $M_{Swb} = 12.5 Ibs$ $M_{Ewb} = 0.0 Ibs$ 0.4536 = Conversion factor from Ibs to kg

 $M_{Bdb} = [(12.5 \times 0.4536) - (0.0 \times 0.4536)] (100/(100 + 5.541))$

 $M_{Bdb} = 5.37 \text{ kg}$

 M_{BSidb} – Weight of test fuel burned during test run segment *i*, dry basis, kg ASTM E2779 equation (2)

 $M_{BSidb} = (MS_{Siwb} - M_{ESiwb})(100/(100 + FM))$

Where,

 M_{SSiwb} = weight of test fuel in hopper at start of test run segment *i*, wet basis, kg M_{ESiwb} = weight of test fuel in hopper at end of test run segment *i*, wet basis, kg

Sample Calculation (from medium burn rate segment):

$$\label{eq:masses} \begin{split} FM &= 5.54 \ \ \% \\ M_{SSiwb} &= 7.3 \ \ lbs \\ M_{ESiwb} &= 2.8 \ \ lbs \\ 0.4536 &= Conversion factor from lbs to kg \end{split}$$

 $M_{BSidb} = [(7.3 \times 0.4536) - (2.8 \times 0.4536)] (100/(100 + 6))$

 M_{BSidb} = 1.95 kg

BR – Average dry burn rate over full integrated test run, kg/hr

ASTM E2779 equation (3)

BR =
$$\frac{60 \text{ M}_{\text{Bdb}}}{\theta}$$

Where,

$$\theta$$
 = Total length of full integrated test run, min

Sample Calculation:

M_{Bdb}	=	5.37	kg
θ	=	360	min
		60 x	5.37
BR	=	36	0
BR	=	0.89	kg/hr

BR_{Si} – Average dry burn rate over test run segment *i*, kg/hr

ASTM E2779 equation (4)

$$BR_{Si} = \frac{60 M_{BSidb}}{\theta_{Si}}$$

Where,

$$\theta_{si}$$
 = Total length of test run segment *i*, min

Sample Calculation (from medium burn rate segment):

$$M_{BSidb} = 1.95 \text{ kg}$$

$$\theta = 120 \text{ min}$$

$$BR = 120$$

$$BR = 120$$

$$BR = 0.98 \text{ kg/hr}$$

$\mathbf{V}_{\mathbf{s}}$ – Average gas velocity in the dilution tunnel, ft/sec

ASTM E2515 equations (9)

$$V_{s} = F_{p} \times K_{p} \times C_{P} \times \left(\sqrt{\Delta P}\right)_{avg} \times \sqrt{\frac{T_{s}}{P_{s} \times M_{s}}}$$

Where:

Sample calculation:

$$Fp = \frac{10.15}{8.49} = 1.196$$

$$V_{s} = 1.196 \times 85.49 \times 0.99 \times 0.126 \times \left(\frac{77.5 + 460}{30.05 + \frac{-0.07}{13.6}} \right) \times 28.78$$
)
$$V_{s} = 10.10 \text{ ft/s}$$

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

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

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

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

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%
А	=	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	=	Absolute average gas temperature in the dilution tunnel, °R; (°R = °F + 460)
P_{std}	=	Standard absolute pressure, 29.92 in Hg

Sample calculation:									30.05	л.	-0.07
0	3600 x (1 - 0 02) x	10 10	v	0 7854	v	5	28	v	30.03	Τ-	13.6
a _{sd} –	5000 X (1 - 0.02) X	10.10	^	0.7054	^	77.5	+	460	2	29.9	2



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

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

Where:

K_1	=	17.64 °R/in. Hg
$V_{\rm m}$	=	Volume of gas sample measured at the dry gas meter, dcf
Υ	=	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. $\mathrm{H_2O}$
Tm	=	Absolute average dry gas meter temperature, °R

Sample Calculation:

Using equation for Train A:

sing equation for Train A:

$$V_{m(std)} = 17.64 \times 53.832 \times 1 \times \frac{(30.05 + \frac{2.19}{13.6})}{(93.2 + 460)}$$

V_{m(std)} = **51.853** dscf

sing equation for Train B: $V_{m(std)} = 17.64 \times 53.632 \times 1 \times \frac{(30.05 + \frac{2.22}{13.6})}{(93.4 + 460)}$ Using equation for Train B:

 $V_{m(std)} = 51.639$ dscf

Using equation for ambient train: sing equation for ambient train: $V_{m(std)} = 17.64 \times 50.26 \times 0.999 \times \frac{(30.05 + 0.00)}{13.6}$ 460 68.9 + (

 $V_{m(std)} = 50.313$ 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):

 $m_n = 0.1 + 2.0 + 0.0$ $m_n = 2.1 mg$

Using equation for Train A (remainder):

 $m_n = 0.0 + 0.6 + 0.0$ $m_n = 0.6 mg$

Train A Aggregate = 2.7 mg

Using equation for Train B:

 $m_n = 0.1 + 1.9 + 0.2$

m_n = **2.2** mg

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

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

Where:

Sample calculation:

For Train A:

$$C_s = 0.001 \text{ x} \frac{2.7}{51.85}$$

For Train B:

$$C_s = 0.001 \times \frac{2.2}{51.64}$$

C_s = **0.00004** g/dscf

For Ambient Train

$$C_r = 0.001 \times \frac{0.0}{50.31}$$

C_r = 0.000000 g/dscf

\mathbf{E}_{T} – Total Particulate Emissions, g

ASTM E2515 equation (15)

$$\boldsymbol{E}_{T} = (\boldsymbol{c}_{s} - \boldsymbol{c}_{r}) \times \boldsymbol{Q}_{std} \times \boldsymbol{\theta}$$

Where:

C_s	=	Concentration of particulate matter in tunnel gas, g/dscf
$\mathbf{C}_{\mathbf{r}}$	=	Concentration particulate matter room air, g/dscf
Q _{std}	=	Average dilution tunnel gas flow rate, dscf/hr
θ	=	Total time of test run, minutes

Sample calculation:

For Train A						
E _T = (0.000052	-	0.000000) x	<u>27592.9</u>	х	<u>360</u> /60
E _T =	<u>8.62</u>	g				

For Train B

$E_T = (\underline{C}$	0.000043	-	0.000000) x	<u>27592.9</u>	х	<u>360</u>	/60
Ε _T =	7.05	g					

Average

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

7.5% of the average =	<u>0.59</u>
Train A difference =	<u>0.78</u>
Train B difference =	<u>0.78</u>

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 A):

PR = <u>94</u> %

 $\ensuremath{\text{PM}_{\text{R}}}$ – Average particulate emissions for full integrated test run, g/hr ASTM E2779 equation (5)

$$PM_{R} = 60 (E_{T}/\theta)$$

Where,

 E_T = Total particulate emissions, grams

 θ = Total length of full integrated test run, min

Sample Calculation:

 E_T (Dual train average) = 7.84 g θ = 360 min $PM_R = 60 \times (7.84 / 360)$

 $PM_R = 1.31 \text{ g/hr}$

PM_F – Average particulate emission factor for full integrated test run, g/dry kg of fuel burned ASTM E2779 equation (6)

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

Where,

Ε _T	=	Total particulate	emissions,	grams
----------------	---	-------------------	------------	-------

M_{Bdb} = Weight of test fuel burned during test run, dry basis, kg

Sample Calculation:

E_T (Dual train average)	=	7.84 g	
M_{Bdb}	=	5.37 kg	g
PM _F	=	7.84 /	5.37)

$$PM_F = 1.46 \text{ g/kg}$$

P42i-TC Test Run Settings

Segment	Temperature Control	Feed Rate	Distribution Blower	Combustion Blower (Max RPM)
Pretest	7	77%	100%	2700
Maximum	7	77%	100%	2700
Medium	4	36%	100%	2300
Minimum	1	25%	100%	2300
Combustion Blower (Min RPM)



11785 SE Hwy 212 Ste 305

Clackamas, OR 97015

Sebastian Button

Twin Ports Testing, Inc. 1301 North 3rd Street Superior, WI 54880 p: 715-392-7114 800-373-2562 p: f: 715-392-7163

Analytical Test Report

PFS-TECO

www.twinportstesting.com USR:W222-0678-01 Report No: **Issue No:** 1

Signed:

Date of Issue:

Im & Inloron

Amber Anderson Chemist 10/26/2022 THIS DOCUMENT SHALL NOT BE REPRODUCED EXCEPT IN FULL

Sample Details

Client:

Attention:

PO No:

Sample Designation:P42iSample Time:Sample Recognized As:BiomassArrival Date:10/17/2022	Sample Log No:	W222-0678-01	Sample Date:	
Sample Recognized As: Biomass Arrival Date: 10/17/2022	Sample Designation:	P42i	Sample Time:	
	Sample Recognized As:	Biomass	Arrival Date:	10/17/2022

Test Results

			MOISTURE	AS
	METHOD	UNITS	FREE	RECEIVED
Moisture Total	ASTM E871	wt. %		5.25
Ash	ASTM D1102	wt. %	0.53	0.50
Volatile Matter	ASTM D3175	wt. %		
Fixed Carbon by Difference	ASTM D3172	wt. %		
Sulfur	ASTM D4239	wt. %	0.011	0.010
SO ₂	Calculated	lb/mmbtu		0.025
Net Cal. Value at Const. Pressure	ISO 1928	GJ/tonne	18.45	17.35
Gross Cal. Value at Const. Vol.	ASTM E711	Btu/lb	8486	8041
Carbon	ASTM D5373	wt. %	43.58	41.29
Hydrogen*	ASTM D5373	wt. %	5.91	5.60
Nitrogen	ASTM D5373	wt. %	1.11	1.05
Oxygen*	ASTM D3176	wt. %	48.86	46.29
*Note: As received values do not include hydro	gen and oxygen in the	total moisture.		
Chlorine	ASTM D6721	mg/kg		
Fluorine	ASTM D3761	mg/kg		
Mercury	ASTM D6722	mg/kg		
Bulk Density	ASTM E873	lbs/ft ³		
Fines (Less than 1/8")	TPT CH-P-06	wt.%		
Durability Index	Kansas State	PDI		
Sample Above 1.50"	TPT CH-P-06	wt.%		
Maximum Length (Single Pellet)	TPT CH-P-06	inch		
Diameter, Range	TPT CH-P-05	inch		to
Diameter, Average	TPT CH-P-05	inch		
Stated Bag Weight	TPT CH-P-01	lbs		
Actual Bag Weight	TPT CH-P-01	lbs		

Comments:



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N° de série: MODEL / MODÈLE: "P42i-TC Pellet Insert"

Serial No.

BARCODE LABEL

Room Heater Pellet Fuel-Burning Type SUITABLE FOR MOBILE-HOME INSTALLATION This pellet burning appliance has been tested and listed for use In Manufactured Homes In accordance with OAR 814-23-900 through 814-23-909

Report #/Rapport #22-823

Tested to/Testé selon: ASTM E 2779-10, ASTM E 2515-11, ASTM E 1509-12, ULC-S628-93, Pellet Fuel-Burning Type, Also

For Use In Mobile Homes. (UM) 84-HUD

"PREVENT HOUSE FIRES" Install and use only in accordance with the manufacturer's installation and operation instructions. Contact local building or fire officials about restrictions and installation inspection in your area.

This wood heater needs periodic inspection and repair for proper operation. Consult the owner's manual for further information. It is against federal regulations to operate this wood heater in a manner inconsistent with the operating instructions in the owner's manual.

Room Heater, Pellet Fuel-Burning Type, Also for Use in Mobile Homes

WARNING: FOR MANUFACTURED HOMES: Do not install appliance in a sleeping room. An outside combustion air inlet must be provided. The structural integrity of the manufactured home floor, ceiling and walls must be maintained.

Refer to manufacturer's instructions and local codes for precautions required for passing chimney through a combustible wall or ceiling. Inspect and clean exhaust venting system frequently in accordance with manufacturer's instructions.

Use a 3" or 4" diameter type "L" or "PL" venting system, or 4" stainless steel flex as per owner's manual.

Do not connect this unit to a chimney flue servicing another appliance.

FOR USE WITH PELLETIZED WOOD FUEL ONLY.

EPA Certified Emissions: 1.0 g/hr

Input Rating Max: 5.2 lb. fuel/hr.

Electrical Rating: 120 VAC, 60 Hz, Start 3.5 AMPS, Run 2.5 AMPS DANGER: Risk of electrical shock. Disconnect power supply before servicing.

For further instruction refer to owner's manual.

Replace glass only with 5mm ceramic available from your dealer.

Keep viewing door tightly closed during operation.

DO NOT REMOVE THIS LABEL/NE PAS ENLEVER CETTE ÉTIQUETTE

MINIMUM CLEARANCES TO COMBUSTIBLE MATERIAL Non-combustible floor protector must extend 6" (152 mm) to the sides and front of the unit, measured from the glass face.

8742-930A

Insert Body to side wall - 12" (305 mm) Insert Body to 12" (305mm) Mantel - 12" (305 mm) Insert Body to 3/4" fascia or trim above - 0" (0 mm) Insert Body to side trim - 0" (0 mm) Floor protection. Measured from glass. - 6" (152mm)

US ENVIRONMENTAL PROTECTION AGENCY Certified to comply with 2020 particulate emission standards. Certifié conforme aux normes 2020 d'émission de particules.



Made in U.S.A. of US and imported parts. / Fabriqué aux États-Unis-d'Amérique par des pièces d'origine américaine et pièces importées.

Ce poêle à granulés a été testé et peut être installé dans les maisons préfabriquées en conformité avec OAR 814-23-9000 à 814-23-909 **PRÉVENTION DES INCENDIES** Respecter scrupuleusement les instructions du constructeur pour l'installation et les consignes de fonctionnement. Respecter les règles de sécurité en vigueur dans votre région.

HF

Ce poêle à bois doit inspection périodique et la réparation pour un fonctionnement correct. Consultez le manuel du propriétaire pour plus d'informations. Ce est contre les règlements fédéraux pour faire fonctionner ce poêle à bois d'une manière incompatible avec les instructions d'utilisation dans le manuel du propriétaire. AVERTISSEMENT POUR MAISONS MOBILES: Ne pas installer dans

une chambre. Il est impératif de prévoir une prise d'air extérieur. L'intégrité structurale du plancher, du plafond et des murs doit être strictement préservée.

Se reporter aux instructions du fabricant et aux réglementations spécifiques locales concernant les précautions requises lorsque la cheminée traverse un mur ou un plafond fabriqué en matière combustible.

Contrôler et nettoyer fréquemment tout le système d'évacuation des fumées conformément aux recommandations du constructeur. Utiliser un conduit de fumée type « L » ou « PL » d'un diamètre de 7,6 cm (3") ou de 10 cm (4"), ou bien une gaine en acier inoxydable de 10 cm (4"),

comme indiqué dans le manuel d'utilisation. Ne pas raccorder ce poêle à un conduit de cheminée déjà utilisé pour un autre

appareil. À UTILISER AVEC LA GRANULE DE BOIS

SEULEMENT. Émissions certifiés EPA: 1,0 g / h Consommation maximum: 2,36 kg/h Caractéristiques électriques: 120 V c.a. - 60 Hz - Intensité au

démarrage 5,0 A Intensité en fonctionnement normal 4,0 A DANGER: Risque d'électrocution. Débrancher l'appareil avant toute

intervention. Pour une information plus complète, se reporter à la notice d'utilisation. Ne remplacer la vitre qu'avec une vitre céramique 5 mm disponible auprès de votre revendeur.

Garder la porte vitrée bien close durant le fonctionnement de l'appareil.

ÉCARTS MINIMUM DE SÉCURITÉ

La protection de sol doit être constituée de matériau incombustible et s'étendre de 152 mm (6") à l'avant et sur les côtés de l'unité, mesurée depuis la vitre (ÉTATS-UNIS).



m) Mantel - 12" (30 - 0" (0 m - 6" (152mm)

Date of Manufacture / Date de fabrication: FEB MAR APR MAY JUN JUL AUG SEP SEP OCT NOV DEC 2023 2024 2025 JAN Manufactured by / Fabriqué par: Hearth and Home Technologies 352 Mountain House Road, Halifax PA 17032

		LADEL	HORET	
ECO:	96780		LABEL SIZE:	11" x 5.75"
PART # / REV:	8742-930A		ADHESIVE:	N/A
ORIGINATOR:	Spidlet		MATERIAL:	24 Gauge Aluminum
DATE:	11/17/22		INK:	Screened Black Background
Н Е А В Т Н Т [†]	HOME technologies he Hearth Experts	352 Mountain House Road Halifax, PA 17032	 (2) Slotted Holes (2) Holes = Ø.2 (4) Corners = R.0 <i>This unit will ne</i> <i>"Wood heater n</i> 	= .156 x .25 062 ed the addendum label that refers to the eeds periodic inspection" Information

Installation Manual Installation and Appliance Setup

INSTALLER: Leave this manual with party responsible for use and operation. OWNER: Retain this manual for future reference.





Tested and approved for wood pellets only. Burning of any other type of fuel voids your warranty. When burning higher ash content pellets more frequent cleanings may be required.

WARNING

Please read this entire manual before installation and use of this pellet fuelburning room heater. Failure to follow these instructions could

result in property damage, bodily injury or even death.

- Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance.
- Do not overfire If any external part starts to glow, you are overfiring. Reduce feed rate. Overfiring will void your warranty.
- Comply with all minimum clearances to combustibles as specified. Failure to comply may cause house fire.



HOT SURFACES!

Glass and other surfaces are hot during operation and cool down.

Hot glass will cause burns.

- Do not touch glass until it is cooled
- NEVER allow children to touch glass
- · Keep children away
- CAREFULLY SUPERVISE children in same room as stove.
- Alert children and adults to hazards of high temperatures.

High temperatures may ignite clothing or other flammable materials.

• Keep clothing, furniture, draperies and other flammable materials away.

NOTE

To obtain a French translation of this manual, please contact your dealer or visit www.harmanstoves.com Pour obtenir une traduction française de ce manuel, s'il vous plaît contacter votre revendeur ou visitez www. harmanstoves.com

A Safety Alert Key:

- DANGER! Indicates a hazardous situation which, if not avoided, will result in death or serious injury.
- WARNING! Indicates a hazardous situation which, if not avoided, could result in death or serious injury.
- CAUTION! Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.
- NOTICE: Indicates practices which may cause damage to the stove or to property.

TABLE OF CONTENTS

4 Decidence Openation and leave attack Opfate lefe weating	
1 Product Specific and Important Safety Information	
A. Appliance Certification	
B. Glass Specifications	
C. Mobile Home Approved 4	
D. BTU & Efficiency Specifications	
E. Non-Combustible Materials Specification	
F. Combustible Materials Specification	
G. Electrical Codes	
H. California Safety Information	

2 Getting Started

Α.	Design and Installation Considerations	6
В.	Tools and Supplies Needed	7
C.	Inspect Appliance and Components	7

3 Clearances

Α.	Appliance Dimension Diagram	8
В.	Clearances to Combustibles & Floor Protection	9
C.	Minimum Opening - Masonry & Manufactured Fireplaces .	9

4 Termination Location and Vent Information

Α.	Vent Termination Requirements
В.	Vent Termination Design 11
C.	Venting & Use of Elbows 15
D.	Battery Back-up Power
Ε.	Outside Air
F.	Locating Your Appliance and Chimney
G.	Negative Pressure
Η.	Avoiding Smoke & Odors
I.	Mobile Home Installation 20
J.	Fire Safety
K.	Inspect Appliance & Components

5 Appliance Setup

Α.	Reducing Weight for Installation	22
Β.	Beginning the Installation	23
C.	Electrical Connection Installation	25
D.	Reminders	25
E.	Firebox Draft and Combustion Fan RPM	26
F.	Wireless Room Sensor	27

6 Reference Materials

Α.	Safety Reminders.	28
Β.	Wiring Diagram.	29

→ = Contains updated information

Installation Standard Work Checklist

ATTENTION INSTALLER:

Follow this Standard Work Checklist

This standard work checklist is to be used by the installer in conjunction with, not instead of, the instructions contained in this installation manual.

Customer: Lot/Address: Model:	Date Installed: Location of Stove: Installer: Dealer/Distributer P Serial Number:	 h #
WARNING! Risk of Fire or Explosion! Failure to ins or explosion.	tall appliance to thes	e instructions can lead to a fire
Appliance Install Section 3 Required non-combustible floor protection Verified clearances to combustible. Unit is Leveled and secured.	YES	IF NO, WHY?
<u>Venting/Chimney</u> Section 4 Venting Configuration complies to vent diagrams. Venting installed, sealed and secured in place with proper cleara Exterior wall/roof flashing installed and sealed Terminations installed and sealed.	nces.	
Electrical Section 1 120 VAC unswitched power provided to the appliance. Check outlet with multi-meter for proper voltage. (115-120 VAC) Record voltage reading:		
Appliance Setup Section 5 All packaging and protective materials are removed Accessories installed properly Manual bag and all it's contents are removed from inside the app and given to party responsible for use and operation Started appliance and verified that all motors and blowers operat as they should. Checked draft using a Manometer Record readings:	Diance	

Hearth and Home Technologies recommends the following:

Photographing the installation and copying this checklist for your file.

This checklist remain visible at all times on the appliance until the installation is complete.

Comments: Further description of the issues, who is responsible (Installer/Builder/Other Trades, etc.) and corrective action needed ______

Comments communicated to party respon	nsible by	on
	(Builder / Gen Contractor) (Installer)	(Date)
		04/4

A. Appliance Certification

MODEL:	P42i-TC Pellet Insert
LABORATORY:	PFS•TECO
REPORT NO.	22-823
TYPE:	Pellet Fueled Insert/Supplementary For Residential Use
STANDARD(s):	ASTM E 2779-10, ASTM E 2515-11, ASTM E 1509-12, ULC-S628-93

NOTE: This installation must conform with local codes. In the absence of local codes you must comply with the ASTM E1509-12, ULC-S628-93 & **(UM) 84-HUD**

The P42i-TC Pellet Insert is certified to comply with 2020 EPA particulate emission standards.



Note: This installation must conform to local codes. In the absence of local codes you must comply with the ASTM E 1509-2012, ULC S628-93, (UM) 84-HUD

B. Glass Specifications

This appliance is equipped with 5mm ceramic glass. Replace glass only with 5mm ceramic glass. Please contact your dealer for replacement glass.

C. Mobile Home Approved

This appliance is approved for mobile home installations when not installed in a sleeping room and when an outside combustion air inlet is provided.

The structural integrity of the mobile home floor, ceiling, and walls must be maintained. The appliance must be properly grounded to the frame of the mobile home using a minimum of 8 AWG copper solid or stranded, insulated or bare wire or equivalent and use only listed pellet vent, Class "PL" connector pipe.

A Harman[®] Outside Air Kit must be installed in a mobile home installation.



CEILING/ROOF MUST BE MAINTAINED.

D. BTU & Efficiency Specifications

EPA Certification Number:	*****
EPA Certified Emissions:	1.0 g/hr
*LHV Tested Efficiency:	84%
**HHV Tested Efficiency:	79%
***EPA BTU Output:	5,637 - 32,782
****BTU Input	7,400 – 41,800
Vent Size:	4 Inch
Hopper Capacity:	64.5 lbs
Fuel	Wood Pellet

* Weighted average LHV efficiency using data collected during EPA emissions test.

