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TEST REPORT

TEST OF A NON-CATALYTIC SINGLE BURN RATE WOOD HEATER FOR EMISSIONS AND EFFICIENCY

PER EPA METHODS 28R, ALT-154 AND ASTM E2515 and ASTM E2780, MAY 2015

Client:

Foyers Suprême

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Montréal,
QC H1Z 2G4

Model Name: 38SFC_D_II & 38ST_D_II

Attention: Rafael Sanchez

TESTED BY:
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TEST DATES: April 15th & 16th 2025
REPORT DATE: April 28th 2025
Revision1: October 29th 2025
Revision2: December 3rd 2025
Revision3: February 17th 2026
Project number: PI-20326

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Revision list:

Revision 1 (October 29th 2025):

1. Certification of Conformity provided
2. ***Max Heat Output (Btu/hr)*****, which can be found in page 1 of the manual
3. Report updated additional table 2.8 to reflect that the room air sample flow rate remains within 20% of the initial rate, blank sampling rate" of 0.20 cfm is correct as it is the "targeted blank sampling rate." In appendix 1
4. include the initial calibration and due dates in an index table that lists the calibration dates along with the next scheduled calibration date for Calibration records are in French.
5. Revise the typo on page 19. For non-cat.
6. Correction of the Discrepancy in reporting static pressures as absolute values appendix 1
7. Appendix 8 updated to Provide information on the front filter holders are made of aluminum and back filter polycarbonate
8. Updated p.15 Confirm filters were weighed in pairs and cite ALT-154
9. appendix 11 updated to include calculation validation of all runs, including PR
10. Appendix 8 updated to Report lab temperature before and after the test run within 3.3-6.6 ft of the appliance.
11. DGM Room in appendix 1 and table 2.8 in the report
12. Appendix 8 updated to Report the location of the lab temperature sensor.
13. **### Owner's Manual Missing Information**. **Federal Warning (C or NC)** Page 1 and page 24. **Warranty Rights**Page 31 and 32. **Replacement Parts**Replacement Parts. Page 30. **Instructions for Warranty Claims**Page 32
14. Gelman A/E 61631 binder free, 47 mm diameter filters confirmed section 4.1 updated
15. test report revised to include the average CO reported to two significant figures. Table 2.2 & WHA
16. Confirm that the room air blank is within 10 feet of the dilution tunnel hood appendix 8 updated with details
17. Appendix 12 drawing signed for dimension confirmation of the firebox
18. Test fuel scale information and calibration certificate added to appendix 3
19. moisture measurements were done within 4 hours of the test, already on technician note p1 appendix 1 but also information added p12 of the report.
20. There are no transverse points within 0.5 inches of the wall (8 inches dilution tunnel used), information appendix 1 updated
21. Confirm that the room air blank is within 10 feet of the dilution tunnel hood appendix 8 updated with details

Revision 2 (December 3rd 2025):

1) Add model 38SFC_D_II in cover page and header of report.
2) Update the figure 1-1, 1-2, 1-3, and 1-4 (page 5 and 6 of 526) with version in WeTransfer – model number has been corrected from 38ST_D_II to 38SFC_D_II.
3) Technical drawings (page 282 of 526) have been updated to include a cover page with the applicable model numbers and names. In addition, the Novo Duo 38 has been altered with Novo Duo 38 II for consistency.
4) Manuals have been updated to include a cover page with each model number and model name.
5) Update the label displayed in page 410 of 526 with version in the attachment – model number has been corrected from 38ST_D_II to 38SFC_D_II.
6) Page 472 of 526 (Volume Calculation), model numbers have been updated from 38SFC_D and 38ST_D to 38SFC_D_II and 38ST_D_II.

7) Air flow drawings (page 483 of 526) have been updated with the model's name altered to Novo Duo 38 II – see last page of technical drawings.
8) Model names and numbers have been altered in the WHA for consistency.

Revision 3 (February 17th 2026):

1. Reference to ALT-154 on cover page and page 5 reference method

List of appendixes

APPENDIX 1: Raw data, forms and results

APPENDIX 2: Proportionality results

APPENDIX 3: Calibration data

APPENDIX 4: Unit pre burn

APPENDIX 5: Participants

APPENDIX 6: Drawings and specifications

APPENDIX 7: Operator's manual

APPENDIX 8: Photographs of test set up

APPENDIX 9: Test load photographs

APPENDIX 10: Laboratory Operating Procedures

APPENDIX 11: Sample calculations

APPENDIX 12: Volume calculations

APPENDIX 13: Operating instruction

APPENDIX 14: Drawing Air flow pattern

APPENDIX 15: 30-day notice, WHA, other

1 INTRODUCTION

1.1 GENERAL

Laboratory

- Location: Services Polytests Inc., 695-B Gaudette St-Jean-sur-Richelieu QC, Canada J3B 7S7
- Elevation: 100 feet above sea level

Test program

- Purpose: unit qualification NSPS 2020
- Test dates: April 15th & 16th 2025
- Test methods used:
    - Particulate emissions: ASTM E2780-10; ASTM E2515-11 methods 28R as referred into 40 CFR Part 60 Subpart AAA
    - Efficiency: CSA B415.1-10
    - Alt-154

1.2 TEST UNIT INFORMATION

General

- Manufacturer: Foyer Supreme
- Product type: non-catalytic freestanding single burn rate wood stove
- Combustion system: no combustion air control
- Unit tested: 38SFC_D_II
- Vent: 6-inch single wall pipe

Particularities

The wood heater is equipped two doors allowing for loading at the front and back of the unit. In addition, the combustion air intakes (primary and secondary) are regulated with bi-metallic variable burn rate controllers. The side walls of the combustion chamber are lined with either cast iron panels or soapstone slabs, allowing for a longer burn at a more uniform heat output. In addition, the casing of the combustion chamber is constructed out of stainless steel, allowing for a quick heat transfer.

The engine will have the model numbers of **38SFC_D_II** (double sided factory-built fireplace) & **38ST_D_II** (double sided freestanding stove), which comprises the standard components related to the combustion of the unit (such as the firebox, the controls, and the baffle system). The engine will however have an optional firebox lining; either with soapstone (model name: **Elegance ST 42 II**, **Novo Duo 38 II - Soapstone**) or cast iron (model name: **Astra Duo 38 II**, **Monarch See-Through 38 II**, **Novo Duo 38 II – Cast Iron, Wayland See-Through 38 II**).

- Elegance ST 42 II: Double sided factory-built fireplace with an optional rectangular/arched door/surround and a soapstone firebox lining.
- Astra Duo 38 II: Double sided factory-built fireplace with a rectangular door/surround and a cast iron firebox lining.
- Monarch See-Through 38 II: Double sided factory-built fireplace with an arched door/surround and a cast iron firebox lining.
- Novo Duo 38 II – Cast Iron: Double sided freestanding stove with a cast iron firebox lining.
- Novo Duo 38 II – Soapstone: Double sided freestanding stove with a soapstone firebox lining.
- Wayland See-Through 38 II: Double sided factory-built fireplace with an arched door and rectangular surround in a rustic design. Firebox lined with cast iron panels.
    - The marking and name plate of the unit is on the ash lip located below the door. The contents of the marking are illustrated in Figure 5-1 to Figure 5-6, which can also be found in **38SFCD_II_LABEL – 2 JUNE 2025.pdf** for the factory-built fireplaces and **24STD_38STD_II_LABEL – 20 MAY 2025.pdf** for the free standing stove.



- **FIGURE 1-1: 38SFC_D_II – ASTRA DUO 38 II LABEL FACTORY BUILT FIREPLACE - DOUBLE SIDED FACTORY-BUILT FIREPLACE WITH A RECTANGULAR DOOR/SURROUND AND A CAST IRON FIREBOX LINING.**



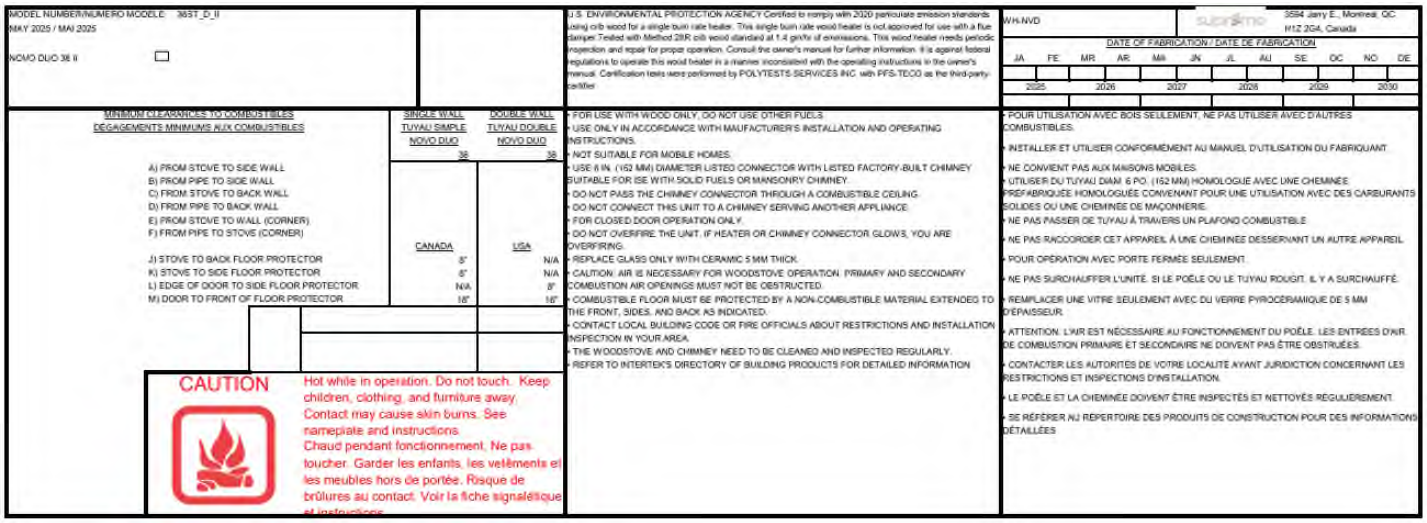
- **FIGURE 1-2: 38SFC_D_II – ELEGANCE ST 42 II LABEL FACTORY BUILT FIREPLACE - DOUBLE SIDED FACTORY-BUILT FIREPLACE WITH AN OPTIONAL RECTANGULAR/ARCHED DOOR/SURROUND AND A SOAPSTONE FIREBOX LINING.**



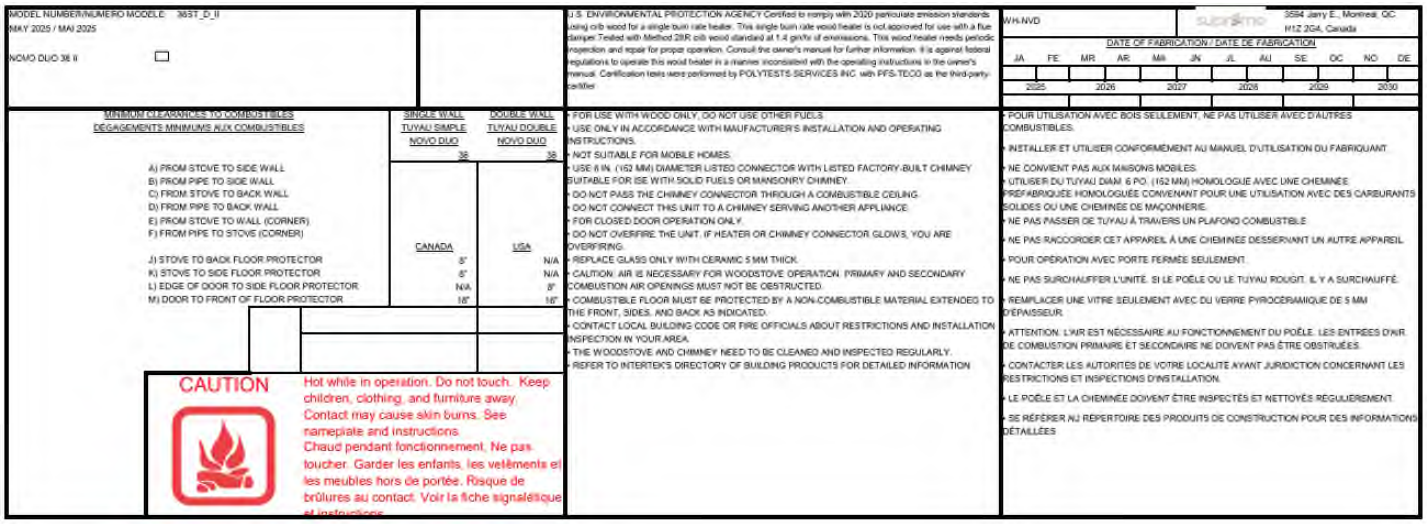
- **FIGURE 1-3: 38SFC_D_II – MONARCH SEE-THROUGH 38 II LABEL FACTORY BUILT FIREPLACE - DOUBLE SIDED FACTORY-BUILT FIREPLACE WITH AN ARCHED DOOR/SURROUND AND A CAST IRON FIREBOX LINING.**



- **FIGURE 1-4: 38SFC_D_II – WAYLAND SEE-THROUGH 38 II LABEL FACTORY BUILT FIREPLACE - DOUBLE SIDED FACTORY-BUILT FIREPLACE WITH AN ARCHED DOOR AND RECTANGULAR SURROUND IN A RUSTIC DESIGN. FIREBOX LINED WITH CAST IRON PANELS.**



- **FIGURE 1-5: 38ST_D_II NOVO DUO 38 II – CAST IRON LABEL FREE STANDING STOVE - DOUBLE SIDED FREESTANDING STOVE WITH A CAST IRON FIREBOX LINING.**



- **FIGURE 1-6: 38ST_D_II NOVO DUO 38 II – CAST IRON LABEL FREE STANDING STOVE - DOUBLE SIDED FREESTANDING STOVE WITH A CAST IRON FIREBOX LINING.**

1.3 RESULTS

Emission results obtained

- Average Emissions Rate: 1,4 g/hr
- WA HHV Efficiency: 70 %
- CSA B415.1-22 Average Emissions Rate: 0,05 g/Mj

Conformity: NSPS Phase 2020 and CSAB415.1-22

1.4 PRETEST INFORMATION

- Unit condition: The unit was received by carrier in good condition in April 2025. The 50hrs of aging was done by the Manufacturer. Fuel: BC FIR between 19% and 25%. (All data in Appendix 4).

Set up

- Venting system type: 6-inch steel pipe and insulated chimney
- System height from floor: 15 feet
- Particularities: None

2 SUMMARY OF TEST RESULTS

2.1 EMISSIONS

Run Number	Test Date (YYYY-MM-DD)	Emission Rate (g/hr)	Burn Rate (kg/hr)	1st hour Emission Rate (g/hr)	CSA B415.1 CO emission Gr/hr	CSA B415.1 emission Gr/Mj	Heat output (BTU/HR)	(OHE) % HHV
1	2025-04-15	1,38	1,909	5,55	91,36	0,05	25 403	70,79%
2	2025-04-16	1,35	1,960	5,89	167,60	0,05	25 174	68,32%

2.2 WEIGHTED AVERAGE CALCULATION

Test No.	Burn Rate (Kg/hr)	(E) Ave. Emission Rate g/hr	(OHE) %	Heat Output (BTU/HR)	CSA B415.1 CO emission g/min	CSA B415.1 CO emission g/Mj
1	1,909	1,38	70,8%	25 403	1,5	0,05
2	1,960	1,35	68,3%	25 174	2,8	0,05
Weighted particulate emission average of 2 test runs: 1,4 grams per hour.						
Weighted average HHV efficiency of 2 test runs: 70 %.						
Average Co 2,2 gr/min						

2.3 TEST FACILITY CONDITIONS

Run Number	*Room Temperature*		*Barometric pressure*		*Relative humidity*		*Air Velocity*	
	Before (F)	*After (F)*	*Before (in.Hg)*	*After (in.Hg)*	*Before (%)*	*After (%)*	*Before (ft/min)*	*After (ft/min)*
1	73	77	29,117	29,087	31,6	29,4	0	0
2	69	69	29,264	29,294	29,4	29,7	0	0

2.4 FUEL QUALITIES

Run Number	*Pre-test Load*			*Test Load*						
	Loading Weight Wet Basis (lbs)	*Moisture Content Dry Basis (%)*	*Coal bed Weight (lbs)*	*Weight Wet Basis (lbs)*	*Density Wet Basis (lbs/cuft)*	*Moisture Content Dry Basis (%)*	*Piece Length (in.)*	*Number of 2X4's*	*Number of 4x4's*	*Number of Spacers*
1	29,00	20,37	4,6	22,83	6,537	19,64	20	0	4	16
2	28,87	20,54	4,8	22,18	6,353	19,84	20	0	4	16

2.5 DILUTION TUNNEL FLOW RATE MEASUREMENTS AND SAMPLING DATA (ASTM E2515)

Average dilution tunnel measurements				*Sample Data*			
Run Number	*Burn Rate (Min)*	*Volumetric Flow Rate (dscf/min)*	*Total Temperatures (°R)*	*Volume sampled (DSCF)*		*Particulate catch (mg)*	
				1	*2*	*1*	*2*
1	272	1104,35	563,49	50,031	50,235	3,50	3,20
2	257	1100,10	557,86	46,969	47,334	3,10	3,00

2.6 DILUTION TUNNEL DUAL TRAIN PRECISION

Run Number	*Sample Ratio*		*Total Emission (g)*			
	Train 1	*Train 2*	*Train 1*	*Train 2*	*% Deviation*	Deviation g/kg
1	1870,53	1862,92	6,54	5,95	4,69%	0,068
2	1905,79	1891,10	5,91	5,67	2,03%	0,028

2.7 GENERAL SUMMARY OF RESULTS

Run Number	*Burn Rate (kg/hr)*	*Average Surface Temperature (F)*	*Change in surface Temperature (F)*	*Initial Draft (in. H2O)*	*static pressure tunnel (in. H2O)*	*Primary Air Setting*	*Run Time (min)*
1	1,909	515,62	-8,3	0,057	-0,160	fix	272
2	1,960	503,16	-19,3	0,048	-0,170	fix	257

2.8 BLANK SAMPLING FLOW RATE

Run Number	Initial flow rate blank sampling (cuft/min)	Average flow rate blank sampling (cuft/min)
1	0,20	0,174
2	0,20	0,218

3 PROCESS DESCRIPTION

3.1 DISCUSSION

The heater has been received in a good shape by a carrier in April 2025. The 50hrs Pre-burn has been done by the manufacturer with crib wood. The wood heater has no air control and no convection fan. Stove is mainly made of steel and inside of the firebox covered with bricks on sides.

3.2 UNIT DIMENSIONS

Baffle

- Location: between top of combustion chamber and hearth
- Material: Stainless steel baffle

Bricks

- Cast Iron brick 1 ¼ inch. Thick cover all back and sides and bottom

Flue gas exhaust

- Location: Top
- Dimensions: 6 in. diameter
- Material: Steel

Gasket

The door of the unit consists of three sections of gaskets, where 2 of them are holding the glass (SGI-260-0230) and 1 is sealing around the door onto the firebox (SGI-265-0125). Note that this wood heater contains 2 doors – front and back. Please refer to page 75 of **38STD_II – MASTER DWG – 02 MAY 2025.pdf** for information on dimensions, materials, and assembly details. Technical specification of the SGI-260-0230 and the SGI-265-0125 can be found in the **DATA – Knitted Fiberglass Rope.pdf** document.

Overall unit dimension

- Firebox dimensions: all detail can be found in appendix 12 volume calculation
- Usable volume: 3.49 cuft.
- Overall heater dimension: 29,875-inch-wide 20-inch-deep 29,141 inch high

Convection fan

- None

Catalyst

- None

3.3 AIR SUPPLY SYSTEM

Description

- Primary air: window wash design with air intake at the top of unit
- Secondary air: secondary baffle design with air intake at the top of unit. Refer appendix 6 for drawing details

Characterization

The following table shows the inlet and outlet sections of each system. The air introduction system number is referred to on a set of drawings in Appendix 6.

AIR INTRODUCTION SYSTEM		INLET (1) sq. in.			OUTLET (sq. in.)
Identification	Type	Imin	Imax	Controlled	
A *	Primary (Air wash and top holes)	1.55 in^2	1.55 in^2	No	9.67 in^2
B *	Secondary Back hole	1.66 in^2	1.66 in^2	No	1.43 in^2
C *	Pilot (Bi-metal)	N/A	N/A	No	-

* This section would be filled by measuring and comparing with the manufacturer's drawings included in the test report.

Legend
Identification: Tag name referred to on drawings in Appendix 14, section airflow pattern
Type: Characterization of air intake
Imin: Minimum air intake of a particular air channel
Imax: Maximum air intake of a particular air channel
Controlled: Determines if a provision for air control is present
Outlet: Total air outlet of a particular air channel

The primary air enters the unit from three channels: the front air wash, the back air wash, and the booster. The opening of the front air wash and booster channel is regulated by a single burn rate automatic bi-metal control (refer to Section 13). The back air wash is not regulated by a control and remains open throughout the operation of the unit. The secondary air enters the combustion chamber from the top and through the baffle system. Please refer to the following illustrations:

The Primary Air Control is a patented mechanism (Patent No: US 7,325,541 B2) that regulates the air flow into the firebox based on the temperature of the unit. It is located on the top of the firebox, at the front/back center of the unit. The combustion air control of the 38STD_II & 38SFCD_II is a single burn rate mechanism with an Activator lever. When starting a fire or adding a new load of wood, the Activator must be pushed in to allow a primary source of air to enter the firebox. The Activator will retract automatically with heat at a factory set position. Please refer to page 51 to 59 of **38STD_II – MASTER DWG – 02 MAY 2025.pdf** for details on the Primary Air Control assembly.

Fully Open Position

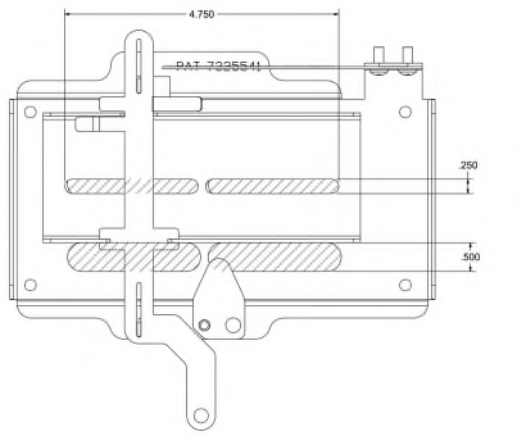


FIGURE 3-1: PRIMARY AIR CONTROL FULLY OPEN

Factory Set Position (Single Burn Rate)

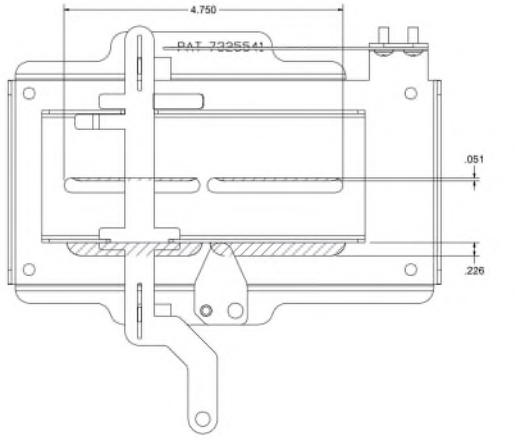


FIGURE 3-2: PRIMARY AIR CONTROL FACTORY SETTING (SINGLE BURN RATE)

3.4 OPERATION DURING TEST

All runs have been found appropriate, no anomalies happened and all runs below have been validate and found. All cribs have been positioned east-west direction into the firebox. Filters have been weighted in pair as per the ALT-154.

Run #1
This run was performed on April 15th 2025. It lasted 272 minutes and a single burn rate was obtained at 1,91 kg/hr & emission at 1,38 gr/hr. The 22,83 lbs load was inserted on a 4,6 lbs coal bed. No weight or air adjustment was done.

Run #2
This run was performed on April 16th 2025. It lasted 257 minutes and a single burn rate was obtained at 1,96 kg/hr & emission at 1,35 gr/hr. The 22,18 lbs load was inserted on a 4,8 lbs coal bed. No weight or air adjustment was done.

- Details: Refer to the front page of each test run data sheets found in appendix for the detailed test sequence showing air supply settings and adjustments, fuel bed adjustments and operational specifics of the test unit.

Test fuel cribs

- Type of wood: Douglas fir, grade c or better, 19 to 25% dry basis moisture content measurement done within 4 of the tests
- Description: for each test, description of the fuel crib is found on the front page of each test run data sheet together with photograph in appendix.

3.5 START-UP OPERATION

The complete manufacturer's firing procedure of each burn rate category is fully described in appendix 13.

3.6 SAMPLING LOCATIONS

Particulate samples are collected from the dilution tunnel. The tunnel has two elbows ahead of the sampling section. The sampling section is a continuous 8-inch diameter pipe straight over its entire length. Tunnel velocity pressure is determined by a standard pitot tube, thermocouple is installed on the pitot tube to measure the dry bulb temperature. MC is assumed, as allowed, to be 2%. Tunnel samplers are located downstream of the pitot tube and upstream from the end of this section. All detail of dilution tunnel can be found in appendix 8.

3.7 DRAWINGS

Various drawings of the stack gas sampling train and of dilution tunnel system are found in Appendix 6.

3.8 EMISSIONS EFFICIENCY TESTING EQUIPMENT LIST

The complete test equipment list together with all corresponding calibration data can be found in Appendix 3.

4 SAMPLING METHODS

4.1 PARTICULATE SAMPLING

Particulates were sampled in strict accordance with ASTM E2515. This method uses two identical sampling systems with Gelman A/E 61631 binder free, 47 mm diameter filters. The dryers used in the sample systems are filled with "Drierite" before each test run.

5 QUALITY ASSURANCE

5.1 INSTRUMENT CALIBRATION

5.1.1 GAS METERS

At the conclusion of each test program the gas meters are verified using the reference dry gas meter. This process involves sampling the train operation for 1 cubic foot of volume. With readings made to .01 fr', the resolution is 1 %, giving an accuracy higher than the 2% required by the standard. ISO17025 calibrated every 6 months.

5.1.2 SCALES

Before each test program, the different scales used are checked with traceable calibration weights to ensure their accuracy. ISO17025 calibrated every 6 months for analytic scale and yearly for floor scale.

5.1.3 GAS ANALYZERS

The continuous analyzers are zeroed and spanned before each test with NBS traceable gases. A mid-scale multi-component calibration gas is then analyzed (values are recorded). At the conclusion of a test, the instruments are checked again with zero, span and calibration gases (values are recorded only). The drift in each meter is then calculated and must not exceed 5% of the scale used for the test.

5.2 TEST METHOD PROCEDURES

5.2.1 LEAK CHECK PROCEDURES

Before and after each test, each sample train is tested for leaks. Leakage rates are measured and must not exceed 0.02 CFM or 4% of the sampling rate. Leak checks are performed checking the entire sampling train. Pre-test and post-test leak checks are conducted with a vacuum of 5 inches of mercury. Vacuum is monitored during each test and the highest vacuum reached is then used for the post-test vacuum value. If leakage limits are not met, the test run is rejected. During these tests, the vacuum is typically less than 2 inches of mercury. Thus, leakage rates reported are expected to be much higher than actual leakage during the tests.

5.2.2 TUNNEL VELOCITY FLOW MEASUREMENT

The tunnel velocity is calculated from a center point pitot tube signal multiplied by an adjustment factor. This factor is determined by a traverse of the tunnel as prescribed in EPA Method 1. Final tunnel velocities and flow rates are calculated from EPA Method 2, Equation 6.9 and 6.10. (Tunnel cross sectional area is the average from both lines of traverse.)

Pitot tubes are cleaned before each test and leak checks are conducted after each test.

5.2.3 PM SAMPLING PROPORTIONALITY (ASTM E2515)

Proportionalities were calculated in accordance with ASTM E2515. The data and results are found in appendix.

APPENDIX 1: Raw data, forms and results

Paramètres

Tous les facteurs de corrections et autres paramètres qui peuvent être modifiés par l'utilisateur du fichier sont regroupés ici.

Code verrouillage:	SUP

Description du test

Test standard	EPA
Run #	1
Date	15-04-2025
Technicien	M.M
Project #	PI 20326

Description de l'unité

Manufacturier	FOYER SUPREME	
Modèle	38 STD	
Combustion system	Non-Cat	
Appliance type	WOOD STOVE	
Firebox volume	3,492	cu ft.
Appliance weight empty	n.a	lbs
Firebox maximum lenght	24	inch

Paramètres du test

Logging time	1	min
Manufacturer's rated heat output	n.a	BTU/h Donnée fournie par le manfacturier
Targeted category	3	
Targeted output	n.a	BTU/h
Cp steel	n.a	BTU/lb-°F

Échantillonnage

Targeted Blank sampling rate	0,20	cuft/min
Internal probe diameter	0,18	in.
Calibration Factor (DGM #1):	0,986	
Equipment number (DGM #1):	EM 178	Dimensionless
Calibration Factor (DGM #2):	1,010	
Equipment number (DGM #2):	EM 318	Dimensionless
Calibration Factor (DGM #3):	0,988	
Equipment number (DGM #3):	EM 179	Dimensionless
Calibration Factor (DGM 1st Hr):	1,000	
Equipment number (DGM 1st Hr):	EM 130	Dimensionless

Tunnel

Targeted tunnel flow rate	350	scfm
Tunnel diameter	8	in.
Molecular weight	29	29 as per ASTM E2515
Pitot tube type	Standard	
Pitot tube coefficient	0,99	Dimensionless

Project nu.	PI 20326
Date	15-04-2025
Technicien	M.M

Fuel data

Fuel type	Dimension	
Fuel specie	D. Fir	
HHV	19810,0	kJ/kg
%C	48,7	
%H	6,9	
%O	43,9	
%Ash	0,5	
HHV	8519,2	Btu/lb
LHV	7451,0	Btu/lb

Default Fuel Values

	D. Fir	Oak/Maple
HHV	19 810	19 887
%C	48,73	50
%H	6,87	6,6
%O	43,9	42,9
%Ash	0,5	0,5
HHV (Btu/lb)	8519	8552
LHV (Btu/lb)	7451	7480

	Start	End
Barometer (kPa):	98,6	98,5
Barometer (in.Hg):	29,12	29,09
Dry Bulb (F):	73,17	73,53
Humidity (%):	31,6	29,4
Air velocity (ft/min)	0	0

DGM #1st hour	Final:	1227,650	cuft	Final:	1227,650	cuft
	Initial:	1215,390	cuft	Initial:	1215,390	cuft
DGM #1	Final:	5056,250	cuft	Final:	143177,050	Liter
	Initial:	5001,398	cuft	Initial:	141623,810	Liter
DGM #2	Final:	31743,895	cuft	Final:	898886,980	Liter
	Initial:	31689,891	cuft	Initial:	897357,770	Liter
DGM room	Final:	22390,709	cuft	Final:	634034,260	Liter
	Initial:	22340,752	cuft	Initial:	632619,630	Liter

Numéro de la ligne dans "Raw data" à partir duquel les données du VRAI test commencent: 245

Autres données à rentrer: dans preload data, load data, traverse et filter set weight

Project nu.	PI 20326
Date	15-04-2025
Technicien	M.M

Preload data sheet

Test Load Weight:

Lower	Ideal	Upper
22,00	24,44	26,89

Load Volume: 0,6806 cu. ft

Loading Density: 8,306 lbs./ft3

Number of Spaces:

Spacer weight (lbs):

Load Density (wet): 42,618 lbs./ft3

Dry Wood Density: 35,405035

Piece Size (in): Thick	Wide	x Length	Weight lbs	Meter Moisture Content Dry Uncorrected %					Ave. MC x Weight	Volume Cubic Inches
1,5	3,5	12	1,85	21,4	21,6	21,6	21,5	21,4	39,775	63,00
1,5	3,5	12	1,882	21,5	21,3	21,8	21,9	22	40,8394	63,00
1,5	3,5	12	1,596	19,9	20	20,1	20,4	20,8	32,30304	63,00
1,5	3,5	12	1,278	21	20,8	20,7	20,7	20,6	26,53128	63,00
1,5	3,5	12	1,632	21,1	21	21	21,1	21,4	34,46784	63,00
1,5	3,5	12	1,606	20,8	20,9	20,4	20,6	20,7	33,21208	63,00
1,5	3,5	12	1,616	19,2	19,7	19,8	19,6	19,8	31,70592	63,00
1,5	3,5	12	1,502	20	19,8	19,9	19,7	19,7	29,76964	63,00
1,5	3,5	12	1,472	20,1	20,1	20	20,3	20	29,5872	63,00
1,5	3,5	12	1,564	19,3	19,3	19,3	19,8	19,7	30,46672	63,00
1,5	3,5	12	1,534	19,9	19,8	19,7	19,8	19,7	30,34252	63,00
1,5	3,5	12	1,302	20,4	20,3	20,4	20,5	20,6	26,61288	63,00
1,5	3,5	20	2,452	20,4	20,3	20,6	20,7	20,7	50,36408	105,00
1,5	3,5	20	2,804	19,9	20	19,6	19,7	19,7	55,46312	105,00
1,5	3,5	20	2,198	20	20,1	20,4	20,3	20,4	44,48752	105,00
1,5	3,5	20	2,716	20,4	20,3	20,6	19,9	20	54,97184	105,00
										0,00
										0,00
										0

FUEL LOAD DATA SHEET, CSA B415

Test Load Weight:

Lower	Ideal	Upper
22,0	24,4	26,9

* For boilers, a loading density factor of 10 lb/ft3 is applied

Load Volume: 0,57 cu. ft

Loading Density: 6,5 lbs./ft3

Number of Spaces: 16

Spacer weight: lbs

Load Density (wet): 36,4 lbs./ft3

Dry Wood Density: 30,4 lbs./ft3 ok

piece lenght minimum 5/6 of firebox lenght 20,00

Piece Size (in): Thick	Wide	Length	Weight lbs	Meter Moisture Content Dry Uncorrected %					Ave. MC x Weight	Volume Cubic Inches	Ave. MC %	
3,5	3,5	20	5,02	19,70	19,60	19,90	19,20	19,10	97,968	245,00	19,5	Load
3,5	3,5	20	5,23	19,60	19,30	19,40	19,10	19,10	100,8618	245,00	19,3	
3,5	3,5	20	5,43	19,80	19,90	20,00	19,70	19,60	107,5536	245,00	19,8	
3,5	3,5	20	4,96	19,90	20,00	19,70	19,80	19,80	98,32704	245,00	19,8	
										0,00		
										0,00		
										0,00		
										0,00		
1,5	0,75	5	0,15			19,10			2,9032	5,63	19,1	spacers
1,5	0,75	5	0,12			19,80			2,4552	5,63	19,8	
1,5	0,75	5	0,11			19,70			2,0882	5,63	19,7	
1,5	0,75	5	0,10			19,80			2,0592	5,63	19,8	
1,5	0,75	5	0,12			20,00			2,48	5,63	20,0	
1,5	0,75	5	0,17			20,10			3,417	5,63	20,1	
1,5	0,75	5	0,14			20,00			2,8	5,63	20,0	
1,5	0,75	5	0,17			20,40			3,3864	5,63	20,4	
1,5	0,75	5	0,15			20,60			3,0076	5,63	20,6	
1,5	0,75	5	0,16			20,00			3,12	5,63	20,0	
1,5	0,75	5	0,12			20,00			2,36	5,63	20,0	
1,5	0,75	5	0,14			19,80			2,7324	5,63	19,8	
1,5	0,75	5	0,13			19,70			2,4822	5,63	19,7	
1,5	0,75	5	0,15			19,80			3,0492	5,63	19,8	
1,5	0,75	5	0,12			19,90			2,3084	5,63	19,9	
1,5	0,75	5	0,15			20,00			3	5,63	20,0	
										0,00		
										0,00		
										0,00		
										0,00

Tunnel Traverse Worksheet (for velocity calculations)

Static Pressure: -0,16 in. H20
Barometer: 29,900 in. Hg

Pour un tunnel de 12" et plus, prendre 6 lectures

	TUNNEL VELOCITY	TUNNEL TEMP	SQUARE ROOT
	In. wc	°F	
A center			0,0000
B center			0,0000
A1			0,0000
A2			0,0000
A3			0,0000
A4			0,0000
A5			0,0000
A6			0,0000
B1			0,0000
B2			0,0000
B3			0,0000
B4			0,0000
B5			0,0000
B6			0,0000
AVERAGE	#DIV/0!	#DIV/0!	0,0000

PITOT CONSTANT=
0,941

Pour un tunnel moins de 12", prendre 4 lectures

	TUNNEL VELOCITY	TUNNEL TEMP	SQUARE ROOT
	In. wc	°F	
A center	0,078	67,66	0,2793
B center	0,077	67,82	0,2775
A1	0,064	67,66	0,2530
A2	0,071	67,73	0,2665
A3	0,068	67,73	0,2608
A4	0,063	67,79	0,2510
B1	0,063	67,8	0,2510
B2	0,068	67,8	0,2608
B3	0,071	67,8	0,2665
B4	0,064	67,8	0,2530
AVERAGE	0,0687	67,7650	0,2619

Project nu.	PI 20326
Date	15-04-2025
Technicien	M.M

Filter set weight

	System 1 (g) 1st hour			System 1 (g)			System 2 (g)			Ambient blank (g)	Date	Heure	Test end date & time
	probe	front/ Back	gasket	probe	front/ Back	gasket	probe	front/ Back	gasket	Filter			
Number	009	107-108	6	36	109-110	9	37	111-112	62	113			
Before (1)													
Before (2)													
Before (3)													
Before (4)													
Before (5)	61,4522	0,2566	4,1821	107,7229	0,2570	4,1738	107,9751	0,2570	4,9804	0,1302	2025-04-14	17:00	
Before (6)	61,4523	0,2566	4,1822	107,7228	0,2571	4,1737	107,9752	0,2569	4,9805	0,1301	2025-04-15	09:00	
After (1)	61,4526	0,2594	4,1841	107,7231	0,2595	4,1763	107,9754	0,2592	4,9825	0,1303	2025-04-15	17:00	
After (2)	61,4524	0,2590	4,1828	107,7228	0,2595	4,1751	107,9753	0,2592	4,9811	0,1302	2025-04-23	09:00	
After (3)	61,4524	0,2590	4,1828	107,7228	0,2594	4,1750	107,9754	0,2593	4,9812	0,1302	2025-04-24	09:00	2025-04-15 16:45
After (4)													
After (5)													
After (6)	61,4524	0,2590	4,1828	107,7228	0,2594	4,1750	107,9754	0,2593	4,9812	0,1302	2025-04-24	09:00	
Difference	0,0001	0,0024	0,0006	0,0000	0,0023	0,0013	0,0002	0,0024	0,0007	0,0001			
Total (mg)		3,1			3,6			3,3		0,1			
Total ajusté (mg)		**3,00**			**3,50**			**3,20**					

Project nu.	PI 20326
Date	15-04-2025
Technicien	M.M

Manufacturer: FOYER SUPREME
Model: 38 STD

Run: 1
Project #: PI 20326
Test Duration: 272 min

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

	HHV	LHV
Eff	70,79%	76,51%
Comb Eff	96,78%	96,78%
HT Eff	73,14%	79,05%
Output	26 779	kJ/h
Burn Rate	1,91	kg/h
Grams CO	414	g
Input	37 831	kJ/h
MC wet	16,42	

Ultimate CO_2
$CO_{2\text{-ult}}$ 19,64
F_0
1,062

Overall Heating Efficiency: 70,79%
Combustion Efficiency: 96,78%
Heat Transfer Efficiency: 73,14%

Heat Output: 25 403 Btu/h
Heat Input: 35 886 Btu/h
Burn Duration: 4,53 h
Burn Rate: 4,21 lb/h
Stack Temp: 426,3 Deg. F

Averages	0,37	8,73	1,57	20,34	11,42	218,86	23,43	0,96	0,73	0,71
INPUT DATA			Oxygen Calculation			Input Data		Combust	Heat	Net
Elapsed Time	Weight Remaining (kg)	% CO [e]	% CO_2 [d]	Excess Air EA	Total O_2	Calc. % O_2 [g]	Flue Gas (ºC)	Room Temp (ºC)	Eff %	Transfer %	Eff %
0,00	10,36	0,63	1,67	755,1%	20,79	18,80	163,8	22,9	79,7%	41,3%	32,9%
1,00	10,28	0,52	1,02	1175,7%	20,84	19,56	168,1	22,9	76,0%	13,1%	9,9%
2,00	10,23	0,64	3,27	402,6%	20,68	17,10	169,3	22,8	87,5%	61,9%	54,2%
3,00	10,17	0,70	3,80	336,8%	20,64	16,50	173,5	22,9	88,0%	64,8%	57,0%
4,00	10,13	0,66	4,23	301,7%	20,62	16,05	178,7	22,7	89,7%	66,3%	59,5%
5,00	10,08	0,63	3,92	331,4%	20,64	16,40	181,9	22,7	89,5%	64,1%	57,4%
6,00	10,04	0,51	5,25	240,9%	20,56	15,05	190,4	22,8	93,3%	69,0%	64,4%
7,00	10,00	0,47	5,66	220,3%	20,54	14,64	198,9	22,8	94,3%	69,4%	65,4%
8,00	9,93	0,48	6,37	186,6%	20,49	13,87	206,1	23,0	94,7%	70,6%	66,9%
9,00	9,86	0,47	5,98	204,6%	20,51	14,30	210,6	22,8	94,5%	69,0%	65,2%
10,00	9,81	0,42	6,27	193,2%	20,50	14,01	216,3	23,0	95,3%	69,3%	66,0%
11,00	9,72	0,41	6,37	189,8%	20,49	13,92	223,2	22,9	95,5%	68,8%	65,8%
12,00	9,62	0,32	8,23	129,7%	20,38	11,99	236,8	23,1	97,2%	71,9%	69,9%
13,00	9,55	0,36	8,34	125,7%	20,37	11,84	241,4	23,0	96,9%	71,7%	69,5%
14,00	9,49	0,45	6,92	166,7%	20,45	13,31	242,4	23,2	95,4%	68,4%	65,3%
15,00	9,37	0,44	7,06	161,9%	20,44	13,16	243,3	23,0	95,6%	68,7%	65,7%
16,00	9,32	0,50	7,54	144,3%	20,41	12,62	248,7	23,1	95,2%	69,4%	66,1%
17,00	9,23	0,34	9,18	106,4%	20,31	10,97	257,5	23,2	97,3%	71,9%	70,0%
18,00	9,13	0,29	9,98	91,2%	20,26	10,14	267,1	23,1	97,9%	72,5%	70,9%
19,00	9,04	0,28	10,67	79,3%	20,22	9,40	276,1	23,0	98,1%	72,8%	71,4%
20,00	8,91	0,27	11,97	60,4%	20,13	8,02	285,1	23,2	98,3%	73,8%	72,6%
21,00	8,82	0,20	11,47	68,3%	20,17	8,60	290,1	23,2	98,8%	72,9%	72,0%
22,00	8,73	0,21	10,92	76,5%	20,20	9,18	292,8	23,1	98,6%	72,0%	71,0%
23,00	8,64	0,19	10,65	81,1%	20,22	9,47	295,1	23,1	98,7%	71,5%	70,6%
24,00	8,50	0,19	10,19	89,1%	20,25	9,96	296,0	23,4	98,7%	70,7%	69,8%
25,00	8,45	0,20	10,03	92,0%	20,26	10,14	297,4	23,4	98,6%	70,4%	69,4%
26,00	8,36	0,19	10,31	87,0%	20,25	9,84	298,2	23,4	98,7%	70,8%	69,9%
27,00	8,23	0,17	10,75	79,8%	20,22	9,38	299,2	23,5	98,9%	71,4%	70,6%
28,00	8,19	0,16	11,07	74,9%	20,20	9,05	299,1	23,5	99,0%	71,8%	71,1%
29,00	8,05	0,15	11,41	69,8%	20,18	8,69	300,4	23,4	99,1%	72,2%	71,5%
30,00	7,96	0,16	11,41	69,8%	20,18	8,69	300,5	23,4	99,1%	72,2%	71,5%
31,00	7,87	0,21	11,71	64,8%	20,15	8,34	297,7	23,4	98,7%	72,7%	71,8%
32,00	7,78	0,30	11,19	71,0%	20,18	8,85	297,5	23,6	98,0%	72,1%	70,6%
33,00	7,73	0,31	11,07	72,6%	20,19	8,96	296,2	23,7	97,9%	72,0%	70,5%
34,00	7,64	0,34	10,90	74,8%	20,20	9,13	295,9	23,6	97,7%	71,8%	70,1%
35,00	7,55	0,37	10,75	76,6%	20,21	9,27	294,7	23,5	97,4%	71,6%	69,8%
36,00	7,47	0,37	10,77	76,4%	20,20	9,25	295,0	23,5	97,5%	71,6%	69,8%
37,00	7,37	0,36	10,94	73,9%	20,19	9,08	295,1	23,5	97,5%	71,9%	70,1%
38,00	7,28	0,33	11,24	69,8%	20,18	8,77	295,7	23,5	97,8%	72,2%	70,6%
39,00	7,23	0,29	11,56	65,8%	20,16	8,45	296,9	23,5	98,1%	72,6%	71,2%
40,00	7,15	0,24	11,77	63,5%	20,15	8,25	297,8	23,4	98,5%	72,8%	71,7%
41,00	7,06	0,23	12,04	60,1%	20,13	7,98	299,3	23,6	98,6%	73,0%	72,0%
42,00	6,96	0,23	12,24	57,6%	20,12	7,77	301,0	23,5	98,6%	73,1%	72,1%
43,00	6,87	0,20	12,27	57,5%	20,12	7,75	302,3	23,6	98,8%	73,1%	72,2%
44,00	6,79	0,20	12,65	52,9%	20,09	7,34	304,4	23,4	98,9%	73,4%	72,6%
45,00	6,69	0,20	12,93	49,6%	20,07	7,04	305,8	23,7	98,9%	73,6%	72,8%
46,00	6,60	0,19	13,00	49,0%	20,07	6,98	307,5	23,5	98,9%	73,6%	72,8%
47,00	6,51	0,18	13,28	45,9%	20,05	6,68	309,9	23,6	99,0%	73,7%	73,0%
48,00	6,42	0,21	13,51	43,1%	20,03	6,42	304,8	23,7	98,8%	74,2%	73,3%
49,00	6,32	0,77	13,74	35,4%	19,98	5,86	298,5	23,3	95,7%	74,6%	71,4%
50,00	6,24	0,54	13,37	41,2%	20,02	6,38	295,7	23,7	96,9%	74,5%	72,2%
51,00	6,19	0,42	13,29	43,3%	20,03	6,53	293,5	23,7	97,6%	74,6%	72,8%
52,00	6,11	0,34	12,76	49,9%	20,07	7,14	292,0	23,7	98,0%	74,2%	72,7%
53,00	6,06	0,31	12,57	52,5%	20,09	7,37	290,7	23,8	98,1%	74,1%	72,7%
54,00	5,96	0,31	12,43	54,1%	20,10	7,51	289,5	23,9	98,1%	74,1%	72,7%
55,00	5,92	0,27	12,38	55,4%	20,11	7,60	287,9	23,9	98,4%	74,1%	72,9%
56,00	5,83	0,27	12,68	51,6%	20,08	7,27	287,9	23,8	98,4%	74,4%	73,2%
57,00	5,74	0,31	12,88	49,0%	20,07	7,04	287,3	23,9	98,2%	74,6%	73,3%
58,00	5,66	0,28	13,47	42,8%	20,03	6,42	288,4	23,7	98,4%	75,1%	73,9%
59,00	5,60	0,44	13,84	37,6%	20,00	5,94	289,4	23,9	97,5%	75,3%	73,5%
60,00	5,51	0,42	13,79	38,2%	20,00	6,00	290,0	23,9	97,6%	75,3%	73,5%
61,00	5,47	0,42	13,73	38,8%	20,01	6,06	291,3	23,8	97,6%	75,2%	73,4%
62,00	5,38	0,40	13,98	36,5%	19,99	5,81	291,8	24,0	97,8%	75,3%	73,7%
63,00	5,29	0,51	14,22	33,3%	19,97	5,49	291,9	24,0	97,2%	75,5%	73,4%
64,00	5,20	0,57	14,46	30,7%	19,95	5,20	293,0	24,1	96,9%	75,6%	73,3%
65,00	5,11	0,61	14,51	29,9%	19,94	5,12	292,7	23,7	96,7%	75,7%	73,1%
66,00	5,06	0,77	14,74	26,7%	19,92	4,79	292,5	23,8	95,9%	75,8%	72,7%
67,00	5,02	0,77	14,74	26,6%	19,92	4,79	292,2	23,9	95,9%	75,8%	72,7%
68,00	4,92	0,72	14,78	26,8%	19,92	4,78	292,4	24,0	96,2%	75,9%	73,0%
69,00	4,83	0,69	14,88	26,2%	19,91	4,69	292,9	23,9	96,4%	75,9%	73,1%
70,00	4,79	0,64	14,89	26,5%	19,91	4,71	293,8	23,5	96,6%	75,9%	73,3%
71,00	4,70	0,57	14,91	26,8%	19,92	4,72	293,3	23,4	97,0%	75,9%	73,6%
72,00	4,62	0,62	14,85	27,0%	19,92	4,76	293,2	23,6	96,7%	75,9%	73,4%
73,00	4,56	0,64	14,84	26,9%	19,92	4,76	293,8	23,4	96,6%	75,8%	73,3%
74,00	4,47	0,58	14,73	28,3%	19,93	4,91	292,8	23,8	96,9%	75,8%	73,4%
75,00	4,43	0,51	14,65	29,5%	19,94	5,03	292,5	23,9	97,2%	75,8%	73,7%
76,00	4,34	0,45	14,66	30,0%	19,94	5,06	292,8	23,8	97,6%	75,8%	74,0%
77,00	4,25	0,47	14,68	29,6%	19,94	5,02	292,0	23,7	97,5%	75,9%	73,9%
78,00	4,20	0,46	14,64	30,0%	19,94	5,07	291,5	23,9	97,5%	75,9%	74,0%
79,00	4,15	0,46	14,58	30,6%	19,95	5,14	291,1	23,9	97,5%	75,8%	74,0%
80,00	4,07	0,49	14,51	31,0%	19,95	5,20	290,8	23,8	97,4%	75,8%	73,8%
81,00	4,02	0,49	14,54	30,6%	19,95	5,16	290,7	23,9	97,3%	75,8%	73,8%
82,00	3,94	0,53	14,63	29,6%	19,94	5,04	290,0	23,7	97,1%	75,9%	73,7%
83,00	3,89	0,60	14,62	29,1%	19,94	5,02	290,2	23,7	96,8%	75,9%	73,4%
84,00	3,79	0,66	14,63	28,5%	19,93	4,97	289,9	23,8	96,5%	75,9%	73,2%
85,00	3,75	0,78	14,63	27,5%	19,92	4,91	289,6	23,9	95,8%	75,9%	72,7%
86,00	3,66	0,87	14,63	26,7%	19,92	4,85	289,0	24,0	95,4%	75,9%	72,4%
87,00	3,62	0,89	14,73	25,8%	19,91	4,74	288,6	23,6	95,3%	76,0%	72,4%
88,00	3,53	0,90	14,74	25,6%	19,91	4,71	288,7	23,8	95,2%	76,0%	72,3%
89,00	3,43	0,77	15,01	24,5%	19,90	4,50	289,0	23,8	96,0%	76,2%	73,1%
90,00	3,39	0,75	15,14	23,6%	19,89	4,38	289,3	23,8	96,1%	76,3%	73,3%
91,00	3,30	0,55	15,07	25,8%	19,91	4,56	289,0	23,7	97,1%	76,3%	74,1%
92,00	3,25	0,42	15,04	27,1%	19,92	4,67	288,2	23,8	97,8%	76,3%	74,6%

93,00	3,21	0,25	14,41	34,0%	19,97	5,44	287,4	24,0	98,7%	76,0%	75,0%
94,00	3,16	0,22	14,16	36,6%	19,99	5,72	287,1	23,9	98,8%	75,8%	74,9%
95,00	3,07	0,19	14,00	38,5%	20,00	5,91	285,7	24,0	99,0%	75,8%	75,0%
96,00	3,02	0,16	13,82	40,5%	20,02	6,12	284,8	24,0	99,2%	75,7%	75,0%
97,00	2,98	0,14	13,64	42,6%	20,03	6,33	283,7	23,7	99,3%	75,6%	75,0%
98,00	2,91	0,12	13,49	44,4%	20,04	6,49	282,7	24,1	99,4%	75,5%	75,1%
99,00	2,89	0,11	13,24	47,2%	20,06	6,76	280,7	23,8	99,5%	75,4%	75,0%
100,00	2,85	0,34	14,00	37,0%	19,99	5,82	279,3	23,9	98,1%	76,1%	74,7%
101,00	2,81	0,31	14,02	37,1%	19,99	5,82	277,9	23,6	98,3%	76,2%	74,9%
102,00	2,76	0,30	13,97	37,7%	20,00	5,88	276,4	23,8	98,3%	76,2%	75,0%
103,00	2,72	0,29	13,90	38,4%	20,00	5,95	275,0	23,8	98,4%	76,2%	75,0%
104,00	2,68	0,28	13,79	39,6%	20,01	6,08	273,5	23,8	98,4%	76,2%	75,1%
105,00	2,63	0,28	13,64	41,1%	20,02	6,24	272,1	23,7	98,4%	76,2%	75,0%
106,00	2,59	0,20	13,34	45,1%	20,05	6,60	270,7	23,8	98,9%	76,1%	75,2%
107,00	2,58	0,11	12,96	50,3%	20,08	7,06	266,5	23,9	99,4%	76,0%	75,6%
108,00	2,53	0,09	12,76	52,8%	20,09	7,28	264,0	23,9	99,6%	76,0%	75,7%
109,00	2,49	0,10	12,98	50,2%	20,08	7,04	262,1	23,7	99,5%	76,3%	75,9%
110,00	2,49	0,09	13,10	48,9%	20,07	6,92	260,6	23,7	99,6%	76,5%	76,1%
111,00	2,43	0,09	13,16	48,2%	20,06	6,85	259,2	23,5	99,5%	76,6%	76,2%
112,00	2,39	0,12	13,10	48,7%	20,07	6,91	257,5	23,7	99,4%	76,6%	76,2%
113,00	2,36	0,11	12,97	50,2%	20,08	7,05	254,7	23,8	99,4%	76,7%	76,3%
114,00	2,33	0,13	12,73	52,8%	20,09	7,30	252,8	23,3	99,3%	76,6%	76,1%
115,00	2,30	0,12	12,66	53,7%	20,10	7,38	250,7	23,6	99,3%	76,7%	76,2%
116,00	2,26	0,13	12,36	57,4%	20,12	7,70	249,1	23,8	99,3%	76,5%	76,0%
117,00	2,26	0,14	12,26	58,4%	20,12	7,79	248,0	23,6	99,2%	76,5%	75,9%
118,00	2,21	0,14	12,12	60,2%	20,13	7,94	247,5	23,7	99,2%	76,4%	75,8%
119,00	2,17	0,15	11,93	62,7%	20,14	8,14	246,3	23,6	99,2%	76,3%	75,6%
120,00	2,12	0,15	11,64	66,6%	20,16	8,44	246,2	23,6	99,1%	76,0%	75,3%
121,00	2,12	0,18	11,33	70,6%	20,18	8,76	245,2	23,5	98,9%	75,7%	74,9%
122,00	2,07	0,19	11,20	72,5%	20,19	8,89	243,4	23,7	98,8%	75,7%	74,8%
123,00	2,05	0,20	10,87	77,5%	20,21	9,24	241,6	23,6	98,7%	75,5%	74,5%
124,00	2,03	0,22	10,54	82,5%	20,23	9,58	240,1	23,6	98,5%	75,2%	74,1%
125,00	1,98	0,26	10,28	86,4%	20,24	9,84	237,6	23,7	98,2%	75,1%	73,7%
126,00	1,98	0,37	9,72	94,5%	20,27	10,36	235,4	23,7	97,2%	74,5%	72,4%
127,00	1,94	0,50	9,29	100,6%	20,29	10,75	232,8	23,5	96,0%	74,0%	71,1%
128,00	1,94	0,54	9,16	102,4%	20,30	10,87	229,7	23,7	95,6%	74,0%	70,8%
129,00	1,90	0,62	8,88	106,8%	20,31	11,12	228,2	23,8	94,8%	73,7%	69,9%
130,00	1,90	0,66	8,79	108,0%	20,32	11,20	226,5	23,6	94,5%	73,7%	69,6%
131,00	1,85	0,69	8,69	109,6%	20,32	11,29	225,3	23,5	94,2%	73,6%	69,3%
132,00	1,85	0,72	8,58	111,3%	20,33	11,39	224,2	23,7	93,9%	73,5%	69,0%
133,00	1,81	0,74	8,55	111,6%	20,33	11,41	222,7	23,7	93,7%	73,6%	68,9%
134,00	1,76	0,76	8,52	111,7%	20,33	11,43	221,3	23,7	93,5%	73,7%	68,8%
135,00	1,76	0,79	8,43	113,0%	20,33	11,51	219,8	23,6	93,1%	73,6%	68,5%
136,00	1,71	0,83	8,33	114,5%	20,34	11,59	218,6	23,6	92,7%	73,5%	68,2%
137,00	1,71	0,89	8,19	116,5%	20,34	11,71	217,6	23,5	92,2%	73,4%	67,6%
138,00	1,71	0,93	8,13	116,9%	20,34	11,75	216,4	23,6	91,8%	73,4%	67,3%
139,00	1,67	0,97	8,05	117,8%	20,34	11,81	216,1	23,6	91,4%	73,2%	66,9%
140,00	1,67	0,20	7,97	140,5%	20,40	12,33	215,4	23,6	98,4%	73,4%	72,2%
141,00	1,67	0,21	7,92	141,7%	20,40	12,38	214,2	23,6	98,3%	73,4%	72,1%
142,00	1,62	0,22	7,87	142,9%	20,41	12,43	213,1	23,6	98,2%	73,4%	72,1%
143,00	1,62	0,22	7,81	144,6%	20,41	12,49	211,9	23,7	98,1%	73,4%	72,0%
144,00	1,58	0,23	7,72	146,9%	20,41	12,57	211,5	23,5	98,0%	73,3%	71,8%
145,00	1,58	0,24	7,67	148,1%	20,42	12,62	210,8	23,5	97,9%	73,2%	71,7%
146,00	1,53	0,25	7,58	151,0%	20,42	12,72	210,1	23,6	97,8%	73,1%	71,5%
147,00	1,53	0,27	7,49	153,1%	20,43	12,80	209,7	23,7	97,6%	73,0%	71,2%
148,00	1,53	0,28	7,41	155,5%	20,43	12,88	208,7	23,5	97,4%	72,9%	71,0%
149,00	1,49	0,29	7,35	157,4%	20,44	12,95	207,8	23,6	97,3%	72,8%	70,9%
150,00	1,53	0,29	7,33	157,7%	20,44	12,96	207,1	23,5	97,2%	72,9%	70,9%
151,00	1,49	0,30	7,25	160,3%	20,44	13,05	206,2	23,7	97,2%	72,8%	70,7%
152,00	1,44	0,31	7,16	162,9%	20,45	13,13	205,7	23,6	97,0%	72,7%	70,5%
153,00	1,39	0,31	7,10	165,1%	20,45	13,20	204,9	23,6	97,0%	72,6%	70,4%
154,00	1,39	0,28	6,85	175,5%	20,47	13,48	204,9	23,6	97,3%	72,1%	70,1%
155,00	1,39	0,29	6,39	194,1%	20,50	13,96	202,9	23,6	97,0%	71,1%	69,0%
156,00	1,35	0,31	6,11	206,0%	20,52	14,25	201,5	23,5	96,6%	70,5%	68,1%
157,00	1,39	0,31	6,03	209,7%	20,52	14,34	199,3	23,6	96,5%	70,5%	68,0%
158,00	1,35	0,32	5,96	212,6%	20,53	14,40	197,3	23,6	96,4%	70,6%	68,0%
159,00	1,35	0,33	5,96	212,3%	20,52	14,40	195,4	23,6	96,3%	70,8%	68,1%
160,00	1,30	0,33	5,91	214,5%	20,53	14,45	194,1	23,6	96,2%	70,8%	68,1%
161,00	1,30	0,34	5,96	211,9%	20,52	14,39	192,5	23,6	96,2%	71,1%	68,4%
162,00	1,30	0,34	5,86	216,6%	20,53	14,50	190,9	23,5	96,0%	71,0%	68,2%
163,00	1,26	0,35	5,83	218,0%	20,53	14,53	189,1	23,6	96,0%	71,1%	68,2%
164,00	1,26	0,35	5,85	217,0%	20,53	14,51	187,4	23,5	95,9%	71,3%	68,4%
165,00	1,26	0,36	5,85	216,7%	20,53	14,51	186,1	23,5	95,8%	71,5%	68,5%
166,00	1,25	0,36	5,83	217,5%	20,53	14,52	184,7	23,5	95,8%	71,6%	68,6%
167,00	1,21	0,36	5,80	219,1%	20,53	14,56	183,4	23,4	95,8%	71,6%	68,6%
168,00	1,22	0,36	5,78	219,8%	20,53	14,57	181,8	23,6	95,7%	71,8%	68,7%
169,00	1,22	0,36	5,75	221,5%	20,54	14,61	180,2	23,4	95,7%	71,9%	68,8%
170,00	1,17	0,37	5,80	218,6%	20,53	14,55	178,7	23,5	95,7%	72,2%	69,0%
171,00	1,17	0,37	5,68	224,3%	20,54	14,67	177,1	23,4	95,5%	72,0%	68,8%
172,00	1,17	0,35	5,80	219,6%	20,53	14,56	176,0	23,5	95,9%	72,5%	69,5%
173,00	1,17	0,32	5,93	214,4%	20,53	14,44	174,8	23,5	96,4%	73,0%	70,3%
174,00	1,13	0,31	5,96	213,0%	20,53	14,41	173,9	23,5	96,4%	73,2%	70,6%
175,00	1,13	0,32	5,78	222,0%	20,54	14,60	172,7	23,5	96,3%	72,8%	70,1%
176,00	1,13	0,32	5,75	223,6%	20,54	14,63	171,9	23,4	96,2%	72,8%	70,1%
177,00	1,13	0,32	5,53	235,4%	20,55	14,86	170,9	23,5	96,1%	72,4%	69,5%
178,00	1,08	0,33	5,48	238,0%	20,56	14,91	170,5	23,4	96,0%	72,3%	69,4%
179,00	1,08	0,33	5,48	237,8%	20,56	14,91	169,5	23,4	96,0%	72,4%	69,5%
180,00	1,08	0,33	5,50	236,8%	20,55	14,89	168,5	23,5	95,9%	72,6%	69,6%
181,00	1,08	0,33	5,55	234,1%	20,55	14,84	167,9	23,4	96,0%	72,8%	69,9%
182,00	1,08	0,33	5,55	234,2%	20,55	14,84	166,9	23,4	96,0%	72,9%	70,0%
183,00	1,03	0,33	5,53	235,2%	20,55	14,86	166,4	23,4	96,0%	72,9%	70,0%
184,00	1,03	0,33	5,53	235,1%	20,55	14,86	165,5	23,4	96,0%	73,0%	70,1%
185,00	1,03	0,33	5,55	234,1%	20,55	14,84	164,9	23,3	96,0%	73,1%	70,2%
186,00	1,03	0,33	5,57	233,0%	20,55	14,82	164,1	23,4	96,0%	73,3%	70,3%
187,00	0,99	0,34	5,62	229,8%	20,55	14,76	163,5	23,4	95,9%	73,5%	70,4%
188,00	0,99	0,34	5,60	230,7%	20,55	14,78	163,1	23,3	95,9%	73,4%	70,4%
189,00	0,99	0,34	5,58	231,6%	20,55	14,80	162,4	23,3	95,9%	73,5%	70,4%
190,00	0,94	0,35	5,63	228,5%	20,55	14,74	161,5	23,4	95,8%	73,7%	70,6%
191,00	0,94	0,35	5,65	227,4%	20,54	14,72	160,8	23,3	95,8%	73,8%	70,7%
192,00	0,94	0,35	5,62	229,3%	20,55	14,76	160,2	23,2	95,8%	73,8%	70,7%
193,00	0,94	0,35	5,58	231,2%	20,55	14,79	160,1	23,4	95,8%	73,8%	70,6%
194,00	0,94	0,36	5,90	213,8%	20,53	14,45	159,6	23,4	95,8%	74,6%	71,4%
195,00	0,90	0,37	5,98	209,5%	20,52	14,36	159,4	23,3	95,8%	74,8%	71,6%
196,00	0,90	0,37	5,95	211,2%	20,52	14,39	158,9	23,3	95,8%	74,8%	71,6%
197,00	0,90	0,36	6,08	205,2%	20,51	14,26	157,9	23,3	95,9%	75,2%	72,1%
198,00	0,85	0,35	6,06	206,2%	20,52	14,28	157,6	23,4	96,0%	75,2%	72,2%
199,00	0,85	0,35	6,05	206,9%	20,52	14,30	156,9	23,3	96,0%	75,2%	72,2%
200,00	0,85	0,36	6,06	206,1%	20,52	14,28	156,1	23,1	96,0%	75,3%	72,3%
201,00	0,85	0,35	6,04	207,0%	20,52	14,30	155,5	23,1	96,0%	75,3%	72,3%
202,00	0,81	0,36	6,03	207,7%	20,52	14,31	155,2	23,1	95,9%	75,3%	72,3%
203,00	0,81	0,36	5,95	211,6%	20,52	14,40	154,7	23,2	95,9%	75,2%	72,1%
204,00	0,81	0,36	5,93	212,4%	20,52	14,42	154,7	23,3	95,8%	75,2%	72,1%
205,00	0,81	0,36	5,88	214,8%	20,53	14,47	154,0	23,2	95,8%	75,1%	72,0%
206,00	0,76	0,36	5,81	218,0%	20,53	14,54	153,6	23,2	95,7%	75,0%	71,8%

207,00	0,76	0,36	5,78	219,9%	20,53	14,57	153,1	23,2	95,7%	75,0%	71,8%
208,00	0,76	0,35	5,57	232,0%	20,55	14,81	153,0	23,2	95,7%	74,5%	71,4%
209,00	0,76	0,34	5,76	222,0%	20,54	14,60	152,7	23,3	96,0%	75,0%	72,1%
210,00	0,72	0,32	5,86	217,5%	20,53	14,51	152,6	23,2	96,3%	75,3%	72,5%
211,00	0,72	0,33	5,78	221,6%	20,54	14,59	152,8	23,2	96,2%	75,1%	72,2%
212,00	0,72	0,33	5,76	222,1%	20,54	14,61	152,7	23,2	96,1%	75,0%	72,1%
213,00	0,72	0,33	5,73	224,0%	20,54	14,64	152,5	23,3	96,1%	75,0%	72,1%
214,00	0,67	0,34	5,75	222,8%	20,54	14,62	152,6	23,2	96,0%	75,0%	72,0%
215,00	0,67	0,34	5,70	225,4%	20,54	14,67	152,2	23,3	96,0%	75,0%	71,9%
216,00	0,67	0,34	5,73	223,7%	20,54	14,64	152,4	23,3	96,0%	75,0%	72,0%
217,00	0,67	0,34	5,68	226,4%	20,54	14,69	152,4	23,2	96,0%	74,9%	71,9%
218,00	0,62	0,34	5,55	233,7%	20,55	14,83	152,2	23,2	95,9%	74,6%	71,5%
219,00	0,62	0,33	5,34	246,5%	20,57	15,06	152,1	23,1	95,8%	74,0%	70,9%
220,00	0,62	0,33	5,24	252,9%	20,57	15,17	151,8	23,2	95,8%	73,8%	70,7%
221,00	0,62	0,33	5,24	252,8%	20,57	15,17	152,4	23,3	95,8%	73,8%	70,6%
222,00	0,62	0,33	5,27	250,8%	20,57	15,14	152,2	23,2	95,8%	73,9%	70,8%
223,00	0,60	0,33	5,18	256,5%	20,58	15,23	151,9	23,2	95,8%	73,7%	70,6%
224,00	0,58	0,32	5,04	266,2%	20,59	15,38	152,1	23,2	95,7%	73,2%	70,1%
225,00	0,58	0,33	5,15	258,1%	20,58	15,26	152,1	23,1	95,7%	73,5%	70,4%
226,00	0,53	0,34	5,14	258,8%	20,58	15,27	151,7	23,2	95,6%	73,6%	70,3%
227,00	0,53	0,33	5,12	260,3%	20,58	15,29	151,9	23,2	95,7%	73,5%	70,3%
228,00	0,49	0,34	5,08	262,6%	20,58	15,33	152,0	23,3	95,6%	73,4%	70,1%
229,00	0,53	0,34	5,04	265,5%	20,59	15,38	151,8	23,2	95,6%	73,3%	70,0%
230,00	0,49	0,34	5,09	261,9%	20,58	15,32	152,2	23,2	95,5%	73,3%	70,1%
231,00	0,49	0,35	5,06	263,6%	20,58	15,35	152,0	23,2	95,4%	73,3%	69,9%
232,00	0,49	0,34	5,04	265,0%	20,58	15,37	152,2	23,3	95,5%	73,2%	69,9%
233,00	0,45	0,35	4,96	270,1%	20,59	15,46	152,4	23,1	95,3%	72,9%	69,5%
234,00	0,45	0,35	4,99	267,9%	20,59	15,42	152,2	23,1	95,3%	73,0%	69,6%
235,00	0,45	0,35	4,97	269,2%	20,59	15,44	152,7	23,3	95,3%	72,9%	69,5%
236,00	0,45	0,34	4,97	269,6%	20,59	15,45	152,8	23,3	95,4%	72,9%	69,6%
237,00	0,40	0,34	4,86	277,5%	20,60	15,57	153,0	23,4	95,3%	72,6%	69,1%
238,00	0,45	0,34	4,81	281,5%	20,60	15,62	153,1	23,3	95,3%	72,4%	69,0%
239,00	0,40	0,34	4,81	281,3%	20,60	15,62	153,4	23,2	95,3%	72,3%	68,9%
240,00	0,40	0,35	4,81	281,1%	20,60	15,62	152,9	23,1	95,2%	72,4%	68,9%
241,00	0,36	0,35	4,84	278,6%	20,60	15,58	153,7	23,1	95,2%	72,4%	68,9%
242,00	0,36	0,35	4,89	274,8%	20,59	15,53	153,8	23,2	95,2%	72,5%	69,1%
243,00	0,36	0,35	5,02	265,8%	20,59	15,39	153,8	23,1	95,4%	72,9%	69,5%
244,00	0,31	0,34	5,06	264,1%	20,58	15,36	154,4	23,1	95,5%	73,0%	69,7%
245,00	0,31	0,31	5,12	261,5%	20,58	15,30	154,0	23,2	96,0%	73,2%	70,3%
246,00	0,31	0,31	5,11	262,4%	20,58	15,32	154,1	23,1	95,9%	73,2%	70,2%
247,00	0,26	0,31	5,02	268,0%	20,59	15,41	154,5	23,0	95,9%	72,8%	69,8%
248,00	0,26	0,32	5,02	267,9%	20,59	15,41	154,3	23,1	95,8%	72,9%	69,8%
249,00	0,26	0,31	5,01	269,1%	20,59	15,42	154,3	23,2	95,8%	72,8%	69,8%
250,00	0,26	0,32	5,01	269,1%	20,59	15,42	154,8	23,2	95,8%	72,8%	69,7%
251,00	0,22	0,32	5,01	268,8%	20,59	15,42	154,9	23,2	95,8%	72,8%	69,7%
252,00	0,22	0,32	5,01	268,8%	20,59	15,42	154,8	23,1	95,8%	72,8%	69,7%
253,00	0,22	0,32	5,01	268,9%	20,59	15,42	154,9	23,0	95,8%	72,7%	69,7%
254,00	0,22	0,32	5,04	266,7%	20,59	15,39	155,0	23,1	95,8%	72,8%	69,8%
255,00	0,22	0,31	5,02	268,2%	20,59	15,41	155,4	22,7	95,9%	72,7%	69,7%
256,00	0,17	0,32	5,02	267,7%	20,59	15,40	155,3	22,6	95,8%	72,7%	69,6%
257,00	0,17	0,32	5,01	268,7%	20,59	15,42	154,6	22,7	95,8%	72,7%	69,7%
258,00	0,17	0,38	5,43	237,7%	20,56	14,93	154,7	22,7	95,2%	73,9%	70,4%
259,00	0,17	0,39	5,38	240,4%	20,56	14,98	154,3	22,7	95,1%	73,8%	70,2%
260,00	0,13	0,39	5,19	252,5%	20,57	15,19	154,2	22,9	94,9%	73,3%	69,6%
261,00	0,16	0,38	5,09	259,0%	20,58	15,30	153,9	22,9	94,9%	73,1%	69,3%
262,00	0,13	0,39	5,07	259,5%	20,58	15,31	153,5	22,8	94,7%	73,1%	69,2%
263,00	0,13	0,39	5,07	259,5%	20,58	15,31	152,8	22,9	94,7%	73,2%	69,3%
264,00	0,08	0,39	4,97	266,3%	20,59	15,42	152,3	22,9	94,7%	72,9%	69,1%
265,00	0,08	0,39	5,01	263,9%	20,58	15,38	151,9	22,9	94,7%	73,1%	69,2%
266,00	0,08	0,40	4,94	268,1%	20,59	15,45	151,7	22,9	94,6%	72,9%	68,9%
267,00	0,08	0,40	4,89	271,4%	20,59	15,50	151,4	23,0	94,5%	72,8%	68,8%
268,00	0,04	0,40	4,92	268,7%	20,59	15,46	151,3	22,9	94,4%	72,9%	68,8%
269,00	0,04	0,41	5,06	259,6%	20,58	15,32	151,3	23,0	94,5%	73,3%	69,3%
270,00	0,04	0,40	5,06	260,2%	20,58	15,33	150,6	23,0	94,7%	73,4%	69,5%
271,00	0,04	0,40	4,97	265,8%	20,59	15,41	150,7	23,0	94,6%	73,2%	69,2%
272,00	0,00	0,40	4,81	277,3%	20,60	15,59	150,1	23,1	94,4%	72,7%	68,7%

*		*	*	*	*1	*2	*3	*4	*6	*7	*8	Mass flow	DGM 1st hour	DGM 1st hour	Filter	DGM 1	DGM 1	DGM 1	Filter 1	Mass flow 2	DGM 2	DGM 2	Filter 2	Tunnel Velocity	Flue draft				Change in
Elapsed		Weight			Flue	Room	Tunnel	Unit	Unit	Unit	Unit	Reading	1st hour	1st hour	1st hour	Reading	Inlet T	Outlet T	Temp	Reading	Inlet T	Outlet T	Temp	Pressure	Pressure	Filter 1st hr	Filter 1	Filter 2	Surface
Time	Raw data row	Remaining	CO	CO_2	Gas	Temp	Dry Bulb	Top	R.Side	L.Side	Bottom	1st hour	Inlet T	Outlet T	Temp									in wc	in wc				Temp.
min		lbs	%	%	°F	°F	°F	°F	°F	°F	°F	cuft/min	oF	oF	oF	cuft/min	oF	oF	oF	cuft/min	oF	oF	oF	in wc	in wc	in. Hg	in. Hg	in. Hg	°F
0	245,00	22,8	0,6	1,7	326,9	73,2	120,3	367,7	475,3	461,0	500,4	0,19	74,5	74,5	83,6	0,18	73,0	74,0	80,4	0,18	73,1	73,3	85,3	0,08	0,04	-0,86	-1,13	-1,03	0,0
1	246,0	22,7	0,5	1,0	334,6	73,2	123,8	355,9	469,0	455,8	506,7	0,19	74,7	74,6	84,3	0,18	73,0	74,0	82,3	0,18	73,2	73,4	86,0	0,08	0,06	-0,81	-1,10	-0,99	-4,2
2	247,0	22,5	0,6	3,3	336,8	73,0	104,8	346,0	462,2	449,9	511,5	0,19	74,6	74,7	83,9	0,18	73,0	73,9	81,9	0,18	73,4	73,4	85,9	0,08	0,06	-0,80	-1,10	-0,97	-8,7
3	248,0	22,4	0,7	3,8	344,3	73,2	102,2	339,4	455,7	444,2	515,9	0,19	74,6	74,7	83,6	0,18	73,1	73,9	81,7	0,18	73,6	73,5	85,6	0,08	0,06	-0,80	-1,09	-0,97	-12,3
4	249,0	22,3	0,7	4,2	353,7	72,9	102,0	337,2	449,8	438,4	519,4	0,19	74,5	74,7	83,5	0,18	73,1	73,8	81,7	0,18	73,7	73,6	85,5	0,08	0,06	-0,81	-1,09	-0,98	-14,9
5	250,0	22,2	0,6	3,9	359,5	72,8	102,0	336,9	444,1	433,4	523,1	0,19	74,4	74,7	83,5	0,18	73,1	73,8	81,9	0,18	73,9	73,7	85,5	0,08	0,06	-0,81	-1,10	-0,99	-16,7
6	251,0	22,1	0,5	5,3	374,8	73,1	103,2	339,8	439,1	429,0	526,3	0,19	74,3	74,6	83,7	0,18	73,1	73,7	82,0	0,18	74,0	73,8	85,5	0,08	0,06	-0,80	-1,11	-0,98	-17,6
7	252,0	22,0	0,5	5,7	390,0	73,1	105,1	348,0	434,7	424,7	529,4	0,19	74,3	74,6	83,9	0,18	73,1	73,7	82,3	0,18	74,2	73,9	85,5	0,08	0,06	-0,81	-1,10	-0,99	-16,9
8	253,0	21,9	0,5	6,4	403,1	73,4	106,2	358,8	431,9	420,9	531,9	0,19	74,3	74,6	83,2	0,18	73,2	73,7	82,5	0,18	74,4	74,1	85,6	0,08	0,07	-0,80	-1,10	-0,99	-15,2
9	254,0	21,7	0,5	6,0	411,2	73,0	106,7	370,0	429,4	417,5	534,5	0,19	74,2	74,6	83,3	0,18	73,2	73,7	82,7	0,18	74,6	74,2	85,6	0,08	0,07	-0,81	-1,11	-0,99	-13,2
10	255,0	21,6	0,4	6,3	421,3	73,3	107,6	382,6	427,2	414,2	537,0	0,19	74,2	74,6	83,5	0,18	73,3	73,7	82,9	0,18	74,8	74,3	85,7	0,08	0,07	-0,81	-1,11	-0,98	-10,9
11	256,0	21,4	0,4	6,4	433,8	73,3	108,8	397,4	425,1	411,5	538,7	0,19	74,2	74,6	83,8	0,18	73,4	73,7	83,2	0,18	75,0	74,4	85,8	0,08	0,07	-0,80	-1,11	-0,98	-7,9
12	257,0	21,2	0,3	8,2	458,2	73,6	112,1	416,2	423,8	410,0	541,1	0,19	74,3	74,6	84,2	0,18	73,4	73,7	83,6	0,18	75,2	74,6	85,9	0,08	0,07	-0,81	-1,11	-0,99	-3,3
13	258,0	21,0	0,4	8,3	466,5	73,3	112,1	431,5	422,4	409,2	542,9	0,19	74,3	74,6	84,4	0,18	73,4	73,7	83,9	0,18	75,4	74,7	86,0	0,08	0,07	-0,81	-1,11	-0,98	0,4
14	259,0	20,9	0,4	6,9	468,3	73,7	112,5	441,5	420,6	409,5	544,9	0,19	74,4	74,6	84,5	0,18	73,5	73,7	84,1	0,18	75,6	74,9	86,1	0,08	0,07	-0,81	-1,11	-0,99	3,0
15	260,0	20,7	0,4	7,1	470,0	73,4	113,5	450,0	418,7	409,3	545,4	0,19	74,4	74,6	84,5	0,18	73,6	73,7	84,3	0,18	75,8	75,0	86,2	0,08	0,07	-0,81	-1,10	-0,99	4,7
16	261,0	20,5	0,5	7,5	479,6	73,5	114,6	458,0	417,8	408,7	546,9	0,19	74,5	74,6	84,8	0,18	73,6	73,7	84,6	0,18	75,9	75,2	86,3	0,08	0,07	-0,81	-1,12	-1,00	6,7
17	262,0	20,3	0,3	9,2	495,5	73,7	116,2	472,6	417,8	408,7	548,2	0,19	74,5	74,6	85,1	0,18	73,6	73,8	84,9	0,18	76,1	75,3	86,5	0,08	0,07	-0,82	-1,12	-1,00	10,7
18	263,0	20,1	0,3	10,0	512,8	73,6	117,3	494,0	419,3	408,2	550,0	0,19	74,6	74,7	85,4	0,18	73,7	73,8	85,2	0,18	76,3	75,4	86,7	0,08	0,08	-0,82	-1,11	-1,00	16,7
19	264,0	19,9	0,3	10,7	528,9	73,4	120,0	519,4	421,6	409,0	551,4	0,19	74,7	74,7	85,8	0,18	73,8	73,8	85,6	0,18	76,5	75,5	86,9	0,08	0,08	-0,82	-1,11	-1,00	24,3
20	265,0	19,6	0,3	12,0	545,2	73,8	121,6	545,5	424,1	410,9	553,2	0,19	74,6	74,7	86,2	0,18	73,7	73,8	86,0	0,18	76,6	75,7	87,1	0,08	0,08	-0,82	-1,12	-1,01	32,3
21	266,0	19,4	0,2	11,5	554,1	73,8	121,8	567,4	427,4	414,1	554,1	0,19	74,6	74,7	86,5	0,18	73,7	73,8	86,3	0,18	76,6	75,8	87,3	0,08	0,08	-0,82	-1,12	-1,00	39,6
22	267,0	19,2	0,2	10,9	559,1	73,7	122,8	584,8	431,0	416,3	555,1	0,19	74,7	74,7	86,9	0,18	73,7	73,8	86,6	0,18	76,8	75,9	87,5	0,08	0,08	-0,83	-1,12	-1,00	45,7
23	268,0	19,0	0,2	10,7	563,2	73,6	123,5	597,8	434,5	418,2	555,4	0,19	74,8	74,7	87,2	0,18	73,7	73,9	86,9	0,18	76,9	76,0	87,8	0,08	0,08	-0,83	-1,12	-0,99	50,4
24	269,0	18,7	0,2	10,2	564,8	74,1	123,6	605,1	437,9	421,0	556,7	0,19	74,8	74,8	87,4	0,18	73,8	73,9	87,1	0,18	77,1	76,1	88,0	0,08	0,08	-0,83	-1,12	-1,00	54,1
25	270,0	18,6	0,2	10,0	567,2	74,2	123,8	608,3	441,2	424,2	557,3	0,19	74,9	74,8	87,7	0,18	73,9	74,0	87,4	0,18	77,3	76,2	88,2	0,08	0,08	-0,83	-1,12	-1,00	56,7
26	271,0	18,4	0,2	10,3	568,8	74,1	123,6	610,9	444,6	427,8	556,8	0,19	74,9	74,8	88,0	0,18	73,8	74,0	87,6	0,18	77,3	76,4	88,4	0,08	0,08	-0,83	-1,12	-1,00	58,9
27	272,0	18,1	0,2	10,8	570,6	74,2	123,7	615,3	448,1	432,7	557,1	0,19	74,9	74,8	87,2	0,18	73,8	74,0	87,8	0,18	77,4	76,5	88,6	0,08	0,08	-0,83	-1,12	-1,01	62,2
28	273,0	18,0	0,2	11,1	570,4	74,3	122,6	621,1	451,8	436,9	558,1	0,19	74,9	74,8	87,4	0,18	73,8	74,0	88,0	0,18	77,4	76,5	88,8	0,08	0,08	-0,83	-1,12	-1,01	65,9
29	274,0	17,7	0,2	11,4	572,7	74,1	122,7	627,3	455,9	440,9	557,7	0,19	74,9	74,9	87,6	0,18	73,7	74,0	87,7	0,18	77,4	76,6	88,4	0,08	0,08	-0,83	-1,11	-1,00	69,3
30	275,0	17,5	0,2	11,4	572,9	74,2	122,3	633,3	460,5	444,4	557,7	0,19	74,9	74,9	87,8	0,18	73,7	74,0	87,9	0,18	77,5	76,7	88,6	0,08	0,08	-0,83	-1,11	-1,00	72,9
31	276,0	17,3	0,2	11,7	567,9	74,0	120,7	640,8	465,4	447,5	557,8	0,19	75,0	74,9	87,9	0,18	73,8	74,0	87,9	0,18	77,6	76,8	88,2	0,08	0,08	-0,84	-1,11	-1,00	76,8
32	277,0	17,2	0,3	11,2	567,5	74,4	120,4	646,9	470,5	450,5	557,5	0,19	75,1	74,9	88,0	0,18	73,9	74,1	88,1	0,18	77,8	76,9	88,4	0,08	0,08	-0,83	-1,12	-1,01	80,2
33	278,0	17,0	0,3	11,1	565,1	74,6	120,2	652,0	475,3	453,0	558,9	0,19	75,1	75,0	88,1	0,18	73,9	74,1	87,7	0,18	77,9	77,1	88,5	0,08	0,08	-0,84	-1,11	-1,00	83,7
34	279,0	16,8	0,3	10,9	564,6	74,4	120,1	656,1	480,3	454,5	558,4	0,19	75,1	75,0	88,3	0,18	73,9	74,1	87,8	0,18	77,9	77,2	88,6	0,08	0,08	-0,83	-1,11	-1,00	86,2
35	280,0	16,6	0,4	10,7	562,4	74,4	119,7	658,4	484,8	456,4	558,9	0,19	75,1	75,0	88,3	0,18	73,9	74,1	88,0	0,18	77,9	77,3	88,2	0,08	0,08	-0,84	-1,11	-1,00	88,5
36	281,0	16,5	0,4	10,8	562,9	74,3	119,9	659,4	489,5	458,3	558,2	0,19	75,1	75,0	88,5	0,18	73,9	74,1	88,1	0,18	78,0	77,3	88,4	0,08	0,08	-0,84	-1,10	-1,01	90,2
37	282,0	16,2	0,4	10,9	563,2	74,3	120,1	660,7	493,8	460,2	558,1	0,19	75,2	75,1	87,6	0,18	73,9	74,2	88,2	0,18	78,1	77,5	88,6	0,08	0,08	-0,84	-1,10	-1,00	92,1
38	283,0	16,0	0,3	11,2	564,3	74,3	120,6	662,1	498,7	461,8	557,8	0,19	75,2	75,1	87,9	0,18	74,0	74,2	87,9	0,18	78,1	77,5	88,7	0,08	0,08	-0,84	-1,10	-1,00	94,0
39	284,0	15,9	0,3	11,6	566,4	74,3	120,3	663,7	503,4	463,7	557,8	0,19	75,2	75,1	88,0	0,18	74,0	74,3	88,0	0,18	78,1	77,6	88,9	0,08	0,08	-0,84	-1,10	-1,00	96,0
40	285,0	15,7	0,2	11,8	568,0	74,2	121,2	666,1	508,3	465,8	557,3	0,19	75,3	75,2	88,1	0,18	74,0	74,3	88,2	0,18	78,2	77,7	89,1	0,08	0,08	-0,85	-1,10	-1,00	98,3
41	286,0	15,6	0,2	12,0	570,8	74,4	121,3	668,8	513,2	467,7	556,9	0,19	75,3	75,2	88,3	0,18	74,1	74,4	88,3	0,18	78,2	77,8	89,2	0,08	0,08	-0,84	-1,10	-1,00	100,5
42	287,0	15,3	0,2	12,2	573,7	74,4	121,5	672,6	518,4	469,6	557,1	0,19	75,3	75,2	88,5	0,18	74,1	74,4	88,4	0,18	78,3	77,9	88,9	0,08	0,08	-0,85	-1,10	-1,01	103,3
43	288,0	15,1	0,2	12,3	576,1	74,4	121,9	677,0	523,3	472,5	556,4	0,19	75,4	75,3	88,7	0,18	74,1	74,4	88,6	0,18	78,3	78,0	89,0	0,08	0,08	-0,85	-1,09	-1,00	106,2
44	289,0	15,0	0,2	12,6	579,9	74,2	122,6	681,4	528,4	474,9	556,1	0,19	75,4	75,3	88,8	0,18	74,2	74,4	88,7	0,18	78,3	78,1	88,7	0,08	0,08	-0,86	-1,09	-1,00	109,1
45	290,0	14,7	0,2	12,9	582,4	74,6	122,9	686,3	532,8	478,4	556,0	0,19	75,4	75,3	89,0	0,18	74,2	74,5	88,9	0,18	78,4	78,1	88,9	0,08	0,08	-0,86	-1,09	-1,00	112,4
46	291,0	14,5	0,2	13,0	585,4	74,3	123,4	690,9	537,6	481,8	555,8	0,19	75,4	75,3	89,2	0,18	74,2	74,5	89,0	0,18	78,4	78,2	89,1	0,08	0,08	-0,85	-1,09	-1,00	115,4
47	292,0	14,4	0,2	13,3	589,8	74,6	123,5	695,7	542,4	485,7	556,2	0,19	75,5	75,3	89,3	0,18	74,2	74,5	89,1	0,18	78,5	78,3	89,2	0,08	0,08	-0,86	-1,09	-1,00	118,9
48	293,0	14,2	0,2	13,5	580,7	74,6	120,1	700,2	547,1	489,7	555,7	0,19	75,5	75,4	89,3	0,18	74,2	74,5	89,1	0,18	78,5	78,3	89,3	0,08	0,08	-0,86	-1,08	-0,99	122,1
49	294,0	13,9	0,8	13,7	569,3	73,9	118,0	704,4	551,0	493,4	555,4	0,19	75,6	75,4	89,1	0,18	74,4	74,6	89,0	0,18	78,8	78,4	88,8	0,08	0,08	-0,86	-1,08	-0,99	125,0
50	295,0	13,8	0,5	13,4	564,3	74,6	116,6	708,5	554,0	495,8	554,9	0,19	75,7	75,5	88,8	0,18	74,6	74,7	88,8	0,18	78,9	78,5	88,8	0,08	0,08	-0,86	-1,08	-0,99	127,2
51	296,0	13,7	0,4	13,3	560,4	74,6	116,3	710,4	556,1	498,0	554,6	0,19	75,8	75,5	88,8	0,18	74,7	74,7	88,3	0,18	79,1	78,6	88,9	0,08	0,08	-0,86	-1,08	-1,00	128,7
52	297,0	13,5	0,3	12,8	557,6	74,7	115,4	709,9	558,3	499,9	554,0	0,19	75,9	75,6	88,8	0,18	74,8	74,8	88,3	0,18	79,2	78,6	89,0	0,08	0,08	-0,86	-1,07	-0,99	129,4
53	298,0	13,4	0,3	12,6	555,3	74,9	116,1	708,8	560,2	501,7	551,9	0,19	76,0	75,6	88,8	0,18	74,9	74,8	88,4	0,18	79,3	78,8	89,1	0,08	0,08	-0,86	-1,07	-0,99	129,6
54	299,0	13,1	0,3	12,4	553,1	75,1	115,3	706,3	561,3	502,8	551,9	0,19	76,0	75,7	88,8	0,18	74,9	74,9	88,4	0,18	79,5	78,9	89,1	0,08	0,08	-0,86	-1,08	-0,99	129,5
55	300,0	13,0	0,3	12,4	550,2	75,0	114,7	703,5	562,0	504,4	550,8	0,19	76,0	75,7	88,8	0,18	74,8	74,9	88,4	0,18	79,3	78,9	89,2	0,08	0,08	-0,86	-1,07	-0,98	129,1
56	301,0	12,9	0,3	12,7	550,2	74,8	115,1	701,1	562,4	505,5	549,5	0,19	75,9	75,7	88,8	0,18	74,7	74,9	88,4	0,18	79,3	78,9	89,3	0,08	0,08	-0,85	-1,08	-0,99	128,5
57	302,0	12,7	0,3	12,9	549,2	75,0	115,7	699,7	563,0	506,0	548,3	0,19	76,0	75,7	88,9	0,18	74,8	74,9	88,5	0,18	79,0	79,4	89,4	0,08	0,08	-0,86	-1,08	-0,99	128,1
58	303,0	12,5	0,3	13,5	551,1	74,7	114,8	697,9	563,4	507,0	547,2	0,19	75,9	75,7	88,9	0,18	74,8	75,0	88,5	0,18	79,4	79,1	89,4	0,08	0,08	-0,86	-1,07	-0,98	127,8
59	304,0	12,3	0,4	13,8	552,9	75,0	114,7	697,4	564,8	508,6	545,5	0,19	76,0	75,8	88,9	0,18	74,9	75,0	88,5	0,18	79,5	79,1	88,9	0,08	0,08	-0,85	-1,07	-0,98	128,0
60	305,0	12,2	0,4	13,8	554,1	75,0	115,8	699,3	566,1	510,1	544,4	0,19	76,0	75,8	89,0	0,18	75,0	75,1	88,6	0,18	79,8	79,2	86,3	0,08	0,08	-0,86	-1,08	-0,98	128,9
61	306,0	12,1	0,4	13,7	556,3	74,9	115,1	701,1	567,5	511,5	543,7	0,00	75,8	75,8	86,5	0,18	75,1	75,1	88,6	0,18	79,8	79,3	84,3	0,08	0,08	0,04	-1,06	-0,98	129,9
62	307,0	11,9	0,4	14,0	557,3	75,2	114,8	701,2	568,5	512,5	541,8	0,00	75,7	75,8	85,5	0,18	75,3	75,2	87,2	0,18	79,9	79,4	83,0	0,08	0,08	0,04	-1,07	-0,99	130,2
63	308,0	11,7	0,5	14,2	557,4	75,2	115,7	704,1	569,7	513,7	540,4	0,43	75,7	75,8	84,9	0,18	75,3	75,3	86,2	0,18	80,1	79,5	82,2	0,08	0,08	0,05	-1,06	-0,98	130,9
64	309,0	11,5	0,6	14,5	559,5	75,3	115,5	705,2	571,0	515,5	539,9	0,00	75,6	76,0	84,6	0,18	75,3	75,4	85,5	0,18	80,2	79,5	81,6	0,08	0,08	-6,60	-1,06	-0,98	131,8
65	310,0	11,3	0,6	14,5	558,8	74,7	114,7	706,8	572,5	517,2	538,8	0,00	76,0	76,1	########	0,18	75,3	75,4	85,1	0,18	80,2	79,6	81,2	0,07	0,08	0,06	-1,06	-0,98	132,7
66	311,0	11,2	0,8	14,7	558,5	74,9	115,1	709,4	573,9	518,9	537,5	0,00	75,8	76,0	########	0,18	75,3	75,4	84,7	0,18	80,1	79,7	80,9	0,08	0,08	0,05	-1,06	-0,97	133,8
67	312,0	11,1	0,8	14,7	558,0	75,1	114,7	711,0	574,4	520,5	538,2	0,00	75,7	76,0	########	0,18	75,4	75,4	84,4	0,18	80,0	79,7	80,6	0,08	0,08	0,05	-1,06	-0,97	134,9
68	313,0	10,9	0,7	14,8	558,4	75,2	115,0	712,7	575,3	521,9	536,2	0,00	75,7	75,9	########	0,18	75,3	75,5	84,2	0,18	80,0	79,6	80,4	0,08	0,08	0,04	-1,06	-0,97	135,4
69	314,0	10,7	0,7	14,9	559,3	75,1	115,7	714,2	575,8	523,4	535,9	0,00	75,7	76,0	########	0,18	75,4	75,5	84,2	0,18	79,6	80,3	80,3	0,08	0,08	0,04	-1,06	-0,97	136,2
70	315,0	10,6	0,6	14,9	560,8	74,4	114,5	715,6	576,6	525,5	535,7	0,00	75,6	76,0	########	0,18	75,3	75,5	84,0	0,18	79,8	79,5	80,2	0,08	0,08	0,04	-1,06	-0,97	137,2
71	316,0	10,4	0,6	14,9	560,0	74,1	114,9	716,4	577,0	526,8	534,4	0,00	75,6	75,9	########	0,18	75,2	75,4	84,0	0,18	79,7	79,5	80,1	0,08	0,08	0,04	-1,07	-0,98	137,5
72	317,0	10,2	0,6	14,8	559,8	74,4	114,9	717,5	577,9	529,0	533,7	0,00	75,5	75,9	########	0,18	75,1	75,4	84,0	0,18	79,7	79,4	80,0	0,08	0,08	0,04	-1,05	-0,97	138,4
73	318,0	10,1	0,6	14,8	560,8	74,0	114,7	718,3	579,1	530,1	533,1	0,00	75,5	75,9	########	0,18	75,1	75,4	83,9	0,18	79,7	79,4	80,0	0,08	0,08	0,04	-1,05	-0,97	139,0
74	319,0	9,9	0,6	14,7	559,1	74,8	114,0	719,6	579,8	531,3	532,1	0,00	75,5	75,9	########	0,18	75,2	75,5	84,0	0,18	79,9	79,4	80,0	0,08	0,08	0,03	-1,07	-0,98	139,6
75	320,0	9,8	0,5	14,6	558,6	75,0	114,4	720,0	580,7	533,0	532,1	0,00	75,6	76,0	########	0,18	75,3	75,5	84,1	0,18	80,0	79,4	80,1	0,08	0,08	0,03	-1,05	-0,98	140,4
76	321,0	9,6	0,4	14,7	559,0	74,8	114,2	719,7	581,5	534,3	531,7	0,00	75,6	76,0	########	0,18	75,4	75,6	84,0	0,18	80,2	79,4	80,0	0,08	0,08	0,03	-1,05	-0,97	140,7
77	322,0	9,4	0,5	14,7	557,6	74,7	113,5	718,9	582,6	535,3	530,5	0,00	75,6	76,0	########	0,18	75,5	75,6	84,0	0,18	80,1	79,4	80,1	0,08	0,08	0,03	-1,06	-0,97	140,8
78	323,0	9,3	0,5	14,6	556,6	75,0	114,1	719,1	583,7	536,9	531,0	0,00	75,6	76,0	########	0,18	75,5	75,6	84,0	0,18	80,1	79,4	80,1	0,08	0,08	0,03	-1,05	-0,97	141,6
79	324,0	9,2	0,5	14,6	556,0	75,1	113,9	719,4	584,8	538,6	530,4	0,00	75,6	76,0	########	0,18	75,5	75,7	84,1	0,18	80,1	79,4	80,1	0,08	0,08	0,03	-1,06	-0,98	142,2
80	325,0	9,0	0,5	14,5	555,4	74,8	113,5	719,3	586,0	539,6	530,1	0,00	75,6	76,1	########	0,18	75,4	75,7	84,1	0,18	80,1	79,5	80,2	0,08	0,08	-0,01	-1,05	-0,97	142,6
81	326,0	8,9	0,5	14,5	555,3	75,0	113,3	719,9	587,5	541,2	530,5	0,00	75,7	76,1	########	0,18	75,4	75,7	84,2	0,18	80,1	79,5	80,2	0,08	0,08	0,03	-1,05	-0,96	143,7
82	327,0	8,7	0,5	14,6	553,9	74,6	113,2	720,6	588,6	542,3	529,4	0,00	75,7	76,1	########	0,18	75,3	75,7	84,2	0,18	80,0	79,5	80,3	0,08	0,08	0,03	-1,05	-0,97	144,1
83	328,0	8,6	0,6	14,6	554,4	74,6	114,5	720,6	590,3	543,7	528,9	0,00	75,7	76,1	########	0,18	75,4	75,7	84,3	0,18	80,0	79,5	80,4	0,08	0,08	0,03	-1,06	-0,97	144,8
84	329,0	8,4	0,7	14,6	553,8	74,9	113,9	720,8	591,8	545,5	529,3	0,00	75,7	76,2	########	0,18	75,4	75,7	84,3	0,18	80,1	79,5	80,5	0,08	0,08	0,03	-1,05	-0,97	145,8
85	330,0	8,3	0,8	14,6	553,3	75,1	114,0	721,7	593,2	546,7	529,3	0,00	75,7	76,2	########	0,18