**Weighted average HHV efficiency using data collected during EPA emissions test.

***A range of BTU outputs based on EPA Default Efficiency and the burn rates from the low and high EPA tests.

****Based on the maximum feed rate per hour multiplied by approximately 8600 BTU's which is the average BTU's from a pound of pellets.

This wood heater has a manufacturer-set minimum low burn rate that must not be altered. It is against federal regulations to alter this setting or otherwise operate this wood heater in a manner inconsistent with operating instructions in this manual.

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

Note: Some generator or battery back-up systems may not be compatible with the micro-processor electronics on this appliance. Please consult the power supply manufacturer for compatible systems.

Note: Hearth & Home Technologies, manufacturer of this appliance, reserves the right to alter its products, their specifications and/or price without notice.

 ${\sf Harman}^{\scriptscriptstyle \otimes}$ is a registered trademark of Hearth & Home Technologies.

E. Non-Combustible Materials Specification

Material which will not ignite and burn. Such materials are those consisting entirely of steel, iron, brick, tile, concrete, slate, glass or plasters, or any combination thereof.

Materials that are reported as passing ASTM E 136, Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750° C and UL763 shall be considered non-combustible materials.

F. Combustible Materials Specification

Materials made of or surfaced with wood, compressed paper, plant fibers, plastics, or other material that can ignite and burn, whether flame proofed or not, or plastered or unplastered shall be considered combustible materials.

G. Electrical Codes

120 VAC, 60 Hz, Start 5.0 Amps, Run 4.0 Amps

Note: Some generator or battery back-up systems may not be compatible with the micro-processor electronics on this appliance. Please consult the power supply manufacturer for compatible systems.

WARNING! Risk of Fire! Hearth & Home Technologies disclaims any responsibility for, and the warranty and agency listing will be voided by the below actions.

DO NOT:

- Install or operate damaged appliance
- Modify appliance
- Install other than as instructed by Hearth & Home Technologies
- Operate the appliance without fully assembling all components
- Overfire
- Install any component not approved by Hearth & Home Technologies
- Install parts or components not Listed or approved.
- Disable safety switches

Improper installation, adjustment, alteration, service or maintenance can cause injury or property damage.

For assistance or additional information, consult a qualified installer, service agency or your dealer.

H. California Safety Information



can expose you to chemicals including lead and carbon black, which is known to the State of California to cause cancer, and carbon monoxide, which is know to the State of California to cause birth defects or other reproductive harm. For more information go to: www.P65Warnings.ca.gov **NOTE:** Hearth & Home Technologies, manufacturer of this appliance, reserves the right to alter its products, their specifications and/or price without notice.

 ${\sf Harman}^{\scriptscriptstyle \otimes}$ is a registered trademark of Hearth & Home Technologies.

A. Design and Installation Considerations

1. Appliance Location

NOTICE: Check building codes prior to installation.

- Installation MUST comply with local, regional, state and national codes and regulations.
- Consult insurance carrier, local building inspector, fire officials or authorities having jurisdiction over restrictions, installation inspection and permits.

It is a good idea to plan your installation on paper, using exact measurements for clearances and floor protection, before actually beginning the installation

Consideration must be given to:

- Safety, convenience, traffic flow
- Placement of the chimney and chimney connector.
- If you are not using an existing chimney, place the appliance where there will be a clear passage for a factory-built listed chimney through the ceiling and roof.
- Installing an optional outside air kit would affect the location of the vent termination.

Suitable fireplaces for installation:

- Masonry Fireplace
- Existing Factory Built Wood Burning Fireplace
- Harman® Zero Clearance Cabinet Part #1-00-574323

EXCEPTION: Masonry or steel, including the damper plate, may be removed from the smoke shelf and adjacent damper frame if necessary to accommodate a chimney liner,

provided that their removal will not weaken the structure of the fireplace and chimney, and will not reduce protection for combustible materials to less than that required by the National Building Code.

Since pellet exhaust can contain ash, soot or sparks, you must consider the location of:

- Windows
- Air Intakes
- Air Conditioner
- · Overhangs, soffits, porch roofs, adjacent walls
- · Landscaping, vegetation

When locating vent and venting termination, vent above roof line when possible.

Warning! Risk of Fire Damaged parts could impair safe operation. Do NOT install damaged, incomplete or substitute components.

NOTICE: Locating the appliance in a location of considerable air movement can cause intermittent smoke spillage from appliance. Do not locate appliance near:

- Frequently open doors
- Central heat outlets or returns



Installation and service of this appliance should be performed by qualified personnel. Hearth & Home Technologies recommends HHT Factory Trained or NFI Certified professionals.



B. Tools And Supplies Needed

Tools and building supplies normally required for installation, unless installing into an existing masonry fireplace:

Reciprocating SawGlovesHammerSafety GlassesPhillips Screw driverElectric Drill & BitsTape MeasureElectric Drill & BitsLevelMay also need:Non-Combustible SealantVent Support StrapsMaterialVenting Paint

C. Inspect Appliance and Components

- Carefully remove the appliance and components from the packaging.
- The vent system components and decorative doors and fronts may be shipped in separate packages.
- If optional log set is purchased, the log bracket must be installed prior to installing the log set.
- Report to your dealer any parts damaged in shipment, particularly the condition of the glass.
- Read all of the instructions before starting the installation. Follow these instructions carefully during the installation to ensure maximum safety and benefit.



RISK OF FIRE OR EXPLOSION! Damaged parts could impair safe operation. DO NOT install damaged, incomplete or substitute components. Keep appliance dry. Hearth & Home Technologies disclaims any responsibility for, and the warranty will be voided by, the following actions:

- Installation and use of any damaged appliance or vent system component.
- · Modification of the appliance or vent system.
- Installation other than as instructed by Hearth & Home Technologies.
- Installation and/or use of any component part not approved by Hearth & Home Technologies.

Any such action may cause a fire hazard.



Risk of Fire, Explosion or Electric Shock! DO NOT use this appliance if any part has been under water. Call a qualified service technician to inspect the appliance and to replace any part of the control system that has been under water.

8742-901A

3 Clearances

A. Appliance Dimension Diagram

Dimensions are actual appliance dimensions. Use for reference only.





B. Clearances to Combustibles & Floor Protection

When selecting a location for the appliance it is important to consider the required clearances to walls (see Figure 3.2).

WARNING! Risk of Fire or Burns! Provide adequate clearance around air openings and for service access. Due to high temperatures, the appliance should be located out of traffic and away from furniture and draperies.

NOTICE: Illustrations reflect typical installations and are FOR DESIGN PURPOSES ONLY. Illustrations/diagrams are not drawn to scale. Actual installation may vary due to individual design preference.

* Floor protection must be used from hearth opening to 6" (152mm) in front of door glass and 6" (152mm) to each side of the door opening OR 8" (203mm) to sides to protect combustibles from hot ashes. A minimum size will be 17" deep by 30" wide and be made of a non-combustible material or meet UL approval.



Figure 3.2

C. Minimum Opening - Masonry and Manufactured Fireplaces



Location		Inches	Millimeters
F	Minimum Width	24-7/8	632
G	Minimum Depth	15-9/16	395
Н	Minimum Height (24" Hopper)	24	610
Н	Minimum Height (20" Hopper)	20	508

A. Vent Termination Requirements

Chimney connector shall not pass through an attic or roof space, closet or similar concealed space, or a floor or ceiling.



WARNING: Venting terminals must not be recessed into a wall or siding.

NOTE: Only PL or L vent pipe wall pass-throughs and fire stops should be used when venting through combustible materials.

NOTE: Always take into consideration the affect the prevailing wind direction or other wind currents will cause with flyash and /or smoke when placing the termination.

In addition, the following must be observed:

- A. The clearance above grade must be a minimum of 12".
- B. The clearance to a window or door that may be opened must be a minimum of 48" to the side and 48" below the window/door, and 12" above the window/door. (with outside air installed, 9" to side and below)
- C. A 12" clearance to a permanently closed window is recommended to prevent condensation on the window.
- D. The vertical clearance to a ventilated soffit located above the terminal within a horizontal distance of 2 feet (607mm) from the center-line of the terminal must be a minimum of 18".
- E. The clearance to an unventilated soffit must be a minimum of 12".
- F. The clearance to an outside corner is 11" from center of pipe.
- G. The clearance to an inside corner is 12".
- H. A vent must not be installed within 3 feet (914mm) above a gas meter/regulator assembly when measured from the horizontal center-line of the regulator.

- I. The clearance to service regulator vent outlet must be a minimum of 6 feet.
- J. The clearance to a non-mechanical air supply inlet to the building or the combustion air inlet to any other appliance must be a minimum of 48".
- K. The clearance to a mechanical air supply inlet must be a minimum of 10 feet. (with outside air installed, 6 feet)
- L. The clearance above a paved sidewalk or a paved driveway located on public property must be a minimum of 7 feet.
- M. The clearance under a veranda, porch, deck or balcony must be a minimum of 12". **(B. also)**

NOTE: The clearance to vegetation and other exterior combustibles such as mulch is 36" as measured from the center of the outlet or cap. This 36" radius continues to grade or a minimum of 7 feet below the outlet.

Certain Canadian and or Local codes or regulations may require different clearances.

A vent shall not terminate directly above a side-walk or paved driveway which is located between two single family dwellings and serves both dwellings.

Only permitted if veranda, porch, deck, or balcony is fully open on a minimum of 2 sides beneath the floor.

See NFPA 211 for more installation clearance reductions when using outside air.

NOTE: In Canada, where passage through a wall or partition of combustible construction is desired, the installation shall conform to CAN/CSA-B365.

B. Venting Termination Design



The chimney top must be capped to prevent rain and/or snow from entering the chimney.

See Figure 4.8, for information on the optional Harman® Adjustable Stainless Steel Intake Extension.

The damper area must be sealed with a non-combustible material and it is recommended that Kaowool, mineral wool, or an equivalent non-combustible insulation be placed on top of the sealed area to reduce the possibility of condensation. Insulation alone should not be used to seal the damper opening. For quick and easy installation, purchase the steel Harman Block Off Plate, 1-00-25625.

Height of existing hearth

Figure 4.1



The chimney top must be capped to prevent rain and/or snow from entering the chimney.

The damper area must be sealed with a non-combustible material and it is recommended that Kaowool, mineral wool, or an equivalent non-combustible insulation be placed on top of the sealed area to reduce the possibility of condensation. Insulation alone should not be used to seal the damper opening. For quick and easy installation, purchase the steel Harman Block Off Plate, 1-00-25625.



#1 Installing into an existing fireplace chimney

This method provides excellent venting with 100% outside air which is the most efficient operation of this unit. This method also provides natural draft in the event of a power failure.

A 4" stainless steel flex pipe is needed for the flue pipe, and 3" aluminum or Stainless Steel Flex Pipe is used for the intake.



CHIMNEY CONNECTOR PIPE MAY NOT PASS THROUGH CONCEALED SPACES INCLUDING AN ATTIC, ROOF SPACE, CLOSET, FLOOR OR CEILING.



DO NOT REMOVE BRICKS OR MORTAR FROM THE EXISTING FIREPLACE.

#2 Installing into an existing fireplace chimney

This method provides excellent venting for normal operation. This method also provides natural draft in the event of a power failure.

A cap should be installed on the chimney to keep out rain.

Combustion air is provided from the living area and enters the feed system from around the wing and stove body spaces.

WARNING

DO NOT REMOVE BRICKS OR MORTAR FROM THE EXISTING FIREPLACE.



Figure 4.3



#3 Installing into an existing chimney

This method provides excellent venting for normal operation. This method also provides natural draft in the event of a power failure. If the chimney condition is questionable you may want to install a liner as in method #2.

This is the minimum allowed vent pipe using 4" stainless steel flex pipe.

The vent pipe must extend past the damper sealing area by at least 12 inches.

Note: The insulation material must not be allowed to expand to the point that it covers the end of the flex pipe.

The chimney should be capped with any style cap that will not allow rain or snow to enter.

In some places in the US and Canada, it is required that the vent pipe extend all the way to the top of the chimney. Check your local codes.



CHIMNEY CONNECTOR PIPE MAY NOT PASS THROUGH CONCEALED SPACES INCLUDING AN ATTIC, ROOF SPACE, CLOSET, FLOOR OR CEILING.



DO NOT REMOVE BRICKS OR MORTAR FROM THE EXISTING FIREPLACES.

#4 Preferred method

This method provides excellent venting for normal operation and in a fireplace with inadequate flue space, or a height of over 30 feet. 4" PL vent pipe should be used with the needed swivel flue stub.

Note: With a 100% outside air kit the outside air can be installed in the same manner as the flue pipe.



KEEP COMBUSTIBLES (SUCH AS GRASS, LEAVES, ETC.) AT LEAST 3 FEET AWAY FROM THE FLUE OUTLET ON THE OUTSIDE OF THE BUILDING.

Figure 4.4

IN CANADA: This fireplace insert must be installed with a continuous chimney liner of a minimum 4" diameter extending from the insert to the top of the chimney. The chimney liner must conform to the Class 3 requirements of CAN/ULC-S635, Standard for Lining Systems for Existing Masonry or Factory Built Chimneys and Vents, or CAN/ULC-S640, Standard for Lining Systems for New Masonry Chimneys.



Installing the P42i Pellet Insert into an existing factory built wood burning fireplace

When installing the P42i-TC Pellet Insert into a factory built wood burning fireplace, the Manufactured Fireplace Installation Kit #1-00-574205 must be used. In addition, several things need to be taken into consideration.

The size of the fireplace opening. Will the unit fit into the opening? Many of these units have metal smoke shields inside the top that can be removed to gain height. Often the side and rear refractory can be removed to gain depth and width. In some circumstances, the front lower lip or grill work may also be removed. Be sure and follow the guidelines in the kit instructions. Floor protection guidelines, as listed on Figure 3.2 must also be followed.

The factory built chimney must be listed per UL 127 (US) and meet type HT requirements of UL 103 (US). Factory Built fireplace chimneys tested to UL 127-98 may be, at the fireplace manufacturers option, tested to the same criteria as UL 103HT requirements. If the chimney is not listed as meeting HT requirements, or if the factory built fireplace was tested prior to 1998, a full height listed chimney liner must be installed from the appliance flue collar to the chimney top. Liner must meet high temperature (2100° F) per UL1777 (US). The liner must be securely attached to both the flue collar and the chimney cap. To prevent room air passage to the chimney cavity of the fireplace, seal the damper area around the chimney liner with fiberglass batting.

Note: If the Harman® P42i Pellet Insert is installed into a factory built wood burning fireplace, this label (Harman® part #3-90-674204) <u>MUST</u> be attached to the altered fireplace. This label is included in the Manufactured fireplace installation kit.

THIS FIREPLACE HAS BEEN ALTERED TO ACCOMMODATE A FIREPLACE INSERT AND SHOULD BE INSPECTED BY A QUALIFIED PERSON PRIOR TO REUSE AS A CONVENTIONAL FIREPLACE

Additionally, the firebox floor of the Zero Clearance Wood Fireplace may be removed down to the outer metal shell of the fireplace if kit 1-00-574305 is used. The kit includes installation instructions and all materials needed to remove the firebox floor and still maintain a safe, compliant installation. Be certain to contact local code enforcement officials before beginning any modifications, as they may not be reversible in many cases.

OPTIONAL HOPPER CONFIGURATIONS FOR SMALLER FIREPLACE OPENINGS:

The Harman® P42i-TC Pellet Insert can be factory built with shorter hopper configurations.

The standard requires a 24" opening. Part #1-90-584240

Option 1: Requires a 20" opening height. Part #1-90-584200

Keep in mind the hopper capacities will decrease with the optional heights.



Installing the P42i-TC Pellet Insert into a Harman Zero Clearance Cabinet

If you don't have a factory built fireplace or masonry fireplace, the P42i-TC Pellet Insert can also be installed into the Harman Zero Clearance Cabinet, Part # 1-00-574323. This is the **only permissible** way to install the P42i-TC Pellet Insert without a suitable fireplace. After the Harman Zero Clearance Cabinet is installed, type PL vent pipe, wall pass-throughs and terminations are used (**Note:** Flex pipe is not approved these types of installation). Detailed installation instructions are included with the Zero Clearance Cabinet. These same installation instructions can also be found on-line at www.harmanstoves.com.

Below are two sample installations using the Harman Zero Clearance Cabinet.



Harman Zero Clearance Cabinet

Requirements for Terminating the Venting through an Exterior Wall.

The clearance to a window or door that may be opened must be a minimum of 48" to the side and 48" below the window/ door, and 12" above the window/door. (with outside air installed, 12" to the side or below)





PL Vent Pipe installed through a ceiling.

PL Vent Pipe installed through an exterior wall

C. Venting & Use of Elbows



Figure 4.6

A combustion blower is used to extract the combustion gases from the firebox. This causes a negative pressure in the firebox and a positive pressure in the venting system as shown in Figure 4.6. The longer the vent pipe and more elbows used in the system, the greater the flow resistance. **The recommended maximum flue lengths for the P42i-TC Pellet Insert are as follows:**

4" Flex Pipe:

Maximum 30 Ft. Vertical

Long runs of flex or PL vent pipe installed directly vertical from the flue stub may require more frequent cleaning due to fly ash falling off inside and collecting directly above the combustion blower outlet.

Any use of horizontal venting will require more frequent cleaning. It is the responsibility of the installer to make sure the entire flue configuration is accessible for cleaning.

4" stainless steel flex vent piping is only allowed for use in masonry fireplaces and chimneys or factory built wood burning fireplaces with class A metal chimneys. All pellet vent pipe must be secured together either by means provided by pipe manufacturer or by 3 screws at each joint.

Note: The unit ships with a 4" starter collar for using with flex pipe. If the unit will be installed with Type PL pellet pipe, 1-00-574100 Stub kit will need to be used.

Use only the specified venting components. Use of any other components will void the product warranty and may pose a hazard.

DO NOT INSTALL A FLUE DAMPER IN THE EXHAUST VENTING SYSTEM OF THIS APPLIANCE.

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

INSTALL VENT AT CLEARANCES SPECIFIED BY THE VENT MANUFACTURER.

D. Battery Back-up Power

Minimizing Smoke During Loss of Power Using Battery Back-up

Harman® strongly recommends installing battery backup to minimize entry of smoke into the room in the event of power loss.

Your pellet/biomass burning appliance relies on a combustion blower to remove exhaust. A power failure will cause the combustion blower to stop. This may lead to exhaust seeping into the room. Vertical rise in the venting may provide natural draft. It is, however, no guarantee against leakage.

There are two Harman® approved battery back-up options for your appliance:

<u>Uninterruptible Power Supply (UPS)</u> battery back-ups are available online or at computer and office equipment stores. Your Harman® appliance with Rev E or later software available beginning in November 2010 may be plugged directly into a Harman® approved UPS:

 The APC (American Power Conversion) model #BE750G and the TrippLite model INTERNET750U are tested and approved. Other brands or models may not be compatible.

When power is lost, a fully charged UPS will power a safe, combustion blower only shut-down. Your appliance will pulse the blower every few seconds to clear exhaust until the fire is out.

Note: The UPS provides safe shut-down only. It is not intended for continued operation.

Your appliance will recognize when power is restored. What happens depends on ESP temperature and whether it is equipped with automatic ignition:

- In "Automatic" setting, units equipped with automatic ignition will respond to the set point and ESP temperature and resume normal operation.
- In "Manual" setting or for units without automatic ignition:
- If the ESP is cool, the appliance will remain shut down.
- If the fire is out and the ESP is still warm, the feeder may restart. Since the fire is out, the ESP temperature will not rise. The unit will then shut-down, and may flash a sixblink status error. (See ESP error codes)
- If the fire is still burning, it will resume normal operation.

Contact your dealer if you have questions about UPS compatibility with your appliance.

CAUTION

Always keep appliance doors and hopper lid closed and latched during operation and during power failures to minimize risk of smoke or burn-back.



Use only Harman® approved battery back-up devices. Other products may not operate properly, can create unsafe conditions or damage your appliance.

E. Outside Air

The outside air kit consists of a Intake Stub, Stub Gasket, Outside Air intake Weldment and hardware. Figure 4.7.

An adjustable chimney intake extension, part #1-00-674104 is available to be used on masonry chimneys only. Figure 4.8.

Additional information and diagrams can be found under the "Venting Termination Design" section of the manual.

To install outside air, use kit part #1-00-574350. Follow the installation instructions provided with the kit.





F. Locating Your Appliance & Chimney

Location of the appliance and chimney will affect performance.

- Install through the warm airspace enclosed by the building envelope. This helps to produce more draft, especially during lighting and die-down of the fire.
- Penetrate the highest part of the roof. This minimizes the effects of wind loading.
- Locate termination cap away from trees, adjacent structures, uneven roof lines and other obstructions.
- · Minimize the use of chimney offsets.
- Consider the appliance location relative to floor and ceiling and attic joists.



- DO NOT CONNECT THIS UNIT TO A CHIMNEY FLUE SERVICING ANOTHER APPLIANCE.
- DO NOT CONNECT TO ANY AIR DISTRIBUTION DUCT OR SYSTEM.

May allow flue gases to enter the house

G. Negative Pressure

WARNING! Risk of Asphyxiation! Negative pressure can cause spillage of combustion fumes and soot.

Negative pressure results from the imbalance of air available for the appliance to operate properly. It can be strongest in lower levels of the house.

Causes include:

- Exhaust fans (kitchen, bath, etc.)
- Range hoods
- Combustion air requirements for furnaces, water heaters and other combustion appliances
- · Clothes dryers
- · Location of return-air vents to furnace or air conditioning
- Imbalances of the HVAC air handling system
- Upper level air leaks such as:
 - Recessed lighting
 - Attic hatch
 - Duct leaks

To minimize the effects of negative air pressure:

- Install the outside air kit with the intake facing prevailing winds during the heating season
- Ensure adequate outdoor air for <u>all</u> combustion appliances and exhaust equipment
- Ensure furnace and air conditioning return vents are not located in the immediate vicinity of the appliance
- Avoid installing the appliance near doors, walkways or small isolated spaces
- Recessed lighting should be a "sealed can" design
- · Attic hatches weather stripped or sealed
- Attic mounted duct work and air handler joints and seams taped or sealed

NOTICE: Hearth & Home Technologies assumes no responsibility for the improper performance of the chimney system caused by:

- Inadequate draft due to environmental conditions
- Down drafts
- Tight sealing construction of the structure
- Mechanical exhausting devices

H. Avoiding Smoke and Odors

Avoiding Smoke and Odors

Negative Pressure, Shut-down, and Power Failure:

To reduce the probability of back-drafting or burn-back in the pellet burning appliance during power failure or shutdown conditions, the stove must be able to draft naturally without exhaust blower operation. Negative pressure in the house will resist this natural draft if not accounted for in the pellet appliance installation.

Heat rises in the house and leaks out at upper levels. This air must be replaced with cold air from outdoors, which flows into lower levels of the house. Vents and chimneys into basements and lower levels of the house can become the conduit for air supply, and reverse under these conditions.