110	355,0	5,5	0,1	13,1	501,2	74,6	108,1	600,9	600,3	581,1	532,8	0,00	75,9	76,5	#######	0,18	75,5	76,0	84,3	0,18	80,3	79,7	82,2	0,08	0,07	0,03	-1,03	-0,95	127,7
111	356,0	5,4	0,1	13,2	498,6	74,2	107,8	594,7	599,7	580,7	532,5	0,00	75,9	76,4	#######	0,18	75,6	76,0	84,3	0,18	80,3	79,7	82,2	0,08	0,08	0,03	-1,03	-0,96	125,8
112	357,0	5,3	0,1	13,1	495,6	74,7	107,4	588,4	598,2	580,4	532,1	0,00	75,9	76,4	#######	0,18	75,6	76,0	84,2	0,18	80,3	79,7	82,3	0,08	0,07	0,03	-1,03	-0,96	123,7
113	358,0	5,2	0,1	13,0	490,4	74,9	107,2	581,9	597,1	580,5	533,1	0,00	75,8	76,4	#######	0,18	75,6	76,0	84,1	0,18	80,2	79,7	82,3	0,08	0,07	0,04	-1,03	-0,97	122,0
114	359,0	5,1	0,1	12,7	487,1	74,0	106,8	575,6	596,0	580,3	532,2	0,00	75,8	76,4	#######	0,18	75,5	76,0	84,1	0,18	80,2	79,6	82,3	0,08	0,07	0,04	-1,02	-0,96	119,9
115	360,0	5,1	0,1	12,7	483,3	74,6	106,3	569,8	594,5	579,7	532,7	0,00	75,8	76,4	#######	0,18	75,5	76,0	84,0	0,18	80,2	79,7	82,4	0,08	0,07	0,03	-1,03	-0,96	118,1
116	361,0	5,0	0,1	12,4	480,3	74,8	105,9	563,7	592,8	578,8	532,1	0,00	75,8	76,3	#######	0,18	75,5	76,0	83,9	0,18	80,2	79,6	82,4	0,08	0,07	0,03	-1,03	-0,97	115,8
117	362,0	5,0	0,1	12,3	478,5	74,5	105,8	558,5	591,5	578,0	532,1	0,00	75,7	76,3	#######	0,18	75,5	76,0	83,8	0,18	80,2	79,6	82,4	0,08	0,07	0,03	-1,03	-0,97	113,9
118	363,0	4,9	0,1	12,1	477,4	74,6	105,9	554,2	590,2	577,1	532,0	0,00	75,7	76,3	#######	0,18	75,4	75,9	83,8	0,18	80,1	79,6	82,4	0,08	0,07	0,03	-1,03	-0,97	112,3
119	364,0	4,8	0,1	11,9	475,4	74,4	106,0	550,3	588,9	576,6	531,4	0,00	75,7	76,3	#######	0,18	75,4	75,9	83,8	0,18	80,0	79,6	82,5	0,08	0,07	0,03	-1,03	-0,96	110,7
120	365,0	4,7	0,2	11,6	475,1	74,5	105,6	546,9	587,5	576,1	531,4	0,00	75,7	76,3	#######	0,18	75,5	75,9	83,7	0,18	80,1	79,6	82,5	0,08	0,07	0,03	-1,03	-0,97	109,3
121	366,0	4,7	0,2	11,3	473,3	74,3	105,8	543,2	586,3	575,8	531,7	0,00	75,7	76,3	#######	0,18	75,4	75,9	83,7	0,18	80,0	79,6	82,5	0,08	0,07	0,03	-1,04	-0,97	108,1
122	367,0	4,6	0,2	11,2	470,0	74,6	105,1	539,0	585,0	575,0	532,0	0,00	75,7	76,3	#######	0,18	75,4	75,9	83,6	0,18	80,1	79,6	82,5	0,08	0,07	0,03	-1,04	-0,96	106,7
123	368,0	4,5	0,2	10,9	466,8	74,5	105,3	534,6	584,0	574,3	531,7	0,00	75,7	76,3	#######	0,18	75,4	75,9	83,6	0,18	80,1	79,6	82,5	0,08	0,07	0,02	-1,03	-0,95	105,0
124	369,0	4,5	0,2	10,5	464,2	74,5	105,2	530,1	583,0	573,8	531,7	0,00	75,7	76,2	#######	0,18	75,4	75,9	83,5	0,18	80,2	79,7	82,5	0,08	0,07	0,03	-1,03	-0,97	103,6
125	370,0	4,4	0,3	10,3	459,7	74,6	104,1	525,6	581,5	572,7	532,0	0,00	75,7	76,2	#######	0,18	75,4	75,9	83,4	0,18	80,2	79,7	82,5	0,08	0,07	0,03	-1,04	-0,97	101,9
126	371,0	4,4	0,4	9,7	455,7	74,7	103,8	521,1	580,3	571,9	532,1	0,00	75,7	76,2	#######	0,18	75,4	75,9	83,3	0,18	80,2	79,6	82,5	0,08	0,07	0,03	-1,03	-0,96	100,3
127	372,0	4,3	0,5	9,3	451,1	74,3	104,3	517,3	579,1	570,9	531,5	0,00	75,7	76,2	#######	0,18	75,4	75,9	83,2	0,18	80,1	79,6	82,4	0,07	0,07	0,03	-1,03	-0,96	98,6
128	373,0	4,3	0,5	9,2	445,5	74,7	103,3	513,4	577,5	569,1	532,2	0,00	75,7	76,2	#######	0,18	75,4	75,9	83,2	0,18	80,1	79,6	82,4	0,08	0,07	0,03	-1,04	-0,96	97,0
129	374,0	4,2	0,6	8,9	442,7	74,8	103,2	509,4	576,0	567,4	531,9	0,00	75,7	76,2	#######	0,18	75,3	75,9	83,1	0,18	80,1	79,6	82,4	0,08	0,07	0,03	-1,04	-0,96	95,1
130	375,0	4,2	0,7	8,8	439,7	74,6	103,4	506,7	574,3	565,5	531,7	0,00	75,7	76,2	#######	0,18	75,3	75,9	83,1	0,18	80,0	79,6	82,4	0,08	0,07	0,03	-1,04	-0,97	93,5
131	376,0	4,1	0,7	8,7	437,5	74,3	102,6	504,1	572,9	564,2	532,6	0,00	75,7	76,2	#######	0,18	75,3	75,9	82,9	0,18	80,1	79,6	82,3	0,08	0,07	0,02	-1,03	-0,96	92,4
132	377,0	4,1	0,7	8,6	435,6	74,7	102,2	501,8	571,8	563,2	533,2	0,00	75,6	76,2	#######	0,18	75,3	75,9	82,9	0,18	80,1	79,6	82,3	0,08	0,07	0,02	-1,03	-0,96	91,4
133	378,0	4,0	0,7	8,5	432,9	74,7	103,0	499,4	571,0	561,7	533,8	0,00	75,6	76,2	#######	0,18	75,3	75,9	82,8	0,18	80,1	79,6	82,3	0,08	0,07	0,02	-1,03	-0,95	90,4
134	379,0	3,9	0,8	8,5	430,4	74,7	102,4	497,7	570,0	560,1	534,4	0,00	75,6	76,2	#######	0,18	75,3	75,9	82,8	0,18	80,1	79,6	82,3	0,08	0,07	0,02	-1,03	-0,96	89,4
135	380,0	3,9	0,8	8,4	427,6	74,5	102,2	495,9	569,3	559,5	535,0	0,00	75,6	76,2	#######	0,18	75,3	75,9	82,7	0,18	80,1	79,6	82,3	0,08	0,07	0,02	-1,03	-0,97	88,8
136	381,0	3,8	0,8	8,3	425,5	74,5	102,1	493,9	568,1	558,6	536,4	0,00	75,6	76,2	#######	0,18	75,3	75,9	82,6	0,18	80,2	79,6	82,2	0,08	0,07	0,03	-1,04	-0,97	88,1
137	382,0	3,8	0,9	8,2	423,6	74,3	101,6	492,0	567,3	557,3	536,5	0,00	75,6	76,2	#######	0,18	75,2	75,9	82,5	0,18	80,1	79,5	82,2	0,08	0,07	0,02	-1,04	-0,97	87,2
138	383,0	3,8	0,9	8,1	421,6	74,5	101,4	490,7	566,7	556,6	537,9	0,00	75,6	76,2	#######	0,18	75,3	75,9	82,4	0,18	80,1	79,5	82,2	0,08	0,07	0,03	-1,04	-0,97	86,8
139	384,0	3,7	1,0	8,0	421,0	74,5	101,7	489,3	565,7	556,1	538,8	0,00	75,6	76,1	#######	0,18	75,2	75,9	82,4	0,18	80,0	79,4	82,2	0,08	0,07	0,02	-1,03	-0,96	86,4
140	385,0	3,7	0,2	8,0	419,7	74,6	101,4	488,1	565,0	555,3	539,9	0,00	75,6	76,1	#######	0,18	75,2	75,8	82,3	0,18	80,0	79,4	82,1	0,08	0,07	0,03	-1,03	-0,96	86,0
141	386,0	3,7	0,2	7,9	417,5	74,4	101,0	486,0	564,3	555,0	540,3	0,00	75,6	76,1	#######	0,18	75,1	75,8	82,2	0,18	80,0	79,5	82,1	0,08	0,07	0,02	-1,03	-0,96	85,3
142	387,0	3,6	0,2	7,9	415,5	74,5	100,3	484,5	563,6	554,4	541,7	0,00	75,6	76,1	#######	0,18	75,1	75,8	82,2	0,18	80,1	79,5	82,0	0,08	0,06	0,03	-1,03	-0,97	84,9
143	388,0	3,6	0,2	7,8	413,4	74,7	100,7	482,5	563,2	553,7	543,0	0,00	75,6	76,1	#######	0,18	75,2	75,9	82,2	0,18	80,2	79,5	82,0	0,08	0,07	0,03	-1,03	-0,97	84,5
144	389,0	3,5	0,2	7,7	412,8	74,4	101,0	481,0	562,5	553,1	544,7	0,00	75,5	76,1	#######	0,18	75,1	75,8	82,1	0,18	80,1	79,4	82,0	0,08	0,06	0,03	-1,03	-0,96	84,2
145	390,0	3,5	0,2	7,7	411,4	74,4	100,8	479,8	561,8	552,5	545,5	0,00	75,5	76,1	#######	0,18	75,1	75,8	82,0	0,18	80,0	79,4	81,9	0,08	0,07	0,03	-1,03	-0,96	83,8
146	391,0	3,4	0,3	7,6	410,2	74,5	100,7	478,8	561,2	552,1	547,2	0,00	75,5	76,0	#######	0,18	75,1	75,8	82,0	0,18	80,1	79,5	81,9	0,08	0,06	0,03	-1,03	-0,96	83,7
147	392,0	3,4	0,3	7,5	409,5	74,6	100,0	477,8	560,5	552,1	548,5	0,00	75,5	76,0	#######	0,18	75,1	75,8	81,9	0,18	80,0	79,4	81,8	0,08	0,06	0,04	-1,03	-0,97	83,6
148	393,0	3,4	0,3	7,4	407,6	74,3	100,3	476,7	560,2	551,5	549,7	0,00	75,5	76,0	#######	0,18	75,1	75,8	81,8	0,18	80,0	79,5	81,8	0,08	0,06	0,03	-1,03	-0,97	83,4
149	394,0	3,3	0,3	7,3	406,1	74,5	99,8	475,6	559,4	550,6	551,1	0,00	75,5	76,0	#######	0,18	75,1	75,7	81,8	0,18	80,1	79,5	81,7	0,08	0,06	0,02	-1,03	-0,97	83,1
150	395,0	3,4	0,3	7,3	404,8	74,2	100,2	474,2	559,2	550,8	551,9	0,00	75,5	76,0	#######	0,18	75,1	75,7	81,7	0,18	80,0	79,5	81,7	0,08	0,06	0,03	-1,03	-0,97	82,9
151	396,0	3,3	0,3	7,2	403,1	74,6	99,5	473,3	558,3	550,8	553,8	0,00	75,5	76,0	#######	0,18	75,2	75,7	81,7	0,18	80,1	79,5	81,7	0,08	0,06	0,03	-1,04	-0,97	82,9
152	397,0	3,2	0,3	7,2	402,3	74,4	99,5	472,4	557,7	550,7	555,4	0,00	75,5	76,0	#######	0,18	75,2	75,7	81,6	0,18	80,0	79,5	81,6	0,08	0,06	0,03	-1,04	-0,97	82,9
153	398,0	3,1	0,3	7,1	400,7	74,4	99,3	471,4	557,2	550,9	556,3	0,00	75,4	76,0	#######	0,18	75,1	75,7	81,5	0,18	80,1	79,5	81,6	0,08	0,06	0,03	-1,03	-0,96	82,9
154	399,0	3,1	0,3	6,9	400,7	74,4	99,1	470,5	556,8	550,5	557,5	0,00	75,5	76,0	#######	0,18	75,1	75,7	81,5	0,18	80,0	79,4	81,5	0,08	0,06	0,03	-1,04	-0,97	82,7
155	400,0	3,1	0,3	6,4	397,2	74,4	99,2	469,1	556,1	550,1	558,1	0,00	75,4	76,0	#######	0,18	75,1	75,7	81,4	0,18	80,0	79,5	81,5	0,08	0,06	0,03	-1,04	-0,97	82,3
156	401,0	3,0	0,3	6,1	394,8	74,4	98,8	466,5	555,1	549,5	558,7	0,00	75,5	76,0	#######	0,18	75,0	75,7	81,4	0,18	79,9	79,5	81,4	0,08	0,06	0,03	-1,04	-0,97	81,4
157	402,0	3,1	0,3	6,0	390,7	74,4	98,5	463,8	553,5	548,9	559,3	0,00	75,5	75,9	#######	0,18	75,0	75,7	81,3	0,18	80,0	79,5	81,3	0,08	0,06	0,03	-1,04	-0,96	80,3
158	403,0	3,0	0,3	6,0	387,2	74,4	98,7	459,9	551,8	547,4	559,8	0,00	75,4	75,9	#######	0,18	75,0	75,7	81,3	0,18	79,9	79,5	81,3	0,08	0,06	0,03	-1,03	-0,96	78,6
159	404,0	3,0	0,3	6,0	383,7	74,6	98,3	456,3	549,8	546,1	560,9	0,00	75,4	75,9	#######	0,18	75,0	75,7	81,2	0,18	79,9	79,5	81,3	0,08	0,06	0,03	-1,04	-0,97	77,2
160	405,0	2,9	0,3	5,9	381,4	74,4	98,0	452,4	547,6	544,6	562,4	0,00	75,4	75,9	#######	0,18	74,9	75,6	81,1	0,18	79,9	79,4	81,2	0,08	0,06	0,03	-1,04	-0,96	75,6
161	406,0	2,9	0,3	6,0	378,4	74,4	97,6	448,4	545,2	543,0	563,3	0,00	75,4	75,9	#######	0,18	75,0	75,7	81,1	0,18	80,0	79,5	81,2	0,08	0,06	0,04	-1,04	-0,97	73,9
162	407,0	2,9	0,3	5,9	375,6	74,4	97,4	444,6	543,0	541,2	564,4	0,00	75,4	75,9	#######	0,18	75,0	75,7	81,0	0,18	79,9	79,5	81,1	0,08	0,06	0,04	-1,04	-0,97	72,2
163	408,0	2,8	0,3	5,8	372,4	74,5	97,5	441,2	541,0	539,7	565,1	0,00	75,4	75,9	#######	0,18	75,0	75,7	80,9	0,18	79,9	79,5	81,1	0,08	0,06	0,04	-1,04	-0,96	70,6
164	409,0	2,8	0,3	5,8	369,4	74,4	97,5	437,6	538,9	538,0	565,7	0,00	75,4	75,9	#######	0,18	75,1	75,7	80,9	0,18	80,1	79,5	81,0	0,08	0,06	0,04	-1,04	-0,96	68,9
165	410,0	2,8	0,4	5,8	366,9	74,3	97,1	434,2	536,6	536,3	566,8	0,00	75,4	75,9	#######	0,18	75,1	75,8	80,8	0,18	80,1	79,5	81,0	0,08	0,06	0,03	-1,03	-0,96	67,4
166	411,0	2,8	0,4	5,8	364,4	74,4	96,7	430,9	534,4	534,7	568,5	0,00	75,4	75,8	#######	0,18	75,1	75,7	80,8	0,18	80,1	79,5	80,9	0,08	0,06	0,03	-1,03	-0,96	66,0
167	412,0	2,7	0,4	5,8	362,2	74,2	96,8	427,8	532,2	533,0	568,7	0,00	75,4	75,8	#######	0,18	75,0	75,7	80,7	0,18	80,1	79,5	80,8	0,08	0,06	0,03	-1,04	-0,97	64,3
168	413,0	2,7	0,4	5,8	359,3	74,5	95,9	424,6	530,0	531,2	569,9	0,00	75,4	75,8	#######	0,18	75,0	75,7	80,6	0,18	80,1	79,5	80,8	0,08	0,06	0,04	-1,04	-0,96	62,8
169	414,0	2,7	0,4	5,7	356,3	74,1	96,1	421,2	528,1	529,3	570,2	0,00	75,3	75,8	#######	0,18	75,0	75,7	80,5	0,18	80,0	79,5	80,7	0,08	0,06	0,03	-1,04	-0,96	61,1
170	415,0	2,6	0,4	5,8	353,7	74,3	96,1	417,8	525,5	527,4	570,6	0,00	75,4	75,8	#######	0,18	75,1	75,7	80,5	0,18	80,1	79,5	80,6	0,08	0,06	0,03	-1,04	-0,97	59,2
171	416,0	2,6	0,4	5,7	350,8	74,1	96,4	414,9	523,3	525,5	571,5	0,00	75,4	75,8	#######	0,18	75,1	75,7	80,5	0,18	80,0	79,4	80,6	0,08	0,06	0,03	-1,03	-0,96	57,7
172	417,0	2,6	0,3	5,8	348,8	74,3	96,3	411,7	521,0	523,9	572,3	0,00	75,4	75,8	#######	0,18	75,1	75,7	80,4	0,18	80,0	79,5	80,5	0,08	0,06	0,03	-1,03	-0,96	56,1
173	418,0	2,6	0,3	5,9	346,6	74,3	95,4	408,8	518,8	521,9	572,3	0,00	75,4	75,8	#######	0,18	75,1	75,7	80,3	0,18	80,0	79,4	80,5	0,08	0,06	0,03	-1,04	-0,97	54,4
174	419,0	2,5	0,3	6,0	344,9	74,3	96,2	405,8	516,7	519,7	572,5	0,00	75,4	75,8	#######	0,18	75,1	75,7	80,3	0,18	79,9	79,5	80,4	0,08	0,06	0,03	-1,04	-0,96	52,6
175	420,0	2,5	0,3	5,8	342,8	74,3	95,1	403,4	514,6	517,9	573,3	0,00	75,4	75,8	#######	0,18	75,0	75,7	80,2	0,18	80,0	79,4	80,3	0,08	0,06	0,02	-1,03	-0,96	51,2
176	421,0	2,5	0,3	5,7	341,4	74,1	94,7	400,9	512,5	516,0	573,3	0,00	75,3	75,8	#######	0,18	75,0	75,7	80,1	0,18	79,9	79,4	80,3	0,08	0,06	0,03	-1,03	-0,97	49,6
177	422,0	2,5	0,3	5,5	339,6	74,3	94,7	398,7	510,6	513,6	573,9	0,00	75,3	75,8	#######	0,18	75,0	75,7	80,0	0,18	79,9	79,4	80,2	0,08	0,06	0,02	-1,03	-0,97	48,1
178	423,0	2,4	0,3	5,5	338,9	74,0	94,2	396,6	508,5	512,1	574,1	0,00	75,3	75,8	#######	0,18	75,0	75,8	79,9	0,18	79,9	79,4	80,1	0,08	0,06	0,03	-1,04	-0,96	46,7
179	424,0	2,4	0,3	5,5	337,1	74,1	94,2	394,6	506,4	510,1	574,2	0,00	75,3	75,8	#######	0,18	75,0	75,7	79,9	0,18	79,9	79,4	80,0	0,08	0,06	0,03	-1,03	-0,96	45,2
180	425,0	2,4	0,3	5,5	335,3	74,2	94,5	392,8	504,7	508,3	574,2	0,00	75,3	75,7	#######	0,18	74,9	75,7	79,8	0,18	79,8	79,3	79,9	0,08	0,06	0,03	-1,03	-0,96	43,9
181	426,0	2,4	0,3	5,6	334,2	74,2	94,4	390,7	503,1	506,4	574,5	0,00	75,3	75,7	#######	0,18	74,9	75,6	79,8	0,18	79,8	79,3	79,9	0,08	0,06	0,03	-1,04	-0,96	42,6
182	427,0	2,4	0,3	5,6	332,5	74,1	94,0	388,8	501,3	504,0	574,6	0,00	75,2	75,7	#######	0,18	74,9	75,6	79,7	0,18	79,8	79,3	79,8	0,08	0,06	0,03	-1,04	-0,97	41,1
183	428,0	2,3	0,3	5,5	331,5	74,1	94,0	386,9	499,6	502,2	575,1	0,00	75,3	75,7	#######	0,18	74,9	75,6	79,7	0,18	79,7	79,3	79,7	0,08	0,06	0,03	-1,03	-0,96	39,8
184	429,0	2,3	0,3	5,5	329,8	74,0	93,9	385,2	498,0	500,2	575,1	0,00	75,2	75,7	#######	0,18	74,8	75,6	79,6	0,18	79,6	79,3	79,6	0,08	0,05	0,03	-1,04	-0,96	38,5
185	430,0	2,3	0,3	5,6	328,8	74,0	93,8	383,7	496,2	498,0	574,7	0,00	75,2	75,6	#######	0,18	74,8	75,6	79,5	0,18	79,6	79,3	79,6	0,08	0,05	0,03	-1,04	-0,96	37,1
186	431,0	2,3	0,3	5,6	327,3	74,0	93,7	382,2	494,5	496,0	574,9	0,00	75,2	75,6	#######	0,18	74,8	75,5	79,4	0,18	79,6	79,2	79,5	0,08	0,05	0,03	-1,04	-0,96	35,8
187	432,0	2,2	0,3	5,6	326,2	74,1	93,5	380,5	493,0	494,3	574,7	0,00	75,2	75,6	#######	0,18	74,8	75,5	79,4	0,18	79,6	79,2	79,4	0,08	0,05	0,03	-1,04	-0,96	34,5
188	433,0	2,2	0,3	5,6	325,6	74,0	93,6	378,9	491,2	492,4	574,6	0,00	75,2	75,6	#######	0,18	74,8	75,5	79,3	0,18	79,5	79,2	79,3	0,08	0,05	0,03	-1,04	-0,96	33,2
189	434,0	2,2	0,3	5,6	324,3	73,9	93,4	377,5	489,9	490,4	574,4	0,00	75,2	75,6	#######	0,18	74,8	75,5	79,3	0,18	79,5	79,2	79,3	0,08	0,05	0,02	-1,04	-0,96	31,9
190	435,0	2,1	0,3	5,6	322,7	74,1	93,4	376,1	488,3	488,8	574,0	0,00	75,1	75,6	#######	0,18	74,8	75,5	79,2	0,18	79,5	79,2	79,2	0,08	0,05	0,03	-1,04	-0,96	30,7
191	436,0	2,1	0,4	5,6	321,4	73,9	94,0	374,8	486,7	486,6	572,9	0,00	75,1	75,6	#######	0,18	74,8	75,5	79,2	0,18	79,5	79,2	79,1	0,08	0,05	0,03	-1,04	-0,96	29,2
192	437,0	2,1	0,3	5,6	320,3	73,8	93,2	373,1	485,4	485,7	573,6	0,00	75,1	75,5	#######	0,18	74,7	75,5	79,1	0,18	79,5	79,1	79,0	0,08	0,05	0,03	-1,04	-0,96	28,3
193	438,0	2,1	0,3	5,6	320,1	74,1	93,2	371,7	484,0	483,3	573,8	0,00	75,1	75,5	#######	0,18	74,8	75,5	79,1	0,18	79,7	79,1	79,0	0,08	0,05	0,03	-1,04	-0,97	27,0
194	439,0	2,1	0,4	5,9	319,3	74,1	92,9	370,3	482,4	481,6	573,1	0,00	75,1	75,5	#######	0,18	74,8	75,5	79,0	0,18	79,6	79,1	78,9	0,08	0,05	0,03	-1,05	-0,96	25,7
195	440,0	2,0	0,4	6,0	319,0	74,0	92,8	369,1	481,0	479,9	573,0	0,00	75,1	75,5	#######	0,18	74,8	75,5	78,9	0,18	79,6	79,0	78,8	0,08	0,05	0,02	-1,04	-0,96	24,6
196	441,0	2,0	0,4	5,9	318,0	73,9	92,7	367,8	479,6	478,0	572,6	0,00	75,1	75,5	#######	0,18	74,8	75,4	78,8	0,18	79,6	79,0	78,7	0,08	0,05	0,03	-1,04	-0,96	23,4
197	442,0	2,0	0,4	6,1	316,1	73,9	92,5	366,8	478,1	476,3	572,5	0,00	75,1	75,5	#######	0,18	74,8	75,4	78,8	0,18	79,6	79,0	78,7	0,08	0,05	0,03	-1,05	-0,96	22,3
198	443,0	1,9	0,4	6,1	315,6	74,0	92,4	365,7	476,7	475,0	572,1	0,00	75,1	75,5	#######	0,18	74,8	75,4	78,7	0,18	79,7	79,0	78,6	0,08	0,05	0,03	-1,04	-0,97

225	470,0	1,3	0,3	5,2	305,8	73,6	91,4	349,9	451,8	444,5	575,3	0,00	74,8	75,1	#######	0,18	74,6	75,4	77,8	0,18	79,6	78,8	77,2	0,08	0,05	0,03	-1,05	-0,97	4,3
226	471,0	1,2	0,3	5,1	305,1	73,8	91,1	349,6	451,1	444,3	577,1	0,00	74,7	75,1	#######	0,18	74,6	75,3	77,8	0,18	79,6	78,9	77,2	0,08	0,05	0,03	-1,05	-0,97	4,4
227	472,0	1,2	0,3	5,1	305,4	73,7	91,2	349,6	450,5	443,3	577,6	0,00	74,8	75,1	#######	0,18	74,6	75,3	77,8	0,18	79,6	78,9	77,1	0,08	0,05	0,03	-1,05	-0,97	4,1
228	473,0	1,1	0,3	5,1	305,6	73,9	91,2	349,8	450,1	442,8	578,4	0,00	74,7	75,1	#######	0,18	74,6	75,3	77,7	0,18	79,6	78,9	77,1	0,08	0,05	0,03	-1,06	-0,97	4,2
229	474,0	1,2	0,3	5,0	305,2	73,8	91,4	349,8	449,6	442,2	578,4	0,00	74,8	75,1	#######	0,18	74,6	75,3	77,7	0,18	79,6	78,9	77,0	0,08	0,05	0,04	-1,05	-0,97	3,9
230	475,0	1,1	0,3	5,1	306,0	73,7	91,1	350,2	449,2	441,6	578,2	0,00	74,7	75,1	#######	0,18	74,6	75,3	77,7	0,18	79,7	78,9	77,0	0,08	0,05	0,03	-1,05	-0,97	3,7
231	476,0	1,1	0,3	5,1	305,5	73,8	91,1	350,8	448,8	441,2	579,1	0,00	74,8	75,1	#######	0,18	74,6	75,4	77,7	0,18	79,7	78,9	76,9	0,08	0,05	0,03	-1,06	-0,97	3,9
232	477,0	1,1	0,3	5,0	305,9	73,9	91,1	350,6	448,7	440,4	578,9	0,00	74,7	75,1	#######	0,18	74,6	75,4	77,6	0,18	79,7	78,9	76,9	0,08	0,05	0,03	-1,05	-0,97	3,5
233	478,0	1,0	0,4	5,0	306,3	73,7	90,4	350,8	448,2	440,1	579,0	0,00	74,7	75,1	#######	0,18	74,6	75,4	77,6	0,18	79,7	78,9	76,9	0,08	0,05	0,03	-1,06	-0,97	3,4
234	479,0	1,0	0,3	5,0	306,0	73,6	91,2	350,5	448,1	439,1	578,2	0,00	74,7	75,1	#######	0,18	74,6	75,3	77,6	0,18	79,7	78,9	76,8	0,08	0,05	0,03	-1,05	-0,98	2,9
235	480,0	1,0	0,3	5,0	306,8	73,9	91,4	350,0	447,4	439,3	577,2	0,00	74,8	75,1	#######	0,18	74,5	75,3	77,6	0,18	79,7	78,9	76,8	0,08	0,05	0,03	-1,06	-0,98	2,4
236	481,0	1,0	0,3	5,0	307,1	74,0	91,1	350,4	447,1	438,8	578,1	0,00	74,8	75,1	#######	0,18	74,6	75,3	77,6	0,18	79,8	78,9	76,8	0,08	0,05	0,03	-1,05	-0,97	2,5
237	482,0	0,9	0,3	4,9	307,4	74,0	90,5	351,0	446,8	438,4	577,7	0,00	74,7	75,1	#######	0,18	74,6	75,3	77,5	0,18	79,8	78,9	76,7	0,08	0,05	0,04	-1,06	-0,98	2,4
238	483,0	1,0	0,3	4,8	307,6	73,9	91,1	350,9	446,3	437,7	576,9	0,00	74,7	75,1	#######	0,18	74,5	75,3	77,5	0,18	79,7	78,9	76,7	0,08	0,05	0,03	-1,05	-0,97	1,8
239	484,0	0,9	0,3	4,8	308,2	73,8	90,6	351,1	445,8	438,1	576,6	0,00	74,7	75,1	#######	0,18	74,5	75,2	77,5	0,18	79,6	78,8	76,7	0,08	0,05	0,03	-1,06	-0,98	1,8
240	485,0	0,9	0,3	4,8	307,1	73,6	90,6	351,8	445,4	437,7	576,2	0,00	74,7	75,1	#######	0,18	74,4	75,2	77,4	0,18	79,5	78,8	76,6	0,08	0,05	0,03	-1,05	-0,98	1,7
241	486,0	0,8	0,3	4,8	308,7	73,6	90,8	352,6	445,3	437,2	575,5	0,00	74,7	75,0	#######	0,18	74,4	75,2	77,4	0,18	79,6	78,8	76,6	0,08	0,05	0,04	-1,05	-0,97	1,5
242	487,0	0,8	0,3	4,9	308,9	73,7	91,3	353,0	445,0	436,7	574,3	0,00	74,7	75,0	#######	0,18	74,4	75,2	77,4	0,18	79,6	78,8	76,6	0,08	0,05	0,03	-1,06	-0,98	1,1
243	488,0	0,8	0,3	5,0	308,9	73,6	91,0	353,7	445,0	436,6	573,4	0,00	74,6	75,0	#######	0,18	74,4	75,2	77,4	0,18	79,6	78,8	76,5	0,08	0,05	0,03	-1,06	-0,98	1,1
244	489,0	0,7	0,3	5,1	309,9	73,7	90,9	354,1	444,5	436,4	573,1	0,00	74,6	75,0	#######	0,18	74,4	75,2	77,4	0,18	79,6	78,8	76,5	0,08	0,05	0,03	-1,05	-0,97	0,9
245	490,0	0,7	0,3	5,1	309,2	73,7	90,8	354,4	444,4	436,5	572,4	0,00	74,6	75,0	#######	0,18	74,4	75,2	77,4	0,18	79,7	78,8	76,5	0,08	0,05	0,03	-1,06	-0,97	0,8
246	491,0	0,7	0,3	5,1	309,4	73,6	90,9	354,7	444,4	436,1	571,4	0,00	74,7	75,0	#######	0,18	74,4	75,2	77,4	0,18	79,8	78,9	76,5	0,08	0,05	0,04	-1,06	-0,98	0,5
247	492,0	0,6	0,3	5,0	310,1	73,5	90,6	354,7	444,3	435,8	572,1	0,00	74,6	75,0	#######	0,18	74,5	75,3	77,3	0,18	79,9	78,8	76,4	0,08	0,05	0,04	-1,06	-0,98	0,6
248	493,0	0,6	0,3	5,0	309,8	73,6	91,3	354,3	444,3	435,9	570,3	0,00	74,6	75,0	#######	0,18	74,6	75,3	77,3	0,18	79,8	78,8	76,4	0,08	0,05	0,02	-1,06	-0,98	0,1
249	494,0	0,6	0,3	5,0	309,7	73,8	91,0	354,1	444,1	435,1	570,2	0,00	74,6	75,0	#######	0,18	74,6	75,3	77,3	0,18	79,8	78,8	76,4	0,08	0,05	0,02	-1,06	-0,97	-0,2
250	495,0	0,6	0,3	5,0	310,7	73,7	90,6	353,9	443,9	434,9	570,8	0,00	74,6	75,0	#######	0,18	74,6	75,3	77,2	0,18	79,8	78,8	76,4	0,08	0,05	0,03	-1,05	-0,99	-0,2
251	496,0	0,5	0,3	5,0	310,7	73,7	90,7	354,2	444,0	434,9	570,5	0,00	74,6	75,0	#######	0,18	74,6	75,3	77,2	0,18	79,7	78,7	76,4	0,08	0,05	0,02	-1,06	-0,98	-0,2
252	497,0	0,5	0,3	5,0	310,6	73,6	90,8	354,0	443,7	434,6	569,8	0,00	74,6	74,9	#######	0,18	74,4	75,2	77,2	0,18	79,6	78,7	76,4	0,08	0,05	0,03	-1,05	-0,97	-0,6
253	498,0	0,5	0,3	5,0	310,9	73,4	90,9	354,2	443,6	433,8	569,6	0,00	74,5	74,9	#######	0,18	74,3	75,2	77,2	0,18	79,6	78,7	76,3	0,08	0,05	0,04	-1,06	-0,97	-0,8
254	499,0	0,5	0,3	5,0	310,9	73,5	90,9	354,3	443,4	434,1	569,4	0,00	74,5	74,9	#######	0,18	74,3	75,1	77,2	0,18	79,5	78,8	76,3	0,08	0,05	0,04	-1,06	-0,97	-0,8
255	500,0	0,5	0,3	5,0	311,7	72,9	90,2	354,2	443,3	433,6	570,1	0,00	74,5	74,9	#######	0,18	74,2	75,1	77,1	0,18	79,3	78,7	76,3	0,08	0,05	0,04	-1,06	-0,97	-0,8
256	501,0	0,4	0,3	5,0	311,6	72,8	89,8	353,9	443,2	433,2	569,6	0,00	74,4	74,8	#######	0,18	74,1	75,0	77,0	0,18	79,2	78,6	76,2	0,08	0,05	0,04	-1,06	-0,98	-1,1
257	502,0	0,4	0,3	5,0	310,3	72,9	90,2	353,9	443,2	432,8	569,0	0,00	74,4	74,7	#######	0,18	74,0	74,9	77,0	0,18	79,1	78,5	76,2	0,08	0,05	0,04	-1,06	-0,97	-1,4
258	503,0	0,4	0,4	5,4	310,5	72,9	90,3	353,5	442,9	432,5	568,6	0,00	74,3	74,7	#######	0,18	73,9	74,8	76,9	0,18	79,0	78,5	76,2	0,08	0,05	0,03	-1,06	-0,98	-1,7
259	504,0	0,4	0,4	5,4	309,8	72,9	90,6	353,3	442,9	431,9	567,6	0,00	74,3	74,6	#######	0,18	73,9	74,8	76,9	0,18	79,1	78,4	76,2	0,08	0,05	0,03	-1,06	-0,97	-2,2
260	505,0	0,3	0,4	5,2	309,5	73,2	90,8	352,9	443,0	431,6	567,1	0,00	74,3	74,7	#######	0,18	73,9	74,8	76,9	0,18	79,1	78,4	76,2	0,08	0,05	0,04	-1,06	-0,98	-2,5
261	506,0	0,4	0,4	5,1	308,9	73,1	90,6	352,7	442,9	431,2	566,9	0,00	74,3	74,6	#######	0,18	73,9	74,8	76,9	0,18	79,1	78,4	76,1	0,08	0,05	0,04	-1,06	-0,98	-2,7
262	507,0	0,3	0,4	5,1	308,4	73,1	90,7	351,8	442,6	431,1	566,7	0,00	74,3	74,6	#######	0,18	73,9	74,8	76,9	0,18	79,1	78,4	76,1	0,08	0,05	0,03	-1,07	-0,99	-3,0
263	508,0	0,3	0,4	5,1	307,1	73,3	90,7	351,1	442,7	430,5	566,3	0,00	74,3	74,6	#######	0,18	73,9	74,8	76,9	0,18	79,1	78,4	76,1	0,08	0,05	0,03	-1,06	-0,98	-3,5
264	509,0	0,2	0,4	5,0	306,1	73,2	90,1	350,3	442,5	429,8	565,5	0,00	74,3	74,6	#######	0,18	74,0	74,8	76,8	0,18	79,1	78,4	76,1	0,08	0,05	0,04	-1,07	-0,99	-4,1
265	510,0	0,2	0,4	5,0	305,4	73,3	90,2	349,2	442,3	429,1	564,6	0,00	74,3	74,6	#######	0,18	74,0	74,8	76,8	0,18	79,1	78,4	76,1	0,08	0,05	0,04	-1,07	-0,98	-4,8
266	511,0	0,2	0,4	4,9	305,0	73,2	89,9	348,4	442,1	429,0	564,0	0,00	74,2	74,6	#######	0,18	74,1	74,8	76,9	0,18	79,2	78,3	75,9	0,08	0,05	0,03	-1,07	-0,99	-5,2
267	512,0	0,2	0,4	4,9	304,4	73,3	90,2	347,7	441,8	428,1	563,8	0,00	74,2	74,6	#######	0,18	74,1	74,8	77,0	0,18	79,2	78,4	76,1	0,08	0,05	0,04	-1,07	-0,98	-5,8
268	513,0	0,1	0,4	4,9	304,4	73,3	90,0	346,8	441,3	427,5	562,4	0,00	74,2	74,6	#######	0,18	74,2	74,8	77,1	0,18	79,2	78,4	76,4	0,08	0,05	0,04	-1,07	-0,98	-6,6
269	514,0	0,1	0,4	5,1	304,3	73,4	90,2	346,5	441,1	427,1	561,7	0,00	74,2	74,6	#######	0,18	74,2	74,9	77,3	0,18	79,3	78,4	76,6	0,08	0,05	0,04	-1,08	-0,99	-7,0
270	515,0	0,1	0,4	5,1	303,1	73,4	90,7	346,2	440,2	426,6	561,1	0,00	74,3	74,6	#######	0,18	74,3	74,9	77,5	0,18	79,5	78,4	77,0	0,08	0,05	0,04	-1,08	-0,98	-7,6
271	516,0	0,1	0,4	5,0	303,2	73,4	90,5	345,8	439,7	425,9	560,9	0,00	74,3	74,6	#######	0,18	74,3	74,9	77,6	0,18	79,5	78,5	77,2	0,08	0,05	0,04	-1,08	-0,98	-8,0
272	517,0	0,0	0,4	4,8	302,2	73,5	89,7	345,5	439,0	425,4	561,4	0,00	74,3	74,7	#######	0,18	74,4	75,0	77,7	0,18	79,6	78,5	77,4	0,08	0,05	0,04	-1,07	-0,98	-8,3

SFBA EPA EMISSION RESULTS

Test Duration: **272** min

PRESSURE FACTOR:	DGM 1st hr	0,945	
	DGM 1	0,937	
	DGM 2	0,940	
	DGM 3	0,973	
TEMPERATURE FACTORS	DGM 1st hr	0,987	
	DGM 1	0,987	
	DGM 2	0,980	
	DGM 3	0,988	
VOLUMES SAMPLED	DGM 1st hr	11,431	SCft
	DGM 1	50,031	SCft
	DGM 2	50,235	SCft
	DGM 3	47,453	SCft

TOTAL TUNNEL VOLUME : 93584

SAMPLE RATIOS

Sample Train 1st Hr:	1805,9
Sample Train 1:	1870,5
Sample Train 2:	1862,9

Paticulate concentration

Sample Train 1st Hr	**0,000271**	g/dscf
Sample Train 1	**0,000072**	g/dscf
Sample Train 2	**0,000066**	g/dscf
Room	**0,000002**	g/dscf

TOTAL EMISSIONS

Sample Train 1st Hr	**5,55**	g
Sample Train 1	**6,54**	g
Sample Train 2	**5,95**	g

EMISSION RATES

Sample Train 1st Hr	**5,55**	g/hr
Sample Train 1	**1,44**	g/hr
Sample Train 2	**1,31**	g/hr

	Train 1	Train 2	Train 1st Hr
Cs	7,196E-05	6,5691E-05	0,0002712

RESULTS

Average emission rate: 1,38 g/hr

Burn Rate : 1,91 Dry kg/hr

BAROMETRIC PRESSURE

Average:	29,10180405	in Hg
Start:	29,11656904	in Hg
End:	29,08703905	in Hg

DGM VALUES

DGM 1st hr	Final:	1227,650	Cuft
	Initial:	1215,390	Cuft
DGM 1	Final:	5056,250	Cuft
	Initial:	5001,398	Cuft
DGM 2	Final:	31743,895	Cuft
	Initial:	31689,891	Cuft
DGM #3	Final:	22390,709	Cuft
	Initial:	22340,752	Cuft

TEMPERATURES

DGM 1st hr	535,023	°R
DGM 1	534,972	°R
DGM 2	538,925	°R

CALIBRATION FACTORS

DGM 1st hr	1,0000
DGM 1	0,9860
DGM 2	1,0100
DGM #3	0,9880

TUNNEL FLOW RATE: 344,1 Dscfm

PARTICULATE CATCH

Total Sample Train 1:	3,60	mg
Total Sample Train 2:	3,30	mg
Total Sample Train 1 1st hour:	3,10	mg

DEVIATION: 4,69%

DATA 2025-04-15 EPA PI 20326 RUN 1 SINGLE BURN RATE
unit preburn

Time	Flue	Room	scale	Right	Back	bottom	Top	Left
acquisition	temp	temp						
minutes	°F	°F	lbs	°F	°F	°F	°F	°F
1	67,98	68,14	29,71	68,01	0,00	68,41	68,14	68,28
2	70,45	68,11	29,72	68,01	0,00	68,41	68,93	68,31
3	108,23	68,14	29,62	68,03	0,00	68,39	92,16	68,27
4	180,76	68,16	29,51	68,06	0,00	68,40	137,53	68,29
5	237,44	68,16	29,31	68,15	0,00	68,41	201,70	68,31
6	265,66	68,22	29,21	68,34	0,00	68,43	231,48	68,38
7	296,94	68,28	29,11	68,72	0,00	68,46	244,88	68,55
8	322,08	68,32	29,02	69,25	0,00	68,49	248,82	68,90
9	343,34	68,40	28,91	69,94	0,00	68,56	249,63	69,50
10	381,62	68,45	28,70	70,70	0,00	68,59	254,03	70,41
11	391,34	68,39	28,60	71,59	0,00	68,70	256,79	71,81
12	405,78	68,37	28,51	72,54	0,00	68,85	263,45	73,63
13	417,68	68,48	28,33	73,59	0,00	69,02	274,20	75,74
14	420,46	68,53	28,22	74,70	0,00	69,22	279,61	78,08
15	409,14	68,45	28,15	75,89	0,00	69,48	280,44	80,58
16	391,85	68,55	28,12	77,11	0,00	69,77	277,71	82,99
17	373,50	68,60	28,12	78,33	0,00	70,07	272,28	85,33
18	353,09	68,61	28,12	79,49	0,00	70,42	262,98	87,48
19	332,00	68,68	28,02	80,63	0,00	70,77	253,12	89,40
20	312,74	68,56	28,02	81,65	0,00	71,16	241,74	91,08
21	295,25	68,54	28,02	82,58	0,00	71,53	230,74	92,48
22	279,75	68,75	28,02	83,38	0,00	71,94	222,12	93,59
23	252,56	68,65	28,70	84,08	0,00	72,31	213,35	94,49
24	241,61	68,62	28,60	84,61	0,00	72,68	208,06	95,16
25	260,32	68,62	28,60	85,02	0,00	73,08	213,77	95,54
26	350,00	68,73	28,41	85,31	0,00	73,42	248,25	95,72
27	472,19	68,76	28,12	85,60	0,00	73,75	332,31	95,78
28	501,64	68,89	30,79	85,97	0,00	74,07	426,28	95,93
29	502,80	68,85	28,03	86,56	0,00	74,41	462,17	96,29
30	526,82	68,94	27,71	87,55	0,00	74,70	488,13	97,27
31	553,52	69,12	27,42	88,99	0,00	75,08	511,72	99,32
32	572,97	69,41	27,22	90,91	0,00	75,49	533,50	102,71
33	587,84	69,60	26,96	93,30	0,00	75,95	544,82	107,14
34	595,56	69,36	26,71	96,15	0,00	76,50	554,47	112,35
35	599,10	69,70	26,52	99,44	0,00	77,13	568,66	118,29
36	602,79	69,75	26,21	103,37	0,00	77,84	582,57	124,44
37	598,83	69,79	26,02	107,62	0,00	78,66	592,21	130,85
38	589,08	69,92	25,82	112,37	0,00	79,57	608,67	137,30
39	575,31	69,86	25,60	117,37	0,00	80,58	621,51	143,84
40	562,94	70,06	25,51	122,34	0,00	81,71	628,62	150,27
41	554,46	70,05	25,32	127,23	0,00	82,87	629,63	156,71
42	547,17	70,06	25,22	132,00	0,00	84,12	630,57	162,84
43	542,84	70,13	25,03	136,65	0,00	85,40	631,15	168,59
44	541,32	69,99	24,90	141,33	0,00	86,76	633,04	174,03
45	542,16	70,25	24,61	145,97	0,00	88,15	635,92	179,30
46	545,67	70,26	24,52	150,65	0,00	89,61	640,39	184,43
47	549,85	70,22	24,33	155,38	0,00	91,11	647,68	189,54
48	553,24	70,22	24,13	160,20	0,00	92,60	654,35	194,67
49	554,18	70,27	24,01	165,06	0,00	94,11	662,12	200,01
50	557,09	70,54	23,82	170,07	0,00	95,67	671,00	205,30
51	561,05	70,62	23,53	175,21	0,00	97,27	678,25	210,83
52	562,31	70,63	23,43	180,89	0,00	98,90	686,15	216,82
53	561,51	70,51	23,22	186,91	0,00	100,57	689,12	223,01
54	559,77	70,54	23,12	193,26	0,00	102,26	690,70	229,26
55	560,14	70,54	22,93	199,82	0,00	103,95	690,97	235,08
56	561,67	70,49	22,73	206,36	0,00	105,70	691,06	240,61
57	562,40	70,52	22,53	212,90	0,00	107,49	692,43	245,62
58	565,66	70,75	22,33	219,26	0,00	109,28	695,82	250,51
59	566,26	70,72	22,23	225,39	0,00	111,10	698,62	255,27
60	569,17	70,78	22,04	231,11	0,00	112,90	701,94	259,81
61	570,33	70,85	21,88	236,64	0,00	114,74	706,24	264,26
62	572,00	70,92	21,72	241,96	0,00	116,62	710,36	268,75
63	572,77	71,10	21,53	246,98	0,00	118,50	714,70	273,09
64	572,59	71,12	21,33	252,08	0,00	120,38	717,88	277,42
65	570,71	71,16	21,24	257,11	0,00	122,30	719,75	281,64
66	569,86	71,03	21,04	261,96	0,00	124,25	718,15	286,17
67	575,23	71,13	20,83	266,97	0,00	126,23	716,70	290,94
68	578,48	71,40	20,63	272,03	0,00	128,23	716,59	296,65

69	579,35	71,33	20,44	277,41	0,00	130,21	716,87	302,76
70	579,45	71,45	20,24	283,17	0,00	132,25	718,29	309,20
71	578,03	71,49	20,12	289,17	0,00	134,32	718,64	315,97
72	576,99	71,21	19,93	295,42	0,00	136,39	720,90	322,35
73	575,38	71,28	19,73	301,57	0,00	138,49	722,53	329,20
74	574,73	71,42	19,54	307,38	0,00	140,60	723,99	335,82
75	573,94	71,15	19,45	313,29	0,00	142,75	724,98	342,45
76	575,43	71,31	19,25	319,16	0,00	144,98	725,23	349,01
77	577,12	71,35	19,03	324,83	0,00	147,19	726,78	355,69
78	580,08	71,58	18,84	330,71	0,00	149,43	728,23	362,52
79	582,77	71,56	18,63	336,60	0,00	151,71	730,37	369,23
80	584,37	71,71	18,43	342,46	0,00	154,02	733,76	375,67
81	582,51	71,96	18,24	348,42	0,00	156,35	736,75	381,67
82	579,73	71,97	18,14	354,25	0,00	158,66	738,66	386,90
83	578,13	72,02	17,95	359,76	0,00	161,03	740,91	391,25
84	578,21	71,80	17,73	364,75	0,00	163,40	741,64	396,08
85	577,64	71,78	17,64	370,03	0,00	165,81	742,08	401,52
86	577,10	72,03	17,45	375,02	0,00	168,26	742,84	407,61
87	574,01	72,08	17,25	379,95	0,00	170,78	742,91	414,07
88	572,85	71,75	17,15	384,99	0,00	173,32	742,32	420,86
89	572,43	72,17	16,94	390,08	0,00	175,90	741,55	428,02
90	572,03	72,20	16,77	395,57	0,00	178,50	740,25	435,52
91	568,93	72,27	16,65	401,29	0,00	181,18	737,66	442,86
92	567,73	72,28	16,45	406,82	0,00	183,91	734,88	449,62
93	565,30	72,22	16,35	412,50	0,00	186,64	731,48	456,05
94	565,05	72,20	16,23	417,87	0,00	189,42	728,87	461,64
95	564,47	72,37	16,04	423,15	0,00	192,24	726,50	466,56
96	563,80	72,18	15,85	428,40	0,00	195,03	724,32	470,82
97	562,72	72,23	15,75	433,19	0,00	197,85	722,79	474,78
98	561,31	72,35	15,65	437,73	0,00	200,69	721,53	477,88
99	562,91	72,45	15,44	441,88	0,00	203,55	720,61	480,71
100	563,70	72,51	15,34	445,94	0,00	206,39	722,02	482,57
101	562,97	72,49	15,15	449,32	0,00	209,23	723,95	483,01
102	561,16	72,29	15,05	452,23	0,00	212,06	724,47	482,84
103	559,47	72,58	14,86	454,77	0,00	214,85	724,01	482,90
104	557,41	72,60	14,74	457,43	0,00	217,69	721,82	484,60
105	556,57	72,74	14,64	459,87	0,00	220,50	720,14	486,64
106	557,73	72,74	14,45	462,80	0,00	223,18	718,84	489,02
107	559,81	72,40	14,35	465,68	0,00	226,05	718,61	491,29
108	559,21	72,55	14,15	469,00	0,00	228,98	720,13	494,45
109	558,05	72,79	13,94	471,60	0,00	231,93	720,40	496,47
110	555,13	72,93	13,94	473,58	0,00	234,95	718,13	497,53
111	553,66	72,52	13,74	475,60	0,00	237,98	714,10	498,09
112	547,92	73,14	13,65	477,46	0,00	241,00	709,47	498,43
113	543,87	72,96	13,55	479,31	0,00	243,93	704,48	499,11
114	541,01	73,16	13,45	481,24	0,00	246,85	699,76	499,12
115	540,82	73,13	13,36	483,46	0,00	249,79	697,35	500,24
116	540,79	73,09	13,15	485,66	0,00	252,69	696,36	503,16
117	540,67	72,76	13,05	488,29	0,00	255,56	695,57	506,67
118	538,29	73,25	12,95	490,50	0,00	258,37	692,31	508,79
119	539,27	73,22	12,85	492,42	0,00	261,14	688,89	510,42
120	537,69	73,38	12,75	493,93	0,00	263,89	687,09	510,98
121	535,77	73,42	12,66	495,44	0,00	266,64	686,29	511,68
122	535,16	73,23	12,46	497,30	0,00	269,31	685,58	512,19
123	533,77	73,51	12,34	499,17	0,00	271,98	685,55	511,88
124	531,83	73,55	12,35	500,86	0,00	274,65	686,05	511,27
125	532,78	73,71	12,15	502,38	0,00	277,25	687,36	510,55
126	533,86	73,13	12,05	503,14	0,00	279,91	688,24	510,77
127	530,53	73,40	12,05	503,56	0,00	282,46	686,87	512,87
128	529,11	73,35	11,86	504,17	0,00	285,07	684,38	515,05
129	528,11	73,56	11,76	505,28	0,00	287,57	682,10	516,12
130	529,00	73,39	11,67	506,28	0,00	290,15	680,96	516,60
131	527,39	73,56	11,55	507,18	0,00	292,73	678,31	517,88
132	526,83	73,75	11,45	507,77	0,00	295,20	675,75	519,40
133	526,44	73,98	11,35	508,72	0,00	297,74	673,06	520,59
134	525,97	73,99	11,16	510,13	0,00	300,21	672,61	520,32
135	527,85	73,45	11,06	511,10	0,00	302,65	673,61	519,48
136	529,38	73,73	10,96	511,81	0,00	305,08	672,99	520,10
137	530,96	73,41	10,85	512,73	0,00	307,54	673,45	521,05
138	530,03	73,64	10,75	513,69	0,00	310,00	673,73	522,37
139	528,69	73,73	10,65	514,42	0,00	312,45	671,32	523,21
140	530,15	73,78	10,46	515,19	0,00	314,93	668,19	524,01

141	531,86	73,79	10,36	516,23	0,00	317,46	665,31	524,60
142	532,06	73,53	10,17	517,45	0,00	320,04	663,28	525,38
143	530,90	73,72	10,05	518,97	0,00	322,66	660,28	526,35
144	531,22	73,74	9,95	520,99	0,00	325,26	657,76	526,85
145	532,67	73,48	9,86	522,06	0,00	328,07	656,71	528,04
146	532,77	73,87	9,66	523,50	0,00	331,01	656,85	529,23
147	533,59	73,46	9,56	525,31	0,00	334,11	656,70	530,23
148	534,29	73,94	9,47	527,60	0,00	337,48	656,01	530,99
149	532,92	73,75	9,25	529,66	0,00	341,09	654,50	531,51
150	530,73	73,41	9,15	531,67	0,00	344,89	652,19	532,39
151	527,47	73,94	9,06	533,75	0,00	348,86	648,30	532,92
152	525,36	74,12	8,95	535,51	0,00	352,96	643,86	533,44
153	525,47	73,77	8,77	536,85	0,00	357,22	638,97	533,98
154	523,90	73,80	8,67	538,17	0,00	361,75	634,49	534,75
155	521,61	73,66	8,57	539,46	0,00	366,34	629,88	535,29
156	520,82	73,61	8,36	540,54	0,00	371,06	625,54	535,81
157	519,47	73,92	8,36	541,44	0,00	375,73	622,99	536,19
158	516,46	74,01	8,16	542,20	0,00	380,36	620,83	536,80
159	514,92	73,93	8,07	543,02	0,00	385,09	619,64	537,10
160	514,64	73,97	7,97	543,55	0,00	389,79	619,57	537,76
161	514,60	74,13	7,77	544,11	0,00	394,46	620,03	537,83
162	516,47	73,71	7,66	544,23	0,00	399,06	622,45	539,07
163	515,27	74,01	7,56	544,88	0,00	404,04	626,71	540,29
164	516,42	73,87	7,37	545,46	0,00	408,96	630,15	541,15
165	516,41	74,06	7,36	546,10	0,00	413,85	633,31	542,39
166	519,08	74,25	7,17	546,98	0,00	418,86	637,06	543,54
167	520,58	74,04	7,07	547,91	0,00	423,64	641,61	545,20
168	520,78	74,30	6,86	548,79	0,00	428,16	645,93	546,48
169	521,53	73,74	7,80	549,59	0,00	432,60	650,92	547,74
170	618,98	74,22	7,37	551,84	0,00	436,29	655,68	549,84
171	589,96	73,69	6,06	555,86	0,00	443,54	653,60	552,84
172	557,17	74,39	5,96	560,33	0,00	449,14	653,73	555,13
173	540,11	74,54	5,87	564,04	0,00	454,29	654,93	557,44
174	526,11	74,34	5,77	566,43	0,00	458,95	654,49	560,39
175	513,99	74,71	5,67	567,96	0,00	462,93	650,73	561,98
176	502,57	74,46	5,67	568,68	0,00	467,02	644,45	561,79
177	495,20	74,00	5,58	568,42	0,00	470,19	634,10	562,62
178	488,61	74,51	5,58	567,17	0,00	472,51	622,51	563,24
179	482,79	74,68	5,48	565,19	0,00	474,60	610,59	563,90
180	477,79	74,45	5,36	563,07	0,00	476,20	599,66	563,26
181	472,35	74,20	5,36	561,06	0,00	477,17	589,26	562,65
182	467,79	74,55	5,26	559,09	0,00	478,35	580,44	560,64
183	460,65	74,27	5,17	556,85	0,00	479,44	572,93	558,52
184	452,71	72,77	5,17	554,39	0,00	479,87	562,41	555,85
185	446,22	71,17	5,07	551,32	0,00	480,64	551,40	553,92
186	439,34	71,21	5,07	548,33	0,00	481,46	539,65	550,47
187	432,25	70,87	5,07	545,49	0,00	481,38	528,75	546,47
188	425,69	70,35	5,07	542,45	0,00	481,57	518,13	541,88
189	416,62	70,20	5,07	538,97	0,00	482,36	507,11	537,31
190	407,38	69,97	5,07	535,54	0,00	482,54	496,15	532,38
191	398,62	69,75	5,07	531,86	0,00	483,02	484,99	526,71
192	389,88	70,29	4,97	528,03	0,00	482,87	473,93	521,67
193	383,19	70,73	4,97	524,27	0,00	483,96	463,75	516,18
194	377,08	71,15	4,97	520,80	0,00	484,22	454,34	511,67
195	371,92	71,45	4,97	516,92	0,00	485,28	445,42	507,63
196	365,49	71,77	4,87	513,61	0,00	485,95	437,27	502,93
197	360,70	72,03	4,87	510,52	0,00	486,88	429,67	498,39
198	355,98	72,25	4,87	507,06	0,00	487,61	422,80	494,69
199	351,76	72,38	4,87	503,43	0,00	489,18	416,51	491,31
200	347,53	72,54	4,87	500,86	0,00	490,06	410,68	487,75
201	343,41	72,71	4,78	497,73	0,00	491,34	405,67	484,10
202	340,35	72,61	4,77	494,75	0,00	492,08	401,09	481,13
203	338,05	72,88	4,76	491,94	0,00	494,47	396,68	477,88
204	335,11	72,64	4,68	489,48	0,00	494,98	392,97	474,75
205	332,98	72,76	4,68	486,84	0,00	497,22	389,21	472,18
206	330,74	72,93	4,56	485,02	0,00	498,18	386,15	469,65
207	329,19	72,82	4,56	482,76	0,00	500,19	383,43	467,16
208	334,89	73,09	4,56	479,73	0,00	499,35	377,37	463,96

POLYTESTS
TESTING THROUGH YOUR REALITY

Date: 2025-04-15 Manufacturer: foyer supreme Model: 38 5+D

Project #: pI 2.326 Run: 1 Tech: M.M Reviewer: JP

28 8 LBS handling + preload START PINT
AFter 3 min closed Door
- Δ 68 LBS Mack WOOD
- Δ 47 LBS Level Load Bed
- AFter 1 min with Load
- AFter 1 min closed Door

TEST LOAD CONFIGURATION

POLYTESTS
TESTING THROUGH YOUR REALITY

PRE / POST CHECKS

Date: 2025-04-15 Manufacturer: foyer supreme Model: 38 std

Project #: PE 20326 Run: 1 Tech: M.M Reviewer: SD

Moisture Meter Calibration Check:	Equipment #	Time	12%	22%
	EM-334	7:00	ok	ok

Pre-Test **Post-Test**

Facility Conditions:

	Pre-Test	Post-Test
Air Velocity from less than 2 feet	0 (max50 Fpm)	0 (max50 Fpm)
Smoke Capture Check (tunnel velocity)	ok	NA
Picture 4 sides	ok	ok

Wood Heater Conditions:

Date Wood Heater Stack Cleaned	2025-04-15
Date Dilution Tunnel Cleaned	2025-04-15
Induced Draft Check (max 0.005 H2O)	ok
Traverse before ignition	ok

Temperature System:

Ambient (65°-90°F)	ok °F

Proportional Checks:

Thermocouple check	ok
Pitot Clean	ok
Pitot verification	ok
Pictures for report: Side	ok
Coal bed	ok
Load	ok
Load in stove	ok
Fuel adjustment	ok
Load Length 5/6 of firebox Length +- 1inch	ok

POLYTESTS
TESTING THROUGH YOUR REALITY

Date: 2025-04-15 Manufacturer: foyer supreme Model: 38 STD

Project #: pi 20326 Run: 1 Tech: M.M Reviewer:

Leakage Checks Tunnel Samplers

	Train 1		Train 2	
Unplugged Flow Rate = .25cfm	Pre-Test ASTM (-15) CSA B415 (-5)	Post-Test (Max test)	Pre-Test ASTM (-15) CSA B415 (-5)	Post-Test (Max test)
Vacuum (inches Hg.)	-7	-7	-7	-7
Final 1minute DGM (Liter)	141 622 93	143177 52	897356 85	898888 03
Initial 1minute DGM (Liter)	141 622 93	143177 52	897356 85	898888 01
Change (Liter)	ϕ	ϕ	ϕ	0.02
Allowable leakage .04 x Sample rate or 0.28Lpm CSA B415 (0.56)				
Check OK	ok	ok	ok	ok

POLYTESTS
TESTING THROUGH YOUR REALITY

Date: 2025-04-15 Manufacturer: foyer supreme Model: 38 STD

Project #: PI 20326 Run: 1 Tech: M.M Reviewer: DO

Leakage Checks Tunnel Samplers

	ambient ~~System 1st hour~~ MM		Sys 1 hour ~~Ambient~~ MM	
Unplugged Flow Rate = .25cfm	Pre-Test ASTM (-15) CSA B415 (-5)	Post-Test (Max test)	Pre-Test ASTM (-15) CSA B415 (-5)	Post-Test (Max test)
Vacuum (inches Hg.)	-7	-7	-7	-7
Final 1minute DGM (Liter)	632 616.06	634 034.73	1215.31	1227.62
Initial 1minute DGM (Liter)	632 616.06	634 034.72	1215.31	1227.62
Change (Liter)	ϕ	0.01	ϕ	ϕ
Allowable leakage .04 x Sample rate or 0.28Lpm CSA B415 (0.56)				
Check OK	ok	OK	ok	OK

POLYTESTS
TESTING THROUGH YOUR REALITY

Date: 2025-04-15 Manufacturer: foyer supreme Model: 38 STD

Project #: PT 20326 Run: 1 Tech: M.P Reviewer: DP

Leakage Checks Flue Gas Sampler

Plugged Probe	Pre-Test	Post Test
Vacuum (inches Hg.)	-5	-5
Rotameter Reading (mml/min.)	0	0
Flow Rate (lpm)	1.5	1.5
Allowable (.02 x Sample Rate)	30	30
Check OK	ok	ok

Leakage Checks Pitot

Plugged Probe	Pre-Test 3 H2o static	Pre-Test 0.4-0.5 H2o velocity	Post Test 3 H2o Static	Post Test 0.4-0.5 H2o velocity
Vacuum (inches Hg.)	3	0.4	3	0.5
Check OK (no change after 15 sec.)	ok	ok	ok	ok

POLYTESTS
TESTING THROUGH YOUR REALITY

Date: 2025-04-15 Manufacturer: foyer supreme Model: 38 STD

Project #: PE 20326 Run: 1 Tech: M.M Reviewer: DP

Scale Type	Audit		Measured Weight
	Equipment #	Weight	
Platform	EM-090	44 lbs, Class F	4,4 lbs
Platform	EM-205	10.00 Kg, Class F	10,00 Kg
Wood	EM-090	44,0 lbs, Class F	44,0 lbs
Analytical	EM 305	100,0 mg, Class S	100,0 mg
Analytical	EM-129	200,0000 g, Class S	200,0000 g

LIMITS OF WEIGHT RANGES

ANALYTICAL SCALE: .....50%-150% of dry filter weight, ± 0.1 mg
PLATFORM SCALE ..... 20%-80% of ideal test load weight, ± 0.1 lbs or 1%
WOOD SCALE ..... 20%-80% of ideal test load weight, ± 0.01 lbs or 1%

CONTINUOUS ANALYZERS

Date: 2025-04-15 Manufacturer: Foyer Supreme Model: 38 STD

Project #: PT 20 366 Run: 1 Tech: M.M Reviewer: NP

FOR TUNNELS < 12 in

Barometric pressure (P_{bar}) _____ (KPa.) Static pressure (P_q) _____(inches w.c.)
Inside diameter: Port A _____ Port B _____.
Tunnel cross sectional area: .1963Ft^2
Pitot tube type: Standard

Traverse Point	Position (inches)			Velocity Head Δ_p (inches H_2O)	Tunnel Temperature (°F)
Tunnel diameter	6 po	7 po	8 po		
A- Centroid	3.00	3.50	4	0,078	67,66
B - Centroid	3.00	3.50	4	0,077	67,82
A-1	0.40	0.50	0.50	0,064	67,66
A-2	1.50	1.75	2	0,071	67,73
A-3	4.50	5.25	6	0,068	67,73
A-4	5.60	6.5	7.5	0,063	67,79
B-1	0.40	0.50	0.50	0,063	67,82
B-2	1.50	1.75	2	0,068	67,80
B-3	4.50	5.25	6	0,071	67,80
B-4	5.60	6.5	7.5	0,064	67,84
				AVERAGE	

CONTINUOUS ANALYZERS

Date:_____ Manufacturer:_____ Model:_____

Project #: _____ Run:_____ Tech:_____ Reviewer:_____

FOR TUNNELS 12 in

Barometric pressure (P_{bar}) _____ (KPa.) Static pressure (P_q) _____(inches w.c.)
Pitot tube type: Standard

Traverse Point	Position (inches)	Velocity Head Δ_p (inches H_2O)	Tunnel Temperature (°F)
A Center	6		
B Center	6		
A-1	0.53		
A-2	1.75		
A-3	3.55		
A-4	8.45		
A-5	10.25		
A-6	11.47		
B-1	0.53		
B-2	1.75		
B-3	3.55	N.A	
B-4	8.45		
B-5	10.25		
B-6	11.47		

POLYTESTS
TESTING THROUGH YOUR REALITY

CONTINUOUS ANALYZERS

Date: 2025-04-15 Manufacturer: Fuyan Supreme Model: 3851D

Project #: PS20326 Run: 1 Tech: M.A Reviewer: RD

Pre-Test (Adjust and Record)

	ZERO		SPAN		CAL. (Record Only)	
CO	0	0	3055	3000	1018	1000
Tolerance CO	0	+/- 0.02	0055	+/- 0.15	0018	+/- 0.05
CO_2	0	0	18,04	18,00	984	10,00
Tolerance CO2	0	+/- 0.02	0,04	+/- 0.5	016	+/- 0.5
O_2 informative CSA B415 calculated value	na	na	na	na	na	na
	Actual	Should Be	Actual	Should Be	Actual	Should Be

Post Test (Record Only)

	Zero	Span	Cal.	Zero Drift	Limit	Span Drift	Limit	Cal. Drift	Limit	OK?	Not OK*
CO	0	3060	1014	0	0.02	0005	0.15	0004	0.05	✓	
CO_2	0	18,01	9 88	0	0.02	903	0.5	6,04	0.5	✓	

POLYTESTS
TESTING THROUGH YOUR REALITY

TEST DATA LOG

Date: 2025-09-15 Manufacturer: Foyer supreme Model: 38 std

Project #: PJ 2326 Run: 1 Tech: M.M Reviewer: NP

RAW DRY GAS METER READINGS

		System 1st hour	System 1	System 2	Blank
Test	Final (Liter)	12765	143177.05	898886.98	634034.26
	Initial (Liter)	12159	141623.81	897357.77	632619.53

AMBIENT CONDITIONS

	Before	After
Barometer (kPa):	98.6	98.5
Dry Bulb (F):	75.5	77.4
Humidity (%):	31.6	29.4

POLYTESTS
TESTING THROUGH YOUR REALITY

FUEL DATA

Date: 2025-04-15 Manufacturer: Foyer supreme Model: 38 STD

Project #: PJ 2026 Run: 1 Tech: MR Reviewer: DP

FUEL DESCRIPTION:

Type of wood:

PRE-TEST LOAD

Piece Size	Weight	Meter Moisture Content (% dry) *				
1 1/2 x 3 1/2 x 12 in.	1850 lbs.	21.4	21.6	21.6	21.5	21.4
1 1/2 x 3 1/2 x 12 in.	1882 lbs.	21.5	21.3	21.8	21.9	22.0
1 1/2 x 3 1/2 x 12 in.	1596 lbs.	19.9	20.0	20.1	20.4	20.8
1 1/2 x 3 1/2 x 12 in.	1278 lbs.	21.0	20.8	20.7	20.7	20.6
1 1/2 x 3 1/2 x 12 in.	1632 lbs.	21.1	21.0	21.0	21.1	21.4
1 1/2 x 3 1/2 x 12 in.	1606 lbs.	20.8	20.9	20.4	20.6	20.7
1 1/2 x 3 1/2 x 12 in.	1616 lbs.	19.2	19.7	19.8	19.6	19.8
1 1/2 x 3 1/2 x 12 in.	1502 lbs.	20.0	19.8	19.9	19.7	19.7
1 1/2 x 3 1/2 x 12 in.	1472 lbs.	20.1	20.1	20.0	20.3	20.0
1 1/2 x 3 1/2 x 12 in.	1564 lbs.	19.3	19.3	19.3	19.8	19.7
1 1/2 x 3 1/2 x 12 in.	1534 lbs.	19.9	19.8	19.7	19.8	19.7
1 1/2 x 3 1/2 x 12 in.	1302 lbs.	20.4	20.3	20.4	20.5	20.6
1 1/2 x 3 1/2 x 20 in.	2452 lbs.	20.4	20.3	20.6	20.7	20.7
1 1/2 x 3 1/2 x 20 in.	2804 lbs.	19.9	20.0	19.6	19.7	19.7
1 1/2 x 3 1/2 x 20 in.	2198 lbs.	20.0	20.1	20.4	20.3	20.4
1 1/2 x 3 1/2 x 20 in.	2716 lbs.	20.4	20.3	20.6	19.9	20
x x in.	lbs.					
x x in.	lbs.					
x x in.	lbs.					
x x in.	lbs.					
x x in.	lbs.					
x x in.	lbs.					
x x in.	lbs.					

TEST LOAD WEIGHT: 2900 **lbs**

Wood Temperature: 21

POLYTESTS
TESTING THROUGH YOUR REALITY

FUEL DATA

Date: 2025-04-15 Manufacturer: Foyer supreme Model: 38 std

Project #: PS 20326 Run: 1 Tech: M.M Reviewer: DD

FUEL DESCRIPTION:

Type of wood:

TEST LOAD

Piece Size	Weight		Meter Moisture Content (% dry)*				
3 1/2 x 3 1/2 x 20 in.	5024	lbs.	19.7	19.6	19.9	19.2	19.1
3 1/2 x 3 1/2 x 20 in.	5 226	lbs.	19.6	19.3	19.4	19.1	19.1
3 1/2 x 3 1/2 x 20 in.	5 432	lbs.	19.8	19.9	20.4	19.7	19.6
3 1/2 x 3 1/2 x 20 in.	4 956	lbs.	19.9	20.0	19.7	19.8	19.8
x x in.		lbs.					
1 1/2 x 3/4 x 5 in.	0 152	lbs.			19.1		
1 1/2 x 3/4 x 5 in.	0 124	lbs.			19.8		
1 1/2 x 3/4 x 5 in.	0 106	lbs.			19.7		
1 1/2 x 3/4 x 5 in.	0 104	lbs.			19.8		
1 1/2 x 3/4 x 5 in.	0 124	lbs.			20.0		
1 1/2 x 3/4 x 5 in.	0 170	lbs.			20.1		
1 1/2 x 3/4 x 5 in.	0 140	lbs.			20.0		
1 1/2 x 3/4 x 5 in.	0 166	lbs.			20.4		
1 1/2 x 3/4 x 5 in.	0 146	lbs.			20.6		
1 1/2 x 3/4 x 5 in.	0 156	lbs.			20.0		
1 1/2 x 3/4 x 5 in.	0 118	lbs.			20.0		
1 1/2 x 3/4 x 5 in.	0 138	lbs.			19.8		
1 1/2 x 3/4 x 5 in.	0 126	lbs.			19.7		
1 1/2 x 3/4 x 5 in.	0 154	lbs.			19.8		
1 1/2 x 3/4 x 5 in.	0 116	lbs.			19.9		
1 1/2 x 3/4 x 5 in.	0 150	lbs.			20.0		
x x in.		lbs.					
x x in.		lbs.					
x x in.		lbs.					
x x in.		lbs.					
x x in.		lbs.					
x x in.		lbs.					

TEST LOAD WEIGHT: 22 83 lbs Min 20%:..... Max 25%:_____

Wood Temperature:

POLYTESTS
TESTING THROUGH YOUR REALITY

DILUTION TUNNEL PARTICULATE SAMPLER DATA

Date: 2025-04-15 Manufacturer: foyer supreme Model: 38 STD

Project #: PJ 20326 Run: 1 Tech: M.M Reviewer: BD

		TEST FILTERS					
		SYSTEM 1st hour			SYSTEM 1		
Pre-test Weight Record		Probe & Housing Number	Front & Back Filter Number	gaskets	Probe & Housing Number	Front & Back Filter Number	gaskets
Date	Time	009	107-108	6	36	109-110	9
2025-04-14	17:00	61 4522	02566	41821	107 7229	02570	41738
2025-04-15	9:00	61 4523	02566	41822	107 7228	02571	41737

		TEST FILTERS					
		SYSTEM 1st hour			SYSTEM 1		
Post-test Weight Record		Probe & Housing Number	Front & Back Filter Number	gaskets	Probe & Housing Number	Front & Back Filter Number	gaskets
Date	Time	009	107-108	6	36	109-110	9
2025-04-15	17:00	61 4526	02594	41841	107 7231	02595	41763
2025-04-23	9:00	61 4524	02590	41828	107 7228	02595	41751
2025-04-24	9:00	61 4524	02590	41828	107 7228	02594	41750

POLYTESTS
TESTING THROUGH YOUR REALITY

DILUTION TUNNEL PARTICULATE SAMPLER DATA

Date: 2025-04-15 Manufacturer: foyer supreme Model: 38 STD

Project #: PI 20 326 Run: 1 Tech: M.M Reviewer: BP

		TEST FILTERS			
		SYSTEM 2			
Pre-test Weight Record		Probe & Housing Number	Front & Back Filter Number	gaskets	Blank Filter
Date	Time	37	111 - 112	62	113
2025-04-14	17:00	107,9751	0,2570	4,9804	0,1302
2025-04-15	9:00	107,9752	0,2569	4,9805	0,1301

		TEST FILTERS				
		SYSTEM 2				
Post-test Weight Record		Probe & Housing Number	Front & Back Filter Number	gaskets	Blank Filter	End test time and date
Date	Time	37	111 - 112	62	113	16:45
2025-04-15	17:00	107,9754	0,2592	4,9825	0,1303	2025-04-15
2025-04-23	9:00	107,9753	0,2592	4,9811	0,1302	
2025-04-24	9:00	107,9754	0,2593	4,9812	0,1302	

Paramètres

Tous les facteurs de corrections et autres paramètres qui peuvent être modifiés par l'utilisateur du fichier sont regroupés ici.

Code verrouillage:	SUP

Description du test

Test standard	EPA
Run #	2
Date	16-04-2025
Technicien	M.M
Project #	PI 20326

Description de l'unité

Manufacturier	FOYER SUPREME	
Modèle	38 STD	
Combustion system	Non-Cat	
Appliance type	WOOD STOVE	
Firebox volume	3,492	cu ft.
Appliance weight empty	n.a	lbs
Firebox maximum lenght	24	inch

Paramètres du test

Logging time	1	min
Manufacturer's rated heat output	n.a	BTU/h Donnée fournie par le manfacturier
Targeted category	3	
Targeted output	n.a	BTU/h
Cp steel	n.a	BTU/lb-°F

Échantillonnage

Targeted Blank sampling rate	0,20	cuft/min
Internal probe diameter	0,18	in.
Calibration Factor (DGM #1):	0,986	
Equipment number (DGM #1):	EM 178	Dimensionless
Calibration Factor (DGM #2):	1,010	
Equipment number (DGM #2):	EM 318	Dimensionless
Calibration Factor (DGM #3):	0,988	
Equipment number (DGM #3):	EM 179	Dimensionless
Calibration Factor (DGM 1st Hr):	1,000	
Equipment number (DGM 1st Hr):	EM 130	Dimensionless

Tunnel

Targeted tunnel flow rate	350	scfm
Tunnel diameter	8	in.
Molecular weight	29	29 as per ASTM E2515
Pitot tube type	Standard	
Pitot tube coefficient	0,99	Dimensionless

Project nu.	PI 20326
Date	16-04-2025
Technicien	M.M

Fuel data

Fuel type	Dimension	
Fuel specie	D. Fir	
HHV	19810,0	kJ/kg
%C	48,7	
%H	6,9	
%O	43,9	
%Ash	0,5	
HHV	8519,2	Btu/lb
LHV	7451,0	Btu/lb

Default Fuel Values

	D. Fir	Oak/Maple
HHV	19 810	19 887
%C	48,73	50
%H	6,87	6,6
%O	43,9	42,9
%Ash	0,5	0,5
HHV (Btu/lb)	8519	8552
LHV (Btu/lb)	7451	7480

	Start	End
Barometer (kPa):	99,1	99,2
Barometer (in.Hg):	29,26	29,29
Dry Bulb (F):	68,51	68,89
Humidity (%):	29,4	29,7
Air velocity (ft/min)	0	0

DGM #1st hour	Final:	1240,030	cuft	Final:	1240,030	cuft
	Initial:	1228,080	cuft	Initial:	1228,080	cuft
DGM #1	Final:	5107,373	cuft	Final:	144624,700	Liter
	Initial:	5056,370	cuft	Initial:	143180,440	Liter
DGM #2	Final:	31794,243	cuft	Final:	900312,680	Liter
	Initial:	31744,042	cuft	Initial:	898891,160	Liter
DGM room	Final:	22448,846	cuft	Final:	635680,520	Liter
	Initial:	22390,821	cuft	Initial:	634037,430	Liter

Numéro de la ligne dans "Raw data" à partir duquel les données du VRAI test commencent: 244

Autres données à rentrer: dans preload data, load data, traverse et filter set weight

Project nu.	PI 20326
Date	16-04-2025
Technicien	M.M

Preload data sheet

Test Load Weight:

Lower	Ideal	Upper
22,00	24,44	26,89

Load Volume: 0,6806 cu. ft

Loading Density: 8,267 lbs./ft3

Number of Spaces:

Spacer weight (lbs):

Load Density (wet): 42,421 lbs./ft3

Dry Wood Density: 35,191533

Piece Size (in): Thick	Wide	x Length	Weight lbs	Meter Moisture Content Dry Uncorrected %					Ave. MC x Weight	Volume Cubic Inches
1,5	3,5	12	1,642	21,1	21,8	21,4	21,3	21,9	35,303	63,00
1,5	3,5	12	1,34	22	22,1	22	21,9	21,6	29,3728	63,00
1,5	3,5	12	1,302	21,6	21,8	21,9	21,4	21,8	28,2534	63,00
1,5	3,5	12	1,634	19,9	19,8	19,9	20	20,1	32,58196	63,00
1,5	3,5	12	1,382	19,4	19,7	19,8	19,7	19,9	27,2254	63,00
1,5	3,5	12	1,666	20,3	20,4	20,6	20,9	20,7	34,28628	63,00
1,5	3,5	12	1,366	19,1	19,3	19,6	19,6	19,3	26,47308	63,00
1,5	3,5	12	1,632	19,9	20	20,1	20,4	20,6	32,9664	63,00
1,5	3,5	12	1,378	20,9	20,8	20,7	20,7	20,9	28,6624	63,00
1,5	3,5	12	1,612	21,1	21,3	21,9	21,8	21,4	34,658	63,00
1,5	3,5	12	1,712	20,9	20,6	20,3	20,4	20,5	35,16448	63,00
1,5	3,5	12	1,71	21,1	21,3	21,3	21	20,5	35,9784	63,00
1,5	3,5	20	2,806	20,8	20,9	21	21	20,8	58,6454	105,00
1,5	3,5	20	2,718	19,9	20	20,1	20,3	20,4	54,74052	105,00
1,5	3,5	20	2,518	19,3	19,4	19,8	19,9	19,9	49,50388	105,00
1,5	3,5	20	2,452	20,4	20,1	20	20	20	49,2852	105,00
										0,00
										0,00
										0

FUEL LOAD DATA SHEET, CSA B415

Test Load Weight:

Lower	Ideal	Upper
22,0	24,4	26,9

* For boilers, a loading density factor of 10 lb/ft3 is applied

Load Volume: 0,57 cu. ft

Loading Density: 6,4 lbs./ft3

Number of Spaces: 16

Spacer weight: lbs

Load Density (wet): 35,3 lbs./ft3

Dry Wood Density: 29,5 lbs./ft3 ok

piece lenght minimum 5/6 of firebox lenght 20,00

Piece Size (in): Thick	Wide	Length	Weight lbs	Meter Moisture Content Dry Uncorrected %					Ave. MC x Weight	Volume Cubic Inches	Ave. MC %	
3,5	3,5	20	4,91	19,60	19,40	19,30	19,90	19,40	95,92128	245,00	19,5	Load
3,5	3,5	20	5,07	19,80	19,00	20,00	20,10	20,10	100,386	245,00	19,8	
3,5	3,5	20	4,97	20,10	20,40	20,60	20,80	20,00	101,20708	245,00	20,4	
3,5	3,5	20	5,08	19,10	19,30	19,60	19,80	19,80	99,20064	245,00	19,5	
										0,00		
										0,00		
										0,00		
										0,00		
1,5	0,75	5	0,12			19,10			2,3302	5,63	19,1	spacers
1,5	0,75	5	0,17			19,30			3,3196	5,63	19,3	
1,5	0,75	5	0,12			19,40			2,328	5,63	19,4	
1,5	0,75	5	0,12			20,00			2,36	5,63	20,0	
1,5	0,75	5	0,11			20,10			2,211	5,63	20,1	
1,5	0,75	5	0,13			20,30			2,5984	5,63	20,3	
1,5	0,75	5	0,13			20,40			2,7336	5,63	20,4	
1,5	0,75	5	0,14			20,60			2,9664	5,63	20,6	
1,5	0,75	5	0,13			19,90			2,6666	5,63	19,9	
1,5	0,75	5	0,13			20,00			2,68	5,63	20,0	
1,5	0,75	5	0,15			20,10			2,9346	5,63	20,1	
1,5	0,75	5	0,12			20,60			2,4308	5,63	20,6	
1,5	0,75	5	0,16			20,80			3,3696	5,63	20,8	
1,5	0,75	5	0,12			20,40			2,448	5,63	20,4	
1,5	0,75	5	0,16			20,30			3,1668	5,63	20,3	
1,5	0,75	5	0,13			20,80			2,7872	5,63	20,8	
										0,00		
										0,00		
										0,00		
										0,00

Tunnel Traverse Worksheet (for velocity calculations)

Static Pressure: -0,17 in. H20
Barometer: 29,900 in. Hg

Pour un tunnel de 12" et plus, prendre 6 lectures

	TUNNEL VELOCITY	TUNNEL TEMP	SQUARE ROOT
	In. wc	°F	
A center			0,0000
B center			0,0000
A1			0,0000
A2			0,0000
A3			0,0000
A4			0,0000
A5			0,0000
A6			0,0000
B1			0,0000
B2			0,0000
B3			0,0000
B4			0,0000
B5			0,0000
B6			0,0000
AVERAGE	#DIV/0!	#DIV/0!	0,0000

PITOT CONSTANT=
0,941

Pour un tunnel moins de 12", prendre 4 lectures

	TUNNEL VELOCITY	TUNNEL TEMP	SQUARE ROOT
	In. wc	°F	
A center	0,078	67,31	0,2793
B center	0,077	67,16	0,2775
A1	0,064	67,31	0,2530
A2	0,070	67,35	0,2646
A3	0,068	67,35	0,2608
A4	0,063	67,24	0,2510
B1	0,063	67,1	0,2510
B2	0,070	67,1	0,2646
B3	0,071	67,1	0,2665
B4	0,063	67,1	0,2510
AVERAGE	0,0687	67,2120	0,2619

Project nu.	PI 20326
Date	16-04-2025
Technicien	M.M

Filter set weight

	System 1 (g) 1st hour			System 1 (g)			System 2 (g)			Ambient blank (g)	Date	Heure	Test end date & time
	probe	front/ Back	gasket	probe	front/ Back	gasket	probe	front/ Back	gasket	Filter			
Number	16	114-115	7	33	116-117	12	35	118-119	50	120			
Before (1)													
Before (2)													
Before (3)													
Before (4)													
Before (5)	108,7499	0,2603	4,1910	109,3625	0,2571	4,1620	109,2821	0,2548	5,0770	0,1290	2025-04-15	17:00	
Before (6)	108,7498	0,2604	4,1909	109,3626	0,2572	4,1621	109,2820	0,2547	5,0771	0,1291	2025-04-16	09:00	
After (1)	108,7499	0,2632	4,1922	109,3628	0,2594	4,1640	109,2820	0,2565	5,0791	0,1293	2025-04-16	16:15	
After (2)	108,7499	0,2630	4,1922	109,3627	0,2593	4,1632	109,2820	0,2565	5,0781	0,1291	2025-04-23	09:00	
After (3)	108,7498	0,2625	4,1921	109,3627	0,2593	4,1631	109,2821	0,2565	5,0781	0,1291	2025-04-24	09:00	2025-04-16 16:15
After (4)	108,7498	0,2624	4,1921	109,3627	0,2593	4,1630	109,2821	0,2566	5,0781	0,1291	2025-04-28	09:00	
After (5)													
After (6)	108,7498	0,2624	4,1921	109,3627	0,2593	4,1630	109,2821	0,2566	5,0781	0,1291	2025-04-28	09:00	
Difference	0,0000	0,0020	0,0012	0,0001	0,0021	0,0009	0,0001	0,0019	0,0010	0,0000			
Total (mg)		3,2			3,1			3		0			
Total ajusté (mg)		**3,20**			**3,10**			**3,00**					

Project nu.	PI 20326
Date	16-04-2025
Technicien	M.M

Manufacturer: FOYER SUPREME
Model: 38 STD

Run: 2
Project #: PI 20326
Test Duration: 257 min

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

	HHV	LHV
Eff	68,32%	73,84%
Comb Eff	94,00%	94,00%
HT Eff	72,68%	78,55%
Output	26 538	kJ/h
Burn Rate	1,96	kg/h
Grams CO	718	g
Input	38 846	kJ/h
MC wet	16,55	

Ultimate CO_2
$CO_{2\text{-ult}}$ 19,64
F_0
1,062

Overall Heating Efficiency: 68,32%
Combustion Efficiency: 94,00%
Heat Transfer Efficiency: 72,68%

Heat Output: 25 174 Btu/h
Heat Input: 36 849 Btu/h
Burn Duration: 4,28 h
Burn Rate: 4,32 lb/h
Stack Temp: 423,8 Deg. F