Outside Air:

Hearth & Home Technologies recommend attaching outside air in all installations, especially lower level and main floor locations.

Per national building codes, consideration must be given to combustion air supply to all combustion appliances. Failure to supply adequate combustion air for all appliance demands, may lead to back-drafting of those and other appliances.

When the appliance is side-wall vented: The air intake is best located on the same exterior wall as the exhaust vent outlet and located lower on the wall than the exhaust vent outlet.

When the appliance is roof vented: The air intake is best located on the exterior wall oriented towards the prevailing wind direction during the heating season.

The outside air connection will supply the demands of the pellet appliance, but consideration must be given to the total house demand. House demand may consume some air needed for the stove, especially during a power failure. It may be necessary to add additional ventilation to the space in which the pellet appliance is located. Consult with your local HVAC professional to determine the ventilation demands for your house.

Vent Configurations:

To reduce probability of reverse drafting during shutdown conditions, Hearth & Home Technologies strongly recommends:

- Installing the pellet vent with a minimum vertical run of five feet, preferably terminating above the roof line.
- Installing the outside air intake at least four feet below the vent termination.

To prevent soot damage to exterior walls of the house and to prevent re-entry of soot or ash into the house:

- Maintain specified clearances to windows, doors, and air inlets, including air conditioners.
- Vents should not be placed below ventilated soffits. Run the vent above the roof.
- · Avoid venting into alcove locations.
- Vents should not terminate under overhangs, decks or onto covered porches.
- Maintain minimum clearance of 12 inches from the vent termination to the exterior wall. If you see deposits developing on the wall, you may need to extend this distance to accommodate your installation conditions.

Hearth & Home Technologies assumes no responsibility for, nor does the warranty extend to, smoke damage caused by reverse drafting of pellet appliances under shut-down or power failure conditions.

WARNING! DO NOT CONNECT THIS UNIT TO ANY AIR DISTRIBUTION DUCT OR SYSTEM.

If a rear exit flue configuration is used, with or without outside air, make sure the flue pipe termination clearances are followed as per NFPA 211.

Vent Pipe

Be sure to use approved pellet vent pipe wall and ceiling pass-through fittings to go through combustible walls and ceilings. Be sure to use a starting collar to attach the venting system to the stove. Follow vent manufacturers instructions for proper sealing.

4" stainless steel flex vent piping is only allowed for use in masonry fireplaces and chimneys or factory built woodburning fireplaces with class A metal chimneys.

Pellet venting pipe (also known as Type PL vent) is constructed of two layers with air space between the layers. This air space acts as an insulator and reduces the outside surface temperature to allow a clearance to combustibles of only 1 inch. The sections of pipe lock together to form an air tight seal. Follow vent manufacturers instructions for proper sealing.

Where passing through an exterior wall or roof, be sure to use the appropriate pass-through device providing an adequate vapor barrier. Venting manufacturers generally provide these pass-through devices.

Venting Termination Requirements

- Termination must exhaust above air inlet elevation. It is recommended that at least 60 inches (1524mm) of vertical pipe be installed when appliance is vented directly through a wall. This will create a natural draft, which will help prevent the possibility of smoke or odor venting into the home during a power outage. It will also keep exhaust from causing a nuisance or hazard by exposing people or shrubs to high temperatures. The safest and preferred venting method is to extend the vent vertically through the roof.
- 2. Distance from doors and operable windows, gravity or ventilation air inlets into building:
 - a. Not less than 48 inches (1219mm) below;
 - b. Not less than 48 inches (1219mm) horizontally from;
 - c. Not less than 12 inches (305mm) above.
- 3. Distance from permanently closed windows:
 - a. Not less than 12 inches (305mm) below, horizontally from or above.
- 4. Distance between bottom of termination and grade should be 12 inches (305mm) minimum. This is conditional upon plants in the area, and nature of grade surface. The grade surface must be a non-combustible material (i.e., rock, dirt). The grade surface must not be lawn. Distance between bottom of termination and public walkway should be 84 inches (2134mm) minimum.
- 5. Distance to combustible materials must be 24 inches (610mm) minimum. This includes adjacent buildings, fences, protruding parts of the structure, roof overhang, plants and shrubs, etc.
- 6. Termination Cap Location (Home Electrical Service)
- Side-to-side clearance is to be the same as minimum clearance to vinyl inside corners.
- Clearance of a termination cap below electrical service shall be the same as minimum clearance to vinyl soffits.
- Clearance of a termination cap above electrical service will be 12 inches (305mm) minimum.
- Location of the vent termination must not obstruct or interfere with access to the electrical service.

<u>For Canada Only:</u> This Fireplace Insert must be installed with a continuous chimney liner of 4" diameter extending from the fireplace insert to the top of the chimney. The chimney liner must conform to the Class 3 requirements of CAN/ULC-S635, Standard for Lining Systems for Existing Masonry or Factory-Built Chimneys and Vents, or CAN/ULC-S640, Standard for Lining Systems for New Masonry Chimneys.

I. Mobile Home Installation

You must use a Harman® Outside Air Kit for installation in a mobile home.

- An outside air inlet must be provided for the combustion air and must remain clear of leaves, debris, ice and/or snow. It must be unrestricted while the appliance is in use to prevent room air starvation which causes smoke spillage. Smoke spillage can also set off smoke alarms.
- 2. The combustion air duct system must be made of metal. It must permit zero clearance to combustible construction and prevent material from dropping into the inlet or into the area beneath the dwelling and contain a rodent screen.
- 3. The appliance must be secured to the mobile home structure by bolting it to the floor (using lag bolts). Use the same holes that secured the appliance to the shipping pallet.
- 4. The appliance must be grounded with #8 solid copper grounding wire or equivalent, terminated at each end with an NEC approved grounding device.
- 5. Refer to "Clearances to Combustibles and Floor Protection" section of this manual for listings to combustibles.
- 6. Use silicone to create an effective vapor barrier at the location where the chimney or other component penetrates to the exterior of the structure.
- 7. Follow the chimney manufacturer's instructions when installing the vent system for use in a mobile home.
- 8. Installation shall be in accordance with the Manufacturers Home & Safety Standard (HUD) CFR 3280, Part 24.



Installation must comply with Manufactured Home and Safety Standard (HUD), CFR 3280, Part 24

CAUTION

THE STRUCTURAL INTEGRITY OF THE MOBILE HOME FLOOR, WALL AND CEILING/ROOF MUST BE MAINTAINED.

Do NOT cut through:

- Floor joist, wall, studs ceiling trusses.
- Any supporting material that would affect the structural integrity.

CAUTION

Never draw outside combustion air from:

- Wall, floor or ceiling cavity.
- Enclosed space such as an attic or garage.



J. Fire Safety

To provide reasonable fire safety, the following should be given serious consideration:

- Install at least one smoke detector on each floor of your home.
- Locate smoke detector away from the heating appliance and close to the sleeping areas.
- Follow the smoke detector manufacturer's placement and installation instructions and maintain regularly.
- Conveniently locate a Class A fire extinguisher to contend with small fires.
- In the event of a hopper fire:
 - Evacuate the house immediately.
 - · Notify fire department.



Hearth & Home Technologies disclaims any responsibility for, and the warranty will be voided by, the following actions:

- Installation and use of any damaged appliance.
- Modification of the appliance.

Fire Risk.

- Installation other than as instructed by Hearth & Home Technologies.
- Installation and/or use of any component part not approved by Hearth & Home Technologies.
- Operating appliance without fully assembling all components.
- Do NOT Overfire.

Or any such action that may cause a fire hazard.



THIS WOOD HEATER HAS A MANUFACTURER-SET MINIMUM LOW BURN RATE THAT MUST NOT BE ALTERED.ITISAGAINSTFEDERAL REGULATIONS TOALTERTHISSETTINGOROTHERWISEOPERATE THIS WOOD HEATER IN A MANNER INCONSISTENT WITHOPERATINGINSTRUCTIONS IN THIS MANUAL.

K. Inspect Appliance & Components

- Remove appliance and components from packaging and inspect for damage.
- Report to your dealer any parts damaged in shipment.
- Read all the instructions before starting the installation. Follow these instructions carefully during the installation to ensure maximum safety and benefit.

WARNING

Inspect appliance and components for damage. Damaged parts may impair safe operation.

- Do NOT install damaged components.
- Do NOT install incomplete components.
- Do NOT install substitute components.

Report damaged parts to dealer.

A. Reducing Weight for Installation







- 2. Remove the ash pan
- 3. Remove the (2) internal pieces of cast iron Figure 5.2. See Figure 5.3 for Center Medallion removal instructions.



Figure 5.2



The drawing above shows the major sub components of the P42i-TC. Take notice as to where the spring latches are located.

Removing the Center Medallion

- 1. Lift up on the 2 bottom corners of the medallion until it is higher than the top of the flame guide.
- 2. Pull the bottom edge of the medallion front approximately 1 inch.
- 3. Pull downward on the corners of the medallion until the top is released from the retainer that keeps the top aligned when in place. Figure 5.3.

Note: The heat exchanger covers will tilt to the front when the center medallion is removed.





B. Beginning the Installation

The use of the optional service rail kit (Part #1-00-574354) is highly recommended for installation.

Locate the 3/8" hex head shipping bolts (one per side) that secure the stove to the mounting frame and use a 3/8" socket or nut-driver to loosen and remove these screws; these screws will not be reused and can be discarded. Figure 5.4



Note: The Distribution blower extends through the mounting frame in the rear approximately 7/8". The overall depth of the mounting frame is 15", this includes the 7/8" overhang referenced in Figure 3.1.

Figure 5.4

Release the spring latches located behind the side panels on both sides of the insert and remove insert from frame.

Using (6) 10-24 nuts and studs, install the left and right surround panels to the mounting frame. Leave these bolts loose until the entire surround assembly has been adjusted for proper clearance. Figure 5.5



Figure 5.5

Next, locate the center top surround section and install four 10-24 Machine Nut & Studs into the holes shown below using a 3/8" wrench or nut driver. Figure 5.7.



Figure 5.7

Slide the center surround section onto the mounting frame and install a 10-24 nut onto each of the four studs. These nuts should remain loose until the entire surround has been installed and adjusted. Figure 5.8.



Figure 5.8

Align the top center surround section between the right and left panels and tighten the four 1/4" nuts to lock it in place. Now tighten the 3 bolts and nuts on the left and right side panels.

Unbolt the mounting frame from the shipping pallet using a 1/2" socket on the three lag screws; the lag screws and the pallet will not be reused and can be discarded.

Install the outside air pipe stub [if used], to the mounting frame. Figure 5.9.

The unit comes standard with a 4" pipe stub.

1. Part # 1-00-574100 is for use with 4" PL vent starter pipe and part# 1-00-574034 for 4"Stainless Steel flex pipe.

The flue stub assembly base is a round plate which allows it to swivel to allow the flue pipe to exit the mounting frame in other positions rather than straight up. Figure 5.10.





Figure 5.9

Inserting the Power Cord

The power cord can be inserted into the Line Filter located behind the side panel. Figure 5.11.





Figure 5.11

Note: If installing the optional wing extension it must be installed before completing the following steps.

With the surround attached, install the coupler nut weldments to the frame in the hole location that suits your needs with the (4) $1/4-20 \times 5/8$ flange screws and nuts and 1/2" jack bolts. Install the (4) 5/16"-18 leveling bolts into the threaded holes in the bottom pan of the mounting frame, install the mounting frame into the opening and adjust these bolts to insure the frame is level. (**Note:** Use of all 4 leveling bolts may not be necessary.) Tighten the 1/2" jack bolts against the lintel. See Figure 5.12.



Figure 5.12

Connect the venting system and outside air system [if used], to the pipe stub(s) on the mounting frame, following the procedures detailed in "Section 4: Termination Location and Venting". If outside combustion air will be used on the unit, be certain to install the Harman® Outside Air Adapter P/N 1-00-574350 onto the unit before installing it into the mounting frame.

Install the optional Service Rail Kit to the mounting frame. Place the unit on the service rail leaving enough room to gain access to the wiring. Figure 5.13.



Figure. 5.13

C. Electrical Connection Installation

Note: If the room sensor is connected as a return air sensor, the wire should be connected long enough to allow this, but not too long that it would get tangled or pinched anywhere.

Connecting the room sensor as a return air sensor

Insert the sensor end of the wire from the rear of the mounting frame through the hole as shown in Figure 5.14.

Room sensor Extension: The room sensor extension can be used to locate the room sensor in a location that best suits your installation needs.

Note: For optimal temperature accuracy and performance, use of the optional Wireless Remote Sensor is highly recommended.

Place the sensor end so that the sensing tip is laying near the ash lip rail. Figure 5.14.



Figure 5.14

Connecting the Room Sensor

Once the location has been decided, run the wiring to the control panel. You'll need to remove the two terminals from the end of the sensor cable and replace them with the two smaller terminals from the hardware bag. Plug the terminals into the control board, Figure 5.15. These connections are not polarity specific.

Note: If the room sensor is located too close to the appliance, or in a direct path of the distribution air, You may need to elevate the temperature setting to maintain a comfortable temperature level throughout the heated space.

If service is performed, the room sensor may need to be disconnected to gain enough room to allow access to the rear of the unit.



Figure 5.15

Slide the unit into the mounting frame making sure wires are clear of the frame and stove body. Snap the left and right spring latches to secure the stove and remove the service rail kit. Re-install the heat exchanger covers and medallion.

D. Reminders

Always disconnect the power cord before the unit is pulled from the mounting frame.

As you can see, the control board is easily accessible from the rear with the body pulled out of the frame, even if it is only pulled out several inches. Figure 16.

Always inspect the wiring harness and the 11 pin socket (large white flat plug where all of the power wires terminate.)

Always inspect the wiring harness where the wires transfer from the control to the rear inside of the body.

Make sure there are no worn or frayed areas.



Figure 5.16

Do not allow pellets or sawdust to build up on the hopper lip. Figure 5.17.

Inspect the hopper lid gasket for damage. A good hopper lid seal is very important for proper operation.



Figure 5.17

After the installation is completed, but before the first fire is lit, check and record the high and low draft readings.

- DO NOT CONNECT THIS UNIT TO A CHIMNEY FLUE SERVICING ANOTHER APPLIANCE.
- DO NOT CONNECT TO ANY AIR DISTRIBUTION DUCT OR SYSTEM.

May allow flue gases to enter the house

E. Firebox Draft and Combustion Fan RPM

These units are pre-tested at the factory with exactly 120 VAC, 60 Hz. They are checked and adjusted for firebox tightness, gasket leakage, motor operation and igniter operation. The P42i-TC is then factory set at a mid-point adjustment and in most cases will not need any adjustments.

Check and record the firebox draft before installing venting and after venting is installed *(before starting fire)*.

There is a silicone draft meter port located behind the left hand door at the power supply plug. Install the magnahelic meter *(capable of at least .5" of water column)* Figure 5.18.

Considerations for successful draft include:

- Negative pressure in the firebox
- · Location of appliance and chimney

To measure the draft or negative pressure on your appliance use a magnahelic or a digital pressure gauge capable of reading 0 - 1 inches of water column (W.C.).

The appliance should be running on high for at least 15 minutes for the test.

With the stove running on high you should have a negative pressure equal to or greater than the number given in the chart below. If you have a lower reading than you find on the chart, your appliance does not have adequate draft to burn the fuel properly.

Plug unit into a 120 VAC, 60 Hz outlet.

Go to the "Home Screen", the power icon should be gray. Press menu, on the first menu press "test".

The test screen has 4 component test modes. The second icon is for the combustion fan test.

One press of the icon turns the combustion fan to full line voltage. (Note: During this test , the combustion fan will not achieve its top RPM of 3200 due to the density of the ambient air.) All RPM displays could vary +/- 50 from that of the set RPM's. Allow several minutes for the fan motor to warm up.



Silicone Draft Meter Port

The Draft Test Port can be accessed from inside the left hand side door just below the power supply plug.

Figure 5.18

Press the icon a second time, the combustion fan will go to "Maximum" (as set in the <u>Authorized Dealer Only</u> area under the combustion fan icon)

The "Maximum" is factory set at 2900 RPM. Allow the RPM to stabilize and record the firebox draft Maximum.

Before Install:	IWC
After Install:	IWC

(Firebox Draft and Combustion Fan RPM Cont.)

Press the icon a third time, the combustion fan will go to "Minimum" (as set in the <u>Authorized Dealer Only</u> area under the combustion fan icon) allow the RPM to stabilize and record the firebox draft minimum.

Before Install:	IWC
After Install:	IWC

Cold Stove Draft:

2500 RPM	Low20 and25
2900 RPM	High45 and50

Leaving the test screen will end any tests in progress and goes back to whatever mode of operation it was set to on the home screen.

If the unit is not adjusted properly, it does not cause a safety concern. If the unit is adjusted too high, only efficiency is lost. If the unit is adjusted too low, the low draft pressure switch will not allow the feed motor or the igniter to operate.

F. Wireless Room Sensor

The Wireless Room Sensor was exclusively designed to communicate with the EASY Touch Controls on Harman pellet products. Simply place the wireless sensor up to 30 feet away, and enjoy the warmth of pellet heat exactly where you want it. The Wireless Room Sensor mounts on a wall wherever you want your heat measured.

The Wireless Room Sensor keeps your space within 1 degree of your set temperature. Simply sync to your EASY Touch Control (which takes about 20 seconds) and install with the provided screws.

Smart Features:

- After a power outage, the wireless room sensor resets the controls to the current time, allowing your heat schedule to resume automatically.
- Communicates to the EASY Touch Control every 17 seconds, keeping your set temperature as accurate as possible, all day, every day.
- Easily mount up to 30 feet away from the stove or insert on any interior wall (mounting hardware included).
- We provide two AA batteries with a life expectancy of more than a year.
- Track connection strength and battery levels on EASY Touch Control Diagnostic page 6 (Located on unit).
- Low Battery Warning messages will be seen on the home screen.
- If connection is lost due to a dead battery the stove continues operation by automatically switching to its back-up sensor when the batteries are dead, and will display a "replace batteries" message on the home screen of the EASY Touch Control).

The Wireless Room Sensor has light indicators to communicate the following:

- A green LED flashes when good communication is made to the display.
- An amber LED flashes when searching.
- A red LED flashes when searching in energy saving mode – this may occur when the appliance has been unplugged, or is experiencing an extended power loss.

A. Safety Reminders

When installing the Harman® P42i-TC Pellet Insert, respect basic safety standards. Read these instructions carefully before you attempt to install or operate the P42i-TC Pellet Insert. Failure to do so may result in damage to property or personal injury and may void the product warranty.

Consult with your local building code agency and insurance representative before you begin your installation to ensure compliance with local codes, including the need for permits and follow-up inspections.



This appliance must be vented to the outside.

Due to high temperatures, this stove should be placed out of traffic and away from furniture and draperies.

Children and adults should be alerted to the hazards of high surface temperatures and should stay away to avoid burn to skin and/or clothing.

Young children should be carefully supervised when they are in the same room as the stove.

Clothing and other flammable materials should not be placed on or near this stove.

Installation and repair of this stove should be done by a qualified service person. The appliance should be inspected before use and at least annually by a qualified service person. More frequent cleaning will be required. It is imperative that control compartments, burners, and circulating air passageways of this stove be kept clean.

WARNING

MOBILE/MANUFACTURED HOME GUIDELINES DO NOT ALLOW INSTALLATION IN A SLEEPING ROOM.

CAUTION

THE STRUCTURAL INTEGRITY OF THE MOBILE HOME FLOOR, WALL, AND CEILING/ROOF MUST BE MAINTAINED.



THE STOVE IS HOT WHILE IN OPERATION.

KEEPCHILDREN, CLOTHINGAND FURNITUREAWAY. CONTACT MAY CAUSE SKIN BURNS.



KEEP COMBUSTIBLE MATERIALS SUCHAS GRASS, LEAVES, ETC. AT LEAST 3 FEET AWAY FROM THE POINT DIRECTLY UNDER THE VENT TERMINATION.



USE OF IMPROPER FUELS, FIRE STARTERS OR ALTERING THE STOVE FOR HIGHER HEAT OUTPUT MAY CAUSE DAMAGE TO THE STOVE AND COULD RESULT IN A HOUSE FIRE. USE ONLY APPROVED FUELS AND OPERATION GUIDELINES



DO NOT USE MAKESHIFT COMPONENTS OR OTHER COMPROMISES WHEN INSTALLING THIS APPLIANCE.



B. Wiring Diagram



352 Mountain House Road, Halifax, PA 17032 www.harmanstoves.com

Please contact your Harman[®] dealer with any questions or concerns. For the location of your nearest Harman[®] dealer, please visit www.harmanstoves.com.

Printed in U.S.A

Owner's Manual Care and Operation

INSTALLER: Leave this manual with party responsible for use and operation.

OWNER: Retain this manual for future reference.

Contact your local dealer with questions on installation, operation or service.



Check building codes prior to installation.

- Installation MUST comply with local, regional, state and national codes and regulations.
- Contact local building or fire officials about restrictions and installation inspection requirements in your area.



Tested and approved for wood pellets only. Burning of any other type of fuel voids your warranty. When burning higher ash content pellets more frequent cleanings may be required.

WARNING



Please read this entire manual before installation and use of this pellet fuelburning room heater.

Failure to follow these instructions could result in property damage, bodily injury or even death.

- Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance.
- Do not overfire If any external part starts to glow, you are overfiring. Reduce feed rate. Overfiring will void your warranty.
- Comply with all minimum clearances to combustibles as specified. Failure to comply may cause house fire.



HOT SURFACES!



Glass and other surfaces are hot during operation and cool down.

Hot glass will cause burns.

- · Do not touch glass until it is cooled
- NEVER allow children to touch glass
- · Keep children away
- CAREFULLY SUPERVISE children in same room as stove.
- Alert children and adults to hazards of high temperatures.
- High temperatures may ignite clothing or other flammable materials.
- Keep clothing, furniture, draperies and other flammable materials away.

NOTE

To obtain a French translation of this manual, please contact your dealer or visit www.harmanstoves.com Pour obtenir une traduction française de ce manuel, s'il vous plaît contacter votre revendeur ou visitez www. harmanstoves.com

Read this manual before operating this appliance. Please retain this Owner's Manual for future reference. Read the Installation Manual before making any installation or finishing changes.

Congratulations, The Harman[®] P42i-TC pellet insert you have selected is designed to provide the utmost in safety, reliability, and efficiency.

As the owner of a new pellet stove, you'll want to read and carefully follow all of the instructions contained in this owner's manual. Pay special attention to all cautions and warnings.

This owner's manual should be retained for future reference. We suggest that you keep it with your other important documents and product manuals. Your new Harman[®] P42i-TC Pellet Insert will give you years of durable use and trouble-free enjoyment. Welcome to the Harman[®] family!

Note: Cast iron is an artisan crafted material, which is made the same way today as nearly 2000 years ago. Due to the intrinsic primitive nature of the casting process, part to part variation is normal and adds to the character of a hand built cast iron appliance

Listing Label Information/Location

The model information regarding your specific stove can be found on the rating plate usually located in the control area of the stove.