Averages	1,15	8,56	1,25	20,30	11,16	217,47	20,89	0,88	0,73	0,64
INPUT DATA			Oxygen Calculation			Input Data		Combust	Heat	Net
Elapsed Time	Weight Remaining (kg)	% CO [e]	% CO_2 [d]	Excess Air EA	Total O_2	Calc. % O_2 [g]	Flue Gas (ºC)	Room Temp (ºC)	Eff %	Transfer %	Eff %
0,00	10,07	0,57	1,57	820,8%	20,80	18,95	167,0	20,3	80,5%	36,2%	29,1%
1,00	9,97	0,43	1,44	951,3%	20,82	19,16	170,2	20,3	83,7%	29,9%	25,1%
2,00	9,91	0,39	2,51	576,9%	20,75	18,04	168,4	20,3	90,4%	53,8%	48,6%
3,00	9,85	0,59	3,62	365,9%	20,66	16,74	173,1	20,3	89,3%	63,3%	56,5%
4,00	9,85	0,51	4,24	313,6%	20,63	16,13	178,8	20,3	92,0%	65,9%	60,6%
5,00	9,81	0,53	3,78	356,5%	20,66	16,62	180,3	20,3	90,8%	63,0%	57,3%
6,00	9,72	0,53	3,97	335,7%	20,64	16,40	184,1	20,3	91,1%	63,7%	58,0%
7,00	9,68	0,45	5,29	242,5%	20,56	15,05	193,6	20,4	94,2%	68,4%	64,4%
8,00	9,59	0,40	6,79	173,3%	20,47	13,48	209,4	20,3	95,8%	71,1%	68,1%
9,00	9,55	0,41	7,08	162,2%	20,45	13,16	217,2	20,4	95,9%	71,0%	68,1%
10,00	9,45	0,36	6,65	180,2%	20,48	13,64	223,1	20,2	96,3%	69,4%	66,8%
11,00	9,41	0,33	6,90	171,6%	20,46	13,40	228,2	20,4	96,7%	69,5%	67,2%
12,00	9,36	0,31	6,56	185,9%	20,49	13,77	227,9	20,4	96,7%	68,6%	66,4%
13,00	9,27	0,38	5,96	209,9%	20,52	14,37	230,3	20,4	95,7%	66,5%	63,6%
14,00	9,18	0,35	7,56	148,2%	20,42	12,68	242,7	20,5	96,7%	69,8%	67,4%
15,00	9,09	0,35	9,27	104,1%	20,30	10,86	252,5	20,4	97,2%	72,2%	70,2%
16,00	9,00	0,32	8,39	125,5%	20,36	11,81	253,8	20,4	97,3%	70,6%	68,6%
17,00	8,91	0,29	8,36	127,3%	20,37	11,87	258,9	20,5	97,6%	70,1%	68,4%
18,00	8,82	0,24	9,39	103,9%	20,30	10,79	268,9	20,5	98,2%	71,2%	69,9%
19,00	8,72	0,24	9,88	94,0%	20,27	10,27	271,3	20,6	98,3%	71,8%	70,6%
20,00	8,64	0,22	9,46	103,0%	20,30	10,73	272,8	20,5	98,4%	71,0%	69,9%
21,00	8,55	0,27	9,03	111,3%	20,33	11,16	275,4	20,5	97,9%	70,1%	68,6%
22,00	8,41	0,24	9,60	99,6%	20,29	10,57	278,9	20,5	98,2%	70,8%	69,6%
23,00	8,36	0,20	10,87	77,4%	20,21	9,24	284,5	20,5	98,7%	72,3%	71,4%
24,00	8,23	0,21	11,00	75,3%	20,20	9,10	290,6	20,7	98,7%	72,1%	71,1%
25,00	8,14	0,20	11,50	68,0%	20,17	8,57	293,9	20,8	98,8%	72,5%	71,6%
26,00	8,00	0,20	11,62	66,2%	20,16	8,44	296,7	20,8	98,8%	72,5%	71,6%
27,00	7,91	0,18	11,70	65,4%	20,16	8,37	296,8	20,6	98,9%	72,6%	71,8%
28,00	7,83	0,15	10,97	76,7%	20,21	9,16	296,0	20,7	99,1%	71,7%	71,0%
29,00	7,73	0,17	10,89	77,7%	20,21	9,24	293,1	20,8	99,0%	71,8%	71,1%
30,00	7,64	0,18	10,30	87,4%	20,25	9,86	291,6	20,8	98,8%	71,0%	70,2%
31,00	7,55	0,19	10,64	81,5%	20,23	9,50	291,8	20,8	98,8%	71,5%	70,6%
32,00	7,46	0,16	11,63	66,6%	20,16	8,45	293,6	20,7	99,1%	72,7%	72,0%
33,00	7,37	0,21	12,01	60,8%	20,13	8,02	295,0	20,8	98,7%	73,1%	72,2%
34,00	7,28	0,26	11,96	60,8%	20,13	8,04	290,8	20,9	98,4%	73,3%	72,1%
35,00	7,19	0,17	10,98	76,2%	20,20	9,14	288,7	20,9	99,0%	72,2%	71,5%
36,00	7,10	0,15	11,02	75,8%	20,20	9,10	289,3	20,8	99,1%	72,2%	71,6%
37,00	7,06	0,30	12,04	59,1%	20,12	7,93	290,3	20,8	98,1%	73,4%	72,0%
38,00	6,96	0,34	12,46	53,4%	20,09	7,46	292,4	20,8	97,9%	73,7%	72,1%
39,00	6,87	0,48	12,93	46,4%	20,05	6,88	295,5	20,8	97,1%	74,0%	71,8%
40,00	6,78	0,54	13,28	42,2%	20,03	6,48	297,8	20,8	96,8%	74,1%	71,8%
41,00	6,69	0,47	13,26	43,0%	20,03	6,54	299,1	20,7	97,2%	74,1%	72,0%
42,00	6,60	0,42	13,20	44,3%	20,04	6,64	300,0	20,7	97,6%	74,0%	72,2%
43,00	6,51	0,36	13,08	46,2%	20,05	6,79	300,1	20,6	97,9%	73,9%	72,3%
44,00	6,42	0,34	13,02	47,1%	20,06	6,87	300,0	20,6	98,0%	73,8%	72,3%
45,00	6,31	0,30	12,94	48,4%	20,07	6,98	299,8	20,8	98,3%	73,8%	72,5%
46,00	6,24	0,30	12,95	48,2%	20,07	6,97	300,0	20,5	98,2%	73,7%	72,4%
47,00	6,15	0,33	13,19	45,2%	20,05	6,69	300,7	20,8	98,1%	73,9%	72,5%
48,00	6,06	0,33	13,28	44,4%	20,04	6,60	301,2	20,9	98,1%	74,0%	72,6%
49,00	5,96	0,34	13,35	43,5%	20,04	6,51	302,4	21,0	98,1%	74,0%	72,6%
50,00	5,88	0,34	13,55	41,4%	20,02	6,31	298,9	20,8	98,0%	74,4%	72,9%
51,00	5,79	0,70	13,46	38,7%	20,00	6,19	294,4	21,1	95,9%	74,5%	71,5%
52,00	5,74	0,47	13,36	42,0%	20,03	6,43	292,7	21,1	97,3%	74,5%	72,5%
53,00	5,65	0,44	13,26	43,4%	20,04	6,56	291,0	20,9	97,4%	74,6%	72,6%
54,00	5,56	0,41	13,41	42,1%	20,03	6,41	289,8	20,9	97,6%	74,8%	73,0%
55,00	5,51	0,45	13,44	41,4%	20,02	6,36	289,9	20,9	97,4%	74,8%	72,8%
56,00	5,42	0,43	13,46	41,5%	20,02	6,35	289,4	21,1	97,5%	74,8%	73,0%
57,00	5,34	0,43	13,42	41,8%	20,03	6,39	289,2	21,2	97,5%	74,8%	73,0%
58,00	5,29	0,37	13,41	42,6%	20,03	6,44	288,3	21,2	97,9%	74,9%	73,3%
59,00	5,24	0,36	13,36	43,2%	20,03	6,49	288,2	21,1	97,9%	74,8%	73,3%
60,00	5,15	0,33	13,37	43,3%	20,03	6,49	288,3	21,0	98,1%	74,9%	73,4%
61,00	5,06	0,34	13,44	42,6%	20,03	6,42	287,4	21,1	98,1%	75,0%	73,5%
62,00	5,02	0,38	13,51	41,4%	20,02	6,32	287,4	21,2	97,8%	75,0%	73,4%
63,00	4,92	0,38	13,67	39,8%	20,01	6,15	287,7	21,1	97,8%	75,1%	73,5%
64,00	4,88	0,36	13,72	39,5%	20,01	6,11	288,0	21,1	98,0%	75,2%	73,6%
65,00	4,75	0,33	13,97	37,4%	20,00	5,86	287,7	21,0	98,2%	75,4%	74,0%
66,00	4,70	0,38	14,00	36,6%	19,99	5,80	288,9	21,1	97,9%	75,4%	73,7%
67,00	4,62	0,46	13,98	36,0%	19,99	5,77	288,7	21,0	97,4%	75,3%	73,4%
68,00	4,56	0,44	14,07	35,4%	19,98	5,70	288,9	20,9	97,5%	75,4%	73,5%
69,00	4,47	0,47	14,12	34,6%	19,98	5,62	289,1	20,9	97,4%	75,4%	73,4%
70,00	4,39	0,49	14,08	34,8%	19,98	5,65	289,3	21,1	97,3%	75,4%	73,3%
71,00	4,34	0,42	14,10	35,3%	19,98	5,67	289,3	21,1	97,6%	75,4%	73,6%
72,00	4,30	0,46	14,07	35,3%	19,98	5,69	289,0	21,1	97,5%	75,4%	73,5%
73,00	4,20	0,45	14,05	35,5%	19,98	5,71	289,0	21,2	97,5%	75,4%	73,5%
74,00	4,11	0,42	14,00	36,1%	19,99	5,77	288,8	21,2	97,6%	75,4%	73,6%
75,00	4,07	0,42	13,95	36,7%	19,99	5,83	288,4	21,2	97,7%	75,3%	73,6%
76,00	4,01	0,42	13,90	37,2%	19,99	5,88	288,4	21,1	97,6%	75,3%	73,5%
77,00	3,93	0,40	13,82	38,2%	20,00	5,98	288,1	21,2	97,8%	75,2%	73,6%
78,00	3,84	0,37	13,86	38,1%	20,00	5,96	287,8	21,2	97,9%	75,3%	73,7%
79,00	3,79	0,33	13,78	39,2%	20,01	6,06	287,3	21,2	98,1%	75,3%	73,9%
80,00	3,71	0,32	13,77	39,4%	20,01	6,08	286,5	21,2	98,2%	75,3%	73,9%
81,00	3,66	0,29	13,82	39,2%	20,01	6,04	285,8	21,0	98,4%	75,4%	74,2%
82,00	3,62	0,30	13,82	39,2%	20,01	6,04	285,8	21,3	98,3%	75,4%	74,2%
83,00	3,53	0,30	13,89	38,5%	20,00	5,97	284,9	21,1	98,3%	75,5%	74,2%
84,00	3,48	0,38	14,06	36,0%	19,99	5,74	283,1	21,2	97,9%	75,7%	74,1%
85,00	3,43	0,42	14,09	35,4%	19,98	5,69	282,4	21,0	97,7%	75,8%	74,0%
86,00	3,34	0,39	14,12	35,4%	19,98	5,67	281,8	21,3	97,9%	75,9%	74,2%
87,00	3,30	0,37	13,94	37,3%	20,00	5,87	281,1	21,3	97,9%	75,7%	74,2%
88,00	3,21	0,35	13,85	38,3%	20,00	5,97	281,1	21,2	98,1%	75,7%	74,2%
89,00	3,16	0,33	13,95	37,6%	20,00	5,88	280,6	21,3	98,2%	75,8%	74,4%
90,00	3,11	0,34	13,99	37,2%	19,99	5,84	280,4	21,3	98,1%	75,8%	74,4%
91,00	3,02	0,32	14,08	36,4%	19,99	5,75	279,8	21,2	98,2%	76,0%	74,6%
92,00	2,98	0,31	13,69	40,3%	20,02	6,17	278,1	21,2	98,3%	75,7%	74,4%

93,00	2,94	0,43	13,23	43,7%	20,04	6,59	277,2	21,2	97,5%	75,4%	73,4%
94,00	2,89	0,38	12,88	48,1%	20,06	6,99	275,1	21,3	97,7%	75,2%	73,4%
95,00	2,85	0,30	12,77	50,3%	20,08	7,16	274,2	21,4	98,2%	75,1%	73,8%
96,00	2,75	0,30	12,50	53,5%	20,10	7,45	272,6	21,3	98,2%	75,0%	73,6%
97,00	2,71	0,29	12,14	58,0%	20,12	7,83	270,9	21,3	98,2%	74,7%	73,4%
98,00	2,66	0,49	11,23	67,5%	20,17	8,69	268,4	21,2	96,7%	73,8%	71,4%
99,00	2,66	0,36	11,30	68,5%	20,17	8,69	266,0	21,3	97,6%	74,1%	72,3%
100,00	2,62	0,28	11,30	69,7%	20,18	8,74	263,9	21,3	98,2%	74,3%	72,9%
101,00	2,57	0,26	11,38	68,8%	20,17	8,66	261,5	21,3	98,3%	74,5%	73,3%
102,00	2,53	0,25	11,48	67,5%	20,17	8,56	260,2	21,2	98,4%	74,7%	73,5%
103,00	2,49	0,22	11,56	66,8%	20,16	8,49	259,6	21,3	98,6%	74,9%	73,9%
104,00	2,43	0,22	11,59	66,2%	20,16	8,45	257,8	21,4	98,6%	75,0%	74,0%
105,00	2,39	0,20	11,76	64,3%	20,15	8,29	257,1	21,2	98,8%	75,2%	74,3%
106,00	2,35	0,17	11,93	62,3%	20,14	8,13	256,9	21,3	99,0%	75,4%	74,7%
107,00	2,30	0,18	11,95	61,9%	20,14	8,09	256,7	21,4	98,9%	75,5%	74,7%
108,00	2,30	0,18	12,04	60,7%	20,13	8,00	257,2	21,4	98,9%	75,5%	74,7%
109,00	2,21	0,14	12,24	58,7%	20,12	7,81	257,5	21,4	99,2%	75,7%	75,1%
110,00	2,21	0,13	12,17	59,6%	20,13	7,89	257,7	21,3	99,3%	75,6%	75,1%
111,00	2,17	0,11	12,42	56,9%	20,11	7,64	257,8	21,2	99,5%	75,9%	75,4%
112,00	2,12	0,09	12,42	57,1%	20,11	7,65	258,1	21,4	99,6%	75,9%	75,5%
113,00	2,12	0,11	12,30	58,2%	20,12	7,76	258,0	21,3	99,4%	75,7%	75,3%
114,00	2,03	0,22	11,66	65,3%	20,16	8,38	256,3	21,3	98,6%	75,2%	74,1%
115,00	1,98	0,45	10,59	78,0%	20,21	9,40	254,6	21,3	96,8%	74,0%	71,6%
116,00	1,98	0,57	10,08	84,4%	20,24	9,87	251,8	21,4	95,7%	73,5%	70,3%
117,00	1,94	0,63	9,78	88,6%	20,25	10,15	248,8	21,4	95,2%	73,3%	69,7%
118,00	1,94	0,94	8,99	97,8%	20,28	10,82	245,4	21,2	92,4%	72,2%	66,7%
119,00	1,93	1,19	8,70	98,6%	20,29	10,99	241,8	21,2	90,2%	71,9%	64,9%
120,00	1,90	1,14	8,71	99,5%	20,29	11,02	237,6	21,3	90,6%	72,3%	65,5%
121,00	1,90	1,05	8,74	100,6%	20,29	11,03	234,9	21,3	91,3%	72,6%	66,3%
122,00	1,85	1,02	8,70	102,0%	20,30	11,09	231,6	21,2	91,5%	72,8%	66,6%
123,00	1,81	1,03	8,64	103,1%	20,30	11,15	229,0	21,2	91,4%	72,9%	66,6%
124,00	1,81	1,07	8,51	105,0%	20,31	11,26	226,0	21,1	91,0%	72,9%	66,4%
125,00	1,81	1,05	8,51	105,4%	20,31	11,27	224,1	21,2	91,1%	73,1%	66,6%
126,00	1,76	1,09	8,40	107,2%	20,31	11,37	221,1	21,2	90,8%	73,1%	66,4%
127,00	1,76	1,09	8,43	106,4%	20,31	11,34	219,3	21,1	90,8%	73,3%	66,6%
128,00	1,76	1,11	8,35	107,7%	20,32	11,41	217,4	21,0	90,5%	73,3%	66,4%
129,00	1,71	1,14	8,31	107,9%	20,32	11,44	215,5	21,1	90,3%	73,4%	66,3%
130,00	1,71	1,17	8,20	109,7%	20,32	11,54	213,7	21,3	89,9%	73,4%	66,0%
131,00	1,67	1,22	8,08	111,0%	20,33	11,63	211,9	21,1	89,4%	73,3%	65,5%
132,00	1,66	1,26	7,99	112,4%	20,33	11,71	209,9	21,1	89,0%	73,3%	65,2%
133,00	1,66	1,28	8,00	111,7%	20,33	11,69	208,2	21,2	88,9%	73,5%	65,3%
134,00	1,62	1,32	7,85	114,0%	20,33	11,82	206,7	21,3	88,3%	73,4%	64,8%
135,00	1,62	1,43	7,58	118,2%	20,35	12,06	204,9	21,1	87,2%	73,0%	63,6%
136,00	1,58	1,52	7,28	123,2%	20,36	12,32	202,7	21,1	86,0%	72,6%	62,4%
137,00	1,58	1,54	7,05	128,8%	20,37	12,55	200,6	21,2	85,6%	72,3%	61,8%
138,00	1,57	1,56	7,00	129,5%	20,37	12,59	199,3	21,2	85,3%	72,3%	61,7%
139,00	1,53	1,57	6,92	131,3%	20,38	12,67	197,3	21,1	85,1%	72,3%	61,5%
140,00	1,53	1,59	6,79	134,4%	20,39	12,80	195,4	21,2	84,7%	72,2%	61,1%
141,00	1,51	1,63	6,52	140,8%	20,40	13,06	193,3	21,2	83,9%	71,8%	60,2%
142,00	1,52	1,68	6,33	145,5%	20,41	13,25	191,9	21,0	83,1%	71,4%	59,4%
143,00	1,49	1,71	6,24	147,0%	20,41	13,32	189,9	21,1	82,7%	71,4%	59,1%
144,00	1,49	1,75	6,21	146,6%	20,41	13,33	188,1	21,1	82,3%	71,5%	58,8%
145,00	1,44	1,77	6,14	148,3%	20,42	13,39	186,5	21,0	82,0%	71,5%	58,7%
146,00	1,44	1,77	6,08	150,3%	20,42	13,46	185,0	21,0	81,9%	71,5%	58,5%
147,00	1,44	1,80	6,04	150,4%	20,42	13,48	183,9	21,0	81,6%	71,5%	58,3%
148,00	1,44	1,81	6,06	149,4%	20,42	13,45	182,2	21,1	81,5%	71,7%	58,5%
149,00	1,39	1,83	6,21	144,2%	20,41	13,28	181,2	21,1	81,7%	72,2%	59,0%
150,00	1,39	1,83	6,23	143,9%	20,41	13,27	180,3	21,0	81,8%	72,3%	59,1%
151,00	1,39	1,82	6,18	145,6%	20,41	13,33	179,0	21,0	81,7%	72,3%	59,1%
152,00	1,39	1,83	6,16	145,8%	20,41	13,34	178,1	21,0	81,6%	72,4%	59,1%
153,00	1,35	1,83	6,11	147,2%	20,42	13,39	177,4	21,1	81,4%	72,4%	58,9%
154,00	1,35	1,77	6,69	132,1%	20,38	12,81	177,5	21,1	83,1%	73,6%	61,2%
155,00	1,30	1,80	6,92	125,4%	20,36	12,55	177,7	21,0	83,4%	74,1%	61,7%
156,00	1,30	1,80	6,98	123,7%	20,36	12,48	177,5	21,0	83,5%	74,2%	61,9%
157,00	1,26	1,80	7,00	123,3%	20,36	12,46	177,3	21,0	83,5%	74,3%	62,0%
158,00	1,26	1,79	7,06	121,9%	20,36	12,40	177,5	21,0	83,6%	74,3%	62,2%
159,00	1,26	1,80	7,03	122,5%	20,36	12,43	177,2	21,0	83,6%	74,3%	62,1%
160,00	1,23	1,80	7,03	122,3%	20,36	12,42	177,1	21,1	83,5%	74,3%	62,1%
161,00	1,21	1,80	7,03	122,4%	20,36	12,42	177,0	21,0	83,5%	74,3%	62,1%
162,00	1,21	1,59	7,02	128,2%	20,37	12,56	176,8	21,0	85,1%	74,4%	63,3%
163,00	1,17	1,65	6,95	128,5%	20,37	12,60	176,5	21,0	84,5%	74,3%	62,8%
164,00	1,17	1,72	6,95	126,4%	20,37	12,55	176,9	21,0	83,9%	74,2%	62,3%
165,00	1,17	1,78	6,95	124,9%	20,36	12,52	176,8	21,0	83,5%	74,2%	62,0%
166,00	1,17	1,80	6,97	124,0%	20,36	12,49	176,7	21,0	83,4%	74,2%	61,9%
167,00	1,13	1,84	6,92	124,4%	20,36	12,53	176,7	21,0	83,1%	74,1%	61,6%
168,00	1,13	1,82	6,87	126,2%	20,37	12,59	176,5	21,0	83,1%	74,1%	61,6%
169,00	1,08	1,85	6,89	124,9%	20,36	12,55	176,5	20,9	82,9%	74,1%	61,4%
170,00	1,08	1,87	6,84	125,6%	20,36	12,59	175,9	20,7	82,6%	74,0%	61,2%
171,00	1,08	1,91	6,62	130,2%	20,38	12,80	175,6	20,8	81,9%	73,6%	60,3%
172,00	1,08	1,97	6,59	129,4%	20,37	12,80	175,3	20,9	81,4%	73,6%	59,9%
173,00	1,03	1,98	6,59	129,2%	20,37	12,79	175,0	20,9	81,4%	73,6%	59,9%
174,00	1,03	1,98	6,47	132,3%	20,38	12,92	174,9	20,8	81,1%	73,4%	59,5%
175,00	1,03	2,02	6,39	133,5%	20,38	12,98	174,7	20,9	80,7%	73,2%	59,0%
176,00	0,99	2,03	6,36	134,3%	20,39	13,01	173,9	20,9	80,5%	73,2%	58,9%
177,00	0,99	2,01	6,37	134,2%	20,39	13,00	173,8	20,8	80,7%	73,2%	59,1%
178,00	0,99	2,01	6,34	135,1%	20,39	13,04	173,2	20,9	80,6%	73,2%	59,0%
179,00	0,94	2,00	6,28	137,3%	20,39	13,12	173,3	20,9	80,5%	73,1%	58,9%
180,00	0,94	2,04	6,28	136,1%	20,39	13,09	173,0	20,7	80,2%	73,1%	58,6%
181,00	0,90	2,05	6,24	137,0%	20,39	13,13	172,1	20,9	80,1%	73,1%	58,6%
182,00	0,90	2,13	6,11	138,4%	20,40	13,22	171,9	20,9	79,2%	72,8%	57,7%
183,00	0,90	2,15	6,06	139,3%	20,40	13,26	171,5	20,9	79,0%	72,7%	57,4%
184,00	0,85	2,14	6,18	136,3%	20,39	13,15	170,8	20,8	79,3%	73,1%	58,0%
185,00	0,90	2,11	5,88	145,9%	20,41	13,48	170,3	20,7	78,8%	72,4%	57,1%
186,00	0,85	2,14	5,80	147,6%	20,42	13,55	169,7	20,9	78,4%	72,3%	56,7%
187,00	0,85	2,15	5,75	148,7%	20,42	13,59	169,2	20,8	78,2%	72,2%	56,4%
188,00	0,81	2,19	5,85	144,3%	20,41	13,47	168,8	20,9	78,1%	72,5%	56,6%
189,00	0,81	2,17	5,63	151,6%	20,42	13,70	167,4	20,9	77,7%	72,1%	56,0%
190,00	0,81	2,16	5,53	155,5%	20,43	13,82	166,9	20,9	77,5%	71,9%	55,8%
191,00	0,81	2,14	5,53	156,0%	20,43	13,83	166,3	20,9	77,7%	72,0%	55,9%
192,00	0,81	2,15	5,55	155,0%	20,43	13,81	166,1	20,9	77,6%	72,1%	55,9%
193,00	0,76	2,10	5,47	159,5%	20,44	13,92	165,1	20,9	77,8%	72,0%	56,0%
194,00	0,73	2,11	5,53	157,1%	20,44	13,85	164,7	20,9	77,9%	72,2%	56,2%
195,00	0,72	2,12	5,48	158,2%	20,44	13,89	164,2	20,9	77,7%	72,1%	56,0%
196,00	0,72	2,12	5,45	159,6%	20,44	13,93	163,6	20,8	77,6%	72,1%	55,9%
197,00	0,72	2,13	5,43	159,6%	20,44	13,94	163,1	20,8	77,4%	72,1%	55,8%
198,00	0,72	2,17	5,35	161,2%	20,44	14,01	162,9	20,8	76,9%	71,9%	55,3%
199,00	0,67	2,13	5,42	160,4%	20,44	13,96	162,3	20,8	77,4%	72,1%	55,9%
200,00	0,67	2,19	5,37	159,9%	20,44	13,98	162,0	20,9	76,8%	72,0%	55,3%
201,00	0,67	2,16	5,30	163,1%	20,45	14,06	161,5	20,9	76,8%	71,9%	55,2%
202,00	0,67	2,15	5,27	164,7%	20,45	14,10	161,2	20,8	76,8%	71,8%	55,2%
203,00	0,67	2,19	5,24	164,4%	20,45	14,12	160,6	20,9	76,4%	71,8%	54,9%
204,00	0,67	2,22	5,17	165,7%	20,45	14,17	160,3	20,8	76,0%	71,6%	54,4%
205,00	0,62	2,22	5,15	166,4%	20,45	14,19	159,4	20,8	76,0%	71,7%	54,5%
206,00	0,61	2,25	5,12	166,5%	20,45	14,21	159,5	20,8	75,6%	71,6%	54,1%

207,00	0,58	2,24	5,09	168,0%	20,46	14,25	158,9	20,9	75,6%	71,6%	54,1%
208,00	0,58	2,24	5,06	169,2%	20,46	14,28	158,6	20,8	75,5%	71,5%	54,0%
209,00	0,58	2,35	5,04	166,0%	20,45	14,24	158,9	20,8	74,7%	71,4%	53,3%
210,00	0,58	2,38	5,02	165,3%	20,45	14,24	158,3	20,8	74,3%	71,4%	53,1%
211,00	0,53	2,37	5,06	164,6%	20,45	14,21	158,0	20,8	74,5%	71,5%	53,3%
212,00	0,53	2,29	5,19	162,7%	20,45	14,11	157,8	20,7	75,5%	71,9%	54,3%
213,00	0,53	2,26	5,11	166,6%	20,45	14,22	157,2	20,8	75,5%	71,8%	54,2%
214,00	0,49	2,36	4,96	168,5%	20,46	14,32	156,7	20,8	74,3%	71,4%	53,0%
215,00	0,49	2,37	4,96	168,2%	20,46	14,32	156,2	20,8	74,2%	71,5%	53,0%
216,00	0,49	2,38	4,92	168,8%	20,46	14,34	155,4	20,7	74,0%	71,4%	52,9%
217,00	0,49	2,20	4,94	174,9%	20,47	14,43	155,5	20,7	75,4%	71,5%	53,9%
218,00	0,49	2,19	4,86	178,5%	20,47	14,52	154,8	20,6	75,2%	71,3%	53,6%
219,00	0,45	2,26	4,81	178,0%	20,47	14,54	154,3	20,5	74,6%	71,2%	53,1%
220,00	0,45	2,29	4,74	179,3%	20,48	14,59	154,5	20,6	74,1%	71,0%	52,6%
221,00	0,45	2,30	4,69	180,8%	20,48	14,63	153,8	20,6	73,8%	70,9%	52,3%
222,00	0,40	2,32	4,69	180,1%	20,48	14,62	153,4	20,7	73,7%	71,0%	52,3%
223,00	0,40	2,37	4,66	179,6%	20,48	14,63	152,9	20,6	73,2%	70,9%	51,9%
224,00	0,40	2,35	4,58	183,4%	20,48	14,73	152,6	20,7	73,0%	70,7%	51,6%
225,00	0,40	1,89	5,19	177,7%	20,47	14,34	152,2	20,7	78,7%	72,7%	57,2%
226,00	0,36	1,80	5,34	175,4%	20,47	14,23	151,9	20,7	79,8%	73,2%	58,4%
227,00	0,36	1,82	5,32	175,2%	20,47	14,24	151,3	20,8	79,6%	73,2%	58,3%
228,00	0,36	1,81	5,24	178,7%	20,47	14,33	151,4	20,7	79,5%	73,0%	58,0%
229,00	0,30	1,80	5,19	181,2%	20,48	14,39	150,9	20,6	79,4%	72,9%	57,9%
230,00	0,30	1,81	5,14	182,8%	20,48	14,44	150,5	20,6	79,2%	72,8%	57,7%
231,00	0,30	1,82	5,09	184,2%	20,48	14,48	150,1	20,6	78,9%	72,7%	57,4%
232,00	0,26	1,84	5,06	184,7%	20,48	14,51	149,6	20,4	78,7%	72,7%	57,2%
233,00	0,26	1,83	4,99	188,0%	20,49	14,58	149,4	20,5	78,6%	72,5%	57,0%
234,00	0,26	1,84	4,91	191,1%	20,49	14,67	148,8	20,6	78,2%	72,3%	56,6%
235,00	0,26	1,85	4,86	192,7%	20,50	14,71	148,5	20,6	78,0%	72,2%	56,3%
236,00	0,22	1,88	4,86	191,5%	20,50	14,70	148,1	20,6	77,8%	72,3%	56,2%
237,00	0,22	1,88	4,88	190,8%	20,49	14,68	147,7	20,5	77,8%	72,4%	56,3%
238,00	0,22	1,87	4,87	191,1%	20,49	14,68	147,1	20,6	77,9%	72,4%	56,4%
239,00	0,22	1,81	4,87	193,7%	20,50	14,72	147,0	20,5	78,4%	72,5%	56,8%
240,00	0,22	1,70	4,94	196,0%	20,50	14,71	146,9	20,6	79,6%	72,7%	57,9%
241,00	0,17	1,61	5,02	196,2%	20,50	14,67	147,2	20,6	80,7%	73,0%	58,8%
242,00	0,17	1,59	5,17	190,4%	20,49	14,53	146,7	20,6	81,2%	73,4%	59,6%
243,00	0,13	1,60	5,19	189,4%	20,49	14,50	146,4	20,5	81,2%	73,5%	59,7%
244,00	0,17	1,66	5,16	188,4%	20,49	14,51	146,4	20,5	80,6%	73,4%	59,1%
245,00	0,13	1,66	5,16	188,4%	20,49	14,51	146,4	20,4	80,6%	73,4%	59,1%
246,00	0,13	1,65	5,16	188,6%	20,49	14,51	146,3	20,4	80,6%	73,4%	59,2%
247,00	0,12	1,67	5,12	189,2%	20,49	14,53	146,1	20,5	80,4%	73,3%	58,9%
248,00	0,08	1,69	5,09	189,8%	20,49	14,56	145,9	20,4	80,1%	73,2%	58,7%
249,00	0,08	1,71	5,02	191,6%	20,50	14,62	145,9	20,5	79,7%	73,1%	58,2%
250,00	0,08	1,75	4,94	193,7%	20,50	14,68	145,7	20,4	79,1%	72,8%	57,6%
251,00	0,08	1,76	4,89	195,4%	20,50	14,73	145,9	20,5	78,9%	72,7%	57,3%
252,00	0,04	1,76	4,91	194,7%	20,50	14,71	145,6	20,5	79,0%	72,7%	57,4%
253,00	0,04	1,77	4,88	195,7%	20,50	14,74	145,5	20,5	78,8%	72,7%	57,2%
254,00	0,04	1,78	4,76	200,5%	20,51	14,86	145,3	20,5	78,3%	72,3%	56,7%
255,00	0,04	1,80	4,78	198,8%	20,51	14,83	145,0	20,4	78,2%	72,4%	56,6%
256,00	0,04	1,81	4,74	199,9%	20,51	14,86	144,8	20,5	78,0%	72,3%	56,4%
257,00	0,00	1,80	4,79	197,9%	20,50	14,81	144,5	20,5	78,2%	72,5%	56,7%

*		*	*	*	*1	*2	*3	*4	*6	*7	*8	Mass flow	DGM 1st hour	DGM 1st hour	Filter	DGM 1	DGM 1	DGM 1	Filter 1	Mass flow 2	DGM 2	DGM 2	DGM 2	Filter 2	Tunnel Velocity	Flue draft				Change in
Elapsed		Weight			Flue	Room	Tunnel	Unit	Unit	Unit	Unit	Reading	1st hour	1st hour	1st hour	Reading	Inlet T	Outlet T	Temp	Reading	Inlet T	Outlet T	Temp	Pressure	Pressure	Filter 1st hr	Filter 1	Filter 2	Surface
Time	Raw data row	Remaining	CO	CO_2	Gas	Temp	Dry Bulb	Top	R.Side	L.Side	Bottom	1st hour	Inlet T	Outlet T	Temp									in wc	in wc				Temp.
min		lbs	%	%	°F	°F	°F	°F	°F	°F	°F	cuft/min	oF	oF	oF	cuft/min	oF	oF	oF	cuft/min	oF	oF	oF	in wc	in wc	in. Hg	in. Hg	in. Hg	°F
0	244,00	22,2	0,6	1,6	332,7	68,5	120,5	365,9	474,0	465,5	494,9	0,19	70,4	70,7	80,1	0,18	69,1	70,0	77,2	0,18	69,4	69,3	81,5	0,08	0,04	-0,77	-1,23	-1,06	0,0
1	245,0	22,0	0,4	1,4	338,3	68,5	114,1	353,8	467,2	459,0	499,6	0,19	70,6	70,8	80,6	0,18	69,1	69,9	78,6	0,18	69,5	69,3	83,0	0,08	0,05	-0,73	-1,20	-1,02	-4,1
2	246,0	21,8	0,4	2,5	335,1	68,5	99,5	344,1	460,4	452,7	503,0	0,19	70,6	70,8	80,6	0,18	69,0	69,8	78,3	0,18	69,5	69,3	82,8	0,08	0,06	-0,73	-1,20	-1,01	-8,0
3	247,0	21,7	0,6	3,6	343,6	68,5	97,5	338,7	454,0	446,0	505,5	0,19	70,5	70,8	80,5	0,18	69,1	69,7	78,0	0,18	69,7	69,4	82,4	0,08	0,06	-0,72	-1,20	-1,01	-11,2
4	248,0	21,7	0,5	4,2	353,9	68,5	97,1	338,3	448,4	439,6	507,2	0,19	70,4	70,8	80,4	0,18	69,0	69,7	78,0	0,18	69,8	69,4	82,1	0,08	0,06	-0,72	-1,20	-1,02	-13,3
5	249,0	21,6	0,5	3,8	356,6	68,5	96,7	338,0	442,6	433,6	508,6	0,19	70,3	70,8	80,4	0,18	69,0	69,6	78,0	0,18	69,9	69,5	82,0	0,08	0,06	-0,72	-1,20	-1,02	-15,5
6	250,0	21,4	0,5	4,0	363,3	68,6	97,4	338,6	437,6	427,9	509,5	0,19	70,2	70,8	80,4	0,18	69,0	69,5	78,1	0,18	70,0	69,6	81,9	0,08	0,06	-0,71	-1,20	-1,02	-17,3
7	251,0	21,3	0,4	5,3	380,5	68,7	99,3	344,6	433,0	422,8	510,2	0,19	70,2	70,7	80,4	0,18	69,0	69,5	78,4	0,18	70,2	69,7	82,1	0,08	0,07	-0,71	-1,21	-1,02	-17,9
8	252,0	21,1	0,4	6,8	408,9	68,5	101,4	361,0	429,3	418,7	510,9	0,19	70,2	70,7	80,5	0,18	69,0	69,5	78,6	0,18	70,4	69,8	82,3	0,08	0,07	-0,72	-1,21	-1,01	-16,1
9	253,0	21,0	0,4	7,1	423,0	68,7	102,2	379,2	426,8	415,1	510,9	0,19	70,1	70,7	80,5	0,18	69,0	69,4	78,7	0,18	70,5	69,9	82,4	0,08	0,07	-0,72	-1,21	-1,02	-13,7
10	254,0	20,8	0,4	6,7	433,6	68,4	103,5	395,0	424,7	412,6	510,6	0,19	70,1	70,7	80,5	0,18	69,1	69,5	79,0	0,18	70,8	70,0	82,6	0,08	0,07	-0,72	-1,22	-1,02	-11,5
11	255,0	20,7	0,3	6,9	442,8	68,7	104,5	404,6	422,5	410,1	509,9	0,19	70,1	70,7	80,6	0,18	69,1	69,5	79,1	0,18	71,0	70,1	82,7	0,08	0,07	-0,71	-1,22	-1,02	-10,6
12	256,0	20,6	0,3	6,6	442,2	68,7	104,7	412,3	420,5	408,6	509,5	0,19	70,1	70,7	80,5	0,18	69,2	69,5	79,3	0,18	71,2	70,2	82,9	0,08	0,07	-0,71	-1,22	-1,02	-9,9
13	257,0	20,4	0,4	6,0	446,5	68,8	104,5	417,1	418,6	407,0	509,6	0,19	70,1	70,7	80,5	0,18	69,1	69,5	79,4	0,18	71,4	70,4	82,9	0,08	0,07	-0,71	-1,21	-1,02	-9,6
14	258,0	20,2	0,4	7,6	468,8	69,0	107,9	422,2	416,6	406,3	509,3	0,19	70,1	70,6	80,6	0,18	69,2	69,5	79,7	0,18	71,6	70,5	83,1	0,08	0,07	-0,71	-1,22	-1,03	-9,2
15	259,0	20,0	0,4	9,3	486,6	68,7	109,2	430,1	414,8	407,2	509,3	0,19	70,1	70,6	80,6	0,18	69,2	69,5	79,9	0,18	71,7	70,6	83,3	0,08	0,07	-0,71	-1,22	-1,02	-7,8
16	260,0	19,8	0,3	8,4	488,8	68,8	109,0	439,8	413,1	408,3	507,5	0,19	70,1	70,6	80,7	0,18	69,3	69,6	80,1	0,18	72,0	70,7	83,4	0,08	0,07	-0,72	-1,22	-1,02	-6,3
17	261,0	19,6	0,3	8,4	498,1	68,8	110,9	453,3	411,8	408,8	508,1	0,19	70,1	70,6	80,8	0,18	69,3	69,6	80,3	0,18	72,1	70,8	83,5	0,08	0,07	-0,72	-1,22	-1,02	-3,7
18	262,0	19,4	0,2	9,4	516,0	68,9	111,6	472,6	411,6	408,9	507,4	0,19	70,2	70,6	80,9	0,18	69,3	69,6	80,5	0,18	72,3	71,0	83,8	0,08	0,08	-0,71	-1,22	-1,03	0,0
19	263,0	19,2	0,2	9,9	520,3	69,0	113,9	493,9	412,4	408,9	507,1	0,19	70,2	70,6	80,9	0,18	69,3	69,6	80,7	0,18	72,3	71,1	84,0	0,08	0,08	-0,73	-1,22	-1,02	4,4
20	264,0	19,0	0,2	9,5	523,0	69,0	113,5	510,1	414,5	409,4	507,2	0,19	70,2	70,6	81,0	0,18	69,3	69,6	80,9	0,18	72,4	71,2	84,1	0,08	0,08	-0,72	-1,23	-1,02	8,2
21	265,0	18,8	0,3	9,0	527,7	69,0	114,9	518,9	416,9	411,0	507,3	0,19	70,2	70,6	81,1	0,18	69,3	69,6	81,1	0,18	72,5	71,3	84,2	0,08	0,08	-0,73	-1,22	-1,03	10,8
22	266,0	18,5	0,2	9,6	534,1	69,0	116,8	526,8	419,6	413,3	507,2	0,19	70,2	70,6	81,2	0,18	69,2	69,6	81,4	0,18	72,6	71,3	84,5	0,08	0,08	-0,73	-1,23	-1,03	13,3
23	267,0	18,4	0,2	10,9	544,1	69,0	117,6	540,5	422,4	416,4	506,1	0,19	70,2	70,6	81,4	0,18	69,2	69,6	81,6	0,18	72,8	71,4	84,7	0,08	0,08	-0,73	-1,23	-1,03	17,0
24	268,0	18,1	0,2	11,0	555,0	69,3	118,1	559,1	425,4	419,6	506,1	0,19	70,3	70,6	81,5	0,18	69,3	69,7	81,8	0,18	72,9	71,4	84,9	0,08	0,08	-0,73	-1,24	-1,04	22,0
25	269,0	17,9	0,2	11,5	561,1	69,4	119,8	578,7	428,7	423,4	506,1	0,19	70,4	70,6	81,6	0,18	69,3	69,7	82,1	0,18	73,0	71,5	85,2	0,08	0,08	-0,73	-1,23	-1,03	27,3
26	270,0	17,6	0,2	11,6	566,0	69,4	119,1	595,6	432,8	427,2	505,5	0,19	70,3	70,7	81,8	0,18	69,3	69,8	82,3	0,18	73,2	71,5	85,4	0,08	0,08	-0,73	-1,24	-1,04	32,2
27	271,0	17,4	0,2	11,7	566,2	69,2	117,8	611,1	437,3	430,5	505,0	0,19	70,3	70,7	81,9	0,18	69,3	69,8	82,5	0,18	73,4	71,6	85,4	0,08	0,08	-0,73	-1,24	-1,03	36,7
28	272,0	17,2	0,2	11,0	564,8	69,3	116,6	621,3	441,9	434,2	504,7	0,19	70,3	70,6	81,9	0,18	69,3	69,8	82,5	0,18	73,4	71,6	85,4	0,08	0,08	-0,73	-1,24	-1,04	40,4
29	273,0	17,0	0,2	10,9	559,5	69,4	114,9	629,0	446,9	437,9	504,4	0,19	70,3	70,6	81,9	0,18	69,3	69,8	82,5	0,18	73,5	71,6	85,3	0,08	0,08	-0,73	-1,24	-1,04	43,6
30	274,0	16,8	0,2	10,3	556,9	69,5	114,6	632,1	451,7	441,6	504,0	0,19	70,3	70,6	81,9	0,18	69,3	69,9	82,5	0,18	73,7	71,7	85,2	0,08	0,08	-0,73	-1,23	-1,04	45,8
31	275,0	16,6	0,2	10,6	557,2	69,4	115,4	632,0	456,5	445,2	503,1	0,19	70,4	70,7	81,9	0,18	69,3	69,9	82,6	0,18	73,7	71,7	85,3	0,08	0,08	-0,73	-1,24	-1,04	47,3
32	276,0	16,4	0,2	11,6	560,4	69,3	115,9	632,7	461,3	448,9	501,4	0,19	70,5	70,7	82,0	0,18	69,3	69,9	82,8	0,18	73,7	71,8	85,4	0,08	0,08	-0,73	-1,24	-1,05	48,8
33	277,0	16,2	0,2	12,0	563,0	69,4	114,9	637,4	466,2	452,9	502,0	0,19	70,5	70,7	82,1	0,18	69,4	70,0	82,8	0,18	73,8	71,9	85,4	0,08	0,08	-0,72	-1,23	-1,04	51,6
34	278,0	16,0	0,3	12,0	555,5	69,6	112,8	643,3	471,2	456,1	501,2	0,19	70,6	70,7	82,2	0,18	69,4	70,0	82,8	0,18	73,8	72,0	85,3	0,08	0,08	-0,73	-1,23	-1,04	54,3
35	279,0	15,8	0,2	11,0	551,7	69,6	111,9	647,6	475,6	459,7	500,5	0,19	70,5	70,8	82,2	0,18	69,5	70,0	82,8	0,18	74,0	72,0	85,2	0,08	0,08	-0,72	-1,23	-1,04	56,6
36	280,0	15,7	0,1	11,0	552,7	69,5	112,2	650,4	479,7	462,8	500,2	0,19	70,6	70,8	82,2	0,18	69,5	70,0	82,8	0,18	73,9	72,1	85,1	0,08	0,08	-0,72	-1,23	-1,04	58,6
37	281,0	15,6	0,3	12,0	554,5	69,4	112,8	654,6	483,6	464,9	498,5	0,19	70,6	70,8	82,2	0,18	69,5	70,0	82,9	0,18	73,9	72,2	85,2	0,08	0,08	-0,72	-1,23	-1,04	60,3
38	282,0	15,3	0,3	12,5	558,3	69,4	112,4	660,5	487,7	467,8	498,7	0,19	70,7	70,8	82,3	0,18	69,4	70,0	82,9	0,18	74,0	72,3	85,2	0,08	0,08	-0,73	-1,23	-1,04	62,9
39	283,0	15,1	0,5	12,9	563,9	69,5	113,1	667,2	491,5	469,8	497,7	0,19	70,7	70,8	82,3	0,18	69,5	70,0	83,0	0,18	74,2	72,3	85,3	0,08	0,08	-0,71	-1,23	-1,05	65,2
40	284,0	15,0	0,5	13,3	568,0	69,4	112,9	673,4	495,3	472,4	496,9	0,19	70,6	70,8	82,4	0,18	69,5	70,1	83,1	0,18	74,2	72,4	85,3	0,08	0,08	-0,73	-1,23	-1,06	67,5
41	285,0	14,7	0,5	13,3	570,4	69,2	113,2	679,7	499,6	474,3	496,1	0,19	70,5	70,8	82,4	0,18	69,6	70,2	83,1	0,18	74,3	72,4	85,3	0,08	0,08	-0,73	-1,23	-1,05	69,9
42	286,0	14,5	0,4	13,2	572,0	69,2	113,0	685,2	503,6	476,6	495,3	0,19	70,6	70,9	82,5	0,18	69,6	70,2	83,2	0,18	74,4	72,5	85,3	0,08	0,08	-0,72	-1,23	-1,04	72,1
43	287,0	14,4	0,4	13,1	572,1	69,1	113,5	689,5	507,7	478,8	495,1	0,19	70,7	70,9	82,5	0,18	69,6	70,2	83,2	0,18	74,2	72,6	85,4	0,08	0,08	-0,73	-1,23	-1,04	74,2
44	288,0	14,2	0,3	13,0	572,0	69,1	113,5	692,8	512,2	480,8	494,1	0,19	70,7	70,9	82,5	0,18	69,6	70,2	83,2	0,18	74,2	72,6	85,4	0,08	0,08	-0,72	-1,23	-1,05	75,9
45	289,0	13,9	0,3	12,9	571,7	69,4	113,0	695,7	516,4	483,1	493,6	0,19	70,7	70,9	82,6	0,18	69,6	70,2	83,3	0,18	74,2	72,7	85,5	0,08	0,08	-0,72	-1,23	-1,04	77,7
46	290,0	13,7	0,3	12,9	572,1	69,0	111,8	698,4	520,7	485,4	492,3	0,19	70,8	70,9	82,7	0,18	69,6	70,2	83,2	0,18	74,3	72,8	85,4	0,08	0,08	-0,72	-1,23	-1,05	79,3
47	291,0	13,6	0,3	13,2	573,3	69,5	112,6	700,8	524,9	487,5	491,3	0,19	70,8	71,0	82,7	0,18	69,7	70,3	83,3	0,18	74,4	72,9	85,5	0,08	0,08	-0,72	-1,23	-1,05	80,8
48	292,0	13,4	0,3	13,3	574,2	69,7	113,0	703,3	529,1	489,7	491,2	0,19	70,8	71,0	82,8	0,18	69,7	70,3	83,3	0,18	74,5	72,9	85,5	0,08	0,08	-0,72	-1,23	-1,05	82,6
49	293,0	13,1	0,3	13,4	576,3	69,7	114,4	705,1	533,7	491,3	490,4	0,19	70,8	71,0	82,8	0,18	69,7	70,3	83,4	0,18	74,6	72,9	85,6	0,08	0,08	-0,72	-1,23	-1,04	84,0
50	294,0	13,0	0,3	13,5	570,1	69,5	111,6	706,8	538,3	493,9	489,9	0,19	70,8	71,0	82,8	0,18	69,8	70,4	83,4	0,18	74,6	73,0	85,6	0,08	0,08	-0,73	-1,23	-1,03	85,7
51	295,0	12,8	0,7	13,5	561,8	70,0	109,5	708,0	542,0	495,6	489,1	0,19	70,9	71,1	82,8	0,18	69,8	70,4	83,3	0,18	74,6	73,1	85,3	0,08	0,08	-0,73	-1,22	-1,03	86,9
52	296,0	12,7	0,5	13,4	558,9	69,9	109,7	710,0	545,7	497,0	488,4	0,19	70,9	71,1	82,8	0,18	69,8	70,4	83,2	0,18	74,6	73,1	85,3	0,08	0,08	-0,72	-1,23	-1,04	88,2
53	297,0	12,5	0,4	13,3	555,7	69,6	109,6	712,0	548,9	498,1	486,3	0,19	70,9	71,1	82,8	0,18	69,9	70,4	83,2	0,18	74,8	73,1	85,2	0,08	0,08	-0,72	-1,23	-1,04	89,0
54	298,0	12,3	0,4	13,4	553,7	69,7	108,4	713,4	552,0	498,5	486,4	0,19	70,9	71,1	82,8	0,18	69,9	70,4	83,2	0,18	74,8	73,1	85,1	0,08	0,08	-0,73	-1,22	-1,03	90,0
55	299,0	12,2	0,4	13,4	553,8	69,7	108,9	714,1	554,7	499,3	486,0	0,19	71,0	71,2	82,7	0,18	69,9	70,5	83,2	0,18	74,9	73,2	85,1	0,08	0,08	-0,72	-1,23	-1,05	90,8
56	300,0	12,0	0,4	13,5	552,9	70,0	109,2	715,2	557,2	500,8	485,2	0,19	71,0	71,2	82,8	0,18	69,9	70,5	83,2	0,18	75,0	73,1	85,1	0,08	0,08	-0,73	-1,23	-1,03	91,6
57	301,0	11,8	0,4	13,4	552,5	70,1	109,7	715,6	559,5	501,7	484,7	0,19	70,9	71,2	82,8	0,18	70,0	70,6	83,2	0,18	75,1	73,2	85,1	0,08	0,08	-0,73	-1,23	-1,03	92,2
58	302,0	11,7	0,4	13,4	551,0	70,2	108,5	715,6	561,4	503,3	483,8	0,19	71,0	71,2	82,8	0,18	70,0	70,6	83,2	0,18	75,2	73,2	85,1	0,08	0,08	-0,72	-1,23	-1,03	92,8
59	303,0	11,6	0,4	13,4	550,7	70,0	108,5	715,8	563,0	504,5	483,0	0,19	71,0	71,2	82,8	0,18	70,1	70,7	83,2	0,18	75,3	73,3	85,1	0,08	0,08	-0,73	-1,23	-1,04	93,2
60	304,0	11,4	0,3	13,4	550,9	69,8	107,9	716,0	564,4	505,9	482,3	0,19	71,0	71,3	82,8	0,18	70,1	70,7	83,2	0,18	75,2	73,3	85,0	0,08	0,08	-0,72	-1,22	-1,04	93,7
61	305,0	11,2	0,3	13,4	549,4	70,0	108,9	715,8	565,6	507,0	481,3	0,00	70,7	71,1	81,3	0,18	70,1	70,7	83,1	0,18	75,2	73,4	85,0	0,08	0,08	0,13	-1,23	-1,04	93,9
62	306,0	11,1	0,4	13,5	549,3	70,2	108,9	716,3	567,0	507,6	480,4	0,00	70,6	71,0	80,8	0,18	70,1	70,8	83,1	0,18	75,2	73,6	85,0	0,08	0,08	0,13	-1,22	-1,03	94,2
63	307,0	10,9	0,4	13,7	549,3	70,0	108,3	716,6	568,6	508,8	480,1	0,00	70,5	70,9	80,5	0,18	70,2	70,8	83,1	0,18	75,4	73,7	84,9	0,08	0,08	0,13	-1,22	-1,03	94,8
64	308,0	10,8	0,4	13,7	550,5	70,0	108,4	716,5	569,9	510,3	479,2	0,00	70,5	70,9	80,4	0,18	70,2	70,9	83,1	0,18	75,4	73,7	85,0	0,08	0,08	0,13	-1,22	-1,02	95,1
65	309,0	10,5	0,3	14,0	549,9	69,8	108,0	715,5	571,1	512,7	477,8	0,00	70,5	70,9	80,3	0,18	70,2	70,9	83,1	0,18	75,4	73,8	85,0	0,08	0,08	0,11	-1,22	-1,03	95,3
66	310,0	10,4	0,4	14,0	552,0	70,0	107,7	715,8	572,5	515,0	477,7	0,00	70,4	70,9	80,2	0,18	70,1	70,9	83,0	0,18	75,3	73,9	84,9	0,08	0,08	0,11	-1,22	-1,02	96,2
67	311,0	10,2	0,5	14,0	551,7	69,9	108,0	716,7	574,0	516,5	477,0	0,00	70,5	71,0	80,1	0,18	70,1	70,9	83,0	0,18	75,3	74,0	84,9	0,08	0,08	0,13	-1,22	-1,03	96,8
68	312,0	10,1	0,4	14,1	552,0	69,6	108,3	716,8	575,3	518,2	476,1	0,00	70,4	71,0	80,0	0,18	70,1	70,9	83,0	0,18	75,2	73,9	84,9	0,08	0,08	0,11	-1,22	-1,03	97,2
69	313,0	9,9	0,5	14,1	552,4	69,7	108,8	718,0	576,6	520,4	476,2	0,00	70,5	71,0	79,9	0,18	70,1	70,9	83,0	0,18	75,2	74,0	85,0	0,08	0,08	0,12	-1,22	-1,02	98,2
70	314,0	9,7	0,5	14,1	552,8	69,9	107,7	718,8	578,0	522,1	475,6	0,00	70,5	71,0	79,8	0,18	70,1	70,9	83,0	0,18	75,2	74,0	84,9	0,08	0,08	0,12	-1,22	-1,03	98,8
71	315,0	9,6	0,4	14,1	552,7	70,0	108,1	719,9	579,6	523,8	475,1	0,00	70,4	71,0	79,7	0,18	70,1	70,9	82,9	0,18	75,2	74,0	84,9	0,08	0,08	0,11	-1,22	-1,02	99,6
72	316,0	9,5	0,5	14,1	552,3	70,0	108,4	720,2	581,3	525,5	474,8	0,00	70,5	71,0	79,6	0,18	70,1	70,9	83,0	0,18	75,2	74,0	84,9	0,08	0,08	0,11	-1,21	-1,02	100,3
73	317,0	9,3	0,5	14,0	552,3	70,2	108,8	721,7	583,5	527,1	474,5	0,00	70,5	71,0	79,5	0,18	70,1	70,9	82,9	0,18	75,3	74,0	84,9	0,08	0,08	0,11	-1,21	-1,02	101,3
74	318,0	9,1	0,4	14,0	551,9	70,2	108,7	723,2	585,6	528,5	474,2	0,00	70,5	71,1	79,4	0,18	70,2	71,0	83,0	0,18	75,5	74,1	84,9	0,08	0,08	0,12	-1,21	-1,03	102,2
75	319,0	9,0	0,4	14,0	551,1	70,2	109,1	724,2	587,5	529,8	473,8	0,00	70,5	71,1	79,3	0,18	70,2	71,0	83,0	0,18	75,5	74,2	84,9	0,08	0,08	0,11	-1,22	-1,03	103,0
76	320,0	8,8	0,4	13,9	551,1	70,0	108,8	724,7	589,5	531,8	473,5	0,00	70,5	71,1	79,2	0,18	70,2	71,1	83,0	0,18	75,5	74,1	85,0	0,08	0,08	0,11	-1,21	-1,03	103,9
77	321,0	8,7	0,4	13,8	550,6	70,2	108,3	725,7	591,8	533,0	473,5	0,00	70,5	71,1	79,1	0,18	70,2	71,1	83,0	0,18	75,5	74,1	84,9	0,08	0,08	0,11	-1,21	-1,02	104,7
78	322,0	8,5	0,4	13,9	550,1	70,2	108,3	726,0	593,7	534,6	473,1	0,00	70,5	71,1	79,0	0,18	70,2	71,1	83,0	0,18	75,6	74,2	84,9	0,08	0,08	0,11	-1,21	-1,02	105,4
79	323,0	8,4	0,3	13,8	549,2	70,2	107,7	725,5	595,9	536,0	473,0	0,00	70,5	71,2	78,9	0,18	70,3	71,1	83,0	0,18	75,6	74,2	84,9	0,08	0,08	0,10	-1,21	-1,01	106,0
80	324,0	8,2	0,3	13,8	547,8	70,2	107,3	725,1	597,7	537,8	473,0	0,00	70,5	71,2	78,8	0,18	70,3	71,2	83,0	0,18	75,6	74,2	84,9	0,08	0,08	0,10	-1,21	-1,02	106,7
81	325,0	8,1	0,3	13,8	546,5	69,9	107,2	723,6	599,8	539,9	472,4	0,00	70,5	71,2	78,8	0,18	70,3	71,2	82,9	0,18	75,5	74,2	84,8	0,08	0,08	0,10	-1,21	-1,02	107,1
82	326,0	8,0	0,3	13,8	546,5	70,3	108,6	722,7	601,9	541,1	472,6	0,00	70,5	71,2	78,7	0,18	70,3	71,2	82,9	0,18	75,6	74,2	84,9	0,07	0,08	0,11	-1,20	-1,01	107,6
83	327,0	7,8	0,3	13,9	544,9	69,9	107,7	722,1	603,7	543,1	472,7	0,00	70,5	71,2	78,6	0,18	70,4	71,2	82,9	0,18	75,6	74,2	84,9	0,08	0,08	0,10	-1,21	-1,02	108,3
84	328,0	7,7	0,4	14,1	541,5	70,1	106,4	721,5	605,6	544,9	472,6	0,00	70,6	71,2	78,6	0,18	70,4	71,2	82,8	0,18	75,5	74,3	84,8	0,08	0,08	0,10	-1,21	-1,02	108,9
85	329,0	7,6	0,4	14,1	540,3	69,8	105,7	720,4