Safety Alert Key:

- DANGER! Indicates a hazardous situation which, if not avoided, will result in death or serious injury.
- WARNING! Indicates a hazardous situation which, if not avoided, could result in death or serious injury.
- CAUTION! Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.
- NOTICE: Used to address practices not related to personal injury.

Table of Contents

1 Product Specifications and Important Safety Information

Appliance Certification / Specifications	4
Mobile Home Approval	4
BTU & Efficiency Specifications	4
Appliance Safety	5
California Safety Information	5
Clear Space	5
Helpful Hints	6
Fuel Specifications	6
EPA Test Settings	7
Quick Start Guide	8
Frequently Asked Questions	9
Cleaning Prompts, Messages and Errors 1	0
	Appliance Certification / Specifications Mobile Home Approval BTU & Efficiency Specifications Appliance Safety California Safety Information Clear Space Helpful Hints Fuel Specifications EPA Test Settings Quick Start Guide Frequently Asked Questions Cleaning Prompts, Messages and Errors

2 Maintenance and Service

Α.	Proper Shutdown Procedure	11
Β.	Quick Reference Maintenance Chart	12
C.	Unit Maintenance	13
	Daily/Weekly Maintenance	13
	Monthly Maintenance	13
	Yearly Maintenance	15

3 Reference Materials

Α.	Service Parts List	18
Β.	Limited Lifetime Warranty	24
C.	Loss of Power Addendum	26
D.	Emergency Manual Ignition	26
Ε.	Troubleshooting	27
F.	Contact Information	28

→ = Contains updated information
A. Appliance Certification

MODEL:	P42i-TC Pellet Insert
LABORATORY:	PFS•TECO
REPORT NO.	22-823
TYPE:	Pellet Fueled Insert/Supplementary For Residential Use
STANDARD(s):	ASTM E 2779-10, ASTM E 2515-11, ASTM E 1509-12, ULC-S628-93
ELECTRICAL RATING:	120 VAC, 60 Hz, Start 4.2 Amps, Run 2.8 Amps
GLASS SPECIFICATION:	5mm mirrored ceramic glass

The P42i-TC Pellet Insert is certified to comply with 2020 EPA particulate emission standards.



NOTE: This installation must conform to local codes. In the absence of local codes you must comply with the ASTM E 1509-12, ULC-S628-93 & (UM) 84-HUD

B. Mobile Home Approved

This appliance is approved for mobile home installations when not installed in a sleeping room and when an outside combustion air inlet is provided.

The structural integrity of the mobile home floor, ceiling, and walls must be maintained. The appliance must be properly grounded to the frame of the mobile home and use only listed pellet vent, Class "PL" connector pipe.

A Harman[®] Outside Air Kit must be installed in a mobile home installation.



THE STRUCTURAL INTEGRITY OF THE MANUFACTUREDHOMEFLOOR, WALL, AND CEILING/ ROOF MUST BE MAINTAINED.

DO NOT INSTALL IN SLEEPING ROOM.



Risk of Fire! Hearth & Home Technologies disclaims any responsibility for, and the warranty and agency listing will be voided by the below actions.

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

C. BTU & Efficiency Specifications

EPA Certification Number:	****
EPA Certified Emissions:	1.0 g/hr
*LHV Tested Efficiency:	84%
**HHV Tested Efficiency:	79%
***EPA BTU Output:	5,637 - 32,782
****BTU Input	7,400 – 41,800
Vent Size:	4 Inch
Hopper Capacity:	64.5 lbs
Fuel	Wood Pellet

* Weighted average LHV efficiency using data collected during EPA emissions test.

**Weighted average HHV efficiency using data collected during EPA emissions test.

***A range of BTU outputs based on EPA Default Efficiency and the burn rates from the low and high EPA tests.

****Based on the maximum feed rate per hour multiplied by approximately 8600 BTU's which is the average BTU's from a pound of pellets.

This wood heater has a manufacturer-set minimum low burn rate that must not be altered. It is against federal regulations to alter this setting or otherwise operate this wood heater in a manner inconsistent with operating instructions in this manual.

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

DO NOT:

- Install or operate damaged appliance
- Modify appliance
- Install other than as instructed by Hearth & Home Technologies
- Operate the appliance without fully assembling all components
- Overfire
- Install any component not approved by Hearth & Home Technologies
- Install parts or components not listed or approved.
- Disable safety switches

Improper installation, adjustment, alteration, service or maintenance can cause injury or property damage.

For assistance or additional information, consult a qualified installer, service agency or your dealer.

NOTE: Hearth & Home Technologies, manufacturer of this appliance, reserves the right to alter its products, their specifications and/or price without notice.

 ${\sf Harman}^{\scriptscriptstyle (\! 8\!)}$ is a registered trademark of Hearth & Home Technologies.

D. Appliance Safety

WARNING

If you expect that small children or vulnerable adults may come into contact with this appliance, the following precautions are recommended:

- Install a physical barrier such as:
 - A decorative fire screen.
 - Adjustable safety gate.
- Never leave children alone near a hot stove, whether operating or cooling down.
- Teach children to <u>**NEVER**</u> touch the stove.
- Consider not using the stove when children will be present.
- Use only specified components as replacement parts. Other components may not allow your stove to operate as it was intended.

Contact your dealer for more information, or visit: <u>www.</u> <u>hpba.org/safety-information</u>.

To prevent unintended operation when not using your stove for an extended period of time (summer months, vacations, trips, etc):

• Unplug stove from receptacle.

Due to high temperatures, this stove should be placed away from traffic, furniture and draperies.

Children and adults should be alerted to the hazards of high surface temperatures and should stay away to avoid burns to the skin and/or clothing.

Young children should be carefully supervised when they are in the same room as the stove.

Clothing and other flammable materials should not be placed on or near this stove.

Installation and repair of this stove should be done by a qualified service person. The appliance should be inspected before use and at least annually by a qualified service person. More frequent cleaning will be required. It is imperative that control compartments and circulating air passageways of this stove be kept clean.

Connect the power cord into a 120 VAC, 60 Hz grounded receptacle. (A surge protector is recommended to protect the circuit board.) Be sure the polarity of the outlet the stove is plugged into is correct.



THIS WOOD HEATER HAS A MANUFACTURER-SET MINIMUM LOW BURN RATE THAT MUST NOT BE ALTERED. IT IS AGAINST FEDERAL REGULATIONS TO ALTER THIS SETTING OR OTHERWISE OPERATE THIS WOOD HEATER IN A MANNER INCONSISTENT WITH OPERATING INSTRUCTIONS IN THIS MANUAL.

E. California Safety Information



This product and the fuels used to operate this product (wood), and the products of combustion of such fuels, can expose you to chemicals including lead and carbon black, which is known to the State of California to cause cancer, and carbon monoxide, which is know to the State of California to cause birth defects or other reproductive harm. For more information go to: www.P65Warnings.ca.gov

F. Clear Space



RISK OF FIRE! Do NOT place combustible objects in front or to the sides of the appliance. High temperatures may ignite clothing, furniture or draperies.

NOTICE: Clearances may only be reduced by means approved by the regulatory authority having jurisdiction.



RISK OF FIRE! Keep combustible materials, gasoline and other flammable vapors and liquids clear of appliance.

- Do **NOT** store flammable materials in the appliance's vicinity.
- Do **NOT** use gasoline, lantern fuel, kerosene, charcoal lighter fluid or similar liquids to start or "freshen up" a fire in this heater.

Keep all such liquids well away from the heater while it is in use as combustible materials may ignite.



MOBILE/MANUFACTURED HOME GUIDELINES: DO NOT ALLOW INSTALLATION IN A SLEEPING ROOM.



USE OF IMPROPER FUELS, FIRESTARTERS OR ALTERING THE STOVE FOR HIGHER HEAT OUTPUT MAY CAUSE DAMAGE TO THE STOVE AND COULD RESULT IN A HOUSE FIRE. USE ONLY APPROVED FUELS AND OPERATION GUIDELINES

G. Helpful Hints

When operating your Harman[®] P42i-TC Pellet Insert, follow basic safety standards. Read these instructions carefully before you attempt to operate the P42i-TC Pellet Insert. Failure to do so may result in damage to property or personal injury and may void the product warranty.

<u>Cleaning Burn Pot:</u> Whenever your stove is not burning, take the opportunity to scrape the burn pot to remove carbon buildup. A vacuum cleaner is handy to remove the residue. Be sure the stove is cold if you use a vacuum.

Carbon buildup can be scraped loose with the fire burning using the special tool provided with your stove. Scrape the floor and sides of the burn pot. The carbon will be pushed out by the incoming fuel. Always wear gloves when scraping the burnpot.

Disposal of Ashes: Ashes should be placed in a steel container with a tight fitting lid. The closed container of ashes should be placed on a non-combustible floor or on the ground, well away from all combustible materials, pending final disposal. If the ashes are disposed of by burial in soil or otherwise locally dispersed, they should be retained in the closed container until all cinders have thoroughly cooled. Other waste shall not be placed in this container.

Soot and Flyash Formation and Need for Removal: The products of combustion will contain small particles of flyash. The flyash will collect in the exhaust venting system and restrict the flow of the flue gases. Incomplete combustion, such as occurs during startup, shutdown, or incorrect operation of the room heater will lead to some soot formation which will collect in the exhaust venting system. The exhaust venting system should be inspected at least once every year to determine if cleaning is necessary.

When burning wood pellets on low, the potential exists for creosote to form. The venting system should be inspected periodically throughout the heating season to determine if creosote buildup has occurred. If a significant layer of creosote has accumulated (1/8" or more), it should be removed to reduce the risk of a chimney fire. If a fire occurs, call the fire department, shut down the stove, and evacuate the residence. Before using the appliance, have the venting system thoroughly inspected and replace any damaged components.

With any hearth appliance, installation of smoke detectors/ Carbon Monoxide detectors is recommended on every level of the home.

Possible causes of smoke detector activation:

Paint curing process - Open a window near the appliance for the first few hours of burning.

Exhaust being drawn back inside the dwelling - Outside air connection to the appliance is necessary.

Vent leakage - Follow vent manufacturers instructions for proper sealing.



This appliance must be vented to the outside.

H. Fuel Specifications

The P42i-TC Pellet Insert is approved for burning any grade of pelletized bio-mass fuel.

It should be noted, however, that higher ash content will require more frequent cleaning.

The moisture content of pellets must not exceed 8%. Higher moisture will rob BTU's and may not burn properly.

Fuel should <u>**not**</u> be stored within the stove installation clearances or within the space required for cleaning and ash removal.

Fuel and Fuel Storage

Pellet fuel quality can fluctuate from manufacturer to manufacturer, and even from bag to bag.

Hearth & Home Technologies recommends using only fuel that is certified by the Pellet Fuels Institute (PFI).

Fuel Material

- Made from sawdust and/or other wood by-products
- Source material typically determines ash content

Higher Ash Content Material

- Hardwoods with high mineral content
- Bark and leaves as source material
- "Standard" grade pellets and other biomass

Lower Ash Content Material

- Softwood; pine, fir, etc.
- · Materials with lower mineral content
- "Premium" grade pellets

Performance

- Higher ash content requires more frequent maintenance.
- "Premium" grade pellets will produce the highest heat output.
- Burning pellets longer than 1-1/2 inches (38mm) can cause inconsistent feeding and/or ignition.

Clinkers

- Minerals and other non-combustible materials, like sand, will turn into a hard glass-like substance when heated.
- Trees from different areas will vary in mineral content. For this reason, some fuels will produce more clinkers than others.

<u>Moisture</u>

- Always burn dry fuel. Burning fuel with high moisture content takes energy to dry and tends to cool the appliance thus, robbing heat from your home.
- Damp pellet fuel could turn back into sawdust which does not flow properly through the feed system.

H. Fuel Specifications (Cont.)

Storage

- Wood pellets should be left in their original sealed bag until ready to use, to prevent moisture.
- Do not store fuel within the specified clearance areas, or in a location that will interfere with routine cleaning and maintenance procedures.

NOTICE

Hearth & Home Technologies is not responsible for stove performance or extra maintenance required as a result of using fuel with higher ash or mineral content.

Do not burn fuel that contains an additive.

- · May cause hopper fire
- Damage to product may result

Read the list of ingredients on the packaging.



Odors and vapors released during initial operation.

- Curing of high temperature paint.
- Open windows for air circulation.

Odors may be irritating to sensitive individuals.



Tested and approved for use with wood pellets ONLY. Burning of any other fuel will void your warranty.



BURNING COLORED PAPER, CARDBOARD, SOLVENTS, TRASH AND GARBAGE OR ALTERING THE STOVE FOR HIGHER HEAT OUTPUT MAY CAUSE DAMAGE TO THE STOVE AND COULD RESULT IN A HOUSE FIRE. USE ONLY APPROVED FUELS AND FOLLOW ONLY THESE OPERATION GUIDELINES.



NEVER USE GASOLINE, GASOLINE-TYPE LANTERN FUEL, KEROSENE, CHARCOAL LIGHTER FLUID, OR SIMILAR LIQUIDS TO START OR 'FRESHEN UP' AFIRE IN THIS HEATER. KEEP ALL SUCH LIQUIDS WELL AWAY FROM THE HEATER, WHILE IN USE.

I. EPA Test Settings

All EPA tests are run with the unit in Constant Burn Mode and configured to the settings below:

Low

Distribution: Off Feed Limit: 25% Temperature Setting: 1.0

Medium

Distribution: 100% Feed Limit: 40% Temperature Setting: 3.1

High

Distribution: 100% Feed Limit: 95% Temperature Setting: 7.0

Please see the EASY Touch Owner's Manual provided with this unit for more information about adjusting settings.

For additional clarification on EPA testing procedures & stove settings, please visit https://www.harmanstoves.com/ about-us/epa-certification to view the EPA Non-CBI report for this unit.

J. Quick Start Guide



Initial start-up Only

1. Select Language

2. Fill hopper with pellets

3. Adjust arrows to set room desired temperature.

4. Touch the On/Off Power Icon. *Refer to Touch Manual for all other operations.*

Please Note: The USB port on the EASY Touch Control *is not* a charging port for smartphones, tablets etc.

K. Frequently Asked Questions

With proper installation, operation, and maintenance your appliance will provide years of trouble-free service. If you do experience a problem, this troubleshooting guide will assist a qualified service person in the diagnosis of a problem and the corrective action to be taken.

Contact your dealer for additional information regarding operation and troubleshooting. Visit www.harmanstoves.com to find a dealer.

ISSUES	SOLUTIONS
Metallic noise.	Noise is caused by metal expanding and contracting as it heats up and cools down, similar to the sound produced by a furnace or heating duct. This noise does not affect the operation or longevity of your appliance.
White ash buildup on glass.	This is normal. Clean the glass using any non-abrasive glass cleaner.
Glass has buildup of black soot	Excessive build-up of ash. The lower burn settings will produce more ash, the higher burn settings produce less. The more it burns on low the more frequent cleaning of the glass is required.
Glass has turned dirty.	Excessive build up of ash. The lower burn settings will produce more ash, the higher burn settings produce less. The more it burns on low the more frequent cleaning of the glass is required.
Fire has tall flames with black tails and is lazy.	The feed rate needs to be reduced or the burnpot needs cleaning. Heat exchanger or exhaust blower needs cleaning.
Smoky start-up or puffs of smoke from the airwash.	Burnpot may be dirty, Clean the burnpot.
Large flame at start-up.	This is normal. Flame will settle down once the fire is established.
Missed Ignition	Ensure pellets in burnpot
	Ensure holes in burnpot are clear of obstructions above the igniter. See Burnpot Maintenance.
	Check to see if the ignitor is getting hot, if not replace ignitor. *See addendum for manual ignition instructions for emergency heating needs.

L. Cleaning Prompts, Messages and Errors

Your EASY Touch Control communicates with you by showing messages on the top center of the EASY Touch Control home screen. If you have more than one message, the messages will show consecutively until you acknowledge the message by performing the task. These communications include:



When properly maintained, your stove will give you many years of trouble-free service. **Contact your dealer** to answer questions regarding proper operation, trouble-shooting and service for your appliance. Visit www.harmanstoves.com to find a dealer. We recommend annual service by a qualified service technician.

A. Proper Shutdown Procedure



Follow the detailed instructions found in this section for each step listed in the chart below.

NOTICE

The type of fuel you are burning will dictate how often you have to clean your burnpot. Clean more frequently if you encounter heavy build-up of ash at the recommended interval or you see soot coming from the vent. **Not properly cleaning your appliance on a regular basis will void your warranty.**

Note: Do not use a household vacuum to clean the stove. We recommend that you use a shop vacuum that is equipped with a fine dust filter called a HEPA filter or a vacuum specially made for fly ash and soot. USING A VACUUM WHICH IS NOT EQUIPPED WITH A FINE DUST FILTER WILL BLOW FLY ASH AND SOOT OUT INTO THE ROOM.

NOTE: THE STOVE MUST BE COMPLETELY OUT BEFORE YOU VACUUM THE STOVE. LIVE PELLET EMBERS, IF SUCKED INTO THE VACUUM, WILL LIGHT THE VACUUM ON FIRE AND MAY ULTIMATELY CAUSE A HOUSE FIRE.

B. Quick Reference Maintenance Chart

Frequency	Cleaning Procedure	Safety Measures	Tips
Daily	Scrape Burn pot	Wear flame resistant gloves ³	Vigorous, strong scraping specifically near neck of burn pot. Scrape every time you add pellets or at least every 3 bags of fuel. ²
Weekly	Empty Ash Pan	Wear protective gloves. ¹ Put ashes into a steel non- combustible container with tight fitting lid outside.	Unit does not need to be turned off. Reduce to low burn during removal.
	Clean the Glass	Stove must be turned off and cold.	
	Scrape & Vacuum Heat Exchanger	Stove must be turned off and cold.	Use provided scraper. Scrape back and sides of firebox.
	Brush & vacuum the distribution fan	Stove must be turned off, cold and unplugged from power supply.	Use provided paint brush. This should be done approximately every 25 bags. ²
Monthly	Inspect Hopper lid gasket for damage		Replace gasketing if frays, tears or other visible damage to gasket. This should be done approximately every 50 bags. ²
	Clean Igniter	Stove must be turned off, cold and unplugged from power supply. Wear protective gloves. ¹ Put ashes into a steel non- combustible container with tight fitting lid outside.	Use provided paint brush. Vacuum loose ash from around igniter and inside burn pot.
	Stove MUST be turned off, cold a	ind unplugged from power supply for	r Yearly Cleaning.
	Brush & vacuum the combustion fan and venting/exhaust path	Wear protective gloves. ¹ Put ashes into a steel non- combustible container with tight fitting lid outside.	Use provided paint brush to brush fan blades. *Use flue brush to clean venting being careful not to damage the ESP. ²
Yearly⁴	Inspect door gasket		Replace gasketing if frays, tears or other visible damage to gasket.
	Brush & vacuum venting system	Wear protective gloves. ¹ Put ashes into a steel non- combustible container with tight fitting lid outside.	

* A flue brush of appropriate size and length may need to be purchased for proper maintenance.

1. Protective gloves will help prevent skin abrasion while working on steel surfaces.

2. Frequency of cleaning depends largely on fuel type. Lower quality pellets require most frequent cleaning.

3. Flame resistant gloves will help protect your skin from potential contact with heat or flames.

4. Yearly cleaning is also known as a Total Clean. This requires completing all the Daily, Weekly, Monthly and Yearly maintenance mentioned. This should be done before you begin burning the unit each heating season.

C. Unit Maintenance

Daily/Weekly Maintenance: It is recommend that the burn pot be scraped whenever adding fuel; taking the opportunity to clean the burn pot will ensure proper daily operation.

Scraping the Burn Pot-

- Using flame resistant gloves, vigorously scrape the top holed surface and sides of the burn pot down to auger tube, be sure to concentrate in the neck of the burnpot. Figure 2.1.
- Scrape loosened material over edge of burnpot grate into the ashpan.
- If needed, empty the ash pan while adding fuel and after scraping the burn pot.





Monthly Maintenance: It is recommend that the unit be shut down and unplugged from any power source for a monthly cleaning. Monthly cleanings will ensure proper operation of your unit throughout the heating season.

- Cleaning Glass Once unit is cold, use a non-abrasive glass cleaner on glass and wipe clean.
- Scrape and Vacuum Heat Exchanger.

Cleaning the Heat Exchanger-

Removing the Center Medallion:

- 1. Lift up on the 2 bottom corners of the medallion until it is higher than the top of the flame guide.
- 2. Pull the bottom edge of the medallion front approximately 1 inch.
- 3. Pull downward on the corners of the medallion until the top is released from the retainer that keeps the top aligned when in place. Figure 2.2.





Cleaning the Heat Exchanger:

Using the scraper provided run the straight edge along the flat surface of the Heat Exchanger removing any carbon deposits or ash build-up. Figure 2.3.



Scrape the heat exchanger free of Fly-Ash and carbon build-up

Figure 2.3

After the Heat Exchanger has been scraped, use the dust brush supplied to remove any remaining fly-ash from the Heat Exchanger as well as other areas throughout the firebox. Figure 2.5.



Figure 2.5

Cleaning the Burn Pot-

- Vigorously scrape the top holed surface and sides of the burn pot down to auger tube, as suggested in the Daily/ Weekly Maintenance Section.
- Use the supplied allen wrench to remove any build-up that may have accumulated in the holes of the burn pot grate. Simply push the allen wrench down through each hole ensuring it is clear of any build-up paying attention not to damage the igniter element in the process. Figure 2.6.



Figure 2.6

DANGER

Disconnect the power to the unit before removing cover.

• Loosen the (2) wing thumb screws on the lower front angle of the burn pot. Figure 2.7



Figure 2.7

- Lift off the clean-out cover to open the bottom clean-out chamber. Figure 2.8
- Clean ash buildup from inside the chamber while cover is off. Use the scraper to tap on the top front edge of the burn pot. This will help knock pieces of ash, loosened by the scraping process, down through the holes. It also helps knock ash buildup from the igniter element and bracket.



Figure 2.8

Cleaning Igniter Bracket-

Check cleanliness of the igniter and inner burnpot. If the igniter has ash buildup it must be removed to ensure proper ignition. Use the provided brush to remove ash buildup from in and around the igniter. Once ash is loose, vacuum around igniter and at the base of burn pot. Figure 2.9.



Use caution when cleaning burn pot clean-out chamber. Do not damage the high temperature igniter wires.

Note: The hot lead/cold lead connection must always be pulled to the rear of the feeder body before operation.



Figure 2.9

Yearly Maintenance: Cleaning the Combustion Fan Chamber-

Remove the combustion cover assembly Figure 2.11. To do this, pull up on the combustion cover latch Figure 2.12, and pull the combustion cover assembly toward you and out. **NOTE:** When re-installing the Combustion Cover Assembly make sure you insert the bottom of the cover first and then slide to the left to engage the bolt, prior to putting it into place.







Once combustion cover assembly is removed you now have access to clean the combustion blower chamber area. Figure 2.13.



Figure 2.13

15

Caring for your Glass-

The glass used in your stove is manufactured to exact standards to withstand the high heat of the fire, but like all glass, it must be treated with common sense and care. Never abuse the glass by slamming the door shut or striking the glass with a heavy object. If the glass is broken or damaged, do not operate the stove until it has been replaced.

Glass - Replacement:

If the stove's glass is cracked or broken, you must replace it before operating your stove. Remove pieces carefully. Replace glass only with Harman® replacement glass; **do not use substitutes.**

Carefully remove damaged glass, gasket material, and glass clips (set aside).

Install the self adhesive 1/4" gasket material around the front face of the glass. Set the glass panel and gasket gently onto the door. Install the glass clips and $1/4-20 \times 1/2"$ screws. **Note:** $1/4-20 \times 1/2"$ screws only need to be snug fit. Do not overtighten.

Glass - Cleaning:

Sometimes it will be necessary to clean accumulated ash from the glass surface; allowing this ash to remain on the glass for long periods can result in "etching" due to the acidity of the ash. Never clean the glass while it is hot, and **do not** use abrasive substances. Wash the surface with cool water and rinse thoroughly. You may wish to use a non-abrasive cleaner specifically designed for use on stove glass. In any case, dry thoroughly before relighting your stove.



Figure 2.14

Inspect all Gaskets-

While the unit is cool, inspect all door gaskets to ensure proper seal. The gasket should be continuous without frays or tears; having plyable gasket means having a correct seal for proper operation. Figures 2.14 & 2.15.





Distribution Blower-

Checking the distribution blowers yearly is a good habit to get into. Dust, animal hair or anything else that can make its way into that area can drastically cut down on the air movement throughout the unit ultimately causing less of a heating efficiency.

Once the unit is shut down and cooled, unplug the unit from its power supply. Behind each side panel release (1) spring latches that holds the unit to the inserts cage. Figure 2.16.



Figure 2.16

Once unit is pulled away from the fireplace, thoroughly vacuum around the Distribution Blowers. Figure 2.17.





Cleaning Venting System-

It is recommend that a certified chimney sweep perform service and inspection to your chimney system to ensure your unit is vented safely and in accordance to local code.

A. Service Parts List



Service Parts

Accentra52i-TC

Beginning Manufacturing Date: July 2017 Ending Manufacturing Date:

Pellet Insert 20" Hopper: 1-90-584200-1 (Black) (Beginning Manufacturing Date: July 2017) (Ending Manufacturing Date: Feb 2020) 1-90-584200-14 (Majolica Brown) (Beginning Manufacturing Date: July 2017)(Ending Manufacturing Date: Feb 2020) 1-90-584201-1 (Black w/Wireless) (Beginning Manufacturing Date: Feb 2020) 1-90-584201-14 (Majolica Brown w/Wirelss) (Beginning Manufacturing Date: Feb 2020) 22" Hopper: 1-90-584220-1 (Black) (Beginning Manufacturing Date: July 2017)(Ending Manufacturing Date: Feb 2020) 1-90-584220-14 (Majolica Brown) (Beginning Manufacturing Date: July 2017)(Ending Manufacturing Date: Feb 2020) 1-90-584221-1 (Black w/Wireless) (Beginning Manufacturing Date: Feb 2020) (Ending Manufacturing Date: July 2022) 1-90-584221-14 (Majolica Brown w/Wireless) (Beginning Manufacturing Date: Feb 2020) (Ending Manufacturing Date 2022) 24" Hopper: 1-90-584240-1 (Black) (Beginning Manufacturing Date: July 2017)(Ending Manufacturing Date: Feb 2020) 1-90-584240-14 (Majolica Brown) (Beginning Manufacturing Date: July 2017)(Ending Manufacturing Date: F 1-90-584241-1 (Black w/Wireless) (Beginning Manufacturing Date: Feb 2020) 1-90-584241-14 (Majolica Brown w/Wireless) (Beginning Manufacturing Date: Feb 2020) D 2 33 32 31 30 29 28 26 20 23 22 Part number list on following page. 07/22

Accentra52i-TC

Beginning Manufacturing Date: July 2017 Ending Manufacturing Date:

6

IMPORTANT: THIS IS DATED INFORMATION. Parts must be ordered from a dealer or distributor. **Hearth and Home Technologies does not sell directly to consumers**. Provide model number and serial number when requesting service parts from your dealer or distributor.