110	354,0	4,9	0,1	12,2	495,9	70,4	101,4	598,9	597,2	589,3	471,7	0,00	70,9	71,7	#######	0,18	70,7	71,6	81,9	0,18	76,1	74,7	83,8	0,08	0,08	0,12	-1,19	-1,02	91,4
111	355,0	4,8	0,1	12,4	496,1	70,1	101,7	600,6	597,4	588,9	472,0	0,00	71,0	71,7	#######	0,18	70,8	71,6	81,8	0,18	76,2	74,7	83,8	0,08	0,08	0,12	-1,19	-1,02	91,7
112	356,0	4,7	0,1	12,4	496,7	70,4	100,9	602,8	597,5	588,9	472,2	0,00	70,9	71,7	#######	0,18	70,8	71,7	81,8	0,18	76,2	74,7	83,7	0,08	0,07	0,12	-1,19	-1,01	92,2
113	357,0	4,7	0,1	12,3	496,5	70,3	101,2	604,0	597,5	589,3	472,5	0,00	71,0	71,7	#######	0,18	70,8	71,7	81,7	0,18	76,1	74,7	83,7	0,08	0,07	0,12	-1,19	-1,02	92,6
114	358,0	4,5	0,2	11,7	493,4	70,4	100,6	604,5	597,2	589,7	472,9	0,00	70,9	71,7	#######	0,18	70,7	71,7	81,7	0,18	75,9	74,7	83,6	0,08	0,08	0,12	-1,18	-1,00	92,8
115	359,0	4,4	0,5	10,6	490,2	70,3	100,6	602,3	596,4	589,4	473,4	0,00	71,0	71,7	#######	0,18	70,7	71,6	81,6	0,18	75,8	74,7	83,5	0,08	0,07	0,12	-1,19	-1,01	92,2
116	360,0	4,4	0,6	10,1	485,2	70,5	100,2	597,8	595,4	589,0	473,4	0,00	71,0	71,7	#######	0,18	70,7	71,6	81,6	0,18	75,8	74,6	83,5	0,08	0,07	0,12	-1,19	-1,02	91,1
117	361,0	4,3	0,6	9,8	479,8	70,5	99,9	591,7	594,5	588,1	474,1	0,00	71,0	71,7	#######	0,18	70,7	71,7	81,5	0,18	76,0	74,6	83,4	0,08	0,07	0,12	-1,19	-1,01	89,6
118	362,0	4,3	0,9	9,0	473,7	70,2	99,3	584,0	592,6	586,8	474,3	0,00	70,9	71,7	#######	0,18	70,7	71,7	81,5	0,18	75,8	74,6	83,3	0,08	0,07	0,12	-1,19	-1,01	87,5
119	363,0	4,3	1,2	8,7	467,3	70,1	99,4	575,4	590,9	585,6	475,0	0,00	70,9	71,7	#######	0,18	70,7	71,6	81,4	0,18	75,6	74,6	83,3	0,08	0,07	0,12	-1,19	-1,01	85,3
120	364,0	4,2	1,1	8,7	459,6	70,3	98,4	567,0	589,4	583,8	475,7	0,00	70,9	71,7	#######	0,18	70,6	71,6	81,3	0,18	75,6	74,6	83,1	0,08	0,07	0,10	-1,18	-1,01	83,1
121	365,0	4,2	1,0	8,7	454,8	70,3	96,5	558,8	587,8	581,8	476,4	0,00	70,9	71,7	#######	0,18	70,6	71,6	81,1	0,18	75,6	74,6	82,9	0,08	0,07	0,10	-1,18	-1,01	80,9
122	366,0	4,1	1,0	8,7	448,9	70,1	97,0	551,4	586,2	579,9	477,1	0,00	71,0	71,7	#######	0,18	70,6	71,5	81,0	0,18	75,6	74,6	82,8	0,08	0,07	0,11	-1,19	-1,01	78,9
123	367,0	4,0	1,0	8,6	444,1	70,1	97,6	544,0	584,5	578,7	478,0	0,00	71,0	71,7	#######	0,18	70,6	71,5	81,0	0,18	75,6	74,6	82,8	0,08	0,07	0,11	-1,19	-1,00	77,0
124	368,0	4,0	1,1	8,5	438,9	69,9	96,8	536,6	583,1	577,2	478,8	0,00	71,0	71,7	#######	0,18	70,6	71,5	80,9	0,18	75,6	74,6	82,7	0,08	0,07	0,10	-1,19	-1,00	75,1
125	369,0	4,0	1,1	8,5	435,4	70,1	96,9	530,2	581,4	575,1	479,9	0,00	71,0	71,7	#######	0,18	70,6	71,5	80,8	0,18	75,5	74,6	82,6	0,08	0,07	0,10	-1,18	-1,00	73,3
126	370,0	3,9	1,1	8,4	430,0	70,2	97,2	523,7	579,6	573,6	481,0	0,00	71,0	71,7	#######	0,18	70,5	71,4	80,8	0,18	75,4	74,6	82,6	0,08	0,07	0,11	-1,18	-1,01	71,5
127	371,0	3,9	1,1	8,4	426,8	70,0	97,6	517,9	577,6	571,7	482,1	0,00	71,0	71,7	#######	0,18	70,5	71,4	80,8	0,18	75,5	74,7	82,6	0,08	0,07	0,10	-1,18	-1,00	69,8
128	372,0	3,9	1,1	8,3	423,4	69,8	95,9	512,3	575,9	570,2	483,2	0,00	71,0	71,7	#######	0,18	70,5	71,5	80,7	0,18	75,6	74,6	82,4	0,08	0,07	0,10	-1,18	-1,00	68,3
129	373,0	3,8	1,1	8,3	419,8	70,0	96,1	507,5	574,4	568,0	484,4	0,00	71,0	71,7	#######	0,18	70,6	71,5	80,6	0,18	75,7	74,7	82,3	0,08	0,07	0,11	-1,19	-1,01	66,8
130	374,0	3,8	1,2	8,2	416,6	70,3	95,8	502,4	572,5	566,7	485,5	0,00	71,0	71,7	#######	0,18	70,5	71,5	80,5	0,18	75,6	74,6	82,2	0,08	0,06	0,10	-1,19	-1,01	65,4
131	375,0	3,7	1,2	8,1	413,4	70,0	95,4	497,4	570,5	565,1	486,7	0,00	71,0	71,7	#######	0,18	70,5	71,5	80,4	0,18	75,6	74,6	82,2	0,08	0,06	0,10	-1,19	-1,01	63,9
132	376,0	3,7	1,3	8,0	409,9	70,0	95,1	492,6	568,8	563,6	487,2	0,00	71,0	71,7	#######	0,18	70,5	71,5	80,3	0,18	75,7	74,6	82,0	0,08	0,07	0,10	-1,19	-1,01	62,4
133	377,0	3,7	1,3	8,0	406,8	70,1	94,8	488,0	566,8	562,2	489,1	0,00	71,0	71,7	#######	0,18	70,5	71,5	80,2	0,18	75,7	74,7	81,9	0,08	0,07	0,10	-1,19	-1,00	61,1
134	378,0	3,6	1,3	7,9	404,1	70,3	95,5	483,6	564,7	560,3	490,3	0,00	71,0	71,7	#######	0,18	70,6	71,5	80,2	0,18	75,7	74,7	81,8	0,08	0,06	0,11	-1,18	-1,00	59,7
135	379,0	3,6	1,4	7,6	400,8	70,0	95,2	479,4	562,7	558,4	491,5	0,00	71,0	71,7	#######	0,18	70,6	71,5	80,1	0,18	75,7	74,7	81,7	0,08	0,06	0,11	-1,19	-1,01	58,4
136	380,0	3,5	1,5	7,3	396,9	70,0	93,7	474,1	561,0	556,5	492,2	0,00	71,0	71,7	#######	0,18	70,6	71,5	80,0	0,18	75,8	74,7	81,6	0,08	0,06	0,10	-1,19	-1,00	56,7
137	381,0	3,5	1,5	7,0	393,1	70,1	94,4	469,2	559,0	554,6	493,8	0,00	71,0	71,7	#######	0,18	70,6	71,5	79,9	0,18	75,7	74,7	81,5	0,08	0,06	0,10	-1,19	-1,01	55,3
138	382,0	3,5	1,6	7,0	390,7	70,1	93,5	464,8	556,7	552,4	495,0	0,00	71,0	71,6	#######	0,18	70,7	71,5	79,8	0,18	75,6	74,8	81,4	0,08	0,06	0,11	-1,19	-1,01	53,7
139	383,0	3,4	1,6	6,9	387,2	70,1	93,5	460,3	554,6	550,3	496,4	0,00	71,0	71,6	#######	0,18	70,7	71,4	79,7	0,18	75,6	74,7	81,3	0,08	0,06	0,10	-1,18	-1,01	52,3
140	384,0	3,4	1,6	6,8	383,8	70,1	93,6	456,0	552,5	547,9	497,0	0,00	71,0	71,6	#######	0,18	70,6	71,4	79,6	0,18	75,7	74,7	81,2	0,08	0,06	0,10	-1,19	-1,01	50,6
141	385,0	3,3	1,6	6,5	380,0	70,2	93,8	450,9	550,3	546,0	498,6	0,00	71,0	71,6	#######	0,18	70,6	71,4	79,5	0,18	75,6	74,7	81,1	0,08	0,06	0,10	-1,19	-1,01	49,1
142	386,0	3,3	1,7	6,3	377,4	69,8	92,3	446,3	548,1	543,7	499,1	0,00	70,9	71,6	#######	0,18	70,5	71,4	79,5	0,18	75,5	74,7	81,0	0,08	0,06	0,10	-1,19	-1,01	47,4
143	387,0	3,3	1,7	6,2	373,8	70,0	92,1	441,8	545,8	541,9	500,4	0,00	70,9	71,6	#######	0,18	70,5	71,4	79,4	0,18	75,6	74,8	80,9	0,08	0,06	0,10	-1,18	-1,01	45,9
144	388,0	3,3	1,8	6,2	370,6	70,0	92,0	437,8	543,7	540,0	501,4	0,00	70,9	71,5	#######	0,18	70,5	71,4	79,3	0,18	75,7	74,8	80,9	0,08	0,06	0,10	-1,19	-1,01	44,5
145	389,0	3,2	1,8	6,1	367,8	69,7	91,8	433,3	541,6	537,9	502,6	0,00	70,9	71,5	#######	0,18	70,5	71,4	79,3	0,18	75,8	74,7	80,8	0,08	0,06	0,10	-1,18	-1,01	43,0
146	390,0	3,2	1,8	6,1	365,0	69,8	92,4	429,4	539,0	535,8	503,2	0,00	70,9	71,5	#######	0,18	70,5	71,4	79,2	0,18	75,7	74,7	80,7	0,08	0,06	0,10	-1,18	-1,01	41,4
147	391,0	3,2	1,8	6,0	363,1	69,7	92,0	425,2	536,6	533,5	504,3	0,00	70,9	71,5	#######	0,18	70,5	71,4	79,1	0,18	75,7	74,7	80,6	0,08	0,06	0,06	-1,18	-1,01	39,9
148	392,0	3,2	1,8	6,1	360,0	69,9	91,6	421,4	534,4	531,5	505,2	0,00	70,9	71,5	#######	0,18	70,4	71,4	79,0	0,18	75,7	74,7	80,5	0,08	0,06	0,10	-1,19	-1,01	38,5
149	393,0	3,1	1,8	6,2	358,2	69,9	91,6	418,3	532,0	529,2	506,0	0,00	70,9	71,5	#######	0,18	70,4	71,4	78,9	0,18	75,7	74,6	80,5	0,08	0,06	0,10	-1,18	-1,01	37,1
150	394,0	3,1	1,8	6,2	356,5	69,9	91,3	415,1	529,7	527,3	507,2	0,00	70,9	71,5	#######	0,18	70,4	71,4	78,8	0,18	75,6	74,6	80,4	0,08	0,06	0,10	-1,18	-1,01	35,8
151	395,0	3,1	1,8	6,2	354,2	69,8	91,5	412,5	527,6	525,2	508,0	0,00	70,9	71,5	#######	0,18	70,4	71,4	78,8	0,18	75,6	74,6	80,4	0,08	0,06	0,11	-1,18	-1,01	34,6
152	396,0	3,1	1,8	6,2	352,6	69,7	90,5	409,9	525,6	523,3	509,4	0,00	70,8	71,5	#######	0,18	70,4	71,4	78,7	0,18	75,6	74,6	80,3	0,08	0,06	0,10	-1,19	-1,01	33,6
153	397,0	3,0	1,8	6,1	351,2	69,9	89,9	407,2	523,5	521,3	510,6	0,00	70,8	71,4	#######	0,18	70,3	71,3	78,6	0,18	75,5	74,6	80,1	0,08	0,06	0,10	-1,19	-1,01	32,5
154	398,0	3,0	1,8	6,7	351,5	69,9	90,3	405,6	521,6	519,5	511,5	0,00	70,8	71,4	#######	0,18	70,4	71,3	78,5	0,18	75,5	74,6	80,0	0,08	0,06	0,11	-1,18	-1,01	31,6
155	399,0	2,9	1,8	6,9	351,9	69,8	91,1	404,1	519,5	518,2	512,5	0,00	70,8	71,4	#######	0,18	70,4	71,3	78,5	0,18	75,4	74,5	79,9	0,08	0,06	0,11	-1,19	-1,02	30,8
156	400,0	2,9	1,8	7,0	351,5	69,7	90,3	403,4	517,9	516,2	513,3	0,00	70,8	71,4	#######	0,18	70,4	71,3	78,5	0,18	75,4	74,5	79,9	0,08	0,06	0,10	-1,19	-1,01	30,1
157	401,0	2,8	1,8	7,0	351,1	69,8	90,3	403,0	516,2	514,5	514,1	0,00	70,7	71,3	#######	0,18	70,3	71,3	78,4	0,18	75,4	74,5	79,9	0,08	0,06	0,11	-1,19	-1,01	29,5
158	402,0	2,8	1,8	7,1	351,6	69,7	90,3	402,4	515,2	513,2	514,7	0,00	70,7	71,3	#######	0,18	70,3	71,2	78,4	0,18	75,3	74,5	79,8	0,08	0,06	0,11	-1,20	-1,02	29,0
159	403,0	2,8	1,8	7,0	350,9	69,9	90,0	402,4	513,8	511,8	516,0	0,00	70,7	71,3	#######	0,18	70,3	71,2	78,3	0,18	75,3	74,5	79,7	0,08	0,06	0,11	-1,20	-1,02	28,7
160	404,0	2,7	1,8	7,0	350,9	69,9	90,4	402,2	513,0	510,6	516,5	0,00	70,7	71,3	#######	0,18	70,3	71,2	78,3	0,18	75,3	74,5	79,7	0,08	0,06	0,11	-1,20	-1,02	28,4
161	405,0	2,7	1,8	7,0	350,5	69,7	90,0	401,8	511,7	509,8	516,6	0,00	70,7	71,2	#######	0,18	70,2	71,2	78,3	0,18	75,2	74,4	79,7	0,08	0,06	0,11	-1,20	-1,01	27,9
162	406,0	2,7	1,6	7,0	350,3	69,8	90,4	402,0	510,7	508,8	518,1	0,00	70,7	71,2	#######	0,18	70,3	71,2	78,2	0,18	75,3	74,5	79,6	0,08	0,06	0,11	-1,20	-1,01	27,9
163	407,0	2,6	1,6	6,9	349,8	69,8	90,0	401,9	509,8	507,8	519,3	0,00	70,7	71,2	#######	0,18	70,3	71,2	78,2	0,18	75,3	74,4	79,6	0,08	0,06	0,11	-1,20	-1,01	27,7
164	408,0	2,6	1,7	7,0	350,5	69,8	90,3	402,0	509,0	506,8	519,8	0,00	70,6	71,2	#######	0,18	70,2	71,2	78,1	0,18	75,2	74,4	79,5	0,08	0,06	0,11	-1,20	-1,01	27,5
165	409,0	2,6	1,8	7,0	350,2	69,8	90,3	401,7	508,0	505,9	520,4	0,00	70,6	71,2	#######	0,18	70,2	71,2	78,1	0,18	75,2	74,4	79,5	0,08	0,06	0,11	-1,21	-1,02	27,1
166	410,0	2,6	1,8	7,0	350,0	69,8	90,4	401,6	507,0	505,0	520,9	0,00	70,6	71,2	#######	0,18	70,2	71,2	78,1	0,18	75,3	74,4	79,5	0,08	0,06	0,11	-1,21	-1,02	26,8
167	411,0	2,5	1,8	6,9	350,0	69,8	90,3	401,2	506,2	504,4	521,8	0,00	70,6	71,2	#######	0,18	70,2	71,2	78,1	0,18	75,3	74,4	79,5	0,08	0,06	0,11	-1,21	-1,02	26,6
168	412,0	2,5	1,8	6,9	349,8	69,9	89,9	401,0	505,6	503,5	522,4	0,00	70,6	71,1	#######	0,18	70,2	71,2	78,0	0,18	75,2	74,4	79,4	0,08	0,06	0,11	-1,20	-1,03	26,4
169	413,0	2,4	1,8	6,9	349,8	69,7	90,2	400,4	504,6	503,0	522,8	0,00	70,6	71,1	#######	0,18	70,2	71,2	78,0	0,18	75,3	74,3	79,4	0,08	0,06	0,11	-1,21	-1,02	26,1
170	414,0	2,4	1,9	6,8	348,6	69,2	89,9	400,1	503,8	502,4	523,1	0,00	70,6	71,1	#######	0,18	70,1	71,1	78,0	0,18	75,2	74,4	79,3	0,08	0,06	0,11	-1,20	-1,02	25,8
171	415,0	2,4	1,9	6,6	348,0	69,5	89,8	399,9	503,0	501,8	524,3	0,00	70,6	71,1	#######	0,18	70,1	71,1	77,9	0,18	75,2	74,4	79,3	0,08	0,06	0,11	-1,20	-1,02	25,8
172	416,0	2,4	2,0	6,6	347,5	69,5	90,0	399,1	502,5	501,1	525,6	0,00	70,6	71,1	#######	0,18	70,1	71,1	77,9	0,18	75,2	74,4	79,2	0,08	0,06	0,11	-1,21	-1,02	25,6
173	417,0	2,3	2,0	6,6	346,9	69,5	89,8	398,7	501,7	500,2	526,0	0,00	70,5	71,1	#######	0,18	70,1	71,1	77,8	0,18	75,1	74,3	79,2	0,08	0,06	0,11	-1,21	-1,02	25,3
174	418,0	2,3	2,0	6,5	346,9	69,5	88,1	398,4	501,0	499,3	527,2	0,00	70,5	71,0	#######	0,18	70,1	71,0	77,7	0,18	75,1	74,4	79,0	0,08	0,06	0,11	-1,20	-1,02	25,1
175	419,0	2,3	2,0	6,4	346,4	69,5	88,8	397,7	500,1	498,6	528,2	0,00	70,5	71,1	#######	0,18	70,2	71,0	77,7	0,18	75,1	74,4	78,9	0,08	0,06	0,11	-1,20	-1,01	24,9
176	420,0	2,2	2,0	6,4	345,1	69,5	89,3	396,9	499,3	498,1	529,5	0,00	70,5	71,0	#######	0,18	70,2	71,0	77,7	0,18	75,1	74,4	78,9	0,08	0,06	0,11	-1,20	-1,02	24,7
177	421,0	2,2	2,0	6,4	344,9	69,5	88,8	396,1	498,4	497,5	530,1	0,00	70,5	71,0	#######	0,18	70,1	71,0	77,6	0,18	75,0	74,3	78,8	0,08	0,06	0,11	-1,20	-1,02	24,4
178	422,0	2,2	2,0	6,3	343,7	69,6	89,2	395,4	497,6	496,6	530,6	0,00	70,5	71,0	#######	0,18	70,1	71,0	77,5	0,18	75,1	74,3	78,8	0,08	0,06	0,11	-1,21	-1,02	24,0
179	423,0	2,1	2,0	6,3	343,9	69,6	88,7	394,7	496,7	496,2	531,3	0,00	70,5	71,0	#######	0,18	70,1	71,0	77,5	0,18	75,1	74,3	78,7	0,08	0,06	0,11	-1,20	-1,02	23,7
180	424,0	2,1	2,0	6,3	343,3	69,3	89,5	393,8	495,8	495,1	532,1	0,00	70,4	71,0	#######	0,18	70,1	71,0	77,5	0,18	75,0	74,3	78,7	0,08	0,06	0,11	-1,21	-1,02	23,3
181	425,0	2,0	2,0	6,2	341,7	69,6	88,9	393,0	494,9	494,7	532,9	0,00	70,4	71,0	#######	0,18	70,1	71,0	77,4	0,18	75,0	74,2	78,7	0,08	0,06	0,12	-1,21	-1,03	22,9
182	426,0	2,0	2,1	6,1	341,4	69,6	88,4	392,2	494,1	493,8	532,6	0,00	70,4	70,9	#######	0,18	70,0	71,0	77,4	0,18	75,0	74,2	78,7	0,08	0,06	0,12	-1,21	-1,02	22,5
183	427,0	2,0	2,1	6,1	340,8	69,6	88,6	391,4	493,1	493,0	534,2	0,00	70,4	70,9	#######	0,18	70,1	71,0	77,4	0,18	75,0	74,2	78,6	0,08	0,06	0,11	-1,20	-1,02	22,3
184	428,0	1,9	2,1	6,2	339,5	69,5	88,4	390,6	492,2	492,1	534,9	0,00	70,4	70,9	#######	0,18	70,1	71,0	77,3	0,18	75,0	74,2	78,6	0,08	0,06	0,12	-1,21	-1,03	21,9
185	429,0	2,0	2,1	5,9	338,6	69,3	88,9	389,4	491,3	491,4	535,4	0,00	70,4	70,9	#######	0,18	70,1	71,0	77,3	0,18	75,1	74,2	78,6	0,08	0,06	0,12	-1,21	-1,02	21,4
186	430,0	1,9	2,1	5,8	337,5	69,6	89,5	388,1	490,4	490,8	536,4	0,00	70,4	70,9	#######	0,18	70,1	71,0	77,4	0,18	75,2	74,2	78,6	0,08	0,06	0,12	-1,20	-1,02	21,1
187	431,0	1,9	2,2	5,7	336,5	69,5	88,6	387,0	489,6	490,2	535,4	0,00	70,4	70,9	#######	0,18	70,1	71,0	77,3	0,18	75,2	74,2	78,6	0,08	0,06	0,12	-1,21	-1,03	20,4
188	432,0	1,8	2,2	5,8	335,9	69,6	89,0	385,9	488,6	488,9	536,3	0,00	70,4	70,9	#######	0,18	70,1	71,1	77,3	0,18	75,3	74,2	78,5	0,08	0,06	0,12	-1,20	-1,03	19,9
189	433,0	1,8	2,2	5,6	333,3	69,6	89,4	384,8	487,7	488,1	536,8	0,00	70,4	70,9	#######	0,18	70,1	71,1	77,3	0,18	75,4	74,2	78,5	0,08	0,06	0,12	-1,21	-1,03	19,4
190	434,0	1,8	2,2	5,5	332,5	69,6	88,4	383,6	486,8	486,8	537,5	0,00	70,4	70,9	#######	0,18	70,1	71,1	77,3	0,18	75,3	74,2	78,5	0,08	0,06	0,12	-1,21	-1,03	18,9
191	435,0	1,8	2,1	5,5	331,3	69,7	88,8	382,0	485,8	485,7	537,2	0,00	70,4	70,9	#######	0,18	70,0	71,1	77,3	0,18	75,3	74,2	78,5	0,08	0,05	0,11	-1,21	-1,02	18,1
192	436,0	1,8	2,2	5,6	330,9	69,6	88,2	380,9	484,6	484,4	537,0	0,00	70,4	70,9	#######	0,18	70,0	71,0	77,2	0,18	75,2	74,2	78,4	0,08	0,06	0,12	-1,21	-1,02	17,3
193	437,0	1,7	2,1	5,5	329,3	69,6	88,5	379,3	483,6	483,2	537,3	0,00	70,4	70,9	#######	0,18	70,0	71,0	77,2	0,18	75,2	74,3	78,4	0,08	0,05	0,13	-1,20	-1,02	16,6
194	438,0	1,6	2,1	5,5	328,5	69,6	88,7	377,8	482,3	481,7	537,3	0,00	70,4	70,9	#######	0,18	69,9	71,0	77,2	0,18	75,2	74,2	78,4	0,08	0,05	0,12	-1,21	-1,02	15,8
195	439,0	1,6	2,1	5,5	327,5	69,7	88,6	376,2	481,1	480,4	536,8	0,00	70,4	70,9	#######	0,18	70,0	71,0	77,2	0,18	75,1	74,2	78,4	0,08	0,06	0,11	-1,20	-1,03	14,9
196	440,0	1,6	2,1	5,5	326,5	69,5	88,4	374,9	480,0	479,1	537,1	0,00	70,3	70,8	#######	0,18	69,9	70,9	77,1	0,18	75,0	74,2	78,3	0,08	0,05	0,11	-1,20	-1,03	14,2
197	441,0	1,6	2,1	5,4	325,6	69,4	88,3	373,7	478,7	478,4	537,1	0,00	70,4	70,9	#######	0,18	69,9	70,9	77,1	0,18	75,0	74,2	78,3	0,08	0,05	0,12	-1,20	-1,02	13,5
198	442,0	1,6	2,2	5,4	325,2	69,5	88,9	372,5	477,8	477,3	536,3	0,00	70,4	70,9	#######	0,18	69,9	70,9	77,0	0,18	75,0	74,2	78,2	0,08	0,05	0,12	-1,20	-1,02

225	469,0	0,9	1,9	5,2	305,9	69,2	86,7	347,7	450,1	447,6	530,9	0,00	70,0	70,5	#######	0,18	70,0	70,7	76,3	0,18	75,0	73,8	77,4	0,08	0,05	0,13	-1,20	-1,01	-4,8
226	470,0	0,8	1,8	5,3	305,5	69,3	86,5	346,7	449,0	446,8	530,6	0,00	70,0	70,5	#######	0,18	70,0	70,8	76,3	0,18	75,0	73,8	77,4	0,08	0,05	0,13	-1,20	-1,01	-5,4
227	471,0	0,8	1,8	5,3	304,3	69,4	85,6	345,8	448,1	445,9	530,4	0,00	70,0	70,5	#######	0,18	70,0	70,8	76,3	0,18	75,0	73,8	77,3	0,08	0,05	0,13	-1,20	-1,01	-6,0
228	472,0	0,8	1,8	5,2	304,6	69,2	85,8	345,1	447,3	444,5	530,2	0,00	70,0	70,5	#######	0,18	70,0	70,8	76,2	0,18	75,0	73,8	77,3	0,08	0,05	0,13	-1,20	-1,02	-6,6
229	473,0	0,7	1,8	5,2	303,6	69,1	85,7	344,0	446,6	443,5	529,4	0,00	70,0	70,4	#######	0,18	70,0	70,8	76,2	0,18	75,0	73,8	77,2	0,08	0,05	0,13	-1,20	-1,02	-7,4
230	474,0	0,7	1,8	5,1	302,8	69,2	85,2	343,5	445,9	442,6	529,7	0,00	70,0	70,5	#######	0,18	70,0	70,8	76,1	0,18	74,9	73,8	77,1	0,08	0,05	0,13	-1,20	-1,02	-7,7
231	475,0	0,7	1,8	5,1	302,1	69,1	85,7	343,0	444,9	441,7	529,3	0,00	70,0	70,5	#######	0,18	69,9	70,7	76,1	0,18	74,8	73,9	77,1	0,08	0,05	0,13	-1,20	-1,02	-8,3
232	476,0	0,6	1,8	5,1	301,3	68,8	85,4	342,4	444,4	441,0	528,3	0,00	70,0	70,5	#######	0,18	69,8	70,7	76,0	0,18	74,7	73,8	77,1	0,08	0,05	0,13	-1,21	-1,02	-8,8
233	477,0	0,6	1,8	5,0	300,8	69,0	85,0	341,7	443,4	439,9	528,8	0,00	70,0	70,4	#######	0,18	69,8	70,7	76,0	0,18	74,7	73,8	77,1	0,08	0,05	0,13	-1,20	-1,01	-9,3
234	478,0	0,6	1,8	4,9	299,9	69,1	85,1	341,0	442,8	439,0	527,7	0,00	70,0	70,4	#######	0,18	69,8	70,6	75,9	0,18	74,7	73,9	77,0	0,08	0,05	0,14	-1,21	-1,01	-10,0
235	479,0	0,6	1,9	4,9	299,3	69,1	85,6	340,1	442,0	438,3	528,5	0,00	69,9	70,4	#######	0,18	69,8	70,6	75,9	0,18	74,7	73,8	77,0	0,08	0,05	0,09	-1,21	-1,01	-10,3
236	480,0	0,5	1,9	4,9	298,6	69,0	85,3	339,6	441,2	437,2	528,3	0,00	69,9	70,4	#######	0,18	69,8	70,6	75,9	0,18	74,6	73,8	76,9	0,08	0,05	0,14	-1,20	-1,01	-10,8
237	481,0	0,5	1,9	4,9	297,9	68,9	85,0	339,0	440,5	436,5	528,2	0,00	69,9	70,3	#######	0,18	69,7	70,6	75,9	0,18	74,6	73,8	76,9	0,08	0,05	0,14	-1,20	-1,01	-11,2
238	482,0	0,5	1,9	4,9	296,8	69,0	85,4	338,1	439,7	435,6	527,4	0,00	69,9	70,3	#######	0,18	69,7	70,5	75,9	0,18	74,5	73,8	76,9	0,08	0,05	0,14	-1,21	-1,01	-11,9
239	483,0	0,5	1,8	4,9	296,6	68,9	84,9	337,6	439,1	434,6	527,0	0,00	69,8	70,3	#######	0,18	69,7	70,5	75,9	0,18	74,6	73,8	76,9	0,08	0,05	0,14	-1,21	-1,01	-12,4
240	484,0	0,5	1,7	4,9	296,5	69,0	85,2	337,3	438,7	434,2	526,9	0,00	69,8	70,3	#######	0,18	69,7	70,6	75,8	0,18	74,7	73,8	76,8	0,08	0,05	0,13	-1,21	-1,01	-12,6
241	485,0	0,4	1,6	5,0	297,0	69,0	84,9	336,8	438,1	432,9	526,6	0,00	69,8	70,3	#######	0,18	69,7	70,5	75,8	0,18	74,7	73,8	76,8	0,08	0,05	0,13	-1,21	-1,01	-13,2
242	486,0	0,4	1,6	5,2	296,1	69,1	85,0	336,1	437,4	432,2	526,0	0,00	69,8	70,3	#######	0,18	69,7	70,5	75,7	0,18	74,7	73,8	76,8	0,08	0,05	0,13	-1,20	-1,01	-13,7
243	487,0	0,3	1,6	5,2	295,6	68,8	85,3	335,7	436,8	431,0	526,0	0,00	69,8	70,2	#######	0,18	69,6	70,5	75,8	0,18	74,6	73,7	76,8	0,08	0,05	0,13	-1,21	-1,02	-14,2
244	488,0	0,4	1,7	5,2	295,5	68,9	85,4	335,4	436,2	430,5	525,5	0,00	69,8	70,2	#######	0,18	69,6	70,5	75,8	0,18	74,6	73,7	76,8	0,08	0,05	0,14	-1,21	-1,01	-14,5
245	489,0	0,3	1,7	5,2	295,4	68,8	84,5	335,0	435,8	429,9	524,8	0,00	69,8	70,2	#######	0,18	69,6	70,4	75,7	0,18	74,5	73,7	76,7	0,08	0,05	0,13	-1,21	-1,01	-15,0
246	490,0	0,3	1,6	5,2	295,4	68,6	84,4	334,6	435,4	429,3	524,2	0,00	69,7	70,2	#######	0,18	69,6	70,4	75,7	0,18	74,5	73,7	76,7	0,08	0,05	0,13	-1,21	-1,01	-15,4
247	491,0	0,3	1,7	5,1	294,9	68,9	85,0	334,3	434,9	428,9	524,2	0,00	69,7	70,2	#######	0,18	69,7	70,4	75,6	0,18	74,6	73,7	76,6	0,08	0,05	0,13	-1,21	-1,01	-15,6
248	492,0	0,2	1,7	5,1	294,7	68,8	85,2	333,9	434,4	428,1	523,8	0,00	69,7	70,2	#######	0,18	69,7	70,4	75,6	0,18	74,5	73,7	76,6	0,08	0,05	0,14	-1,21	-1,01	-16,0
249	493,0	0,2	1,7	5,0	294,6	68,9	85,2	333,6	434,0	427,8	523,3	0,00	69,7	70,2	#######	0,18	69,6	70,4	75,6	0,18	74,5	73,6	76,6	0,08	0,05	0,14	-1,22	-1,02	-16,3
250	494,0	0,2	1,7	4,9	294,2	68,7	85,2	333,5	433,6	427,3	523,1	0,00	69,7	70,1	#######	0,18	69,6	70,4	75,6	0,18	74,4	73,6	76,6	0,08	0,05	0,13	-1,21	-1,02	-16,6
251	495,0	0,2	1,8	4,9	294,7	68,9	85,2	333,0	432,9	426,7	522,5	0,00	69,7	70,1	#######	0,18	69,6	70,4	75,5	0,18	74,5	73,6	76,5	0,08	0,05	0,14	-1,20	-1,00	-17,0
252	496,0	0,1	1,8	4,9	294,1	68,8	85,1	332,6	432,4	426,1	522,1	0,00	69,7	70,1	#######	0,18	69,6	70,4	75,5	0,18	74,5	73,6	76,5	0,08	0,05	0,13	-1,21	-1,00	-17,4
253	497,0	0,1	1,8	4,9	293,9	68,9	84,2	332,2	432,0	425,6	521,7	0,00	69,7	70,1	#######	0,18	69,5	70,4	75,5	0,18	74,4	73,6	76,5	0,08	0,05	0,14	-1,21	-1,00	-17,8
254	498,0	0,1	1,8	4,8	293,6	68,9	84,7	331,8	431,3	425,0	521,8	0,00	69,7	70,1	#######	0,18	69,6	70,4	75,5	0,18	74,4	73,6	76,4	0,08	0,05	0,14	-1,21	-1,01	-18,1
255	499,0	0,1	1,8	4,8	292,9	68,8	84,4	331,3	430,7	424,4	520,6	0,00	69,7	70,1	#######	0,18	69,6	70,4	75,5	0,18	74,5	73,6	76,5	0,08	0,05	0,14	-1,21	-1,01	-18,7
256	500,0	0,1	1,8	4,7	292,6	68,9	84,9	330,8	430,0	423,9	521,1	0,00	69,6	70,1	#######	0,18	69,6	70,4	75,5	0,18	74,5	73,6	76,4	0,08	0,05	0,14	-1,21	-1,01	-18,9
257	501,0	0,0	1,8	4,8	292,1	68,9	84,6	330,5	429,4	423,4	520,6	0,00	69,6	70,1	#######	0,18	69,7	70,4	75,4	0,18	74,6	73,5	76,4	0,08	0,05	0,13	-1,21	-1,01	-19,3

SFBA EPA EMISSION RESULTS

Test Duration: **257** min

PRESSURE FACTOR:	DGM 1st hr	0,954	
	DGM 1	0,938	
	DGM 2	0,944	
	DGM 3	0,979	
TEMPERATURE FACTORS	DGM 1st hr	0,995	
	DGM 1	0,995	
	DGM 2	0,988	
	DGM 3	0,997	
VOLUMES SAMPLED	DGM 1st hr	11,348	SCft
	DGM 1	46,969	SCft
	DGM 2	47,334	SCft
	DGM 3	55,932	SCft

TOTAL TUNNEL VOLUME : 89514

SAMPLE RATIOS

Sample Train 1st Hr:	1841,6
Sample Train 1:	1905,8
Sample Train 2:	1891,1

Paticulate concentration

Sample Train 1st Hr	**0,000282**	g/dscf
Sample Train 1	**0,000066**	g/dscf
Sample Train 2	**0,000063**	g/dscf
Room	**0,000000**	g/dscf

TOTAL EMISSIONS

Sample Train 1st Hr	**5,89**	g
Sample Train 1	**5,91**	g
Sample Train 2	**5,67**	g

EMISSION RATES

Sample Train 1st Hr	**5,89**	g/hr
Sample Train 1	**1,38**	g/hr
Sample Train 2	**1,32**	g/hr

	Train 1	Train 2	Train 1st Hr
Cs	6,6E-05	6,3379E-05	0,000282

RESULTS

Average emission rate: 1,35 g/hr

Burn Rate : 1,96 Dry kg/hr

BAROMETRIC PRESSURE

Average:	29,27898398	in Hg
Start:	29,26421898	in Hg
End:	29,29374897	in Hg

DGM VALUES

DGM 1st hr	Final:	1240,030	Cuft
	Initial:	1228,080	Cuft
DGM 1	Final:	5107,373	Cuft
	Initial:	5056,370	Cuft
DGM 2	Final:	31794,243	Cuft
	Initial:	31744,042	Cuft
DGM #3	Final:	22448,846	Cuft
	Initial:	22390,821	Cuft

TEMPERATURES

DGM 1st hr	530,656	°R
DGM 1	530,404	°R
DGM 2	534,158	°R

CALIBRATION FACTORS

DGM 1st hr	1,0000
DGM 1	0,9860
DGM 2	1,0100
DGM #3	0,9880

TUNNEL FLOW RATE: 348,3 Dscfm

PARTICULATE CATCH

Total Sample Train 1:	3,10	mg
Total Sample Train 2:	3,00	mg
Total Sample Train 1 1st hour:	3,20	mg