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TO A STANDARD, NOT

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requesting	g service parts from your dealer or distributor.		at Denot	
ITEM	Description	COMMENTS	PART NUMBER	
1	Cast Side Hinge	Right & Left	1-00-574075	
2	All Thread .500-13 x 12, Frame Jacking	Qty 2 req	3-31-00949	
	Jack Plate	Qty 2 req	1-10-574099W	
3	Mounting Frame Assembly		1-10-584031A	
	Roller hardware	4 sets	1-00-02243	Y
4	Pipe Stub for 4 in. Flex/PL w/gasket		1-00-574034	Y
5	Pipe Stub Plate Gasket		3-44-574045	Y
6	Cast Side Hinge	Right & Left	1-00-574075	
7	Docking Gasket Silicone		3-44-06108	Y
8	Thermister Probe (ESP Probe)		3-20-00844	Y
9	Differential Switch		3-20-6866	Y
	Silicone Tubing, 1/8"	5 Ft	1-00-5113574	Y
10	Power Cord - 14'		3-20-584024	Y
	Line Filter		3-20-803744	Y
11	Control Board Mounting Plate		1-10-584012A	
	Control Board		1-00-05372	Y
	Gasket, Hopper Top	20 ft	1-00-375501	Y
	Gasket, Hopper Throat		3-44-677185	Y
12	Wiring Harness		3-20-08888	Y
13	Line Filter Mounting Bracket		1-00-584034	
14	Combustion Cover Latch Assembly		1-00-574080	
15	Medallion Holder		1-10-574098W	Y
16	Cast Center Medallion		3-00-584027	Y
17	Ash Pan		1-10-574007A	Y
10	Cast Wing Contor	Black Paint	4-00-574323P	Y
10		Majolica Brown	1-10-574323-14	Y
19	Cast Top / Hopper Lid Assembly		See following page	
20	Cast Wing Left	Black Paint	4-00-574321P	Y
		Majolica Brown	1-10-574321-14	Y
21	Door Assembly		See following page	
22	Cast Bottom Ashlin	Black Paint	3-00-574318P	
~~~	Cast Bottom Aship	Majolica Brown	1-10-574318-14	
	Magnetic Latch Assembly w/3/16" Hole	2 Sets	1-00-08288	
	On at Oida Dawal, Ota O and	Black Paint	4-00-674054P	
23	Casi Side Parlei, Qiy 2 req	Majolica Brown	1-10-574054-14	
		Black Paint	4-00-574322P	Y
24	Cast wing Right	Majolica Brown	1-10-574322-14	Y
25	Burn Pot Weldment		See following page	

Accentra52i-TC

Beginning Manufacturing Date: July 2017 Ending Manufacturing Date:

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PRICE

model nu	umber and serial number when requesting service parts from your dealer or distributor.				
ITEM	Description	COMMENTS	PART NUMBER		
26	Cast Heat Exchanger CVR	Qty 2 req	SRV3-00-674050	Y	
27	Cleanout Plate Assembly		1-00-574086		
	Cleanout Plate Gasket	12 Ft	1-00-10050	Y	
28	Combustion Cover		1-10-574087A		
29	Hinge Plate	Qty 2 req	3-00-674047		
30	Spring Latches with hardware	Set of 2	1-00-00927	Y	
31	Fan Blade	Commonly required	1-10-574500A	Y	
	Blower Mounting Screws (5 Sets)	replacement	1-00-832150		
32	Combustion Blower		1-00-02275	Y	
33	Feeder Assembly		See following page		
34	Distribution Blower	Qty 2 req	3-21-33647	Y	

### **#19 Hopper Lid Assembly**

TO A STANDARD,



19.1	Touch Control		1-00-777552	Y
	Touch Control Screws	Pkg of 30	SRV8787-011	
	Cable Cover Gasket	Post HF2084013	3-44-777549	
19.2	Screw Post Kit	Set of 20	1-00-129004	Y
19.3	Touch Control Hopper Lid Glass		3-40-574365	Y
19.4	Hopper Lid Knob w/Screw	Black	1-00-02000-1	
19.5	Hopper Lid Latch		1-00-0669697	Y
10.6	Cast Tap	Black Paint	4-00-584020P	
19.0	Cast Top	Majolica Brown	1-00-584020-14	
19.7	Hopper Lid Hinge w/Hardware		1-00-584003	Y
	Gasket, 3/8 x 1/2	20 Ft	1-00-375501	Y
	Ball Plunger Retainer	6 Sets	1-00-5500	Y
	Hinge Pin Plate w/Hardware	1 Set	1-00-777560	
	Dowel Pin, 1/4 x 3/4	Pkg of 15	3-30-2015-15	
	Hopper Lid Latch Release Kit w/Hardware		1-00-584345	Y



## Accentra52i-TC

Beginning Manufacturing Date: July 2017 **Ending Manufacturing Date:** 

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model nu	odel number and serial number when requesting service parts from your dealer or distributor.					
ITEM	Description	COMMENTS	PART NUMBER			
#21	Load Door Assembly 21.1 21.2 21.3 21.4 21.5 21.6	21.10 - 21.9 21.7 ^{21.8}				
21.1	Door Assembly	Black Paint	4-00-674053A	Y		
21.1		Majolica Brown	4-00-674053-14A	Y		
21.2	Air Grill		3-00-674052S	Y		
21.3	Gasket, 3/8 4 Strand	30 Ft	1-00-00888	Y		
21.4	Gasket, 3/16 Round w/PSA	10 FT	1-00-1186258229	Y		
21.5	Glass w/Gasket		1-00-677000	Y		
21.6	Glass Clips	Pkg of 4	1-00-249140	Y		
21.7	Latch Retainer		2-00-674098S			
21.8	Latch Trim Plate(Enamel Only)		2-00-674206P			
21.9	Wooden Handle w/Bolt	Pkg of 2	1-00-00247			
21.10	Door Latch, Painted		3-00-249119P	Y		
	Door Latch Roller Hardware		1-00-05230	Y		
#25	5 Burn Pot Weldment 25.1 25.2 25.4 25.5 25.4 25.5 25.4 25.5 25.4 25.4	574602 674602				
25.1	Burn Pot Weldment w/Cradle		1-00-574605	Y		
05.0			3-20-677200	Y		
25.2		Pkg of 10	1-00-677200	Y		

25.3 Υ Igniter Cradle 1-00-777907 25.4 Burn Pot Cleanout Cover w/Wing Screws 2 sets 1-00-06623 Υ 25.5 Thumb Screw, 1/4-20 x 5/8 Pkg of 10 3-31-782108-10 Υ Gasket, Burn Pot 3-44-237639 Υ Υ Flame Guide 3-00-03000



## Accentra52i-TC

Beginning Manufacturing Date: July 2017 Ending Manufacturing Date:

IMPORTANT: THIS IS DATED INFORMATION. Parts must be ordered from a dealer or distributor. Hearth and Stocked Home Technologies does not sell directly to consumers. Provide model number and serial number when requesting service parts from your dealer or distributor. at Depot **Description** COMMENTS ITEM PART NUMBER #33 Feeder Assembly 33.15 33.1 33.2 33.14 33.3 33.13 33.4 33.12 CC O 33.11 33.10 33.7 33.6 33.5 33.8 33.9 Ultra Feeder Weldment 1-10-680021W 33.1 Υ 33.2 Slide Plate Assembly 1-10-677121A Υ 33.3 Pusher Arm Pillow Block Pkg of 4 3-31-3614087-4 Υ Gasket, UL Feeder Cover 33.4 1-00-677122 Υ 33.5 5/16-18 wing screw Pkg of 25 3-30-8012-25 33.6 UL Feeder Pusher Arm 1-10-677187W Υ 33.7 UL Feeder Auger Assembly 3-50-00565 Υ 33.8 Cam Block Assembly 1-10-777950A Υ Cam Bearing 3-31-3014 Υ Motor Mount w/Hardware 1-00-584035 33.9 Υ 33.10 Pellet Feeder Gear Motor, 4 RPM Υ 3-20-60906 Bearing Flange w/Hardware 1-00-04035 Υ 33.11 33.12 Feeder Air Crossover Kit 1-00-67900 Υ 9MM Silicone Tube 5 Ft 1-00-511427 Υ Gasket Ultra Air Intake Pkg of 10 3-44-677160-10 Υ 33.13 33.14 Pellet Air Intake Assembly 1-10-06810A 33.15 Gasket Feeder Air Intake 3-44-72224-6 Υ Pkg of 6 Silicone Cap Pgk of 10 3-99-123/10



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ITEM	Description	COMMENTS	PART NUMBER	
	Burn Pot Scraper	Pkg of 10	2-00-777692-10	
	Communication Cable		3-20-72662	Y
	Draft Meter Assembly		1-00-00637	Y
	Draft Meter Bolt & Tube		1-00-04004	
	Fuse, Ceramic 5A	Pkg of 5	1-00-05237	Y
	Gasket Set (Includes: Burn Pot, Pipe Stube, Exhaust Flange, Combust	ion Housing)	SRV3-44-574325	
	Labels, Caution & Danger	10 Ea	1-00-200408541	
	Manual Dook	Black	SRV1-00-00584BK	
		Majolica Brown	SRV1-00-00584MH	
	Return Air Sensor		3-20-08780	Y
	Room/Return Sensor Extension	14 FT	3-20-584023	
	Smoke Shield w/hardware		1-00-574430	Y
	Touch Up Paint. Black	12 oz Can	3-42-19905	
	Touch Up Paint	Majolica Brown	1-00-0014	
	Wireless Room Sensor		3-20-777556	Y

### B. Limited Lifetime Warranty

### Hearth & Home Technologies LLC LIMITED LIFETIME WARRANTY

Hearth & Home Technologies LLC ("HHT") extends the following warranty for HHT gas, wood, pellet and electric hearth appliances (each a "Product" and collectively, the "Product(s)") and certain component parts set forth in the table below ("Component Part(s)") that are purchased from a HHT authorized dealer or distributor.

#### WARRANTY COVERAGE:

HHT warrants that the Products and their Component Parts will be free from defects in materials and workmanship for the applicable period of Warranty coverage set forth in the table below ("Warranty Period"). If a Product or Component Parts are found to be defective in materials or workmanship during the applicable Warranty Period, HHT will, at its option, repair the applicable Component Part(s), replace the applicable Component Part(s), or refund the purchase price of the applicable Product(s). The maximum amount recoverable under this Warranty is limited to the purchase price of the Product. This Warranty is transferable from the original purchaser to subsequent owners, but the Warranty Period will not be extended in duration or expanded in coverage for any such transfer. This Warranty is subject to conditions, exclusions, and limitations as described below.

#### WARRANTY PERIOD:

Warranty coverage begins at the date of installation. In the case of new home constructions, Warranty coverage begins on the date of first occupancy of the dwelling or six months after the sale of the Product(s) by an independent, authorized HHT dealer or distributor, whichever occurs earlier. However, the Warranty coverage shall commence no later than 24 months following the date of Product shipment from HHT, regardless of the installation or occupancy date.

The term "Lifetime" in the table below is defined as: 20 years from the beginning date of warranty coverage for gas appliances, 10 years from the beginning date of warranty coverage for wood and pellet appliances, and 5 years from the beginning of warranty coverage for standalone gas log sets. These time periods reflect the minimum expected useful lives of the designated Component Parts under normal operating conditions.

Warranty	Warranty Period				HHT Manufactured Appliances and Venting			
Component Parts	Labor	Gas	Pellet	Wood	Electric	Venting	Component Parts Covered by this Warranty	
1 Ye	1 Year     X     X     X     X     All parts including handles, external enancomponents and other material except as components and other material except as components. Warranty Conditions, Warranty Exclusion: Warranty Limitations listed		All parts including handles, external enameled components and other material except as covered by Warranty Conditions, Warranty Exclusions, and Warranty Limitations listed					
2 Ye	ars				x		All parts except as covered by Warranty Conditions, Warranty Exclusions, and Warranty Limitations listed	
			x	x			Igniters, Auger Motors, Electronic Components, and Glass	
2 уеа	2 years X Electrical components limited to modules, results witches, valves, pilots, blowers, junction tharnesses, transformers and lights (excluding		Electrical components limited to modules, remotes/wall switches, valves, pilots, blowers, junction boxes, wire harnesses, transformers and lights (excluding light bulbs)					
		х		x			Molded Refractory Panels, Glass Liners	
3 yea	ars		x				Firepots, burnpots, mechanical feeders/auger assemblies	
5 yea	ars	x					Burners and logs for standalone gas log sets (Vented and Vent Free gas log sets not sold as components of the fireplace or stove)	
5 vears	1 vear	x					Vent Free Burners and Vent Free Log components of HHT manufactured fireplaces or stoves	
0 youre	, your		Х	X			Castings, Medallions and Baffles	
6 years	3 years			X			Catalysts	
7 years	3 years		х	x			Manifold tubes, HHT Chimney and Terminations	
10 years	1 year	x					Burners, logs and refractory components of HHT manufactured fireplaces or stoves	
Limited Lifetime	3 years	x	x	x			Firebox and heat exchanger, FlexBurn® System (engine, inner cover, access cover and fireback)	
		(         )						
1 Year	None	x	x	X	х	x	All purchased replacement parts	

4021-645M 9/21

#### WARRANTY CONDITIONS:

- Because HHT cannot control the quality of any Products sold by unauthorized sellers, this Warranty only covers Products that are purchased through an HHT authorized dealer or distributor unless otherwise prohibited by law; a list of HHT authorized dealers is available on the HHT branded websites.
- This Warranty is only valid while the applicable Product remains at the site of original installation.
- This Warranty is only valid in the country in which the HHT authorized dealer or distributor that sold the applicable Product is authorized to sell applicable Product.
- Contact your installing distributor or dealer for Warranty service. If the installing dealer or distributor is unable to provide necessary parts, contact the nearest HHT authorized dealer or supplier. Additional service fees may apply if you are seeking Warranty service from a dealer other than the dealer from whom you originally purchased the applicable Product.
- No HHT consumer should bear cost of warranty service or costs incurred while servicing warranty claims (i.e., travel, gas, or mileage) when the service is performed within the terms of this Warranty. Check with your dealer or distributor in advance for any costs to you when arranging a warranty call. Travel and shipping charges for parts are not covered by this Warranty.

#### WARRANTY EXCLUSIONS:

This Warranty does not cover the following:

- Changes in surface finishes as a result of normal use. As a heating appliance, some changes in color of interior and exterior surface finishes may occur. This is not a flaw and is not covered under the Warranty.
- Damage to printed, plated, or enameled surfaces caused by fingerprints, accidents, misuse, scratches, melted items or other external sources and residues left on the plated surfaces from the use of abrasive cleaners or polishes.
- Repair or replacement of parts that are subject to normal wear and tear during the Warranty Period are not covered. These parts include: paint, wood and pellet gaskets, firebricks, grates, flame guides, batteries and the discoloration of glass.
- Minor expansion, contraction, or movement of certain parts causing noise. These conditions are normal and complaints related to this noise are not covered by this Warranty.
- Damages resulting from: (1) failure to install, operate, or maintain the applicable Product in accordance with the installation instructions, operating instructions, and listing agent identification label furnished with the applicable Product; (2) failure to install the applicable Product in accordance with local building codes; (3) shipping or improper handling; (4) improper operation, abuse, misuse, continued operation with damaged, corroded or failed components, accident, or improperly/incorrectly performed repairs; (5) environmental conditions, inadequate ventilation, negative pressure, or drafting caused by tightly sealed constructions, insufficient make-up air supply, or handling devices such as exhaust fans or forced air furnaces or other such causes; (6) use of fuels other than those specified in the operation instructions; (7) installation or use of components not supplied with the applicable Product or any other components not expressly authorized and approved by HHT; (8) modification of the applicable Product.
- Non-HHT venting components, hearth connections or other accessories used in conjunction with the applicable Product.
- Any part of a pre-existing fireplace system in which an insert or a decorative gas applicable Product is installed.
- HHT's obligation under this Warranty does not extend to the Product's capability to heat the desired space. Information is provided to assist the consumer and the dealer in selecting the proper Product for the application. Consideration must be given to the Product location and configuration, environmental conditions, insulation and air tightness of the structure.

#### This warranty is void if:

- The applicable Product has been over-fired, operated in atmospheres contaminated by chlorine, fluorine, or other damaging chemicals. Over-firing can be identified by, but not limited to, warped plates or tubes, deformation/warping of interior cast iron structure or components, rust colored cast iron, bubbling, cracking and discoloration of steel or enamel finishes.
- The applicable Product is subjected to prolonged periods of dampness or condensation.
- There is any damage to the applicable Product due to water or weather damage which is the result of, but not limited to, improper chimney or venting installation.

### LIMITATIONS OF REMEDIES AND LIABILITY:

EXCEPT TO THE EXTENT PROVIDED BY LAW, HHT MAKES NO EXPRESS WARRANTIES OTHER THAN THE WARRANTY SPECIFIED HEREIN. The owner's exclusive remedy and HHT's sole obligation under this Warranty or in contract, tort or otherwise, shall be limited to replacement of the Component Part(s), repair of the Component Part(s), or refund of the original purchase price of the applicable Product(s), as specified above; provided, however, that (i) if HHT is unable to provide replacement of the Component Part(s) and repair of the Component Part(s) is not commercially practicable or cannot be timely made, or (ii) the customer is willing to accept a refund of the purchase price of the applicable Product(s), HHT may discharge all such obligations by refunding the purchase price of the applicable Product. In no event will HHT be liable for any incidental or consequential damages caused by defects in the applicable Product. Some States do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you. This Warranty gives you specific legal rights and you may also have other rights which vary from State to State. THE DURATION OF ANY IMPLIED WARRANTY IS LIMITED TO DURATION OF THE EXPRESSED WARRANTY SPECIFIED ABOVE FOR THE APPLICABLE PRODUCT. Some States do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you.

4021-645M 9/21

### C. Loss of Power

Harman pellet burning appliances rely on a combustion blower to remove exhaust from the firebox. A power failure will cause the combustion blower to stop running, which may lead to exhaust see page into the room. Vertical rise in the venting system can help create natural draft, which may reduce the likelihood of exhaust leakage into the home.

Installation of a low-cost uninterruptible power supply (UPS) or battery backup system can help ensure the units shuts down without any minor smoke leakage into the home. Harman recommends the installation of one of these two systems for areas prone to power outages.

## There is one Harman® approved UPS option for your appliance:

<u>Uninterruptible Power Supply UPS</u> battery back-ups are available online or at computer and office equipment stores. Your Harman® appliance with Rev E or later software available beginning in November 2010 may be plugged directly into a Harman® approved UPS:

• **TrippLite model INTERNET750U** is tested and approved. Other brands or models may not be compatible.

When power is lost, a fully charged UPS will power a safe, combustion blower only shut-down. Your appliance will pulse the blower every few seconds to clear exhaust until the fire is out. **NOTE: The UPS provides safe shut-down only. It is not intended for continued operation.** 

• A Inverter/Charger connects to a 12 volt deep cycle battery that will run your appliance for up to eight (8) hours. It includes a trickle charge feature that keeps your battery charged when power is available. **NOTE:** If the power is out for longer than battery life, smoke leakage may still occur unless your stove has been safely shut down.

## For an approved Inverter/Charger refer to www. harmanstoves.com.

Your appliance will recognize when power is restored. What happens depends on ESP temperature and whether it is equipped with automatic ignition:

- In "Automatic" Mode, units equipped with automatic ignition will respond to the set point and ESP temperature and resume normal operation.
- In "Idle" Mode, or for units without automatic ignition:
  - If the ESP is cool, the appliance will remain shut down.
  - If the fire is out and the ESP is still warm, the feeder may restart. Since the fire is out, the ESP temperature will not rise. The unit will then shut-down, and may flash a six-blink status error. (See ESP error codes)
  - If the fire is still burning, it will resume normal operation.

Contact your dealer if you have questions about UPS compatibility with your appliance.

**IMPORTANT!**: UPS or Battery Backup cannot prevent smoke leakage from an improperly maintained unit. Keep the venting system clean and free from obstructions and maintain all gaskets to keep an airtight seal.

## WARNING

Use only Harman[®] approved battery back-up devices. Other products may not operate properly, can create unsafe conditions or damage your appliance.

## 

Always keep appliance doors and hopper lid closed and latched during operation and during power failures to minimize risk of smoke or burn-back.

### **D. Emergency Manual Ignition**

Harman[®] pellet stoves and inserts should be lit using the automatic ignition system. This is the safest and most reliable way for igniting the unit. In the event the automatic igniter is not functioning, the steps below may be followed to manually light the stove or insert in the "Constant Burn" mode. Manual lighting is for emergency purposes only, and the igniter should be repaired or replaced as soon as practical.

## WARNING

Only use firestarter commercially marketed for pellet stoves and inserts, including wax coated wood chips, pellet starter gel and pellet igniter blocks. Use of any other type of firestarter is prohibited.

To avoid serious injury or death read and follow manufacturer's warning and instructions for use of firestarter. Use of firestarter is only permitted when performing a cold start.

Never attempt to manually light a stove or insert that has been operated recently and is not at room temperature. If automatic ignition was attempted, be sure to give the stove or insert at least 30 minutes or longer to cool to room temperature.

Be sure that the stove or insert is in the "Igniter - Disabled" mode of operation.

Once all the precautions have been taken, follow these steps:

- 1. On the touch control, select the Burn Mode icon then select "Constant Burn".
- 2. Arrow back and select the Igniter icon then select "Manual" for the ignition method. Select the Home Icon to go back to the Main Menu.
- 3. Fill burn pot with pellets, only half way. (Do Not Over Fill).
- 4. Add firestarter to pellets following manufacturer's instructions.
- 5. Light pellet gel with a match, and close the door, touch the On/Off icon on the home screen. Operation will begin when the fire reaches the proper temperature.

### E. Troubleshooting

ISSUES	SOLUTIONS
Stove does not feed	No fuel in hopper.
	<ul> <li>Firebox draft may be too low for sensing switch in feeder circuit to operate. Check for closed doors, loose or missing gasket on doors or hopper lid.</li> </ul>
	<ul> <li>Feed motor will not run until the ESP control senses a certain temperature. Maybe you did not put enough fuel or starting gel in the burn pot before manually lighting the fire (In Constant Burn, Manual Light Only.)</li> </ul>
	• Restriction in the hopper or feeder. Remove all fuel and examine. Clear the obstruction.
	Feed motor has failed.
Partially burned pellets	Feed rate too high.
	<ul> <li>Poor air to fuel mixture. (Check burn pot clean-out cover and air intake).</li> </ul>
	Burn pot may need to be cleaned.
	Combination of all the above.
Smoke smell	Seal the vent pipe joints and connection to stove with silicone. The exhaust vent is the only part of the system that is under positive pressure.
Fire has gone out	No fuel in hopper.
	Draft is too low, blocked flue.
	Something is restricting fuel flow.
	Hopper lid not closed properly.
	Feed motor or combustion fan has failed.
Smoke is visible coming out of vent	Air-fuel ratio is too rich.
	- Feed rate too high.
	- Draft too low caused by a gasket leak.
Low heat output	Feed rate too low
	Draft too low because of gasket leak.
	Poor quality or damp pellets
	Combination of 1 and 2.



A brand of Hearth & Home Technologies 352 Mountain House Road, Halifax, PA 17032 www.harmanstoves.com

Please contact your Harman[®] dealer with any questions or concerns. For the location of your nearest Harman[®] dealer, please visit www.harmanstoves.com.

### - NOTES -





## EASY Touch Control Easy, Accurate, Smart and provides Yearly savings.

# **Owner's Manual**

## Table of Contents

EASY Touch Control Overview						
Quick Start: Starting Your Pellet Stove						
Menus						
Menu I Overview						
Burn Mode						
Cleaning Prompts						
Diagnostics						
Feed Limit						
lgniter						
Room Fan						
Schedule						
Test						
Menu 2 Overview						
Home Screen Options						
Screen Brightness						
Dav/Time						
Euel Calibration 24						
Lock 25						
Languages & Units 26						
Wireless Room Sensor 27						
Menu 3 Overview 29						
Dealer Information						
Factory Defaults						
USB						
Video/Manual						
Prompts, Messages & Errors						
Software Updates						
FAQ						

## **EASY Touch Control Overview**

The EASY Touch Control home screen manages the essential functions of your Harman pellet stove.



## Quick Start: Starting Your Pellet Stove



#### Fill the hopper with pellets

Use the up and down arrows to set desired room temperature

Touch the Power icon

Your EASY Touch Control automatically runs at our factory default settings which is the most convenient way to heat with a Harman pellet stove. Factory default settings include but are not limited to:

- Room Sensing Mode
- Automatic Ignition
- Automatic Fan

Note:

- The first time the unit is plugged in, you will need to choose the preferred language, then hit the Home icon
- The temperature setting must be higher than the room temperature for the stove to light

### Menus

You can easily heat your home using just the home screen functions.

Using the Menu, Home, Left and Right arrow icons you can get to any function.

When more customization is desired, the Menu icon allows you to scroll through three pages of icons to access controls for individual features.

The menu pages are organized in order of most frequent use.







Menu 3

Page 3/3

## Menu 1 Overview



The first menu gains access to the most used options.

- A Burn Mode: Select Room Sensing or Constant Burn Sensing
- B Cleaning: Displays current cleaning percent accumulated and allows for reset
- C Diagnostics: Six pages of data showing how the stove is performing
- D Feed Limit: Adjust the amount of pellets being fed to the burn pot
- E Igniter: Select method of ignition and set shut down, to automatic or disabled
- F Fan: Choose Automatic or Manual fan
- G Schedule: Program when you want your temperatures to change, seven days a week
- H Test: Test individual functionality of motors and igniter

Note:You cannot cause harm to the unit by changing settings, however, you may not achieve your ideal temperature. If you are unsure of what you have set, you can always go to Factory Default on page 3 to revert to factory settings.

## Burn Mode



Burn Mode allows you to select how you want the stove to operate. Refer to the stove owner's manual for detailed description.



**Room Sensing** utilizes the onboard backup room sensor or optional wireless room sensor to monitor temperatures and automatically adjusts the stove to maintain your desired temperature setting.

The home screen will display your actual room temperature on the center of the screen in this mode.



**Constant Burn** allows you to manually control heat output. In Constant Burn you will set the heat level at a number between one(low) to seven(high) using the slider bar on the home screen. For your reference, the room temperature is displayed to the right of the slider bar on the home screen. The stove will not shut down regardless of room temperature, until you manually turn it off or run out of pellet fuel in the hopper.

## **Cleaning Prompts**



The Cleaning Prompts screen displays the percentage of time that has accumulated since the last cleaning. When it reaches 100%, you will get messages on the home screen to perform that specific maintenance. Press the checkmark on the home screen to reset. Resetting maintenance sets it back to 0% and tells the control to start calculating until the next cleaning is needed.

In case you clean your stove before prompted, this menu allows you to manually reset the percent accumulated. You can expect to see messages at the following intervals:



**Burn Pot:** You will be prompted to scrape the burn pot approximately every two to three days*



**Ash Pan:** You will be prompted to empty it approximately every five days, depending on the unit*



**Total Clean:** You will be prompted to completely clean the unit and venting after each ton*

It is important to perform these maintenance tasks to keep your Harman pellet stove/insert warming your home as efficiently as possible.

*Depending on stove model and quality of the pellets burned. Five days is based on the Absolute43 Pellet stove which has a smaller ash pan. See Fuel Calibration screen for more details.

## Diagnostics - Page 1

Jr.Jr	Input & Output Status	
Diagnostics		
Room Fan		0%
Combustion Far	RPM	0
Feed Motor		OFF
Feed Rate		0%
lgniter		OFF
Pressure Switch		Closed
Page //6		
	Home	

There are six pages of diagnostic information that will be helpful if you have questions about your Harman pellet product. The data on these screens allows you to understand and reference how your unit is working.

#### Diagnostic information on Page I of 6 includes:

- Room Fan: Current room fan speed percent
- Combusion Fan RPM: Current fan RPMs
- Feed Motor: Displays if the feed motor is currently on or off
- Feed Rate: Current feed rate percentage
- Igniter: Displays if igniter is currently on or off
- **Pressure Switch:** Displays if the pressure switch is currently open or closed

#### Diagnostic information on page 2 of 6 displays temperature sensors:



**ESP Temperature:** Displays the current temperature of the exhaust sensing probe .

**Room Temperature:** Displays room temperature sensed from either the optional wireless room sensor or the backup room sensor, depending on which sensor is being used to control the unit.

**Backup Room Sensor:** Displays the room air temperature returning to the unit. The stove/insert uses this sensor to

regulate the temperature if the optional wireless room sensor loses signal or is not installed. You will see Using Backup Sensor on your home screen if the wireless room sensor loses signal or for a short time after power loss.

Wireless Room Sensor: Displays whether or not the optional wireless room sensor is disabled or displays the actual wireless sensor temperature if enabled.

**Outside Air Temperature:** Displays outside temperature when the optional outside air kit is installed. (*Feature not yet available.*)



## Diagnostic information on Page 3 of 6 displays limits and fuel usage:

**Ignition Charge Time (min):** This can only be altered by an authorized Harman dealer. Displays amount of time the auger feeds fuel during the ignition cycle.

**Feed Rate Limit (%):** Displays the maximum allowed percentage as set in the Feed Limit screen.

**ESP Temperature Limit:** Displays the maximum temperature of the ESP allowed by the control, based on current settings.

**Fuel Used in 24 Hours^{*}:** Displays how many pounds of fuel burned in the past 24 hours.

**Fuel Used Since Cleaning**^{*}: Displays how many pounds of fuel was used since last total clean.

**Fuel Remaining**^{*}: Displays amount of fuel in hopper. To enhance accuracy, fuel calibration should be completed, see Menu 2.

* Fuel calibration should be done for the most accurate fuel gauge and usage, menu 2/3.

## Diagnostics - Pages 4, 5 & 6



## Diagnostic information on page 4 of 6 displays hardware information:

- Model name
- Model number
- Control board number
- Touch display
- Date of installation
- Hours of operation

$\frown$	Software Version Inf	o
A A	Bootloader	14.07.22
JUM	Touch Software	14.11.19
Diagnostics	Control Software	14.11.14
0	Control Flash Image	14.11.14
	Wireless Room Sensor	16.04.12
	International Table	14.08.11
	Language Text	14.11.19
	Model Table	14.11.13
	Graphics Package	14.08.11
Page 5/6	Home	

## Diagnostic information on page 5 of 6 displays software version information:

- Bootloader
- Touch software
- Control software
- Control flash image
- Wireless room sensor
- International table
- Language text
- Model table
- Graphics package



# Diagnostic information on page 6 of 6 displays wireless sensor information:

- Sensor signal strength (wireless)
- Communication status: enabled
   or disabled
- Sensory battery
- Sensor ID
- Sensor temperature
# Feed Limit



The Feed Limit screen allows you to adjust the amount of fuel being fed to the burn pot. The factory default for this is 65% which is best for most pellets. Adjustment may be needed based on fuel quality.

### To Adjust:

- Move the slider bar by tapping or sliding it to the desired adjustment
- Decrease your feed limit if you see unburnt pellets falling into the ash pan
- Increase your feed limit to maintain approximately one inch of completely burnt pellets on the burn pot





There are two ignition and shutdown modes for Harman pellet products:Automatic and Disabled. Each can be used in conjunction with constant burn mode.

Automatic will automatically ignite and shut down.

Disabled requires the stove to be lit in Automatic and then switched to Disabled. The stove will alter its flame size to keep at your set temperature. Disabled allows your stove to continue to run without shutting down, even once set temperature is achieved, keeping a continous heat without going through the ignition cycle.

## Igniter

**Automatic and Room Sensing mode:** The unit will automatically ignite and shutdown. As long as there is fuel in the hopper, the stove will automatically reignite when there is a demand for heat. *Note: This is the most common and recommended method of operation.* 





Automatic and Constant Burn mode: The unit will automatically ignite and will operate at your selected Constant Burn setting. The unit will not shut down unless the On/Off icon is touched or if the hopper runs out of fuel.





**Disabled and Room Sensing mode:** The stove must be lit in Automatic and then switched to Disabled. The stove will alter its flame size to keep at your set temperature. However, if set temperature is achieved, the unit can only go to minimum burn. The unit will not shut down unless the On/Off icon is touched or if the hopper runs out of fuel.



**Disabled and Constant Burn mode:** The stove must be lit in Automatic and then switched to Disabled. The stove will operate at your selected constant burn setting. The unit will not shut down unless the On/Off icon is touched or if the hopper runs out of fuel.





Harman EASY Touch Control Owners Manual

## Room Fan



The Room Fan screen gives you two choices to control the way warm air enters the room: Automatic and Manual. The default is set as Automatic.

Automatic allows the stove to automatically adjust the amount of warm air entering the room to achieve and maintain the set temperature.

In Manual, you can set the fan rate between off and maximum. For your reference, the fan percentage rate is displayed on the lower right of the screen.

Safety note: The unit will override the low Manual setting at high burn rates.

# Schedule



The Schedule screen gives you the ability to set temperatures you want your home to be throughout the day.

### Here's How:

- Press Set Schedule to get to the scheduling screen (see instructions on adjacent page)
- Set schedule for all seven days of the week
- Return to scheduling screen
- Press Schedule On or Schedule Off icon

The Schedule icon will have a 22 through it if schedule is on but the time is not set. This also may occur due to power outage.

The Schedule icon will have a  $\bigoplus$  over it when temperatures are overridden by adjusting the up and down arrows on the home screen. Scheduling will resume at the next time period.

Notes:

- When scheduling is on, a small clock icon will show on top right of the home screen
- You can choose to change any of these settings at any time
- If you unplug your stove at the end of the heating season, the EASYTouch Control will remember your schedule setting
- Scheduling will not work in Constant Burn mode. Constant Burn will override scheduling to maintain the consistent burn you set
- The day and time must be set for scheduling to function

# Schedule



М	6:00am	7:30am	5:30pm	10:30pm
	70°	65°	72°	68°
ΤU	6:00am	7:30am	5:30pm	10:30pm
	70° 🔵	65°	72°	68°
W	6:00am	7:30am	5:30pm	10:00pm
	72°	65°	72°	67°
τн	6:00am	8:00am	6:00pm	9:30pm
	72° 🔵	65°	70°	70°
F	6:00am	8:00am	6:00pm	11:00pm
	70°	65°	72°	68°
SA	9:00am	10:30am	8:30pm	11:30pm
	72°	62°	72°	67°
SU	9:00am	11:00am	7:00pm	10:00pm
	72°	62°	70°	68°
Back		Tou	ch Any Block	to Edit

# Set Schedule

**Step I:** Choose day



MONDAY

- **Step 3:** Set temperature
- Step 4: Choose Whisper Mode on/off



## **Copy Schedule**

- Copy this day's schedule 🛄
- Choose day for this schedule
- Paste into each day you want this schedule

### Review Schedule



- Press any block to edit, if needed, to return to previous menu
- Touch Exit when finished scheduling all seven days



or select Back



MONDAY





Test screen allows you to test the individual functionality of the motors and igniter. To test functionality, simply press the icon for the component you want to test. The icon will change colors while testing.

During testing, the components will do the following:

Room Fan: (Is air moving?)

- First touch turns blower on maximum set point
- Second touch reduces blower to minimum set point
- Third touch turns off the fan

Combustion Fan: (Can you hear it?) A message will appear stating the RPM.

- First touch turns on full voltage RPM
- Second touch goes to max RPM set point
- Third touch goes to minimum RPM set point
- Fourth touch turns off the fan

Note: A cold unit may show reduced RPM's due to air density.

Feed Motor: (Is auger moving?)

- First touch starts the test, and automatically turns on combustion fan to activate the pressure switch safety device in the auger circuit
- Second touch turns off the igniter
- Third touch turns off the combustion fan

**Igniter:** This test only needs to be performed if you experience failed ignition. We recommend contacting your authorized Harman dealer for assistance. (After one minute, open the front door and check for heat. Be careful since the burn pot can be hot.)

- First touch starts the test and automatically turns on combustion fan to activate the pressure switch safety device in the igniter circuit
- Second touch turns off the igniter
- Third touch turns off the combustion fan

**Touch Test:** The touch accuracy can be tested on the Touch Test Area by pressing inside the rectangle. If circles appear outside of the area you touched, calibration may need to be completed by your authorized Harman dealer. The other data on this screen are factory tests that do not need to be accessed.

## Menu 2 Overview



The second menu includes:

- A Home Screen Options: Add more data to your home screen if desired
- **B** Screen Brightness: Change the brightness of the touch screen
- C Day/Time: Set the day and time that appears on the home screen
- D Fuel Calibration: Adjust low fuel indicator timing
- **E** Lock: Lock your screen to protect from others in your home from changing temperature/setting
- F Languages: Choose the language you prefer
- G Units: Choose Metric or English units of measure
- H Wireless Room Sensor: Enable optional wireless room sensor

## Home Screen Options



If you prefer to see how your Harman pellet stove is performing without going into the menus, you can elect to have information shown on your home screen.

### Show Dashboard will display status of:

- Room fan with percentage
- Combustion blower with RPMs
- Auger motor with percentage
- Igniter: On when color, ESP temperature when grey

### Show Fuel Gauges will display:

• Estimated pounds until empty: Turning this function on enables the Touch Here If Hopper Was Filled prompt which notifies the calculator when a bag of pellets was added or the hopper is filled

Note: Fuel calibration is required to obtain accuracy - see page 23

- Approximate fuel used in last 24 hours
- Outside air temperature (requires outside air kit)



This screen shot shows what the home screen would look like if both Show Dashboard and Show Fuel Gauges are selected.

## Home Screen Options, continued



The **Low Fuel Warning Flash** will enable the hopper light to flash when it senses the fuel is low. This flashing light is a signal to add fuel and is visible from a distance. The low fuel warning/flash only occurs if fuel gauge or flash turned on.



### Hopper Fill Screen

For the most accurate fuel calculations, Fuel Calibration (Page 24) should be performed and either Show Fuel Gauges and/or Low Fuel Warning Flash should be selected on the Home Screen Options screen. Both of these icons signal the Hopper Fill screen to appear each time the hopper senses it was opened, then closed.

A screen will appear asking how much fuel has been added.

- Select: No Fuel Added, Add One Bag, Totally Filled or Exit
- If you added more than one bag, press the Add One Bag for each bag added
- If a partial bag was added, the arrows in the lower right corner allow you to adjust the pounds

**Note:** If you do not press anything, the screen will return to the home screen after five minutes.

## Screen Brightness



The Brightness screen allows you to change how bright the display screen is when it is active and inactive.

Active: Touch screen brightness and adjust with arrows from 20% to 100%

Auto-Dim: Touch screen brightness and adjust with arrows from 0% to 100%

After 30 seconds of inactivity the display will revert to the auto-dim state and go back to the home screen.

# Day/Time



The Day/Time screen allows you to set the current month, day, year and time.

### To set:

- Select the current month using up and down arrows
- Touch the day, which will turn yellow, and select the current day by using the up and down arrows
- Touch the year and select the current year by using the up and down arrows
- Touch Time to adjust the hours, continuing for am and pm.
- Touch the minutes numbers and adjust by using the up and down arrows

#### Note:

- You can easily go back to reset the date and time by touching the Day/Time area on the home screen
- The Day/Time must be set for the scheduling feature to work
- The Day/Time will automatically set to the correct time after a power outage if it is connected to the optional wireless room sensor



# **Fuel Calibration**



Fuel Calibration should be done for the most accurate fuel gauge and usage. When used in conjuction with the Hopper Fill screen(requires indicating when you add fuel. See Page 21), the Low Fuel Warning appears on the home screen at the most appropriate time.

#### To Calibrate:

Go to Menu page 2/3, select Fuel Calibration. Follow the instructions on the screen:

- · Begin with an empty hopper
- Press Start on the Fuel Calibration screen
- Add one full bag of pellet to hopper (this is preset at 40lb bag, but settings allows you to alter the weight of the bag)
- Burn until a handful of fuel remains this will take several hours
- Return to Fuel Calibration screen then press End to complete the calibration

You will notice the Lbs/Empty and Calibration Percent will automatically change, indicating the changes made to properly calibrate your fuel. If you desire even more precise calculation, use Settings to alter the bag size, hopper size and calibration percent.

If, during calibration, the hopper is completely emptied and the stove runs until an error appears, press End. The calibration percent could be increased manually by a few percent to compensate for the time the stove ran without pellets.

Note:

- For best calibration, burn the stove in the same fashion as you would on a daily basis
- · Calibration may be required when using various brands of fuel based on quality
- If you return to the home screen while fuel calibration is in progress, a message will be visible as a reminder
- You can also turn on a low fuel warning light within home screen options that will cause the hopper light to blink and alert you when pellets are getting low









The Lock screen provides an easy way to lock the EASY Touch Control. This feature protects the control from being accessed.

### To Lock:

- Go to Lock screen
- Press the Lock icon
- Return to home screen and notice the small Lock icon on the lower right corner—settings cannot be altered when control is locked

### To Unlock

- Press the small Lock icon on the lower right corner of the home screen this will take you to the Lock screen
- Press the Unlock icon

### **Temporary Unlock**

• Unlocks the control for 30 seconds to allow adjustments throughout the control, then automatically re-locks

## Languages and Units



The Languages screen allows you to select the language of your choice. The units of measure will change to the standard units for that language, e.g. French will change to kilograms and Celsius. If the selected units of measure are not preferred, they can be changed in the Units screen.



The Units screen gives the option to see temperature in Fahrenheit or Celsius and weight in pounds or kilograms. Simply press the icon of the preferred unit.

## Wireless Room Sensor



The optional wireless room sensor provides accurate room temperature within one degree in the area you choose to place the sensor.

The optional wireless room sensor (part #3-20-777556) is purchased separately and includes the wireless room sensor, two "AA" batteries, mounting screws and instructions.



### Placement:

We recommend the wireless room sensor be mounted on an interior wall approximately five feet from the floor

and up to 30 feet away from the pellet appliance with minimal obstruction for proper signal strength.

The wireless room sensor is powered by two "AA" batteries. If the batteries are low, you will receive a message on the home screen reminding you to change the batteries. If the batteries are exhausted, the home screen will tell you to replace batteries in wireless room sensor. If the batteries are exhausted, the unit will use the backup sensor to continue heating your home based on the temperature detected by this sensor located at the back of your unit.

The light at the bottom of the sensor will turn colors as follows:

- Green: When signal is being transmitted
- Amber: When searching
- Red: When signal is lost

In the event of a power outage, the wireless room sensor will automatically reset the day and time which will allow the schedule to resume, if it was turned on.

Connection strength and battery levels of the wireless room sensor can be seen on Diagnostic page 6 of 6.

## Wireless Room Sensor Instructions

Note: Touch software (diagnostics page 5/6) must be 16.01.01 or newer. Remarque: Le logical Toucher (Diagnostics, page 5/6) doit être 16.01.01 ou plus récent. Nota: El Programa de toque (diagnóstico página 5/6) debe ser 16.01.01 o más reciente

#### I. Press Menu Appuyez sur Menu sur l'écran d'accueil

Pulse Menú en la pantalla de inicio

2. Go to Page 2/3 • Allez à la Page 2/3

Vaya a la página 2/3

#### 3. Press Wireless Sensor Icon Appuyer sur icône de capteurs sans fil

Presione el icono de Sensor inalámbrico

## 4. Press Enable Communication

Appuyez sur Activer Communication Pulse Activer Comunicación

## 5. Insert batteries into wireless sensor

Insérez les piles dans le capteur sans fil Inserte les baterías wirelesss sensor

### 6. Wireless Sensor Found will appear Sonde sans fil détecté s'affiche

Se encontró el sensor inalámbrico aparecerá

## 7. Press Select Sensor

Appuyez sur sélectionner sonde Pulse Seleccionar Sensor

## 8. Wireless Sensor Status OK will appear

État du sonde sans fil OK s'affiche

Estado del sensor inalámbrico OK aparecerá

### 9. Press Home

28

Icon; the wireless temperature will appear within 20 seconds

Appuyez sur Home – la température sans fil s'affiche dans les 20 seconds Presione Home – la temperatura inalámbrica aparecerá en 20 segundos

## 10. Mount the wireless sensor up to 30 feet away, five feet off the floor

Monter le capteur sans fil jusqu'à 10 mètres, large de 150 centimètres du sol Monte el Sensor inalámbrico de hasta 10 metros, 150 centímetros fuera de la planta



Wireless Temperature Sensor Wireless Sensor Found

Wireless Temperature Sensor

Wireless Sensor Status OK







## Menu 3 Overview



The third menu includes:

- A Dealer Info: Access your authorized Harman dealer's contact information
- B Factory Defaults: Allows you to reset to factory settings
- C USB: Shows the USB menu for software upgrades
- D Video/Manual: Scan QR codes to view manuals and use and care video

## **Dealer Information**



The Dealer Information screen contains your Harman dealer information. Please contact this dealer for all your Harman pellet stove needs.

In case you feel you have a problem with your unit, your dealer may instruct you to press the Diagnostic or Test icon to give them more detailed data to properly troubleshoot your pellet stove over the phone.

## **Factory Defaults**



The Factory Default screen guides you through properly resetting your unit to the factory default settings.



Select Yes to erase your settings and return to factory defaults.

Select No to cancel reset.



If Yes was selected, this screen will appear to confirm the EASY Touch Control has been reset to the factory default.

# USB



The USB screen displays actions that use the USB jump-drive port on the side of the EASY Touch Control. **Please Note:** The USB port <u>is not</u> a charging port for smart phones, tablets etc.

This screen includes:

**Save History** saves data of your unit's performance history that can be shared with an authorized dealer to help troubleshoot your unit.

**Firmware Update** is used for EASY Touch Control updates which can be uploaded to the provided USB drive. You may use another USB drive. Firmware update notices are available on harmanstoves.com on the Downloads tab for your model. Follow the direction published on the website.

Load Settings allows you to load your saved settings.

- While on the USB screen, insert the USB drive
- The icons will become colored, indicating they can be selected
- Select the Load Settings Icon
- The information is transferred immediately

**Save Settings** allows you to save your settings on the EASY Touch Control onto a USB drive.

- While on the USB screen, insert the USB drive
- The icons will become colored, indicating they can be selected
- Select the Save Settings icon
- The information is transferred immediately

# Video/Manual



This screen allows you to access the EASY Touch Control video and manual anytime by scanning the QR code with your smart-phone or tablet.

## **Cleaning Prompts, Messages and Errors**

Your EASY Touch Control communicates with you by showing messages on the top center of the EASY Touch Control home screen. If you have more than one message, the messages will show consecutively until you acknowledge the message by performing the task. These communications include:

#### A prompt means cleaning needs to be performed.



When prompted, scrape burnpot. Press checkmark to reset.

When prompted, inspect and empty ash pan as needed. Press checkmark to reset.

When prompted, inspect and perform total clean. Press checkmark to reset.

#### A message is a notification.

	Wireless Room Sensor Low Battery Warning
ES	Using Backup Sensor
SSAG	lgniting
Ψ	Shutting Down
	Fuel Calibration in Progess

Replace the two AA batteries in the Wireless Room Sensor.

If wireless room sensor batteries die, the backup sensor will continue to heat your home.

Will show on the display when the unit is in the process of igniting.

Will show on the display when the unit is in the process of shutting down.

Will show in display when Fuel Calibration has been enabled. Once calibration is complete, message will disappear. An error message means attention must be given to the message for proper stove performance.



Check and close the front and ash doors for the stove to continue to heat.

Close the hopper lid for the stove to continue to heat.

Fill the hopper with pellets. Press checkmark to reset. If you did not fill the hopper, the message will stop after 30 seconds.

Batteries in wireless room sensor have expired. Replace the two AA batteries.

Backup room sensor has failed. Call your Harman dealer.

Unit has failed to ignite. Scrape the burnpot. Call your Harman dealer if problem persists.

EASY Touch Control has lost communication. Unplug unit and plug back in. If no change, call your Harman dealer.

Exhaust Sensing Probe (ESP) has failed. Clean the ESP. If issue persists, call your Harman dealer.

Clean your stove. Call your Harman dealer if problem persists.

Once fuel level reaches 15% capacity this will show on the touch display. This error only appears if Fuel Gauge is enabled.

Once fuel level reaches 15% capacity the light located on the underside of the touch display will flash if the home screen options do not have Flash enabled.

Will show on display when power loss is sensed and Continue Operation is enabled in the power failure menu. Only displays when a battery backup is present.

## Software Updates

The software update file can be used for all Harman product with the EASY Touch Control. The software update file has been placed in the downloads tab of each unit, for your convenience.

- Go to downloads tab of any Harman pellet stove with EASY Touch Control and find the software update area. (Example: http://www. harmanstoves.com/Products/Absolute43-Pellet-Stove.aspx?page=Downloads).
- Insert a USB drive into your computer. If the USB has a HarmanFW folder on it, delete the folder. Click on the EASY Touch Control software update and "Save As" to the USB (example: E:\ drive).
- Go to the location of the file you just saved. Right click on the HarmanFW.zip file and select Extract All.
- When prompted to select the location for the files, select the USB. (example E:\HarmanFW), then press Extract.

5.

36

drive (example E:\)then click Eject to safely remove the USB drive from your computer.

After progress bar is complete, right click on the USB

- 6. Place the USB drive into the programming port on the side of the EASY Touch Control.
- 7. Go to menu page 3/3 and press the USB icon. On the USB screen, press the Firmware Update icon and select Yes, You Are Sure to load software update.

10001010-451	aler otove shown in re	reciam binjonen i	1. In the second second
OVERVIEW	FEATURES/OPTIONS	SPECIFICATIONS	DOWNLOAI



LE Extract Compressed (Zipped) Folders	
Select a Destination and Extract Files	
Files will be extracted to this folder:	
CM longer IW	Drowse
V Show extracted files when complete	
	Estract Cancel

Computer
SDisk (C:)

Expand

Format.



## Software Updates Cont.

8. The EASY Touch Control will automatically upload the software update into the EASY Touch Control. The display will flash, for approximately one minute, then yellow text will scroll on the screen for one minute. The Harman logo or Language Selection will appear when complete. Remove the USB drive from the EASY Touch Control.

#### Notes:

- You can use any USB, however your Harman pellet stove was shipped with a Harman USB.
- Software updates may include added features, icons, or corrections
- Your settings and schedule (if set) will not be overridden during the software update process

#### Troubleshooting:

If the update fails part way through the process

(bad USB or power fail or USB removed too soon), the touch may appear to be dead or look strangely(missing text/icons). Insert a good USB containing a good update then plug in stove to power will force a reload.



### I. What's the difference between Whisper on/off?

Whisper optimizes all sound reducing components to make the stove operate at the quietest levels possible. The maximum BTU in Whisper is reduced by roughly 5,000 BTU.

### 2. How do I know when to clean the stove?

A cleaning message will appear in the message area of the home screen. Simply perform the cleaning and press the yellow checkmark.

### 3. What happens if I press Reset to Factory Default?

While you cannot hurt your stove or cause harm, Factory Default resets the control board to the original factory settings.

#### 4. Do I need to use the menus?

The EASY Touch Control was designed for you to never have to leave the home screen if you want to operate in the most popular, Automatic Ignition and Room Temperature mode. However, the most used menu items are on the first menu page.

### 5. Who do I contact for Customer Service?

If you have questions or concerns about your Harman pellet stove, call your local authorized Harman dealer. Their contact information is on menu 3 for your convenience.





www.harmanstoves.com

# **Dry Gas Meter Calibration**

Meter Manufacturer:	Apex	
Model:	XC-60	
Lab ID #:	53	
Serial #:	1902130	
Calibration Date:	7/25/2022	
Calibration Expiration:	1/25/2023	
Barometric Pressure:	29.74	in. Hg
Barometric Pressure:	29.74	in. Hg



<b>Reference Stand</b>	lard DGM	Unit Under Test Previous	Calibration
Manufacturer:	Apex	Date	3/21/2022
Model:	SK25DA	γ Factor:	1.015
Lab ID#:	47	Allowable Deviation (±5%):	0.05075
Serial #:	1101001	Actual Deviation:	0.02
n Expiration Date: 3/30/2023		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)	143.588	142.845	142.939
Standard DGM Temperature (°F)	80.0	80.0	80.0
Standard DGM Pressure (in H ₂ O)	0.00	0.00	0.0
DGM Initial Volume (ft ³ )	0.000	0.000	0.000
DGM Final Volume (ft ³ )	5.232	5.241	5.261