DEVIATION: 2,03%

DATA 2025-04-16 EPA PI 20326 RUN 2 SINGLE BURN RATE
unit preburn

Time	Flue	Room	scale	Right	Back	bottom	Top	Left
acquisition	temp	temp						
minutes	°F	°F	lbs	°F	°F	°F	°F	°F
1	69,66	66,17	30,01	66,67	0,00	66,97	66,85	66,87
2	96,18	66,21	30,11	66,68	0,00	66,99	73,09	66,90
3	187,10	66,20	29,81	66,70	0,00	66,96	94,98	66,91
4	295,65	66,32	29,61	66,74	0,00	66,98	162,82	66,97
5	393,22	66,28	29,40	66,88	0,00	67,01	245,35	67,10
6	424,52	66,14	29,21	67,20	0,00	67,06	323,23	67,37
7	442,16	66,15	29,01	67,69	0,00	67,13	379,36	67,86
8	461,03	66,43	28,82	68,51	0,00	67,23	404,23	68,84
9	480,47	66,49	28,60	69,70	0,00	67,38	416,74	70,51
10	496,26	66,54	28,41	71,29	0,00	67,61	423,47	73,05
11	506,12	66,53	28,32	73,35	0,00	67,88	433,49	76,34
12	518,28	66,51	28,12	75,78	0,00	68,22	443,16	80,28
13	530,01	66,57	27,91	78,45	0,00	68,63	455,12	84,61
14	543,99	66,52	27,70	81,45	0,00	69,07	466,26	89,35
15	562,94	66,70	27,42	84,57	0,00	69,58	481,68	94,28
16	584,01	66,62	27,22	88,02	0,00	70,14	495,59	99,52
17	593,04	66,61	26,91	91,75	0,00	70,77	513,32	104,99
18	593,34	66,69	26,72	95,79	0,00	71,49	533,09	110,58
19	590,51	66,77	26,43	100,16	0,00	72,29	548,47	116,20
20	589,03	66,74	26,31	104,80	0,00	73,15	561,77	121,77
21	583,36	66,82	26,11	109,64	0,00	74,06	573,94	127,39
22	580,29	66,85	25,92	114,66	0,00	75,14	581,01	133,04
23	571,55	66,78	25,72	119,70	0,00	76,24	585,92	138,66
24	561,74	66,86	25,52	124,74	0,00	77,45	587,30	144,21
25	553,69	66,80	25,31	129,58	0,00	78,72	590,08	149,67
26	547,47	66,82	25,22	134,32	0,00	80,02	590,91	155,02
27	543,40	66,94	25,03	138,88	0,00	81,37	590,16	160,25
28	540,82	66,98	24,93	143,23	0,00	82,80	590,05	165,37
29	540,51	66,89	24,72	147,51	0,00	84,23	592,47	170,47
30	540,12	66,97	24,62	151,68	0,00	85,70	598,57	175,63
31	540,51	67,05	24,43	155,87	0,00	87,22	602,47	181,29
32	542,52	67,00	24,22	160,05	0,00	88,73	609,05	186,98
33	547,13	66,85	24,01	164,28	0,00	90,29	615,34	192,50
34	550,52	66,92	23,92	168,40	0,00	91,89	620,25	197,89
35	554,21	66,93	23,63	172,75	0,00	93,50	623,69	203,33
36	558,86	66,81	23,52	177,04	0,00	95,11	628,15	208,46
37	563,72	66,84	23,34	181,58	0,00	96,77	632,39	213,60
38	568,38	66,83	23,03	186,15	0,00	98,45	637,20	218,55
39	573,65	67,00	22,83	191,40	0,00	100,17	648,34	223,47
40	573,96	67,07	22,63	197,19	0,00	101,87	660,56	228,54
41	573,38	67,12	22,42	203,40	0,00	103,65	668,66	233,47
42	573,83	67,06	22,28	210,04	0,00	105,44	674,89	238,20
43	574,96	67,12	22,03	216,67	0,00	107,26	678,08	242,96
44	579,70	67,15	21,84	223,05	0,00	109,10	682,51	247,73
45	582,72	67,26	21,63	229,27	0,00	110,94	686,93	252,44
46	584,94	67,20	21,43	235,36	0,00	112,84	688,27	257,02
47	583,93	67,28	21,23	241,33	0,00	114,75	687,62	261,92
48	581,97	67,21	21,04	246,95	0,00	116,72	682,65	266,72
49	577,58	67,19	20,92	252,49	0,00	118,72	678,13	271,41
50	574,65	67,19	20,73	257,86	0,00	120,74	672,45	276,63
51	572,65	67,15	20,63	263,08	0,00	122,80	667,48	282,17
52	570,97	67,21	20,44	268,26	0,00	124,88	662,50	287,90
53	569,90	67,23	20,24	273,25	0,00	126,96	658,50	293,84
54	566,43	67,27	20,12	278,37	0,00	129,06	654,75	300,17
55	563,37	67,22	19,93	283,27	0,00	131,18	653,20	306,81
56	562,58	67,25	19,83	288,10	0,00	133,30	652,98	312,91
57	565,60	67,15	19,54	293,29	0,00	135,47	657,87	318,88
58	563,86	67,26	19,44	298,73	0,00	137,66	666,45	324,34
59	564,42	67,20	19,23	304,56	0,00	139,84	672,75	330,20
60	563,66	67,34	19,13	310,15	0,00	142,04	673,91	335,69
61	562,79	67,46	18,93	315,80	0,00	144,29	673,78	341,42
62	563,93	67,23	18,75	321,35	0,00	146,54	672,81	347,12
63	566,17	67,42	18,53	326,92	0,00	148,82	673,77	353,02
64	566,70	67,17	18,34	332,19	0,00	151,12	678,45	358,91
65	567,22	67,34	18,14	337,69	0,00	153,46	682,48	365,36
66	567,01	67,42	18,04	343,49	0,00	155,84	686,02	371,90
67	564,37	67,37	17,83	349,45	0,00	158,21	687,12	377,99
68	563,56	67,73	17,63	355,37	0,00	160,65	684,20	383,46

69	563,30	67,66	17,44	361,14	0,00	163,11	681,20	389,35
70	562,92	67,63	17,35	366,65	0,00	165,62	678,32	394,77
71	560,24	67,76	17,15	371,92	0,00	168,15	676,94	399,08
72	558,30	67,90	17,04	377,42	0,00	170,76	675,22	402,85
73	556,50	67,92	16,74	382,67	0,00	173,40	673,21	406,27
74	554,75	67,81	16,64	387,71	0,00	176,10	669,98	410,12
75	551,82	67,76	16,45	392,50	0,00	178,80	665,97	414,67
76	551,80	67,99	16,35	397,02	0,00	181,54	663,18	419,82
77	555,14	68,18	16,13	401,37	0,00	184,30	663,53	425,37
78	556,20	67,92	15,94	405,60	0,00	187,09	666,49	430,58
79	554,07	67,80	15,85	409,65	0,00	189,90	669,74	434,14
80	550,00	67,76	15,65	413,23	0,00	192,66	671,25	436,24
81	546,51	67,79	15,55	416,61	0,00	195,40	669,16	438,01
82	541,17	67,96	15,44	420,10	0,00	198,18	663,84	440,02
83	536,60	67,89	15,24	423,51	0,00	200,87	656,90	442,17
84	532,19	68,06	15,14	427,26	0,00	203,68	649,39	445,38
85	531,38	67,82	15,05	430,79	0,00	206,39	642,42	448,28
86	534,99	67,79	14,85	434,60	0,00	209,08	638,23	451,89
87	537,69	67,91	14,64	438,79	0,00	211,76	636,46	455,91
88	540,83	67,98	14,45	443,00	0,00	214,41	637,42	460,96
89	542,77	67,65	14,35	446,92	0,00	217,07	641,30	465,64
90	544,17	68,12	14,16	450,95	0,00	219,74	646,40	469,08
91	545,42	68,08	14,06	454,86	0,00	222,42	651,31	472,12
92	544,90	68,23	13,84	458,53	0,00	225,07	655,98	475,67
93	546,43	67,83	13,74	461,89	0,00	227,72	659,56	477,03
94	544,69	68,11	13,55	464,10	0,00	230,46	662,45	475,54
95	543,28	68,24	13,45	466,25	0,00	233,33	660,89	474,55
96	541,71	68,21	13,26	468,44	0,00	236,31	657,26	475,07
97	539,48	68,10	13,14	470,53	0,00	239,32	652,35	475,98
98	535,71	67,90	13,04	472,48	0,00	242,35	647,62	479,13
99	531,50	68,15	12,85	474,28	0,00	245,39	642,07	480,80
100	530,03	68,23	12,75	475,92	0,00	248,32	636,44	481,09
101	528,18	67,81	12,66	477,07	0,00	251,25	628,51	480,44
102	523,15	68,21	12,46	478,02	0,00	254,18	619,24	479,81
103	518,06	68,24	12,46	478,56	0,00	256,96	609,51	478,74
104	515,77	68,09	12,33	478,70	0,00	259,67	600,41	477,30
105	513,49	68,43	12,15	478,88	0,00	262,24	592,36	476,26
106	513,00	68,41	12,05	479,03	0,00	264,68	585,46	475,77
107	513,94	68,18	11,96	479,54	0,00	267,06	581,34	475,82
108	514,22	68,27	11,86	480,02	0,00	269,37	578,32	476,11
109	514,82	68,21	11,66	480,26	0,00	271,55	576,24	476,10
110	515,36	68,09	11,54	480,70	0,00	273,72	574,37	476,53
111	514,97	68,37	11,45	481,05	0,00	275,81	572,82	477,43
112	513,50	68,43	11,35	481,44	0,00	277,89	570,37	477,66
113	510,99	68,43	11,25	481,67	0,00	279,96	567,40	478,30
114	509,27	68,48	11,16	482,03	0,00	282,08	565,50	478,51
115	507,68	68,32	11,06	482,47	0,00	284,19	564,70	479,59
116	505,09	68,34	10,85	483,15	0,00	286,37	564,72	481,07
117	503,69	68,69	10,75	483,78	0,00	288,59	564,75	482,59
118	504,81	68,53	10,65	484,48	0,00	290,87	567,09	484,05
119	502,33	68,63	10,56	485,75	0,00	293,29	571,66	486,95
120	499,98	68,90	10,36	487,30	0,00	295,87	577,09	489,73
121	496,10	68,89	10,36	488,81	0,00	298,62	580,20	491,86
122	492,66	68,49	10,16	490,40	0,00	301,56	580,76	494,19
123	488,91	68,70	10,05	491,52	0,00	304,69	579,28	496,15
124	489,65	68,75	9,95	492,38	0,00	308,00	576,77	497,30
125	491,36	68,50	9,85	493,51	0,00	311,56	576,18	498,93
126	490,30	68,57	9,66	494,43	0,00	315,22	576,90	500,14
127	489,68	68,72	9,56	495,29	0,00	319,04	577,72	500,53
128	490,79	68,75	9,47	496,56	0,00	322,96	578,06	500,42
129	491,67	68,94	9,37	497,80	0,00	327,03	578,17	500,85
130	490,89	68,63	9,25	499,21	0,00	331,11	577,66	501,12
131	492,32	68,74	9,06	500,89	0,00	335,34	577,80	501,84
132	492,82	68,84	9,05	502,35	0,00	339,91	578,76	502,63
133	494,24	68,94	8,86	503,87	0,00	344,56	580,12	504,03
134	496,49	69,11	8,77	505,46	0,00	349,43	581,92	505,15
135	498,67	68,86	8,57	507,22	0,00	354,38	584,49	506,28
136	500,54	69,12	8,45	508,77	0,00	359,50	589,13	508,23
137	501,54	68,97	8,35	510,69	0,00	364,87	593,63	509,64
138	503,78	69,08	8,16	512,17	0,00	370,46	598,76	511,60
139	505,18	69,02	8,06	513,88	0,00	376,13	603,28	512,79
140	505,89	68,68	7,97	515,42	0,00	381,86	607,42	514,46

141	507,17	68,83	7,87	517,22	0,00	387,74	610,63	515,95
142	507,49	68,96	7,77	518,76	0,00	393,63	613,46	517,94
143	508,96	69,18	7,56	520,71	0,00	399,60	615,71	519,92
144	509,99	68,88	7,46	522,63	0,00	405,65	618,06	522,65
145	511,21	69,44	7,36	524,26	0,00	411,55	619,86	524,79
146	513,77	68,95	7,17	526,08	0,00	417,69	622,75	527,18
147	515,33	69,00	7,07	528,06	0,00	423,88	625,67	529,52
148	516,74	69,51	6,96	530,02	0,00	430,27	629,48	531,45
149	516,91	69,37	6,86	531,97	0,00	436,37	631,61	534,34
150	601,25	69,31	7,20	534,34	0,00	439,38	636,04	535,77
151	585,04	69,31	6,16	536,61	0,00	447,99	633,89	537,46
152	551,27	69,37	6,06	540,10	0,00	454,68	634,48	540,96
153	534,57	69,17	5,96	543,78	0,00	460,95	636,53	545,16
154	523,12	69,42	5,87	546,40	0,00	465,88	634,99	549,28
155	513,40	69,33	5,84	547,70	0,00	470,41	630,87	553,34
156	506,64	69,06	5,77	548,38	0,00	473,93	624,71	555,26
157	501,52	69,35	5,67	548,99	0,00	476,65	619,37	556,99
158	495,31	69,49	5,57	549,92	0,00	478,75	613,73	557,14
159	489,51	69,40	5,48	550,34	0,00	479,89	606,53	556,57
160	482,20	69,36	5,48	550,61	0,00	480,27	597,66	554,73
161	474,57	69,20	5,36	551,02	0,00	481,05	587,94	553,15
162	466,62	69,04	5,36	550,92	0,00	481,68	576,79	551,00
163	458,04	69,23	5,26	549,78	0,00	482,13	565,69	549,21
164	451,03	69,24	5,26	547,96	0,00	482,72	554,64	546,81
165	442,66	68,86	5,26	546,02	0,00	482,71	543,38	543,24
166	433,24	68,93	5,26	542,80	0,00	483,35	531,36	540,31
167	424,74	68,90	5,17	539,06	0,00	483,59	518,92	535,93
168	414,98	68,84	5,17	535,36	0,00	483,78	506,45	532,08
169	406,97	68,78	5,17	531,22	0,00	483,93	494,71	528,19
170	399,74	68,74	5,07	527,65	0,00	484,42	483,13	524,37
171	392,79	68,55	5,07	523,74	0,00	484,71	472,49	520,04
172	385,82	68,54	5,07	520,08	0,00	485,30	462,61	516,22
173	378,99	68,75	5,07	516,77	0,00	486,31	453,13	512,04
174	373,06	68,53	4,97	513,34	0,00	486,92	444,57	508,63
175	369,12	68,63	4,97	510,01	0,00	487,73	436,91	504,82
176	364,06	68,67	4,97	506,81	0,00	488,34	429,72	501,27
177	359,42	68,42	4,97	503,53	0,00	489,24	423,13	497,82
178	355,13	68,63	4,97	500,73	0,00	489,92	416,99	494,03
179	351,56	68,54	4,97	497,89	0,00	490,71	411,12	491,23
180	348,54	68,32	4,87	495,13	0,00	491,66	406,00	488,55
181	346,28	68,69	4,87	492,65	0,00	492,26	401,12	484,93
182	343,65	68,83	4,87	489,99	0,00	493,40	397,25	482,12
183	341,59	68,77	4,87	487,45	0,00	494,21	393,21	479,21
184	338,78	68,65	4,77	485,01	0,00	495,26	389,60	476,71
185	336,29	68,78	4,77	482,75	0,00	496,09	386,12	474,73
186	333,97	68,71	4,68	480,65	0,00	496,79	383,00	472,23
187	344,24	68,70	4,68	478,25	0,00	496,62	377,16	469,30

POLYTESTS
TESTING THROUGH YOUR REALITY

Date: 2025-04-16 Manufacturer: foyer supreme Model: 38 STD

Project #: PI 20326 Run: 2 Tech: M.M Reviewer: NP

- 30 LBS preload + handling STAND FIRE
- After 3 min close Door
- Ajout 68 LBS Rack WOOD
- Ajout 48 LBS Level coal Bed
- After 1 min insert Load
- After 1 min close Door

TEST LOAD CONFIGURATION

POLYTESTS
TESTING THROUGH YOUR REALITY

Date: 2025-09-16 Manufacturer: foyer supreme Model: 38 std D

Project #: PT 20326 Run: 2 Tech: M.A Reviewer: DP

Leakage Checks Tunnel Samplers

	System 1st hour		Ambient	
Unplugged Flow Rate = .25cfm	Pre-Test ASTM (-15) CSA B415 (-5)	Post-Test (Max test)	Pre-Test ASTM (-15) CSA B415 (-5)	Post-Test (Max test)
Vacuum (inches Hg.)	-7	-7	7	-7
Final 1minute DGM (Liter)	1277 97	1240.09	634035 40	635 380 92
Initial 1minute DGM (Liter)	1277 97	1240.09	634035 40	635380 92
Change (Liter)	ϕ	9	ϕ	ϕ
Allowable leakage .04 x Sample rate or 0.28Lpm CSA B415 (0.56)				
Check OK	ok	ok	ok	ok

POLYTESTS
TESTING THROUGH YOUR REALITY

Date: 2025-04-16 Manufacturer: Foyer Supreme Model: 38 STD

Project #: PI 20326 Run: 2 Tech: M.H Reviewer: AD

Leakage Checks Flue Gas Sampler

Plugged Probe	Pre-Test	Post Test
Vacuum (inches Hg.)	-5	-5
Rotameter Reading (mml/min.)	0	0
Flow Rate (lpm)	1.5	1.5
Allowable (.02 x Sample Rate)	30	30
Check OK	ok	ok

Leakage Checks Pitot

Plugged Probe	Pre-Test 3 H2o static	Pre-Test 0.4-0.5 H2o velocity	Post Test 3 H2o Static	Post Test 0.4-0.5 H2o velocity
Vacuum (inches Hg.)	3	0.4	3	04
Check OK (no change after 15 sec.)	ok	ok	ok	ok

POLYTESTS
TESTING THROUGH YOUR REALITY

Date: 2025-04-16 Manufacturer: foyer supreme Model: 38 STD

Project #: pI 20326 Run: 2 Tech: M.M Reviewer: [illegible]

Scale Type	Audit		Measured Weight
	Equipment #	Weight	
Platform	EM-090	4,4 lbs, Class F	4,4 lbs
Platform	EM 205	10,00 Kg, Class F	10,00 Kg
Wood	EM-090	4,40 lbs, Class F	4,40 lbs
Analytical	EM 335	100,0 mg, Class S	100,0 mg
Analytical	EM-129	200,0000 g, Class S	200,0000 g

LIMITS OF WEIGHT RANGES

ANALYTICAL SCALE: .....50%-150% of dry filter weight, ± 0.1 mg
PLATFORM SCALE ..... 20%-80% of ideal test load weight, ± 0.1 lbs or 1%
WOOD SCALE ..... 20%-80% of ideal test load weight, ± 0.01 lbs or 1%

CONTINUOUS ANALYZERS

Date: 2025-04-16 Manufacturer: Foyer Supreme Model: 38 STD

Project #: PI 20 326 Run: 2 Tech: M.M Reviewer: DP

FOR TUNNELS < 12 in

Barometric pressure (P_{bar}) _____ (KPa.) Static pressure (P_q) _____(inches w.c.)
Inside diameter: Port A _____ Port B ____.
Tunnel cross sectional area: .1963Ft^2
Pitot tube type: Standard

Traverse Point	Position (inches)			Velocity Head Δ_p (inches H_2O)	Tunnel Temperature (°F)
Tunnel diameter	6 po	7 po	8 po		
A- Centroid	3.00	3.50	4	0078	67,31
B - Centroid	3.00	3.50	4	0,077	67,16
A-1	0.40	0.50	0.50	0064	67,31
A-2	1.50	1.75	2	0070	67,35
A-3	4.50	5.25	6	0068	67,35
A-4	5.60	6.5	7.5	0063	67,24
B-1	0.40	0.50	0.50	0063	67,07
B-2	1.50	1.75	2	0070	67,07
B-3	4.50	5.25	6	0,071	67,13
B-4	5.60	6.5	7.5	0063	67,13
				AVERAGE	

CONTINUOUS ANALYZERS

Date:_____ Manufacturer:_____ Model:_____

Project #: _____ Run:_____ Tech:_____ Reviewer:_____

FOR TUNNELS 12 in

Barometric pressure (P_{bar}) _____ (KPa.) Static pressure (P_q) _____(inches w.c.)
Pitot tube type: Standard

Traverse Point	Position (inches)	Velocity Head Δ_p (inches H_2O)	Tunnel Temperature (°F)
A Center	6		
B Center	6		
A-1	0.53		
A-2	1.75		
A-3	3.55		
A-4	8.45		
A-5	10.25		
A-6	11.47		
B-1	0.53		
B-2	1.75	N.A	
B-3	3.55		
B-4	8.45		
B-5	10.25		
B-6	11.47		

POLYTESTS
TESTING THROUGH YOUR REALITY

CONTINUOUS ANALYZERS

Date: 2025-04-16 Manufacturer: Foyer Supreme Model: 38 std

Project #: PI 20326 Run: 2 Tech: M. M Reviewer: DP

Pre-Test (Adjust and Record)

	ZERO		SPAN		CAL. (Record Only)	
CO	0	0	3058	3.000	1.006	1.000
Tolerance CO	0	+/- 0.02	0.058	+/- 0.15	0.006	+/- 0.05
CO_2	0	0	18.07	18.00	9.81	10.00
Tolerance CO2	0	+/- 0.02	0.07	+/- 0.5	0.19	+/- 0.5
O_2 informative CSA B415 calculated value	na	na	na	na	na	na
	Actual	Should Be	Actual	Should Be	Actual	Should Be

Post Test (Record Only)

	Zero	Span	Cal.	Zero Drift	Limit	Span Drift	Limit	Cal. Drift	Limit	OK?	Not OK*
CO	0	3.051	1.009	0	0.02	0.007	0.15	0.003	0.05	✓	
CO_2	0	18.01	9.84	0	0.02	0.06	0.5	0.03	0.5	✓	

POLYTESTS
TESTING THROUGH YOUR REALITY

TEST DATA LOG

Date: 2025-04-16 Manufacturer: Foyer Supreme Model: 38 STD

Project #: PT 20326 Run: 2 Tech: M.A Reviewer: DP

RAW DRY GAS METER READINGS

		System 1st hour	System 1	System 2	Blank
Test	Final (Liter)	12 40, 03	144 624, 70	900 312, 68	635 380, 52
	Initial (Liter)	1228, 08	143 180, 44	898 891, 16	634 037, 43

AMBIENT CONDITIONS

	Before	After
Barometer (kPa):	99.1	99.2
Dry Bulb (F):	68.4	69.4
Humidity (%):	29.4	29.7

POLYTESTS
TESTING THROUGH YOUR REALITY

FUEL DATA

Date: 2025-04-16 Manufacturer: foyer supreme Model: 38 STD

Project #: pI 2326 Run: 2 Tech: M.A Reviewer: BD

FUEL DESCRIPTION:

Type of wood:

PRE-TEST LOAD

Piece Size	Weight	Meter Moisture Content (% dry) *				
1 1/2 x 3 1/2 x 12 in.	1642 lbs.	21.1	21.8	21.6	21.3	21.9
1 1/2 x 3 1/2 x 12 in.	1340 lbs.	22.0	22.1	22.0	21.9	21.6
1 1/2 x 3 1/2 x 12 in.	1302 lbs.	21.6	21.8	21.9	21.4	21.8
1 1/2 x 3 1/2 x 12 in.	1634 lbs.	19.9	19.8	19.9	20.0	20.1
1 1/2 x 3 1/2 x 12 in.	1382 lbs.	19.4	19.7	19.8	19.7	19.9
1 1/2 x 3 1/2 x 12 in.	1666 lbs.	20.3	20.4	20.6	20.9	20.7
1 1/2 x 3 1/2 x 12 in.	1366 lbs.	19.1	19.3	19.4	19.6	19.3
1 1/2 x 3 1/2 x 12 in.	1632 lbs.	19.9	20.0	20.1	20.4	20.6
1 1/2 x 3 1/2 x 12 in.	1378 lbs.	20.9	20.8	20.7	20.3	20.9
1 1/2 x 3 1/2 x 12 in.	1612 lbs.	21.1	21.3	21.9	21.8	21.4
1 1/2 x 3 1/2 x 12 in.	1712 lbs.	20.9	20.6	20.3	20.4	20.5
1 1/2 x 3 1/2 x 12 in.	1710 lbs.	21.1	21.3	21.3	21.0	20.5
1 1/2 x 3 1/2 x 20 in.	2806 lbs.	20.8	20.9	21.0	21.0	20.8
1 1/2 x 3 1/2 x 20 in.	2718 lbs.	19.9	20.5	20.1	20.3	20.4
1 1/2 x 3 1/2 x 20 in.	2518 lbs.	19.3	19.4	19.8	19.9	19.9
1 1/2 x 3 1/2 x 20 in.	2452 lbs.	20.4	20.1	20.0	20.0	20.0
x x in.	lbs.					
x x in.	lbs.					
x x in.	lbs.					
x x in.	lbs.					
x x in.	lbs.					
x x in.	lbs.					
x x in.	lbs.					

TEST LOAD WEIGHT: 2887 **lbs**

Wood Temperature:

POLYTESTS
TESTING THROUGH YOUR REALITY

FUEL DATA

Date: 2025-04-16 Manufacturer: Foyer Supreme Model: 38 STD

Project #: pI 2032 Run: 2 Tech: M.M Reviewer: DP

FUEL DESCRIPTION:

Type of wood:

TEST LOAD

Piece Size				Weight		Meter Moisture Content (% dry)*				
3 1/2	x 3 1/2	x 20	in.	4 914	lbs.	196	194	193	199	194
3 1/2	x 3 1/2	x 20	in.	5070	lbs.	198	199	20°	20¹	20°
3 1/2	x 3 1/2	x 20	in.	4 966	lbs.	20¹	20⁴	206	20 8	200
3 1/2	x 3 1/2	x 20	in.	5082	lbs.	191	193	19	198	198
1 1/2	x	x 5	in.	0 122	lbs.			191		
1 1/2	x	x 5	in.	0 172	lbs.			193		
1 1/2	x	x 5	in.	0 120	lbs.			194		
1 1/2	x	x 5	in.	0 118	lbs.			20°		
1 1/2	x	x 5	in.	0 110	lbs.			20¹		
1 1/2	x	x 5	in.	0 128	lbs.			20³		
1 1/2	x	x 5	in.	0 134	lbs.			20⁴		
1 1/2	x	x 5	in.	0 144	lbs.			20⁶		
1 1/2	x	x 5	in.	0 134	lbs.			199		
1 1/2	x	x 5	in.	0 134	lbs.			20⁵		
1 1/2	x	x 5	in.	0 146	lbs.			20¹		
1 1/2	x	x 5	in.	0 118	lbs.			20		
1 1/2	x	x 5	in.	0 162	lbs.			20 8		
1 1/2	x	x 5	in.	0 120	lbs.			20⁴		
1 1/2	x	x 5	in.	0 156	lbs.			20³		
1 1/2	x	x 5	in.	0 134	lbs.			208		
	x	x	in.		lbs.					
	x	x	in.		lbs.					
	x	x	in.		lbs.					
	x	x	in.		lbs.					
	x	x	in.		lbs.					
	x	x	in.		lbs.					
	x	x	in.		lbs.					

TEST LOAD WEIGHT: 22 18 lbs Min 20%:..... Max 25%:_____

Wood Temperature:

POLYTESTS
TESTING THROUGH YOUR REALITY

DILUTION TUNNEL PARTICULATE SAMPLER DATA

Date: 2025-04-16 Manufacturer: Foyr Supreme Model: 3850

Project #: PJ20326 Run: 2 Tech: M.M Reviewer: DP

		TEST FILTERS					
		SYSTEM 1st hour			SYSTEM 1		
Pre-test Weight Record		Probe & Housing Number	Front & Back Filter Number	gaskets	Probe & Housing Number	Front & Back Filter Number	gaskets
Date	Time	16	114-115	7	33	116-117	12
2025-04-15	17:00	108 7499	02603	41910	109 3625	02571	41620
2025-04-16	9:30	108 7498	02604	41909	109 3626	02572	41621

		TEST FILTERS					
		SYSTEM 1st hour			SYSTEM 1		
Post-test Weight Record		Probe & Housing Number	Front & Back Filter Number	gaskets	Probe & Housing Number	Front & Back Filter Number	gaskets
Date	Time	16	114-115	7	33	116-117	12
2025-04-16	16:15	108 7499	02632	41922	109 3628	02594	41640
2025-04-23	9:00	108 7499	~~02613~~ 02630 MM	41922	109 3627	02593	41632
2025-04-24	9:00	108 7498	02625	41921	109 3627	02593	41631
2025-04-28	9:00	108 7498	02624	41921	109 3627	02593	41630

POLYTESTS
TESTING THROUGH YOUR REALITY

DILUTION TUNNEL PARTICULATE SAMPLER DATA

Date: 2025-04-16 Manufacturer: Foyer Supreme Model: 38 51D

Project #: PT 20 326 Run: 2 Tech: M.A Reviewer: AP

Pre-test Weight Record		TEST FILTERS – SYSTEM 2			
		Probe & Housing Number	Front & Back Filter Number	gaskets	Blank Filter
Date	Time	35	118. 119	50	120
2025-04-15	17:00	109 2821	02548	5,0770	0 1290
2025-04-16	9100	109 2820	02547	50771	0 1291

Post-test Weight Record		TEST FILTERS – SYSTEM 2				
		Probe & Housing Number	Front & Back Filter Number	gaskets	Blank Filter	End test time and date
Date	Time	35	118. 119	50	120	2025-04-16 ~~15:00~~ 16:00
2025-04-16	16:15	109 2820	02565	50791	0 1293	
2025-04-23	9100	109 2820	02565	50781	0 1291	
2025-04-24	9100	109 2821	02565	50781	0 1291	
2025-04-28	9100	109 2821	02566	50781	0 1291	

APPENDIX 2: Proportionality results

Average	Average	Average	Average								Average
18,41	Inlet +	Inlet +	Inlet +								0,283
	Outlet	Outlet	Outlet	Average	Average	Average	#1st Hr	#1	#2		
Tunnel	Temp.	Temp.	Temp.	105,55	98,48	97,82	System 1st Hr	System 1	System 2		SQRT
Velocity	Meter 1st Hr	Meter 1	Meter 2	**Proportional Rates**			Vol.Std.	Vol.Std.	Vol.Std.		Delta-P
				PR1st hour	**PR1**	**PR2**				Time	
Ft/Sec	Deg. R	Deg. R	Deg. R	**%**	**%**	**%**	(ft3)	(ft3)	(ft3)	min	(in H2O)2
18,594	534,668	533,5	533,2				0,182	0,172	0,176	0	0,282
18,413	534,668	533,5	533,3	103,4	102,4	102,5	0,182	0,172	0,176	1	0,278
18,474	534,652	533,5	533,4	99,8	98,5	98,6	0,183	0,172	0,176	2	0,284
18,243	534,627	533,5	533,6	100,4	99,5	99,4	0,182	0,172	0,175	3	0,281
18,475	534,578	533,5	533,7	99,3	98,0	98,1	0,183	0,172	0,175	4	0,284
18,591	534,521	533,4	533,8	98,4	97,5	97,5	0,182	0,172	0,175	5	0,286
18,435	534,474	533,4	533,9	99,7	98,5	98,4	0,183	0,172	0,175	6	0,283
18,468	534,450	533,4	534,1	99,9	98,8	98,7	0,183	0,172	0,175	7	0,283
18,247	534,448	533,4	534,2	101,2	100,2	100,0	0,182	0,172	0,175	8	0,280
18,374	534,421	533,4	534,4	100,6	99,3	99,1	0,183	0,172	0,175	9	0,282
18,210	534,402	533,5	534,6	101,7	100,5	100,4	0,183	0,172	0,175	10	0,279
18,291	534,385	533,5	534,7	101,6	100,1	100,2	0,183	0,172	0,175	11	0,280
18,695	534,428	533,5	534,9	99,9	98,7	98,5	0,183	0,172	0,175	12	0,285
18,462	534,463	533,6	535,0	101,2	100,0	99,8	0,183	0,172	0,175	13	0,282
18,288	534,507	533,6	535,2	102,3	101,0	100,7	0,183	0,172	0,175	14	0,279
18,484	534,514	533,6	535,4	101,3	100,0	99,8	0,183	0,172	0,175	15	0,282
18,499	534,560	533,7	535,6	101,3	100,1	99,8	0,183	0,172	0,175	16	0,282
18,407	534,596	533,7	535,7	102,1	100,8	100,6	0,182	0,172	0,175	17	0,280
18,364	534,644	533,7	535,9	102,3	101,4	101,0	0,182	0,172	0,175	18	0,279
18,553	534,670	533,8	536,0	101,9	100,7	100,6	0,182	0,172	0,175	19	0,281
18,464	534,666	533,8	536,1	102,9	101,6	101,1	0,183	0,172	0,175	20	0,279
18,616	534,669	533,7	536,2	102,1	100,7	100,3	0,183	0,172	0,175	21	0,282
18,452	534,697	533,7	536,3	103,1	101,9	101,4	0,183	0,172	0,175	22	0,279
18,421	534,768	533,8	536,5	103,2	102,0	101,5	0,182	0,172	0,174	23	0,278
18,837	534,810	533,9	536,6	100,9	99,8	99,3	0,182	0,172	0,174	24	0,285
18,347	534,846	533,9	536,7	103,8	102,5	102,1	0,182	0,172	0,174	25	0,277
18,647	534,858	533,9	536,9	102,1	100,9	100,3	0,182	0,172	0,174	26	0,282
18,531	534,873	533,9	536,9	102,6	101,5	101,1	0,182	0,172	0,174	27	0,280
18,173	534,860	533,9	537,0	104,6	103,4	102,8	0,183	0,172	0,174	28	0,275
18,751	534,885	533,9	537,0	101,5	100,2	99,6	0,183	0,172	0,174	29	0,283
18,566	534,916	533,9	537,1	102,2	101,1	100,8	0,182	0,172	0,175	30	0,281
18,444	534,937	533,9	537,2	102,6	101,6	100,9	0,182	0,172	0,175	31	0,279
18,318	534,999	534,0	537,4	103,3	102,3	101,5	0,182	0,172	0,174	32	0,277
18,593	535,023	534,0	537,5	101,6	100,5	100,0	0,182	0,172	0,174	33	0,282
18,470	535,049	534,0	537,5	102,3	101,2	100,5	0,182	0,172	0,174	34	0,280
18,344	535,052	534,0	537,6	103,1	102,0	101,3	0,183	0,172	0,174	35	0,278
18,426	535,087	534,0	537,7	102,4	101,2	100,6	0,182	0,172	0,174	36	0,279
18,224	535,130	534,1	537,8	103,9	102,5	102,0	0,183	0,171	0,174	37	0,276
18,357	535,166	534,1	537,8	102,9	102,0	101,4	0,182	0,172	0,174	38	0,278
18,534	535,184	534,1	537,9	101,9	101,0	100,3	0,182	0,172	0,174	39	0,281
18,548	535,220	534,2	537,9	102,2	100,9	100,4	0,183	0,172	0,174	40	0,281
18,853	535,243	534,2	538,0	100,5	99,3	98,6	0,182	0,172	0,174	41	0,285
18,553	535,270	534,2	538,1	102,2	100,8	100,3	0,182	0,171	0,174	42	0,281
18,620	535,322	534,3	538,2	101,7	100,5	100,0	0,182	0,171	0,174	43	0,282
18,631	535,327	534,3	538,2	102,0	100,6	100,3	0,182	0,171	0,174	44	0,282
18,376	535,360	534,3	538,3	103,3	101,9	101,5	0,182	0,171	0,174	45	0,278
18,703	535,394	534,3	538,3	101,7	100,4	99,8	0,182	0,171	0,174	46	0,283
18,524	535,410	534,4	538,4	102,9	101,6	100,8	0,183	0,172	0,174	47	0,280
18,531	535,458	534,4	538,4	102,1	100,7	100,3	0,182	0,172	0,174	48	0,281
18,631	535,511	534,5	538,6	101,1	100,1	99,2	0,182	0,172	0,174	49	0,283
18,772	535,600	534,6	538,7	99,9	98,8	98,2	0,182	0,172	0,174	50	0,285
18,699	535,674	534,7	538,8	100,2	99,2	98,5	0,182	0,171	0,174	51	0,284
18,576	535,731	534,8	538,9	100,9	99,6	98,9	0,182	0,171	0,174	52	0,283
18,407	535,803	534,8	539,0	102,1	100,8	100,0	0,182	0,171	0,174	53	0,280
18,574	535,832	534,9	539,2	100,8	99,6	99,1	0,182	0,171	0,174	54	0,283
18,385	535,809	534,9	539,1	101,5	100,6	100,0	0,182	0,171	0,174	55	0,280
18,451	535,805	534,8	539,1	101,6	100,3	99,5	0,182	0,171	0,174	56	0,281
18,400	535,863	534,9	539,2	101,9	100,5	100,0	0,182	0,171	0,174	57	0,280
18,506	535,843	534,9	539,3	101,0	99,9	99,2	0,182	0,171	0,174	58	0,282
18,506	535,868	535,0	539,3	100,9	99,8	99,1	0,182	0,171	0,174	59	0,282
18,759	535,888	535,1	539,5	99,8	98,7	97,9	0,182	0,171	0,174	60	0,285
18,511	535,805	535,1	539,6	0,0	99,8	99,2	0,000	0,171	0,174	61	0,282
18,447	535,768	535,2	539,7	0,0	100,2	99,4	0,000	0,171	0,174	62	0,281
18,280	535,759	535,3	539,8	230,8	101,4	100,5	0,410	0,171	0,174	63	0,278
18,457	535,801	535,3	539,8	0,4	100,2	99,7	0,001	0,171	0,174	64	0,281
17,765	536,047	535,4	539,9	0,0	104,0	103,1	0,000	0,171	0,174	65	0,270
18,331	535,886	535,4	539,9	0,0	100,8	100,1	0,000	0,171	0,173	66	0,279
18,384	535,836	535,4	539,8	0,0	100,6	99,8	0,000	0,171	0,174	67	0,280
18,510	535,807	535,4	539,8	0,0	100,1	99,2	0,000	0,172	0,174	68	0,282
18,460	535,812	535,4	539,8	0,0	100,2	99,5	0,000	0,171	0,174	69	0,281
18,407	535,798	535,4	539,7	0,0	100,3	99,5	0,000	0,171	0,173	70	0,280
18,447	535,736	535,3	539,6	0,0	100,2	99,4	0,000	0,171	0,173	71	0,281
18,447	535,727	535,3	539,6	0,0	100,2	99,4	0,000	0,171	0,174	72	0,281
18,375	535,731	535,3	539,6	0,0	100,6	99,7	0,000	0,171	0,173	73	0,280
18,427	535,738	535,3	539,6	0,0	100,0	99,4	0,000	0,171	0,174	74	0,281
18,319	535,770	535,4	539,7	0,0	100,9	99,9	0,000	0,171	0,173	75	0,279
18,497	535,778	535,5	539,8	0,0	99,7	99,2	0,000	0,171	0,174	76	0,282
18,373	535,795	535,5	539,8	0,0	100,4	99,6	0,000	0,171	0,174	77	0,280
18,255	535,815	535,6	539,8	0,0	101,0	100,2	0,000	0,171	0,173	78	0,278

18,492	535,816	535,6	539,8	0,0	99,7	98,9	0,000	0,171	0,173	79	0,282
18,365	535,843	535,6	539,8	0,0	100,4	99,7	0,000	0,171	0,174	80	0,280
18,421	535,867	535,5	539,8	0,0	100,1	99,1	0,000	0,171	0,173	81	0,281
18,421	535,880	535,5	539,7	0,0	99,8	99,3	0,000	0,171	0,173	82	0,281
18,381	535,913	535,5	539,8	0,0	100,5	100,0	0,000	0,171	0,174	83	0,280
18,491	535,935	535,6	539,8	0,0	99,7	99,0	0,000	0,171	0,174	84	0,282
18,493	535,951	535,6	539,8	0,0	99,8	98,9	0,000	0,171	0,173	85	0,282
18,662	535,964	535,6	539,8	0,0	98,8	98,1	0,000	0,171	0,173	86	0,284
18,338	536,003	535,5	539,8	0,0	100,5	99,8	0,000	0,171	0,174	87	0,279
18,663	536,005	535,5	539,8	0,0	98,6	98,2	0,000	0,171	0,174	88	0,284
18,558	536,010	535,6	539,8	0,0	99,5	98,8	0,000	0,171	0,174	89	0,283
18,489	536,022	535,6	539,9	0,0	99,6	99,1	0,000	0,171	0,174	90	0,282
18,386	536,020	535,6	539,9	0,0	100,2	99,7	0,000	0,171	0,174	91	0,280
18,430	536,045	535,7	539,9	0,0	100,0	99,4	0,000	0,171	0,174	92	0,281
18,426	536,061	535,7	539,9	0,0	100,0	99,4	0,000	0,171	0,174	93	0,281
18,660	536,095	535,7	540,0	0,0	98,8	98,0	0,000	0,171	0,174	94	0,284
18,711	536,095	535,7	540,0	0,0	98,5	97,6	0,000	0,171	0,173	95	0,285
18,702	536,079	535,7	539,9	0,0	98,3	97,5	0,000	0,171	0,173	96	0,285
18,466	536,099	535,7	539,9	0,0	99,4	99,0	0,000	0,171	0,174	97	0,282
18,513	536,121	535,8	540,0	0,0	99,3	98,5	0,000	0,171	0,174	98	0,283
18,525	536,130	535,8	539,9	0,0	99,1	98,6	0,000	0,171	0,174	99	0,283
18,638	536,158	535,8	540,0	0,0	98,5	97,8	0,000	0,171	0,173	100	0,284
18,514	536,042	535,6	539,8	0,0	99,3	98,6	0,000	0,171	0,174	101	0,283
18,449	536,050	535,6	539,9	0,0	99,4	98,8	0,000	0,171	0,174	102	0,282
18,339	536,064	535,6	539,9	0,0	100,0	99,4	0,000	0,171	0,174	103	0,280
18,380	536,079	535,7	539,9	0,0	99,7	99,1	0,000	0,171	0,174	104	0,281
18,375	536,069	535,7	539,9	0,0	99,8	99,1	0,000	0,171	0,174	105	0,281
18,607	536,094	535,7	540,0	0,0	98,5	97,7	0,000	0,171	0,174	106	0,284
18,639	536,145	535,7	540,0	0,0	98,1	97,2	0,000	0,171	0,173	107	0,285
18,640	536,129	535,7	539,9	0,0	98,0	97,2	0,000	0,171	0,173	108	0,285
18,455	536,152	535,8	540,0	0,0	98,8	98,3	0,000	0,171	0,174	109	0,283
18,634	536,163	535,8	540,0	0,0	98,0	97,2	0,000	0,171	0,174	110	0,285
18,398	536,136	535,8	540,0	0,0	99,1	98,4	0,000	0,171	0,173	111	0,282
18,387	536,139	535,8	540,0	0,0	99,2	98,4	0,000	0,171	0,173	112	0,282
18,560	536,123	535,8	539,9	0,0	98,0	97,4	0,000	0,171	0,173	113	0,284
18,367	536,080	535,8	539,9	0,0	99,3	98,5	0,000	0,171	0,174	114	0,282
18,579	536,056	535,8	539,9	0,0	97,9	97,1	0,000	0,171	0,174	115	0,285
18,656	536,045	535,7	539,9	0,0	97,6	96,7	0,000	0,171	0,173	116	0,286
18,360	536,035	535,7	539,9	0,0	99,2	98,4	0,000	0,171	0,174	117	0,282
18,597	536,037	535,7	539,8	0,0	97,8	97,1	0,000	0,171	0,174	118	0,285
18,382	536,021	535,7	539,8	0,0	98,8	98,2	0,000	0,171	0,174	119	0,282
18,617	536,027	535,7	539,8	0,0	97,6	97,0	0,000	0,171	0,174	120	0,286
18,301	536,021	535,6	539,8	0,0	99,4	98,6	0,000	0,171	0,174	121	0,281
18,409	536,004	535,6	539,9	0,0	98,7	97,9	0,000	0,171	0,174	122	0,283
18,523	536,004	535,6	539,9	0,0	98,0	97,3	0,000	0,171	0,173	123	0,284
18,586	535,974	535,6	539,9	0,0	97,6	97,0	0,000	0,171	0,173	124	0,285
18,508	535,962	535,7	539,9	0,0	98,1	97,1	0,000	0,171	0,173	125	0,284
18,327	535,975	535,6	539,9	0,0	98,7	98,1	0,000	0,171	0,173	126	0,282
17,797	535,959	535,6	539,9	0,0	101,8	101,1	0,000	0,171	0,174	127	0,273
18,421	535,960	535,6	539,8	0,0	98,3	97,6	0,000	0,171	0,174	128	0,283
18,436	535,948	535,6	539,8	0,0	98,2	97,5	0,000	0,171	0,174	129	0,283
18,203	535,936	535,6	539,8	0,0	99,4	98,9	0,000	0,171	0,174	130	0,280
18,602	535,930	535,6	539,8	0,0	97,2	96,5	0,000	0,171	0,174	131	0,286
18,536	535,916	535,6	539,8	0,0	97,5	96,7	0,000	0,171	0,173	132	0,285
18,436	535,919	535,6	539,8	0,0	98,1	97,3	0,000	0,171	0,173	133	0,284
18,422	535,903	535,6	539,8	0,0	98,1	97,7	0,000	0,171	0,174	134	0,283
18,125	535,906	535,6	539,9	0,0	99,8	99,2	0,000	0,171	0,174	135	0,279
18,476	535,905	535,6	539,9	0,0	97,6	97,0	0,000	0,171	0,174	136	0,284
18,452	535,902	535,6	539,8	0,0	97,9	97,0	0,000	0,171	0,173	137	0,284
18,465	535,900	535,6	539,8	0,0	97,9	96,9	0,000	0,171	0,173	138	0,284
18,295	535,881	535,5	539,7	0,0	98,7	98,1	0,000	0,171	0,174	139	0,282
18,523	535,873	535,5	539,7	0,0	97,4	96,7	0,000	0,171	0,174	140	0,285
18,516	535,853	535,4	539,7	0,0	97,3	96,6	0,000	0,171	0,174	141	0,285
18,621	535,840	535,5	539,8	0,0	96,7	96,0	0,000	0,171	0,174	142	0,287
18,513	535,829	535,5	539,8	0,0	97,3	96,6	0,000	0,171	0,174	143	0,285
18,458	535,798	535,5	539,8	0,0	97,5	96,9	0,000	0,171	0,174	144	0,284
18,279	535,788	535,4	539,7	0,0	98,6	97,7	0,000	0,171	0,173	145	0,282
18,453	535,767	535,5	539,8	0,0	97,7	97,1	0,000	0,171	0,174	146	0,284
18,266	535,759	535,5	539,7	0,0	98,8	97,7	0,000	0,172	0,174	147	0,282
18,446	535,740	535,4	539,7	0,0	97,7	96,9	0,000	0,172	0,173	148	0,284
18,254	535,756	535,4	539,8	0,0	98,5	97,9	0,000	0,171	0,174	149	0,282
18,210	535,736	535,4	539,8	0,0	98,9	98,1	0,000	0,171	0,174	150	0,281
18,433	535,735	535,4	539,8	0,0	97,7	96,8	0,000	0,171	0,173	151	0,284
18,433	535,726	535,4	539,8	0,0	97,7	96,6	0,000	0,172	0,173	152	0,284
18,195	535,710	535,4	539,8	0,0	98,8	98,0	0,000	0,171	0,173	153	0,281
18,251	535,708	535,4	539,7	0,0	98,6	97,8	0,000	0,171	0,174	154	0,282
18,194	535,695	535,4	539,7	0,0	98,6	98,1	0,000	0,171	0,174	155	0,281
18,481	535,712	535,4	539,7	0,0	97,2	96,4	0,000	0,171	0,174	156	0,285
18,416	535,698	535,4	539,7	0,0	97,5	96,6	0,000	0,171	0,173	157	0,284
18,420	535,680	535,3	539,7	0,0	97,5	96,9	0,000	0,171	0,174	158	0,284
18,238	535,674	535,3	539,7	0,0	98,3	97,7	0,000	0,171	0,174	159	0,282
18,234	535,646	535,3	539,7	0,0	98,4	97,7	0,000	0,171	0,174	160	0,282
18,461	535,646	535,3	539,7	0,0	97,1	96,3	0,000	0,171	0,174	161	0,285
18,404	535,649	535,3	539,7	0,0	97,6	96,6	0,000	0,171	0,173	162	0,284
18,458	535,634	535,4	539,7	0,0	97,2	96,5	0,000	0,172	0,174	163	0,285
18,223	535,617	535,4	539,8	0,0	98,3	97,7	0,000	0,171	0,174	164	0,282