DGM Temperature (°F)	105.0	105.0	105.0
DGM Pressure (in H ₂ O)	4.58	1.95	1.06
Time (min)			
Net Volume for Standard DGM (ft ³ )	5.071	5.045	5.048
Net Volume for DGM (ft ³ )	5.232	5.241	5.261

Dry Gas Meter γ Factor	1.000	1.000	0.999
γ Factor Deviation From Average	1.000	1.000	0.999

## Average Gas Meter y Factor

Calibration Expiration Date: 3/30/202

Calibration y Factor: 0.9978

1.000

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 Fullon

# **Pressure Gauge Calibration Work Sheet**

Gauge Manufacturer:	Арех	
Maximum Range (inH ₂ O):	1	
Instrument ID #:	053 (dP)	
Calibration Date:	7/26/2022	
Calibration Expiration:	7/26/2023	
Barometric Pressure:	29.74	in. Hg



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

Calibration Point (inH ₂ O)	Reference Gauge Reading (inH2O)	Pressure Gauge Reading (inH2O)	Difference (Reference - UUT)	% Error of Full Range
0.0 - 0.2	0.14	0.15	0.009	0.9%
0.2 - 0.4	0.30	0.32	0.018	1.8%
0.4 - 0.6	0.46	0.48	0.027	2.7%
0.6 - 0.8	0.62	0.66	0.034	3.4%
0.8 - 1.0	0.82	0.85	0.033	3.3%

Acceptable tolerance is 4%

Fullon Technican Signature:

Date: 7/26/2022

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

## **Emissions Sampling System Thermocouple Calibration Check**

Calibration based on NIST Monograph 175 per ASTM E2515-11 All thermocouples are type "K"

Date: 07/25/2022

Sampling System ID Numbers: 053/054

Performed By: S. Button

Calibration Instrument ID Number: 165

Reference	Acceptable	Thermocouple Location						
(F)	Error (F)	FB Left	FB Right	FB Back	FB Top	FB Bottom	Catalyst Exit	Flue
0	± 4.0	1.3	1.3	1.7	1.2	1.2	1.5	2.0
200	± 4.0	201.1	201.0	201.5	200.9	201.0	201.3	201.7
400	± 4.0	401.2	401.0	401.5	400.8	401.0	401.3	401.7
600	± 4.5	601.9	600.9	601.4	600.8	600.9	601.3	601.6
800	± 6.0	801.0	800.9	801.3	800.8	800.8	801.2	801.6

Reference	Acceptable	Thermocouple Location					
(F)	Error (F)	Ambient*	Filter A	Filter B	Meter A	Meter B	Dilution Tunnel
0	± 4.0	0.1	2.2	1.3	1.5	1.6	2.3
200	± 4.0	200.0	201.9	202.5	201.2	201.2	201.9
400	± 4.0	399.9	401.9	402.4	401.2	401.2	402.0
600	± 4.5	600.0	601.9	602.2	601.1	601.2	601.8
800	± 6.0	-	801.8	801.9	801.0	801.0	801.6

*Ambient Probe is a Type T, Error Limit is ± 0.9 F

Technician Signature: Julian Date: 7/25/2022

# **Dry Gas Meter Calibration**

Meter Manufacturer:	Apex	
Model:	XC-60	
Lab ID #:	54	
Serial #:	1902133	
Calibration Date:	7/25/2022	
Calibration Expiration:	1/25/2023	
Barometric Pressure:	29.70	in. Hg



Reference Standard DGM			
Manufacturer: Apex			
Model:	SK25DA		
Lab ID#:	47		
Serial #:	1101001		
Calibration Expiration Date:	3/30/2023		
Calibration y Factor:	0.9978		

Unit Under Test Previous Calibration		
Date	3/21/2022	
γ Factor:	0.985	
Allowable Deviation (±5%):	0.04925	
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)	146.661	157.228	144.674
Standard DGM Temperature (°F)	81.0	81.0	82.0
Standard DGM Pressure (in H ₂ O)	0.00	0.00	0.0
DGM Initial Volume (ft ³ )	0.000	0.000	0.000
DGM Final Volume (ft ³ )	5.390	5.750	5.339
DGM Temperature (°F)	108.0	108.0	109.0
DGM Pressure (in H ₂ O)	2.75	4.77	1.28
Time (min)			
Net Volume for Standard DGM (ft ³ )	5.179	5.552	5.109
Net Volume for DGM (ft ³ )	5.390	5.750	5.339

Dry Gas Meter γ Factor	1.000	1.000	0.999
γ Factor Deviation From Average	1.000	1.000	0.999

## Average Gas Meter y Factor

1.000

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%.

Technican: Futon

# **Pressure Gauge Calibration Work Sheet**

Gauge Manufacturer:	Арех	
Maximum Range (inH ₂ O):	1	
Instrument ID #:	054 (dP)	
Calibration Date:	7/26/2022	
Calibration Expiration:	7/26/2023	
Barometric Pressure:	29.74	in. Hg



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

Calibration Point (inH ₂ O)	Reference Gauge Reading (inH2O)	Pressure Gauge Reading (inH2O)	Difference (Reference - UUT)	% Error of Full Range
0.0 - 0.2	0.13	0.15	0.019	1.9%
0.2 - 0.4	0.36	0.38	0.027	2.7%
0.4 - 0.6	0.50	0.51	0.012	1.2%
0.6 - 0.8	0.62	0.65	0.028	2.8%
0.8 - 1.0	0.91	0.94	0.028	2.8%

Acceptable tolerance is 4%

- Eullon Technican Signature:

Date: 7/26/2022

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

# **Dry Gas Meter Calibration**

_____

Mater Manufactures	A	
Meter Manufacturer:	Арех	
Model:	XC-50-DIR	
Lab ID #:	203	
Serial #:	A2204292	
Calibration Date:	7/25/2022	
Calibration Expiration:	1/25/2023	
Barometric Pressure:	29.77	in. Hg



Reference Standard DGM		
Manufacturer:	Apex	
Model:	SK25DA	
Lab ID#:	47	
Serial #:	1101001	
Calibration Expiration Date:	3/30/2023	
Calibration γ Factor:	0.9978	

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)	146.097	151.718	144.533
Standard DGM Temperature (°F)	78.5	79.0	80.0
Standard DGM Pressure (in H ₂ O)	0.00	0.00	0.0
DGM Initial Volume (ft ³ )	0.000	0.000	0.000
DGM Final Volume (ft ³ )	5.340	5.541	5.316
DGM Temperature (°F)	100.0	104.0	105.0
DGM Pressure (in H ₂ O)	1.00	1.00 3.64	
Time (min)			
Net Volume for Standard DGM (ft ³ )	5.159	5.358	5.104
Net Volume for DGM (ft ³ )	5.340	5.541	5.316

Dry Gas Meter γ Factor	1.000	1.001	0.998
γ Factor Deviation From Average	1.000	1.001	0.998

## Average Gas Meter y Factor

0.999

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: Setate Fullon

# **Dry Gas Meter Calibration**

Meter Manufacturer:	Apex	
Model:	Apex-AK-600	
Lab ID #:	55	
Serial #:	810016	
Calibration Date:	7/27/2022	
Calibration Expiration:	7/27/2023	
Barometric Pressure:	29.86	in. Hg



Reference Standard DGM				
Manufacturer:	Арех			
Model:	SK25DA			
Lab ID#:	47			
Serial #:	1101001			
Calibration Expiration Date:	3/30/2023			
Calibration γ Factor:	0.9978			

Unit Under Test Previous Calibration				
Date 10/8/2021				
γ Factor:	0.997			
Allowable Deviation (±5%):	0.04985			
Actual Deviation:	0.03			
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)	165.822	145.728	160.540
Standard DGM Temperature (°F)	75.0	75.0	77.0
Standard DGM Pressure (in H ₂ O)	0.00	0.00	0.0
DGM Initial Volume (ft ³ )	0.000	0.000	0.000
DGM Final Volume (ft ³ )	5.745	5.045	5.556
DGM Temperature (°F)	80.0	81.0	82.0
DGM Pressure (in H ₂ O)	0.00	0.00 0.00	
Time (min)			
Net Volume for Standard DGM (ft ³ )	5.856	5.146	5.669
Net Volume for DGM (ft ³ )	5.745	5.045	5.556

Dry Gas Meter γ Factor	1.027	1.029	1.028
γ Factor Deviation From Average	1.027	1.029	1.028

## Average Gas Meter y Factor

1.028

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%.

Technicatedan Fullon

## Certificate of Calibration

743892 Certificate Number:

PFS TECO



11785 SE Hwy 212 Suite 305 Clackamas, OR 97015		PO: 1033 Order Date: 03/08/2021 Authorized By: N/A	ACCREDITED 0723.01 Calibration
Property #:	007	Calibrated on: $02/10/2021$	
rioperty #.	097		
User:	N/A	*Recommended Due: $03/18/2026$	
Department:	N/A	Environment: 19 °C 41 % RH	
Make:	Unknown	* As Received: Other - See Remarks	
Model:	10 Lbs.	* As Returned: Other - See Remarks	
Serial #:	097	Action Taken: Calibrated	
Description:	Mass	Technician: 126	
Procedure:	DCN 500901		
Accuracy:	Raw Data		

* 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. Remarks: Uncertainties include the effects of the unit.

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

			<u>c</u>	Standards	Used			
Std ID	Manufacturer	Model		Nome	enclature		Due Date	Trace ID
484A	Rice Lake	1kg-10k	g (Class AST	M 1) Mass	s Set,		05/28/2021	699197
503A	Rice Lake	1mg-200	g (Class O)	Mass	s Set,		09/11/2021	729241
550A	And (A&D) Co.	HP- 30K	-	Bal a	nce 30 Kg		12/31/2021	739307
723A	Rice Lake	1mg-200	g (Class O)	Mass	s Set,		06/09/2021	723431
Parameter	r		Mea	asurement	Data			
Measure	ment Description	Range Unit					UUT	Uncertainty
Before/	After		Reference	Min	Max	*Error		Accredited = $\ddot{U}$
Mass								
Raw Data		g	4535.92370000	0.0000000	0.0000000	0.1785299	4536.1022299 g	3.5E-01 Ü

This instrument has been calibrated in accordance with the JJ Calibrations Quality Assurance Manual and is traceable to either the SI or to National Institute of Standards and Technology (NIST). The quality system and this certificate are in compliance with ANSI/NCSL Z540-1-1994, ISO/IEC 17025-2017, ISO 10012-1, the ISO 9000 family and QS 9000. The expanded uncertainties of measurements for this calibration are based upon 95% (2 sigma) confidence limits. Unless stated in the comments, certificates reflect the "Simple Acceptance Rule" as specified by JCGM 106:2012. Unless otherwise stated, a test accuracy ratio (TAR) of 4:1, if achievable, is maintained. The results reported herein apply only to the calibration of the item described above. This report may not be reproduced, except in full, without written approval of JJ Calibrations.

2

3 Issued 03/25/2021 Rev #15

agge Merrie


On-Site (Customer's)

Page _____ of ____

**IAS** 

Calibration Laborator

# **CERTIFICATE OF CALIBRATION**

**CUSTOMER:** PFS-TECO: CLACKAMAS, OR CALIBRATION DATE: 05/03/2022 **PO NUMBER:** 1071 CALIBRATION DUE: 05/03/2023 DWYER **INST. MANUFACTURER: PROCEDURE:** T.O.33K6-4-1769-1 VELOMETER INST. DESCRIPTION: **CALIBRATION FLUID:** AIR @ 14.7 PSIA 70°F **MODEL NUMBER:** 471 **RECEIVED CONDITION:** WITHIN MFG. SPECS. SERIAL NUMBER: CP288559 ID# 095 WITHIN MFG. SPECS. LEFT CONDITION: **RATED ACCURACY:** SEE NOTES BELOW. **AMBIENT CONDITIONS:** 763mm HGA 51% RH 72°F UNCERTAINTY GIVEN: ± 0.43% RD ; k=2 **CERTIFICATE FILE #:** 490265.2021 NOTES: ± 3% FS (0-500 / 0-1500) *** ± 4% F.S. (0-5000) ***± 5% F.S. (0-15000) *** ± 2 °F

DICK MUNNS COMPANY

LIQUID & GAS FLOW CALIBRATION

#### Q.MANUAL IM 2.0 REV 2020.2 DATED 7-27-2020 **** DECISION RULE : NO PFA%

UUT	DM.STD.	UUT	DM STD.
INDICATED	ACTUAL	INDICATED	ACTUAL
FT/MIN	FT/MIN	DEG. F	DEG. F
65	68	0 TO 200°F	0 TO 200°F
129	133	45.1	44.2
260	266	71.7	70.9
498	509	99.3	98.5
526	534		
1039	1058		
1484	1517		
523	534	-	
3076	3151		
4998	5127		
6752	6907	-	
14679	15068	-	

STANDARDS USED:		
A24: HART SCIENTIFIC TEMP. STANDARD   ± 0.024 F   TRACE# 1617259390	DUE	04/12/2023
A800: FLOW-DYNE SONIC NOZZLE SYSTEM   0 - 1086 CFM ± 0.46% RD.   TRACE# 1329407628, 89576, 152043238	DUE	12/10/2022

All instruments used in the performance of the shown calibration have traceability to the National Institute of Standards and Technology (NIST). The uncertainty ratio between the calibration standards (DM.STD.) and the Unit Under Test (UUT) is a minimum of 4:1, unless otherwise noted. Calibration has been performed according to the shown procedure. The use of IAS/ILAC logo indicates calibrations are in accordance to ISO/IEC 17025:2017.

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

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

 Issuing Date:
 Approved By:
 Cal. Technician:
 Calibrated at:
 Lab

05/03/2022

cluichang sta



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PFS Teco 11785 SE Hwy 212 STE#305 Clackamas, OR 97015 Report Number: DIRI0134307497220609

## A2LA ACCREDITED CERTIFICATE OF CALIBRATION WITH DATA

## INSTRUMENT INFORMATION

ltem	Mal	(e	Model	Serial Number	r Custome	r ID Location			
Balance	Sarto	Sartorius ENTRIS224		IS 34307497	#107	Lab			
Units	Reada	ability SOP		Cal Date Last Ca		Date Cal Due Date	)		
g	0.00	)1 QC012		6/9/22	1/27/22	1/2023			
	FUNCTIONAL CHECKS								
E	ECCENTRICITY L		ARITY	STANDARD DE	ENVIRONMENTAL				
Test	Wt: Tol:	Test Wt:	Tol:	Test Wt:	Tol:	CONDITIONS			
1	00 0.0003	50 x 4	0.0002	100	0.0001				
	As-Found:	As-F	ound:	1.100.0000 5.100.000	00 <b>9.</b> 100.0001	Good Fair Poor			
Pass:	☑ Fail: □	Pass: 🗹	Fail:	<b>2.</b> 100.0001 <b>6.</b> 100.000	01 <b>10.</b> 100.0000				
	As-Left: As-Left:		3.100.0001 7.100.000	00 <u>Result</u>	Temperature: 22.3°C				
Pass	E 🗹 Fail: 🗆	Pass: 🗹	Fail:	<b>4.</b> 100.0000 <b>8.</b> 100.000	01 0.00005				
		Δ2ΙΔ	ACCREDI						

	ALLA AUGILLU U		
Standard	As-Found	As-Left	Expanded Uncertainty
200	199.9988	200.0000	0.00017
100	99.9989	100.0000	0.00016
50	49.9994	49.9999	0.00016
20	19.9999	20.0000	0.00015
1	1.0000	1.0000	0.00015
0.1	0.1000	0.1000	0.00015

## CALIBRATION STANDARDS

Item	Make	Model	Serial Number	Cal Date	Cal Due Date	NIST ID
Weight Set	R.L./Troemner	10kg to 1mg	G782	4/14/22	4/2023	20220751

## Permanent Information Concerning this Equipment:

Comments/Info Concerning this Calibration:

6 month calibration cycle

Report prepared/reviewed by:

1/22 Extra checkpoint to encapsulate user range 0.05g. AF= 0.0500g A/L= 0.0500

122	Technician:	K.	Dex
		4	1.1.1.1

6/22: Adjusted Span, RH- 45.3%

xter Signature: M

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

Date: (, 19

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.



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## **Report of Calibration**

Firm: PFS-TECO Address: 11785 SE Hwy 212, Ste 305 City/State/Zip: Clackamas, OR 97015 Test Completed: 05/09/22 Purchase Order: 1067 Traceable Number: 20220682

Test Item: 200 mg and 100 mg Individual Weights Serial No.: Listed in Table Manufacturer: Troemner Customer ID: Listed in Table

Material Stainless Steel Assumed Density 7.95 g/cm³

<u>Range</u> 200 mg & 100 mg Tolerance Class ASTM Class 1

#### Method and Traceability

The procedure used for this calibration is NIST IR 6969 SOP 4 Double Substitution Weighing Design. Standards used for comparison are traceable to the National Institute of Standards and Technology (reports on file) and are part of a comprehensive measurement assurance program for ensuring continued accuracy and traceability within the level of uncertainty reported. The Traceable Number listed above is Traceable to National Standards through an unbroken chain of comparison each having stated uncertainties.

Standards Used:100 g to 1 mg Working Standards Were Calibrated:07/02/21Due:07/31/22Standards ID:723318Mass Comparators Used:MET-05Tested by:D. Thompson

**Conventional Mass:** "The conventional value of the result of weighing a body in air is equal to the mass of a standard, of conventionally chosen density, at a conventionally chosen temperature, which balances this body at this reference temperature in air of conventionally chosen density. International Recommendation 33 (OIML IR 33 1973, 1979). "Conventional Value of the Result of Weighing in Air" (Previously known as "Apparent Mass vs. 8.0 g/cm³).

**Uncertainty Statement:** The uncertainty conforms to the ISO Guide to the Expressions of Uncertainty in Measurement. Uncertainty as reported is based on a coverage factor k=2 for an approximate 95 percent level of uncertainty. Uncertainty components include the standard deviation of the process, the uncertainty of the standard used, an uncertainty component associated with the potential drift of the standard used, and the estimated uncertainty related to measuring and determining the air buoyancy effect.

Conventional Mass Values are listed on page 2 of this report.

pa	ge 1 of 2
Quality Control Services, Inc.	Date: 05/09/22
Metrology Laboratory Manager	<u></u>
E-mail dthompson@qc-services.com	
	Signature David S. Thompson

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## **Report of Calibration**

Firm: PFS-TECO Address: 11785 SE Hwy 212, Ste 305 City/State/Zip: Clackamas, OR 97015 Test Completed: 05/09/22 Purchase Order: 1067 Traceable Number: 20220682

Test Item: 200 mg and 100 mg Individual Weights Serial No.: Listed in Table Manufacturer: Troemner Customer ID: Listed in Table

Laboratory Environment at time of test

Temperature °C	Pressure mmHg	Humidity %RH
21.93 to 21.94	760.7 to 760.8	47.8 to 47.9

## **Conventional Mass Value**

Nominal Value	As Found Value (g)	As Found Correction* (mg)	As Left Value (g)	As Left Correction* (mg)	Uncertainty (mg)	Tolerance (mg)
200 mg, 1000101395, #109-B	0.2000082	0.0082	0.2000082	0.0082	0.0014	0.010
100 mg, 1000126267, #109-A	0.1000065	0.0065	0.1000065	0.0065	0.0014	0.010

*Correction is the difference between the conventional mass value of a weight and its nominal value.

Comments: These weights were received in good condition and were within ASTM Class 1 tolerances As Found.

**Recalibration Due:** The customer has requested a 5-year calibration cycle. The calibration due date for these weights is 05/09/27. The values listed above were found at the time of calibration. Any number of factors may cause these items to drift out of calibration before the calibration interval has expired.

Accredited by the American Association for Laboratory Accreditation (A2LA) under Calibration Laboratory Code 115953 and Certificate Number 1550.01. This laboratory meets the requirements of ISO/IEC 17025:2017 General Requirements for the Competence of Testing and Calibration Laboratories. This laboratory also meets the requirements of ANSI/NCSL Z540-1-1994 and any additional program requirements in the field of calibration.

	page 2 to 2
Quality Control Services, Inc.	Date: 05/09/22
Metrology Laboratory Manager	
E-mail dthompson(@qc-services.com	Signature David S. Thompson

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

## Report Number: DIRI01C101887027220127

## A2LA ACCREDITED CERTIFICATE OF CALIBRATION WITH DATA

INSTRUMENT INFORMATION										
ltem	Make		Model		Serial Number		Custome	r ID Lo	cation	
Scale		Mettler	IND570 -	1000lbx0.	C1018870	27	#189		Lab	
Units	Re	eadability	SOP		Cal Date		Last Cal E	Date Cal D	Due Date	
lbs		0.02	(	QC033	1/27/22		N/A	1	/2023	
	FUNCTIONAL CHECKS									
	SHIFT TESTTest Wt:Tol:4000.10		LINE/ Test Wt: HB44	ARITY Tol: HB44	REPEAT Test Wt: 200	ABILITY Tol: 0.04	ENVII	RONMENTAL ONDITIONS		
	As-Fo Pass:⊠	ound: Fail: □	O     As-Found:       □     Pass:☑     Fail: □       As-Left:     □       □     Pass:☑     Fail: □		As-Found: Pass:☑ Fail:□		Good	☑ □ Fair Poor		
	<b>As-I</b> Pass:⊠	L <b>eft:</b> Fail:□			As-I Pass:⊠	L <b>eft:</b> Fail: □	Temper	rature: 20.4°C		
				CALIBRAT	ION DATA				Ļ	
Stand	ard		As-Found	b		As-Left		Expanded Un	certainty	
100	0		999.46		999.96			0.012		
60	600		599.68	599.68		599.96		0.011		
400	400		399.80		399.98			0.011		
20	200		199.92		199.98			0.011		
10	100		99.98	99.98		99.98		0.011		
50	)		49.98			50.00		0.011		

## **CALIBRATION STANDARDS**

ltem	Make	Model	Serial Number	Cal Date	Cal Due Date	NIST ID				
Avoirdupois Cast W	Rice Lake	25 and 50lb	PWO990-CA	3/13/20	3/2022	202000041				
Permanent Information Concerning this Equipment: Comments/Information Concerning this Calibration										
1/22 RH= 28%. Adjusted span.										
Report prepared/reviewed by: Date: 1/27/22 Technician: Lolaechio Signature:										
THIS CERTIFICA	IE SHALL NOT BE	REPRODUCED, EXCER	PT IN FULL, WITHOUT TH	IE APPROVAL OF Q	UALITY CONTROL SERV	ICES, INC.				
The uncertainty is calculated according to the ISO Guide to the Expression of Uncertainty in Measurement and includes the uncertainty of standards used combined with the observed standard deviation of the unit under test. The uncertainty is expanded with a k factor of 2 for an approximate 95% level of confidence. Instruments listed above were calibrated using standards traceable to the National Institute of Standards and Technology (NIST). Calibration data reflect results at the time and location of calibration. Calibration data should be reviewed to insure that the instrument is performing to its required accuracy. Calibrations comply with ISO/IEC 17025 and ANSI/Z540-1-1994 quality standards.										
L	Member: National Conference of Standards Laboratories and Weights & Measures									

# Aquatech Scientific Instruments LLC

680 Heacock Rd, Suite 204A, Yardley, PA. 19067 web: www.digitalbarograph.com email: sales@digitalbarograph.com PHONE: 215-428-9400 FAX: 267-790-0404

# PRESSURE CALIBRATION TEST REPORT

SEBASTIAN BUTTON	DBX2	118222	X1177	4/16/2022	68
PREPARED FOR	MODEL	SERIAL #	SB #	DATE	TEMP

PRESSURE WHEN SET	INIT OFFSET
997.5	-1.2

118222

DRUCK DPI-740	TEST UNIT	CORRECTION	ADJUSTMENT	ZONE	RANGE
1080.0	1080.2	-0.2	-0.20	ZONE 11	>1075
1060.0	1060.1	-0.1	-0.10	ZONE 10	1070
1040.0	1040.1	-0.1	-0.10	ZONE 9	1050
1020.0	1020.1	-0.1	-0.10	ZONE 8	1030
1000.0	1000.1	-0.1	-0.10	ZONE 7	1010
980.0	980.1	-0.1	-0.10	ZONE 6	990
960.0	960.1	-0.1	-0.10	ZONE 5	970
940.0	940.0	0.0	0.00	ZONE 4	950
920.0	920.0	0.0	0.00	ZONE 3	930
900.0	900.0	0.0	0.00	ZONE 2	910
880.0	880.0	0.0	0.00	ZONE 1	890
860.0	860.0	0.0	0.00	ZONE 0	<865

Values represent actual (mb) data of test unit, prior to unit adjustment (calibration) Pressure standard used is a NIST traceable instrument GE Druck DPI-740 S/N 74003994 Pressure standard used is rated at +/-0.15hPa (mb) of true pressure. GE Druck DPI-740 S/N 74003994 Calibration Due Date: May 31st, 2022

NOTE: Calibration Due Date of test unit: 1 YEAR FROM TEST DATE



## 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



Microtector[®] Gage

## Precision Pressure Measurement

The Microtector[®] Gage combines the timeproven 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 shutoff 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

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 **IPRAXAIR** 

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### DocNumber: 271681

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Praxair Distribution, Inc. 5700 S. Alameda Street Los Angeles CA 90058 Tel: 323-585-2154 Fax: 714-542-6689 PGVP ID: F22019

PXPKG TUALATII 10450 SW TUALA TUALATIN OR 97	nformation N OR H NTIN SHERWOOD R( 062-9547	DAD	Certificate Issu Praxair Orde Pa Customer Pi	ance Date: 10/16/2019 er Number: 71120745 nt Number: NI CD17C08 O Number: 79106732	E-AS Cylind Cylinder Pres	Fill Date: Lot Number: der Style & Outlet: sure and Volume:	10/07/2019 70086928009 AS CGA 590 1300 psig 99 ft3
				1			
		1-01-00	Certified C	Concentration		P	noSpec FZ Co
	Expiration D	ate:	10/16/2027		NIST Traceable	î	
	Cylinder Num	ber:	CC106574		Expanded Uncer	tainty	
4	17	.00 %	Carbon dioxide		+05%	. 2	
	4	.31 %	Carbon monoxid	le	+06%		
	16	.95 %	Oxvgen		± 0.0 %	100	
14		Balanco	Nitrogon	5	± 0.2 %	. 0	
	1	Datance	Nilogen				
This cylinder wa Do Not Use this CO2 responses i ytical Data Component: Requested Certified Cc	s certified according t Standard if Pressure have been corrected f Carbon diox Concentration: 17 % procentration: 17.0	o the 2012 EPA Trac is less than 100 PSI( for Oxygen IR Broad R=Reference Standa ide 0 %	xeability Protocol, Document 3. ening effect. O2 responses h Ird, Z=Zero Gas, C=Gas Car.	#EPA-600/R-12/531, us have been corrected for ( indidate) Reference Standar	ng Procedure G1. CO2 interference. d: Type / Cylinder # Concentration / Uncertainty	#: GMIS / CC1499 /: 19.98 % ±0.275	981 19%
Instrument	Used: Horii	a VIA-510 S/N 20C	194WK	Traceable to: SF	Expiration Date M # / Sample # / Cylinder #	2: 06/07/2026 #: RGM#CC2803:	3 / N/A / RGM#CC2803
Analytical M Last Multing	lethod: NDIF	₹ 8/2010		SRM	Concentration / Uncertainty	y: 19.67% / ±0.04	%
	vsis Data:-	512013	Date 10/16/2019		SRM Expiration Date	e: 07/15/2021	
Z: 0	R: 19.98	C: 17	Conc: 17	Secon	nd Analysis Data:	0. 0	Date
R: 19.9	8 Z: 0	C: 17	Conc: 17	R:	0 Z: 0	C: 0	Conc: 0 Conc: 0
110M- %	C: 17.01	R: 19.99	Conc: 17.01	Z:	0 C: 0	R: 0	Conc: 0
Companyati	0.1			UOM:	70	Mean Test	Assay: %
Certified Co Instrument Analytical M Last Multipu	Incentration: 4,31 Used: Horit Aethod: NDIF pint Calibration: 09/1	% ≫a VIA-510 S/N UB9 ₹ 9/2019	UCSYX	Traceable to: SF SRM	Expiration Date RM # / Sample # / Cylinder # Concentration / Uncertainty SRM Expiration Date	e: 04/03/2025 #: SRM 2642a / 5 y: 7.859% / ±0.03 e: 07/15/2019	51-D-23 / FF23106 9%
First Anal	Dysis Data:	C: 4.34	Date 10/16/2019	Seco	nd Analysis Data:		Date
R: 5	Z: 0	C: 4.31	Conc: 4.31 Conc: 4.31	Z:	0 R: 0	C: 0	Conc: 0
7. 0	C: 4.32	R: 5.01	Conc: 4.32	Z:	0 C: 0	R: 0	Conc: 0
2. 0	0 -	Mean Test /	Assay: 4.31 %	UOM	: %	Mean Test	Assay: %
UOM: %	Oxygen			Reference Standar	d: Type / Cylinder	#: GMIS / CC506	521
UOM: %		3			Concentration / Uncertaint Expiration Date	y: 20.87 % ±0.108 e: 12/14/2026 #: SRM 2659a / 7	3% 1-E-19 / FF22331 21%
Component: Requested Certified Co Instrument Analytical N Last Multipo	Concentration:       17 %         pincentration:       16.9         Used:       OXY         Method:       Para         pint Calibration:       09/1	5 % 'MAT 5E Imagnetic 8/2019		Traceable to: SF SRM	RM # / Sample # / Cylinder i Concentration / Uncertaint SRM Expiration Date	y: 20.863% / ±0.0 e: 08/23/2021	
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Praxair Distribution, Inc. 5700 S. Alameda Street Los Angeles CA 90058 Tel: 323-585-2154 Fax: 714-542-6689 PGVP ID: F22019 CERTIFICATE OF ANALYSIS / EPA PROTOCOL GAS

Custome	C TUALATIN ODU	Certificate Issua Praxair Order	nce Date: 10/16/2019	Fil	I Date: 10/08/2019	
10450 SW TUALATIN SHERWOOD ROAD TUALATIN OR 97062-9547		Part	Number: NI CD10C033E-AS	Lot Number: 70086928102 BE-AS Cylinder Style & Outlet: AS CGA 590 Cylinder Pressure and Volume: 2000 psig 140 ft3		
		Customer PO	Number: 79106732			
		i				
	E C C R	Certified Co	oncentration	*	ProSpec EZ Cert	
	Expiration Date:	10/16/2027	NIST	Traceable		
5	Cylinder Number:	CC139173	Expa	nded Uncertainty		
	10.09 %	Carbon dioxide	the second s	+04%		
	2.53 %	Carbon monoxide	3	10.4 %		
	10.48 %	Ovugan		± 0.6 %		
Sec. 1	Bell	oxygen		± 0.4 %		
2	Balance	Nitrogen				
Certific	ation Information: Certifica	tion Date: 10/16/2019	Term: 96 Months	Expiration D	ato: 10/16/2007	
Th	is cylinder was certified according to the 2012 EPA Trace	ability Protocol, Document,#	EPA-600/R-12/531 Using Procedure	CAPITATION De	ate. 10/16/2027	
Do	Not Use this Standard if Pressure is less than 100 PSIG	1	and a start for the start of th	e oi.	13.16	
A CC	2 responses have been corrected for Oxygen IR Broade	ning effect. O2 responses ha	ve been corrected for CO2 interfere	nce.		
Analyti	cal Data: (R=Reference Standard	d, Z=Zero Gas, C=Gas Cand	idate)			
1. sCo	mponent: Carbon dioxide		Reference Standard: T	vpe / Cylinder #: GMIS / C	C164230	
	Certified Concentration: 10 %		Concentratio	on / Uncertainty: 14.00 % :	t0.265%	
	Instrument Used: Horiba VIA-510 S/N 20C1s	4WK	Traceable to: SPM # / Some	Expiration Date: 04/16/202	27	
100	Analytical Method: NDIR	Set Land	SRM Concentratio	on / Uncertainty: 13 963%	5b / 6-F-51 / CAL014538	
	Last Multipoint Calibration: 09/18/2019	0	SRM	Expiration Date: 05/16/202	12.00478	
	7. 0 P: 14 C: 40 co	Date 10/16/2019	Second Analysis	Data:	Date	
1.5	<b>R:</b> 14 Z: 0 C: 10.09	Conc: 10.09	Z: 0	R: 0 C:, 0	Conc: 0	
	Z: 0 C: 10.1 R: 14.01	Conc: 10.1	R: 0	Z: 0 C: 0	Conc: 0	
	UOM: % Mean Test As	say: 10.09 %	2: U	C: 0 R: 0	Z Conc: 0	
2. Co	mponent: Carbon monoxide	100 March 100 Ma		e Mean	Test Assay: %	
	Requested Concentration: 2.5 %		Reference Standard: Tj	rpe / Cylinder #: GMIS / C	2242633	
	Certified Concentration: 2.53 %		Concentratio	Expiration Date: 04/03/202	2543%	
1.1	Analytical Method: NDIR	CSYX	Traceable to: SRM # / Sampl	e # / Cylinder #: SRM 264	2a / 51-D-23 / FF23106	
	Last Multipoint Calibration: 09/19/2019		SRM Concentratio	n / Uncertainty: 7.859% /	£0.039%	
	First Analysis Data;	Date 10/16/2019	Second Analysis	Date:	9	
	Z: 0 R: 5 C: 2.53	Conc: 2.53	7. 0	P: 0 C: 0	Date	
10	R: 5 Z: 0 C: 2.53	Conc: 2.53	R: 0	Z: 0 C: 0	Conc: 0	
AG. J.	UOM: %	Conc: 2.54	Z: 0	C: 0 R: 0	Conc: 0	
3 60	mean rest As	say: 2.53 %	UOM: %	Mean	Test Assay: %	
0. 00.	Requested Concentration: 10.5 %		Reference Standard: Ty	pe / Cylinder #: NTRM / D	T0010384	
	Certified Concentration: 10.48 %		Concentratio	n / Uncertainty: 9.875 % d	.0.4%	
	Instrument Used: OXYMAT 5E		Traceable to: SRM # / Sample	#/Cylinder #: NTRM / 1	2 70701 / NTRM DT0010384	
	Last Multipoint Calibration: 09/18/2019	3	SRM Concentratio	n / Uncertainty: 9.875% / :	±0.040%	
	First Analysis Data:	Date 10/16/2010	SRM E	Expiration Date: 11/18/202	2	
	Z: 0 R: 9.88 C: 10.49	Conc: 10.48	Second Analysis	Data:	Date	
	R: 9.88 Z: 0 C; 10.49	Conc: 10.48	Z: 0	R: 0 C: 0	Conc: 0	
	Z: 0 C: 10.5 F: 9.89	Conc: 10.49	Z: 0	C: 0 C: 0	Conc: 0	
°.	UOM: % Mean Test As	say: 10.48 %	UOM: %	Mean	Test Assav:	
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				$\wedge$ 1	10: 1100	
				for a lol	Vien (th).	
Ana	lyzed By Jose Vasetiez	· · · · · · · · · · · · · · · · · · ·	Certified By	lenna Lockman		
					A PARTY AND	
			Sec. Sec. and	-1 -1 - N		
Information competition of the methods empty and the methods empty	ontained herein has been prepared at your request by qu	alified experts within Praxair	Distribution, Inc. While we believe t	hat the information is accur	rate within the limits of the sector	
information is	offered with the understanding that any use of the inform	ation is at the sole discretion	arranty or representation as to the and risk of the user. In no event st	suitability of the use of the i	nformation for any purpose. The	
	autor contained nerein exceed the ree established for prov	nding such information.		in the nating of Praxair D	surbution, Inc., arising out of the use	
			The second second		1. at 1. 1997 at 18	