18,452	535,604	535,4	539,8	0,0	97,2	96,3	0,000	0,171	0,174	165	0,285
18,328	535,601	535,4	539,8	0,0	97,6	97,0	0,000	0,171	0,174	166	0,283
18,446	535,585	535,4	539,8	0,0	97,2	96,3	0,000	0,171	0,174	167	0,285
18,490	535,588	535,4	539,8	0,0	96,8	96,0	0,000	0,172	0,174	168	0,286
18,304	535,582	535,4	539,8	0,0	97,7	96,9	0,000	0,171	0,174	169	0,283
18,310	535,601	535,4	539,8	0,0	97,7	97,0	0,000	0,171	0,174	170	0,283
18,326	535,607	535,4	539,7	0,0	97,4	96,8	0,000	0,171	0,174	171	0,283
18,382	535,601	535,4	539,7	0,0	97,2	96,7	0,000	0,171	0,174	172	0,284
18,420	535,607	535,4	539,7	0,0	97,0	96,1	0,000	0,171	0,174	173	0,285
18,438	535,594	535,4	539,7	0,0	97,0	96,3	0,000	0,171	0,174	174	0,285
18,419	535,584	535,3	539,7	0,0	96,8	95,9	0,000	0,171	0,173	175	0,285
18,413	535,559	535,3	539,7	0,0	96,6	96,2	0,000	0,171	0,173	176	0,285
18,187	535,550	535,4	539,6	0,0	98,1	97,3	0,000	0,171	0,174	177	0,282
18,355	535,533	535,4	539,6	0,0	97,1	96,4	0,000	0,171	0,174	178	0,284
18,345	535,527	535,4	539,6	0,0	97,1	96,5	0,000	0,171	0,174	179	0,284
18,117	535,491	535,3	539,6	0,0	98,3	97,6	0,000	0,171	0,174	180	0,281
18,232	535,497	535,3	539,5	0,0	97,7	97,0	0,000	0,171	0,174	181	0,283
18,455	535,471	535,3	539,5	0,0	96,4	95,8	0,000	0,171	0,174	182	0,286
18,402	535,468	535,2	539,5	0,0	96,8	96,1	0,000	0,171	0,174	183	0,285
18,399	535,431	535,2	539,5	0,0	96,9	96,2	0,000	0,171	0,174	184	0,285
18,224	535,424	535,2	539,5	0,0	97,8	97,1	0,000	0,171	0,174	185	0,283
18,338	535,415	535,2	539,4	0,0	97,0	96,3	0,000	0,171	0,174	186	0,284
18,394	535,386	535,1	539,4	0,0	96,8	96,1	0,000	0,171	0,174	187	0,285
18,336	535,390	535,1	539,4	0,0	97,1	96,4	0,000	0,171	0,174	188	0,284
18,216	535,379	535,1	539,4	0,0	97,8	96,9	0,000	0,171	0,174	189	0,283
18,463	535,363	535,1	539,3	0,0	96,4	95,8	0,000	0,171	0,174	190	0,286
18,401	535,346	535,1	539,4	0,0	97,0	96,1	0,000	0,172	0,174	191	0,285
18,445	535,332	535,1	539,3	0,0	96,5	95,8	0,000	0,172	0,174	192	0,286
18,387	535,338	535,1	539,4	0,0	96,8	96,1	0,000	0,171	0,174	193	0,285
17,913	535,317	535,1	539,4	0,0	99,2	98,6	0,000	0,171	0,174	194	0,278
18,429	535,297	535,1	539,3	0,0	96,7	95,7	0,000	0,171	0,174	195	0,286
18,379	535,289	535,1	539,3	0,0	96,8	96,2	0,000	0,172	0,174	196	0,285
18,142	535,271	535,1	539,3	0,0	97,9	97,2	0,000	0,171	0,174	197	0,282
18,360	535,257	535,1	539,4	0,0	96,8	96,0	0,000	0,171	0,174	198	0,285
18,085	535,243	535,1	539,4	0,0	98,2	97,6	0,000	0,171	0,174	199	0,281
18,317	535,218	535,0	539,4	0,0	96,9	96,3	0,000	0,171	0,174	200	0,284
18,255	535,161	535,0	539,3	0,0	97,4	96,5	0,000	0,171	0,174	201	0,283
18,263	535,128	534,9	539,2	0,0	97,4	96,6	0,000	0,172	0,174	202	0,283
18,379	535,130	534,9	539,2	0,0	96,9	96,2	0,000	0,172	0,174	203	0,285
18,433	535,111	534,9	539,2	0,0	96,5	95,6	0,000	0,172	0,174	204	0,286
18,192	535,098	534,9	539,2	0,0	97,6	96,8	0,000	0,172	0,174	205	0,283
18,018	535,094	535,0	539,2	0,0	98,6	97,9	0,000	0,171	0,174	206	0,280
18,304	535,076	535,0	539,2	0,0	97,1	96,3	0,000	0,172	0,174	207	0,284
18,190	535,057	534,9	539,2	0,0	97,6	97,0	0,000	0,172	0,174	208	0,283
18,071	535,062	534,9	539,2	0,0	98,2	97,6	0,000	0,171	0,174	209	0,281
18,363	535,042	535,0	539,2	0,0	96,7	95,8	0,000	0,171	0,174	210	0,285
18,138	535,024	535,0	539,2	0,0	97,9	97,3	0,000	0,171	0,174	211	0,282
18,361	535,026	535,0	539,2	0,0	96,7	95,9	0,000	0,171	0,174	212	0,285
18,360	535,030	535,0	539,2	0,0	96,7	95,7	0,000	0,172	0,174	213	0,285
18,362	535,030	535,0	539,2	0,0	96,9	96,1	0,000	0,172	0,174	214	0,285
18,363	535,031	535,0	539,2	0,0	96,7	95,9	0,000	0,172	0,174	215	0,285
18,420	535,017	535,0	539,2	0,0	96,4	95,6	0,000	0,171	0,174	216	0,286
18,354	535,012	535,0	539,2	0,0	96,4	95,7	0,000	0,171	0,173	217	0,285
18,243	535,017	535,0	539,2	0,0	97,3	96,4	0,000	0,171	0,173	218	0,283
18,406	534,997	535,0	539,3	0,0	96,4	95,7	0,000	0,171	0,174	219	0,286
18,410	534,979	535,0	539,3	0,0	96,4	95,6	0,000	0,171	0,174	220	0,286
18,358	534,969	535,0	539,2	0,0	96,6	96,0	0,000	0,171	0,174	221	0,285
18,407	534,980	535,0	539,3	0,0	96,3	95,6	0,000	0,171	0,174	222	0,286
18,418	534,965	535,0	539,3	0,0	96,4	95,6	0,000	0,171	0,174	223	0,286
18,350	534,947	535,0	539,2	0,0	96,6	96,0	0,000	0,171	0,174	224	0,285
18,473	534,948	535,0	539,2	0,0	96,1	95,3	0,000	0,171	0,174	225	0,287
18,406	534,927	535,0	539,2	0,0	96,2	95,6	0,000	0,171	0,174	226	0,286
18,239	534,932	534,9	539,2	0,0	97,3	96,6	0,000	0,171	0,174	227	0,283
18,180	534,932	534,9	539,3	0,0	97,6	96,7	0,000	0,171	0,174	228	0,283
18,414	534,947	535,0	539,2	0,0	96,4	95,7	0,000	0,171	0,174	229	0,286
18,353	534,933	535,0	539,3	0,0	96,6	95,8	0,000	0,171	0,174	230	0,285
18,352	534,930	535,0	539,3	0,0	96,5	95,9	0,000	0,171	0,174	231	0,285
18,410	534,915	535,0	539,3	0,0	96,0	95,6	0,000	0,171	0,174	232	0,286
18,341	534,915	535,0	539,3	0,0	96,6	96,0	0,000	0,171	0,174	233	0,285
18,180	534,916	535,0	539,3	0,0	97,6	96,8	0,000	0,171	0,174	234	0,283
18,415	534,935	534,9	539,3	0,0	96,4	95,7	0,000	0,172	0,174	235	0,286
18,409	534,929	535,0	539,3	0,0	96,2	95,5	0,000	0,171	0,174	236	0,286
18,399	534,913	534,9	539,3	0,0	96,1	95,3	0,000	0,171	0,173	237	0,286
18,295	534,894	534,9	539,3	0,0	97,1	96,1	0,000	0,171	0,173	238	0,284
18,460	534,895	534,9	539,2	0,0	96,0	95,3	0,000	0,172	0,174	239	0,287
18,286	534,880	534,8	539,2	0,0	96,8	96,0	0,000	0,171	0,174	240	0,284
18,347	534,852	534,8	539,2	0,0	96,6	96,2	0,000	0,171	0,174	241	0,285
18,471	534,842	534,8	539,2	0,0	96,0	95,2	0,000	0,171	0,174	242	0,287
18,399	534,802	534,8	539,2	0,0	96,3	95,6	0,000	0,171	0,174	243	0,286
18,345	534,813	534,8	539,2	0,0	96,7	96,0	0,000	0,171	0,174	244	0,285
18,347	534,812	534,8	539,2	0,0	96,6	96,0	0,000	0,172	0,174	245	0,285
18,295	534,822	534,8	539,3	0,0	97,0	96,2	0,000	0,172	0,174	246	0,284
18,286	534,795	534,9	539,4	0,0	97,0	96,2	0,000	0,172	0,174	247	0,284
18,413	534,790	534,9	539,3	0,0	96,5	95,7	0,000	0,172	0,174	248	0,286
18,350	534,805	534,9	539,3	0,0	96,7	95,9	0,000	0,172	0,174	249	0,285
18,344	534,786	535,0	539,3	0,0	96,6	95,6	0,000	0,172	0,174	250	0,285

18,288	534,784	534,9	539,2	0,0	96,9	96,3	0,000	0,171	0,174	251	0,284
18,347	534,741	534,8	539,2	0,0	96,5	95,7	0,000	0,171	0,174	252	0,285
18,522	534,731	534,8	539,2	0,0	95,6	94,9	0,000	0,171	0,174	253	0,288
18,407	534,712	534,7	539,1	0,0	96,3	95,4	0,000	0,171	0,174	254	0,286
18,395	534,686	534,7	539,0	0,0	96,3	95,5	0,000	0,172	0,174	255	0,286
18,214	534,616	534,5	538,9	0,0	97,0	96,4	0,000	0,171	0,174	256	0,283
18,337	534,556	534,4	538,8	0,0	96,5	95,8	0,000	0,171	0,174	257	0,285
18,339	534,506	534,4	538,7	0,0	96,7	95,8	0,000	0,172	0,174	258	0,285
18,346	534,463	534,3	538,7	0,0	96,6	96,1	0,000	0,172	0,174	259	0,285
18,405	534,468	534,4	538,7	0,0	96,4	95,7	0,000	0,172	0,174	260	0,286
18,345	534,456	534,3	538,7	0,0	96,7	95,9	0,000	0,172	0,174	261	0,285
18,115	534,455	534,3	538,7	0,0	98,0	97,2	0,000	0,172	0,174	262	0,282
18,345	534,447	534,4	538,7	0,0	96,6	96,1	0,000	0,172	0,174	263	0,285
18,336	534,448	534,4	538,7	0,0	96,5	95,9	0,000	0,171	0,174	264	0,285
18,395	534,443	534,4	538,7	0,0	96,2	95,8	0,000	0,171	0,174	265	0,286
18,447	534,426	534,4	538,8	0,0	96,0	95,3	0,000	0,171	0,174	266	0,287
18,509	534,424	534,5	538,8	0,0	95,8	95,1	0,000	0,172	0,174	267	0,288
18,391	534,417	534,5	538,8	0,0	96,2	95,5	0,000	0,172	0,174	268	0,286
18,393	534,431	534,5	538,8	0,0	96,2	95,7	0,000	0,171	0,174	269	0,286
18,054	534,449	534,6	538,9	0,0	98,2	97,4	0,000	0,171	0,174	270	0,281
18,325	534,456	534,6	539,0	0,0	96,5	95,8	0,000	0,171	0,174	271	0,285
18,211	534,476	534,7	539,1	0,0	97,0	96,4	0,000	0,171	0,174	272	0,283

Average	Average	Average	Average								Average
18,33	Inlet +	Inlet +	Inlet +								0,284
	Outlet	Outlet	Outlet	Average	Average	Average	#1st Hr	#1	#2		
Tunnel	Temp.	Temp.	Temp.	103,19	99,10	98,08	System 1st Hr	System 1	System 2		SQRT
Velocity	Meter 1st Hr	Meter 1	Meter 2	**Proportional Rates**			Vol.Std.	Vol.Std.	Vol.Std.		Delta-P
				PR1st hour	**PR1**	**PR2**				Time	
Ft/Sec	Deg. R	Deg. R	Deg. R	**%**	**%**	**%**	(ft3)	(ft3)	(ft3)	min	(in H2O)2
18,607	530,708	529,6	529,3				0,185	0,174	0,178	0	0,283
18,023	530,708	529,5	529,4	105,2	104,0	103,7	0,185	0,174	0,178	1	0,275
18,325	530,734	529,4	529,4	100,9	99,7	99,3	0,185	0,174	0,178	2	0,283
18,349	530,653	529,4	529,5	100,4	99,1	98,9	0,185	0,174	0,178	3	0,284
18,348	530,593	529,3	529,6	100,4	99,0	98,7	0,185	0,174	0,178	4	0,284
18,045	530,520	529,3	529,7	101,9	100,7	100,3	0,185	0,174	0,178	5	0,280
18,465	530,481	529,2	529,8	99,8	98,3	98,1	0,185	0,174	0,178	6	0,286
18,193	530,475	529,2	529,9	101,6	100,3	100,0	0,185	0,174	0,178	7	0,281
18,416	530,445	529,2	530,1	100,7	99,5	99,2	0,185	0,174	0,178	8	0,284
18,193	530,400	529,2	530,2	102,1	101,1	100,3	0,185	0,174	0,178	9	0,281
18,448	530,378	529,3	530,4	100,9	99,6	99,3	0,185	0,174	0,178	10	0,284
18,407	530,355	529,3	530,6	101,4	100,0	99,4	0,185	0,174	0,178	11	0,283
18,514	530,362	529,3	530,7	101,0	99,5	98,8	0,186	0,174	0,177	12	0,285
18,405	530,375	529,3	530,9	101,4	100,1	99,4	0,185	0,174	0,177	13	0,283
18,462	530,369	529,3	531,0	101,7	100,4	99,7	0,185	0,174	0,177	14	0,283
18,365	530,351	529,3	531,2	102,4	101,2	100,4	0,185	0,174	0,177	15	0,282
18,490	530,359	529,4	531,3	101,7	100,5	99,8	0,185	0,174	0,177	16	0,284
18,570	530,370	529,4	531,5	101,6	100,1	99,5	0,185	0,174	0,177	17	0,284
18,224	530,428	529,5	531,6	103,6	102,4	101,7	0,185	0,174	0,177	18	0,279
18,081	530,426	529,5	531,7	104,9	103,8	102,6	0,185	0,174	0,177	19	0,276
18,255	530,429	529,5	531,8	103,7	102,6	101,8	0,185	0,174	0,177	20	0,279
18,480	530,409	529,5	531,9	102,8	101,6	100,8	0,185	0,174	0,177	21	0,282
18,487	530,375	529,4	531,9	103,2	101,9	101,1	0,185	0,174	0,177	22	0,282
18,380	530,405	529,4	532,1	103,9	102,4	101,8	0,185	0,174	0,177	23	0,280
18,388	530,477	529,5	532,2	104,1	102,5	101,8	0,185	0,174	0,177	24	0,280
18,416	530,503	529,5	532,3	104,0	102,7	101,9	0,185	0,174	0,177	25	0,280
18,427	530,487	529,5	532,4	103,9	102,4	101,8	0,185	0,174	0,177	26	0,280
18,445	530,469	529,6	532,5	103,4	102,3	101,4	0,185	0,174	0,177	27	0,281
18,304	530,454	529,6	532,5	104,1	102,7	101,9	0,185	0,174	0,177	28	0,279
18,096	530,463	529,6	532,5	104,6	103,7	102,6	0,184	0,174	0,177	29	0,276
18,212	530,461	529,6	532,7	104,4	102,8	102,0	0,185	0,174	0,177	30	0,278
18,483	530,519	529,6	532,7	102,9	101,7	100,7	0,185	0,174	0,177	31	0,282
18,234	530,574	529,6	532,8	104,5	102,9	102,1	0,185	0,174	0,177	32	0,278
18,337	530,630	529,7	532,9	103,6	102,3	101,3	0,185	0,174	0,177	33	0,280
18,482	530,650	529,7	532,9	102,5	101,0	100,2	0,185	0,174	0,177	34	0,283
18,010	530,659	529,7	533,0	104,8	103,7	102,7	0,185	0,174	0,177	35	0,276
18,468	530,676	529,8	533,0	102,4	101,0	100,0	0,185	0,174	0,177	36	0,282
18,426	530,703	529,7	533,1	102,5	101,4	100,6	0,185	0,174	0,177	37	0,282
18,653	530,749	529,7	533,1	101,3	100,2	99,2	0,185	0,174	0,177	38	0,285
18,605	530,752	529,8	533,3	101,8	100,6	99,5	0,185	0,174	0,177	39	0,284
18,273	530,727	529,8	533,3	103,6	102,4	101,2	0,185	0,174	0,177	40	0,279
18,658	530,687	529,9	533,3	101,5	100,1	99,3	0,185	0,174	0,177	41	0,285
18,368	530,731	529,9	533,4	103,0	101,7	100,8	0,185	0,174	0,177	42	0,281
18,434	530,769	529,9	533,4	102,9	101,2	100,5	0,185	0,174	0,177	43	0,282
18,434	530,787	529,9	533,4	102,7	101,5	100,5	0,185	0,174	0,177	44	0,282
18,439	530,830	529,9	533,5	102,4	101,3	100,4	0,185	0,174	0,177	45	0,282
18,635	530,851	529,9	533,5	101,2	100,0	99,0	0,185	0,174	0,177	46	0,285
18,300	530,914	530,0	533,6	103,2	102,0	100,9	0,185	0,174	0,176	47	0,280
18,307	530,902	530,0	533,7	103,4	102,0	101,0	0,185	0,174	0,177	48	0,280
18,389	530,919	530,0	533,7	103,3	101,9	100,8	0,185	0,174	0,177	49	0,281
18,397	530,943	530,1	533,8	102,6	101,2	100,1	0,185	0,174	0,176	50	0,282
18,309	531,004	530,1	533,8	102,8	101,3	100,2	0,185	0,174	0,176	51	0,281
18,313	530,993	530,1	533,8	102,8	101,4	100,3	0,185	0,174	0,176	52	0,281
18,549	531,019	530,2	533,9	101,4	99,9	99,1	0,185	0,174	0,177	53	0,284
18,173	531,030	530,1	533,9	103,2	101,7	100,9	0,185	0,174	0,177	54	0,279
18,364	531,066	530,2	534,0	102,4	100,9	99,8	0,185	0,174	0,176	55	0,282
18,371	531,087	530,2	534,1	102,3	101,0	99,9	0,185	0,174	0,176	56	0,282
18,373	531,071	530,3	534,1	102,2	101,1	99,9	0,185	0,174	0,176	57	0,282
18,531	531,096	530,3	534,2	101,2	99,6	98,9	0,185	0,174	0,176	58	0,284
18,590	531,130	530,4	534,3	100,9	99,7	98,5	0,185	0,174	0,176	59	0,285
18,234	531,142	530,4	534,2	102,9	101,4	100,3	0,185	0,174	0,176	60	0,280
18,183	530,904	530,4	534,3	0,0	102,1	100,8	0,000	0,174	0,176	61	0,279
18,302	530,794	530,4	534,4	0,0	101,3	100,2	0,000	0,174	0,176	62	0,281
18,350	530,719	530,5	534,5	0,0	101,0	99,7	0,000	0,174	0,176	63	0,282
18,529	530,694	530,6	534,6	0,0	100,0	99,1	0,000	0,174	0,176	64	0,284
18,523	530,699	530,6	534,6	0,0	99,8	98,8	0,000	0,174	0,177	65	0,284
18,226	530,698	530,5	534,6	0,0	101,3	100,4	0,000	0,174	0,176	66	0,280
18,346	530,732	530,5	534,6	0,0	100,8	99,9	0,000	0,174	0,177	67	0,282
18,555	530,724	530,5	534,5	0,0	99,8	98,6	0,000	0,174	0,176	68	0,285
18,241	530,738	530,5	534,6	0,0	101,6	100,6	0,000	0,174	0,176	69	0,280
18,517	530,751	530,5	534,6	0,0	99,7	98,7	0,000	0,174	0,176	70	0,284
18,537	530,738	530,5	534,6	0,0	99,7	98,8	0,000	0,174	0,176	71	0,285
18,234	530,754	530,5	534,6	0,0	101,5	100,5	0,000	0,174	0,176	72	0,280
18,359	530,758	530,5	534,7	0,0	100,8	99,7	0,000	0,174	0,176	73	0,282
18,357	530,767	530,6	534,8	0,0	100,9	99,8	0,000	0,174	0,176	74	0,282
18,658	530,782	530,6	534,8	0,0	99,2	98,2	0,000	0,174	0,176	75	0,286
18,594	530,786	530,6	534,8	0,0	99,7	98,4	0,000	0,174	0,176	76	0,285
18,392	530,802	530,6	534,8	0,0	100,6	99,5	0,000	0,174	0,176	77	0,282
18,390	530,832	530,7	534,9	0,0	100,7	99,6	0,000	0,174	0,176	78	0,282

18,282	530,844	530,7	534,9	0,0	101,2	99,8	0,000	0,174	0,176	79	0,281
18,570	530,848	530,7	534,9	0,0	99,4	98,3	0,000	0,174	0,176	80	0,285
18,098	530,859	530,7	534,8	0,0	102,0	100,7	0,000	0,174	0,176	81	0,278
17,569	530,863	530,7	534,9	0,0	105,3	104,1	0,000	0,174	0,176	82	0,270
18,576	530,868	530,8	534,9	0,0	99,4	98,4	0,000	0,174	0,176	83	0,285
18,613	530,882	530,8	534,9	0,0	99,0	97,9	0,000	0,174	0,176	84	0,286
18,485	530,898	530,8	534,8	0,0	99,6	98,5	0,000	0,174	0,176	85	0,284
18,321	530,899	530,8	534,8	0,0	100,6	99,7	0,000	0,174	0,176	86	0,282
18,323	530,910	530,7	534,8	0,0	100,6	99,6	0,000	0,174	0,176	87	0,282
18,319	530,930	530,8	534,9	0,0	100,6	99,5	0,000	0,174	0,176	88	0,282
18,305	530,944	530,8	534,9	0,0	100,5	99,5	0,000	0,174	0,176	89	0,282
18,444	530,961	530,8	534,9	0,0	100,1	98,9	0,000	0,174	0,176	90	0,284
18,486	530,997	530,8	534,9	0,0	99,6	98,5	0,000	0,174	0,176	91	0,284
18,309	531,034	530,8	534,9	0,0	100,6	99,4	0,000	0,174	0,176	92	0,282
18,475	531,064	530,8	534,9	0,0	99,6	98,6	0,000	0,174	0,176	93	0,284
18,482	531,105	530,8	534,9	0,0	99,8	98,4	0,000	0,174	0,176	94	0,284
18,511	531,103	530,8	534,9	0,0	99,1	98,1	0,000	0,174	0,176	95	0,285
18,348	531,133	530,9	535,0	0,0	100,1	99,0	0,000	0,174	0,176	96	0,283
18,452	531,135	530,9	535,0	0,0	99,2	98,5	0,000	0,174	0,176	97	0,284
18,316	531,157	531,0	535,1	0,0	99,8	99,0	0,000	0,173	0,176	98	0,283
18,504	531,184	531,0	535,1	0,0	99,3	98,0	0,000	0,174	0,176	99	0,285
18,267	531,206	531,0	535,1	0,0	100,2	99,0	0,000	0,174	0,176	100	0,282
18,191	531,214	531,0	535,1	0,0	100,5	99,5	0,000	0,174	0,176	101	0,281
18,464	531,215	531,0	535,1	0,0	99,0	98,1	0,000	0,174	0,176	102	0,285
18,246	531,203	531,0	535,0	37,0	100,2	99,2	0,067	0,174	0,176	103	0,282
18,556	531,336	531,0	535,0	0,3	98,7	97,8	0,001	0,174	0,176	104	0,286
18,421	531,428	531,0	535,1	0,0	99,1	98,1	0,000	0,174	0,176	105	0,284
18,434	531,350	531,1	535,1	0,0	99,4	98,5	0,000	0,174	0,176	106	0,284
18,360	531,314	531,0	535,2	0,0	99,4	98,4	0,000	0,174	0,176	107	0,283
18,323	531,311	531,1	535,3	0,0	99,7	98,6	0,000	0,174	0,176	108	0,283
18,540	531,315	531,1	535,4	0,0	98,5	97,6	0,000	0,174	0,176	109	0,286
18,239	531,322	531,2	535,4	0,0	100,1	99,1	0,000	0,174	0,176	110	0,282
18,421	531,320	531,2	535,4	0,0	99,3	98,0	0,000	0,174	0,176	111	0,284
18,523	531,326	531,2	535,4	0,0	98,4	97,5	0,000	0,174	0,176	112	0,286
18,528	531,326	531,2	535,4	0,0	98,6	97,3	0,000	0,174	0,176	113	0,286
18,461	531,301	531,2	535,3	0,0	98,7	97,8	0,000	0,174	0,176	114	0,285
18,343	531,350	531,2	535,2	0,0	99,6	98,3	0,000	0,174	0,176	115	0,283
18,453	531,334	531,2	535,2	0,0	98,7	97,6	0,000	0,174	0,176	116	0,285
18,506	531,328	531,2	535,3	0,0	98,6	97,4	0,000	0,174	0,176	117	0,286
18,613	531,329	531,2	535,2	0,0	97,7	96,7	0,000	0,174	0,176	118	0,288
18,497	531,314	531,1	535,1	0,0	98,2	97,3	0,000	0,173	0,176	119	0,286
18,440	531,316	531,1	535,1	0,0	98,5	97,4	0,000	0,174	0,176	120	0,286
18,392	531,312	531,1	535,1	0,0	98,5	97,3	0,000	0,174	0,176	121	0,285
18,401	531,318	531,1	535,1	0,0	98,4	97,3	0,000	0,174	0,176	122	0,285
18,411	531,347	531,1	535,1	0,0	98,5	97,4	0,000	0,174	0,176	123	0,285
18,570	531,321	531,0	535,1	0,0	97,5	96,6	0,000	0,174	0,176	124	0,288
18,454	531,333	531,0	535,1	0,0	98,2	97,2	0,000	0,174	0,176	125	0,286
18,462	531,345	531,0	535,0	0,0	98,1	97,2	0,000	0,174	0,176	126	0,286
18,353	531,348	531,0	535,1	0,0	99,0	97,9	0,000	0,174	0,176	127	0,284
18,441	531,335	531,0	535,1	0,0	98,0	97,0	0,000	0,174	0,176	128	0,286
18,443	531,339	531,0	535,2	0,0	98,2	97,0	0,000	0,174	0,176	129	0,286
18,439	531,327	531,0	535,1	0,0	98,1	97,1	0,000	0,174	0,176	130	0,286
18,373	531,329	531,0	535,1	0,0	98,6	97,2	0,000	0,174	0,176	131	0,285
18,542	531,323	531,0	535,2	0,0	97,3	96,4	0,000	0,174	0,176	132	0,288
18,307	531,344	531,0	535,2	0,0	98,7	97,4	0,000	0,174	0,176	133	0,284
18,377	531,315	531,0	535,2	0,0	98,3	97,4	0,000	0,174	0,176	134	0,285
18,021	531,320	531,0	535,2	0,0	100,3	99,4	0,000	0,174	0,176	135	0,280
18,404	531,335	531,1	535,2	0,0	97,9	96,8	0,000	0,174	0,176	136	0,286
18,125	531,321	531,1	535,2	0,0	99,6	98,5	0,000	0,174	0,176	137	0,282
18,299	531,316	531,1	535,2	0,0	98,3	97,2	0,000	0,174	0,176	138	0,285
18,471	531,299	531,1	535,2	0,0	97,5	96,5	0,000	0,174	0,176	139	0,287
18,401	531,285	531,0	535,2	0,0	97,8	96,8	0,000	0,174	0,176	140	0,286
18,462	531,288	531,0	535,1	0,0	97,7	96,5	0,000	0,174	0,176	141	0,287
18,381	531,262	531,0	535,1	0,0	97,8	96,7	0,000	0,174	0,176	142	0,286
18,435	531,251	531,0	535,2	0,0	97,6	96,3	0,000	0,174	0,176	143	0,287
18,319	531,236	531,0	535,2	0,0	98,0	96,9	0,000	0,174	0,176	144	0,285
18,257	531,229	531,0	535,3	0,0	98,3	97,3	0,000	0,174	0,176	145	0,284
18,439	531,219	531,0	535,2	0,0	97,4	96,3	0,000	0,174	0,176	146	0,287
18,376	531,208	530,9	535,2	0,0	97,9	96,8	0,000	0,174	0,176	147	0,286
18,367	531,209	530,9	535,2	0,0	97,7	96,6	0,000	0,174	0,176	148	0,286
18,138	531,186	530,9	535,1	0,0	99,0	98,0	0,000	0,174	0,176	149	0,283
18,307	531,181	530,9	535,1	0,0	98,1	96,9	0,000	0,174	0,176	150	0,285
18,368	531,179	530,9	535,1	0,0	97,7	96,6	0,000	0,174	0,176	151	0,286
18,303	531,153	530,9	535,1	0,0	98,0	96,6	0,000	0,174	0,176	152	0,285
18,455	531,116	530,8	535,0	0,0	97,0	95,9	0,000	0,174	0,176	153	0,288
18,347	531,110	530,8	535,0	0,0	97,6	96,5	0,000	0,174	0,176	154	0,286
18,302	531,090	530,9	535,0	0,0	98,0	96,8	0,000	0,174	0,176	155	0,285
18,271	531,068	530,9	535,0	0,0	98,1	96,9	0,000	0,174	0,176	156	0,285
18,404	531,038	530,8	534,9	0,0	97,4	96,2	0,000	0,174	0,176	157	0,287
18,347	531,011	530,8	534,9	0,0	97,5	96,6	0,000	0,174	0,176	158	0,286
18,285	531,000	530,8	534,9	0,0	97,8	96,8	0,000	0,174	0,176	159	0,285
18,291	530,975	530,8	534,9	0,0	97,9	97,0	0,000	0,174	0,176	160	0,285
18,285	530,944	530,7	534,8	0,0	97,8	97,0	0,000	0,174	0,176	161	0,285
18,175	530,947	530,7	534,9	0,0	98,7	97,2	0,000	0,174	0,176	162	0,283
18,284	530,934	530,7	534,9	0,0	98,0	96,8	0,000	0,174	0,176	163	0,285
18,303	530,902	530,7	534,8	0,0	97,8	96,7	0,000	0,174	0,176	164	0,285

18,198	530,896	530,7	534,8	0,0	98,4	97,4	0,000	0,174	0,176	165	0,284
18,293	530,899	530,7	534,8	0,0	98,0	96,8	0,000	0,174	0,176	166	0,285
18,348	530,904	530,7	534,9	0,0	97,6	96,6	0,000	0,174	0,176	167	0,286
18,340	530,875	530,7	534,8	0,0	97,4	96,6	0,000	0,174	0,176	168	0,286
18,287	530,844	530,7	534,8	0,0	98,1	96,9	0,000	0,174	0,176	169	0,285
18,226	530,839	530,6	534,8	0,0	98,4	97,2	0,000	0,174	0,176	170	0,284
18,223	530,844	530,6	534,8	0,0	98,2	97,2	0,000	0,174	0,176	171	0,284
18,112	530,830	530,6	534,8	0,0	99,0	97,6	0,000	0,174	0,176	172	0,283
18,281	530,825	530,6	534,7	0,0	97,9	96,7	0,000	0,174	0,176	173	0,285
18,138	530,787	530,6	534,7	0,0	98,4	97,5	0,000	0,174	0,176	174	0,283
18,321	530,805	530,6	534,7	0,0	97,5	96,6	0,000	0,174	0,176	175	0,286
18,041	530,784	530,6	534,7	0,0	99,1	98,0	0,000	0,174	0,176	176	0,282
18,436	530,776	530,6	534,7	0,0	96,8	95,9	0,000	0,174	0,176	177	0,288
18,056	530,740	530,6	534,7	0,0	98,9	97,9	0,000	0,174	0,176	178	0,282
18,320	530,732	530,6	534,7	0,0	97,6	96,4	0,000	0,174	0,176	179	0,286
18,218	530,704	530,5	534,6	0,0	98,2	97,2	0,000	0,174	0,176	180	0,284
18,271	530,704	530,5	534,7	0,0	97,8	96,8	0,000	0,174	0,176	181	0,285
18,259	530,691	530,5	534,6	0,0	97,8	96,7	0,000	0,174	0,176	182	0,285
18,088	530,684	530,5	534,6	0,0	98,8	97,7	0,000	0,174	0,176	183	0,283
18,316	530,663	530,5	534,6	0,0	97,7	96,4	0,000	0,174	0,176	184	0,286
18,440	530,647	530,5	534,6	0,0	96,9	95,9	0,000	0,174	0,176	185	0,288
17,996	530,650	530,6	534,7	0,0	99,5	98,2	0,000	0,174	0,176	186	0,281
18,319	530,648	530,6	534,7	0,0	97,3	96,5	0,000	0,174	0,176	187	0,286
18,268	530,642	530,6	534,8	0,0	97,8	96,8	0,000	0,174	0,176	188	0,285
18,274	530,628	530,6	534,8	0,0	98,1	96,7	0,000	0,174	0,176	189	0,285
18,315	530,629	530,6	534,8	0,0	97,5	96,4	0,000	0,174	0,176	190	0,286
18,320	530,613	530,6	534,8	0,0	97,6	96,5	0,000	0,174	0,176	191	0,286
18,312	530,617	530,5	534,7	0,0	97,4	96,4	0,000	0,174	0,176	192	0,286
18,259	530,609	530,5	534,7	0,0	98,0	96,7	0,000	0,174	0,176	193	0,285
18,320	530,603	530,5	534,7	0,0	97,6	96,5	0,000	0,174	0,176	194	0,286
18,204	530,622	530,5	534,6	0,0	98,3	97,1	0,000	0,174	0,176	195	0,284
18,258	530,588	530,4	534,6	0,0	97,7	96,8	0,000	0,174	0,176	196	0,285
18,256	530,616	530,4	534,6	0,0	97,9	96,8	0,000	0,174	0,176	197	0,285
18,324	530,608	530,4	534,6	0,0	97,6	96,5	0,000	0,174	0,176	198	0,286
18,174	530,597	530,4	534,6	0,0	98,3	97,2	0,000	0,174	0,176	199	0,284
18,307	530,597	530,4	534,6	0,0	97,5	96,3	0,000	0,174	0,176	200	0,286
18,189	530,575	530,4	534,6	0,0	98,1	97,1	0,000	0,174	0,176	201	0,284
18,079	530,562	530,4	534,7	0,0	98,8	97,6	0,000	0,174	0,176	202	0,283
18,311	530,550	530,4	534,6	0,0	97,5	96,6	0,000	0,174	0,176	203	0,286
18,195	530,544	530,4	534,6	0,0	98,1	97,1	0,000	0,174	0,176	204	0,284
18,246	530,523	530,4	534,5	0,0	97,6	96,6	0,000	0,174	0,176	205	0,285
18,308	530,500	530,4	534,5	0,0	97,5	96,5	0,000	0,174	0,176	206	0,286
18,415	530,489	530,4	534,5	0,0	96,9	95,8	0,000	0,174	0,176	207	0,288
18,304	530,477	530,3	534,5	0,0	97,5	96,5	0,000	0,174	0,176	208	0,286
18,296	530,469	530,3	534,6	0,0	97,5	96,4	0,000	0,174	0,176	209	0,286
18,420	530,436	530,3	534,6	0,0	97,0	95,8	0,000	0,174	0,176	210	0,288
18,192	530,454	530,3	534,5	0,0	98,1	97,0	0,000	0,174	0,176	211	0,284
18,359	530,446	530,3	534,5	0,0	97,2	96,1	0,000	0,174	0,176	212	0,287
18,235	530,418	530,3	534,4	0,0	97,8	96,6	0,000	0,174	0,176	213	0,285
18,304	530,410	530,3	534,4	0,0	97,4	96,5	0,000	0,174	0,176	214	0,286
18,360	530,397	530,3	534,4	0,0	96,9	96,1	0,000	0,174	0,177	215	0,287
18,322	530,396	530,3	534,4	0,0	97,4	96,1	0,000	0,174	0,176	216	0,287
18,233	530,390	530,3	534,3	0,0	97,8	96,7	0,000	0,174	0,176	217	0,285
18,247	530,354	530,2	534,3	0,0	97,8	96,6	0,000	0,174	0,176	218	0,285
18,292	530,329	530,2	534,3	0,0	97,4	96,4	0,000	0,174	0,176	219	0,286
18,339	530,319	530,2	534,3	0,0	97,0	96,2	0,000	0,174	0,177	220	0,287
18,384	530,281	530,3	534,3	0,0	96,7	95,7	0,000	0,174	0,177	221	0,288
18,211	530,270	530,3	534,4	0,0	97,5	96,7	0,000	0,174	0,176	222	0,285
18,310	530,255	530,3	534,4	0,0	97,0	96,1	0,000	0,174	0,177	223	0,287
18,271	530,257	530,3	534,4	0,0	97,5	96,3	0,000	0,174	0,176	224	0,286
18,113	530,264	530,4	534,4	0,0	98,3	97,4	0,000	0,174	0,176	225	0,283
18,340	530,241	530,4	534,4	0,0	97,0	96,0	0,000	0,174	0,176	226	0,287
18,268	530,232	530,4	534,4	0,0	97,5	96,3	0,000	0,174	0,176	227	0,286
18,272	530,244	530,4	534,4	0,0	97,4	96,2	0,000	0,174	0,176	228	0,286
18,271	530,239	530,4	534,4	0,0	97,2	96,2	0,000	0,174	0,176	229	0,286
18,204	530,238	530,4	534,4	0,0	97,6	96,5	0,000	0,174	0,176	230	0,285
18,213	530,240	530,3	534,4	0,0	97,7	96,6	0,000	0,174	0,176	231	0,285
18,287	530,221	530,3	534,3	0,0	97,2	96,1	0,000	0,174	0,176	232	0,286
18,202	530,205	530,2	534,3	0,0	97,6	96,5	0,000	0,174	0,176	233	0,285
18,203	530,184	530,2	534,3	0,0	97,5	96,5	0,000	0,174	0,176	234	0,285
18,211	530,145	530,2	534,3	0,0	97,6	96,5	0,000	0,174	0,176	235	0,285
18,263	530,129	530,2	534,2	0,0	97,3	96,2	0,000	0,174	0,176	236	0,286
18,301	530,114	530,2	534,2	0,0	97,1	96,0	0,000	0,174	0,176	237	0,287
18,207	530,093	530,1	534,2	0,0	97,6	96,4	0,000	0,174	0,176	238	0,285
18,200	530,066	530,1	534,2	0,0	97,6	96,5	0,000	0,174	0,176	239	0,285
18,283	530,059	530,1	534,2	0,0	97,2	96,2	0,000	0,174	0,176	240	0,286
18,234	530,045	530,1	534,2	0,0	97,4	96,4	0,000	0,174	0,176	241	0,286
18,258	530,051	530,1	534,2	0,0	97,3	96,3	0,000	0,174	0,177	242	0,286
18,377	530,024	530,1	534,1	0,0	96,8	95,6	0,000	0,174	0,176	243	0,288
18,208	530,018	530,0	534,1	0,0	97,5	96,5	0,000	0,174	0,176	244	0,285
18,193	529,984	530,0	534,1	0,0	97,6	96,5	0,000	0,174	0,176	245	0,285
18,252	529,958	530,0	534,1	0,0	97,2	96,1	0,000	0,174	0,176	246	0,286
18,257	529,952	530,1	534,2	0,0	97,4	96,3	0,000	0,174	0,176	247	0,286
18,349	529,954	530,0	534,1	0,0	96,7	95,8	0,000	0,174	0,177	248	0,288
18,316	529,937	530,0	534,1	0,0	97,1	96,0	0,000	0,174	0,177	249	0,287
17,973	529,919	530,0	534,0	0,0	99,2	97,6	0,000	0,174	0,176	250	0,282

18,262	529,904	530,0	534,1	0,0	97,2	96,2	0,000	0,174	0,176	251	0,286
18,260	529,892	530,0	534,1	0,0	97,2	96,2	0,000	0,174	0,176	252	0,286
18,245	529,883	530,0	534,0	0,0	97,1	96,3	0,000	0,174	0,177	253	0,286
18,253	529,897	530,0	534,0	0,0	97,3	96,3	0,000	0,174	0,177	254	0,286
18,361	529,877	530,0	534,0	0,0	96,7	95,6	0,000	0,174	0,176	255	0,288
18,256	529,855	530,0	534,1	0,0	97,2	96,1	0,000	0,174	0,176	256	0,286
18,137	529,860	530,0	534,1	0,0	98,0	96,8	0,000	0,174	0,176	257	0,284

APPENDIX 3: Calibration data

POLYTESTS
TESTING THROUGH YOUR REALITY

TEST DATA PACKAGE

CLIENT	Foyer Supreme	PROJECT NUMBER	PI-20326
PRODUCT	Single burn rate Wood heater	SAMPLE ID#	QI-20513
MODEL	38ST_D		
STANDARDS	EPA, Method 28R, ASTME2515-11,		

TEST EQUIPMENT

ITEM	EQUIPMENT TYPE	MANUFACTURER	EQUIPMENT #	CALIBRATION DATE	CALIBRATION DUE DATE
1	Digital Manometer	Dwyer	EM-006	Ref to certificate	2025 May
2	Digital Manometer	Dwyer	EM-249	Ref to certificate	2025 May
3	Data acquisition System	Keithley	EM-147	Ref to certificate	2025 May
4	analytical scale 200gr.	Ohaus	EM-051	Ref to certificate	2025 May
5	Weight 2kg	N/A	EM-090	Ref to certificate	2027 MARS
6	Pitot tube	Dwyer	EM-296	Verif. before use	Verif. before use
7	Scale 0-1000lbs Rough Deck	Rice lake	EM-114 / EM-137	Ref to certificate	2025 September
8	Gas analyzer	Siemen's	EM-118	Verif. before use	Verif before use
9	Vacuum gauge	Dwyer	EM-126	Ref to certificate	2025 May
10	Vacuum gauge	Dwyer	EM-127	Ref to certificate	2025 May
11	Calibration weight 100mg	Troemer	EM-335	Ref to certificate	2027-March
12	Calibration weight 200g	Troemer	EM-129	Ref to certificate	2027 March
13	Temperature humidity meter	Fluke	EM-136	Ref to certificate	2026 January
14	Digital manometer	Dwyer	EM 313	Ref to certificate	2025 May
15	Measuring tape	Stanley	EM-224	Ref to certificate	2025 May
16	Chronometer	Extech	EM-175	Ref to certificate	2026 January
17	Dry gas meter	Shinagawa	EM-178	January 2025	2025 July
18	Dry gas meter	Shinagawa	EM-179	January 2025	2025 July
19	Dry gas meter	Shinagawa	EM-318	January 2025	2025 July
20	Dry gas meter	Am. meter	EM-130	January 2025	2025 July
21	Calibration gas	Praxair	EM-336	Ref to certificate	2030
22	Calibration gas	Praxair	EM-338	Ref to certificate	2030
23	20 ch. card Thermocouple	Keithley	EM-015	Ref to certificate	2025 June
24	20 ch. card Thermocouple	Keithley	EM-154	Ref to certificate	2025 June
25	Barometer	Control company	EM 333	Ref to certificate	2025 June
26	Vane anemometer	Omega	EM-153	Ref to certificate	2026 January
27	Weight 10kg	N/A	EM-205	Ref to certificate	2026 MARS
28	Calibration block	Delmhorst	EM-334	Ref to certificate	2026 January
29	Vacuum gauge	Dwyer	EM-340	Ref to certificate	2025 May
30	Test fuel scale	Ohaus	EM-204	Ref to certificate	2025 sept

Instrumentation Saint•Laurent inc.
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CALIBRATION CERTIFICATE

CERTIFICATE #	CE-EM-006 2024-05-23

CLIENT	
Company:	Services Polytests Inc
Address:	695 B rue Gaudette
	St-Jean-sur-Richelieu, Québec, J3B 7S7

CALIBRATION SPECIFICATION	
Service Procedure:	4IN9106
Required Accuracy:	+\-0.25"H2O
Calibration Frequency:(days)	365

INSTRUMENT SPECIFICATION			
Instrument Type:	Indicator	Input Type:	Pression
Manufacturer:	Dwyer	Output Type:	Digitale
Model #:	MS-321-LCD	Measurement Type:	Pressure
Serial #:	E47U020014	Range:	0-0.5"H2O
Location:	N.A.	Version:	Machine: N.A.

CALIBRATORS SPECIFICATION			
Calibrator:	Fluke Pression	Certification #:	2023009508
Serial #:	3330050	Certification Date:	2023-11-23
Certified by:	Alpha Controls	Next Certification:	2024-11-23
Comments:			
Calibrator:	Fluke 744	Certification #:	AC24041903
Serial #:	8180008	Certification Date:	2024-05-09
Certified by:	alpha Controls	Next Certification:	2025-05-09
Comments:			

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CALIBRATION CERTIFICATE

CERTIFICATE #	CE-EM-006 2024-05-23

CALIBRATION RESULTS

Entry Source	Given Value	Initial Value	Ini. Deviation Error	Final Value	Fin. Deviation Error	Accuracy	Uncertainty
Conformity	Comment						
0.0000 "H2O	0.000 "H2O	-0.002 "H2O	-0.002 "H2O	-0.002 "H2O	-0.002 "H2O	+\-0.25 "H2O	± 0.5 "H2O
Compliant	Verification of the indicator						
0.2500 "H2O	0.250 "H2O	0.247 "H2O	-0.003 "H2O	0.247 "H2O	-0.003 "H2O	+\-0.25 "H2O	± 0.5 "H2O
Compliant	Verification of the indicator						
0.5000 "H2O	0.500 "H2O	0.500 "H2O	0.000 "H2O	0.500 "H2O	0.000 "H2O	+\-0.25 "H2O	± 0.5 "H2O
Compliant	Verification of the indicator						
0.7500 "H2O	0.750 "H2O	0.750 "H2O	0.000 "H2O	0.750 "H2O	0.000 "H2O	+\-0.25 "H2O	± 0.5 "H2O
Compliant	Verification of the indicator						
1.0000 "H2O	1.000 "H2O	0.996 "H2O	-0.004 "H2O	0.996 "H2O	-0.004 "H2O	+\-0.25 "H2O	± 0.5 "H2O
Compliant	Verification of the indicator						
0.7500 "H2O	0.7500 "H2O	0.750 "H2O	0.000 "H2O	0.750 "H2O	0.000 "H2O	+\-0.25 "H2O	± 0.5 "H2O
Compliant	Verification of the indicator						
0.5000 "H2O	0.5000 "H2O	0.500 "H2O	0.000 "H2O	0.500 "H2O	0.000 "H2O	+\-0.25 "H2O	± 0.5 "H2O
Compliant	Verification of the indicator						
0.2500 "H2O	0.2500 "H2O	0.247 "H2O	-0.0030 "H2O	0.247 "H2O	-0.0030 "H2O	+\-0.25 "H2O	± 0.5 "H2O
Compliant	Verification of the indicator						
0.0000 "H2O	0.0000 "H2O	-0.002 "H2O	-0.0020 "H2O	-0.002 "H2O	-0.0020 "H2O	+\-0.25 "H2O	± 0.5 "H2O
Compliant	Verification of the indicator						
0.0000 "H2O	0.0000 V.DC.	0.0021 V.DC.	+0.0021 V.DC.	0.0021 V.DC.	+0.0021 V.DC.	+\-0.25 V.DC.	0.5 V.DC.
Compliant	Verification of the analogic output						
0.2500 "H2O	2.5000 V.DC.	2.4823 V.DC.	-0.0177 V.DC.	2.4823 V.DC.	-0.0177 V.DC.	+\-0.25 V.DC.	0.5 V.DC.
Compliant	Verification of the analogic output						
0.5000 "H2O	5.0000 V.DC.	4.9896 V.DC.	-0.0104 V.DC.	4.9896 V.DC.	-0.0104 V.DC.	+\-0.25 V.DC.	0.5 V.DC.
Compliant	Verification of the analogic output						
0.7500 "H2O	7.5000 V.DC.	7.4895 V.DC.	-0.0105 V.DC.	7.4895 V.DC.	-0.0105 V.DC.	+\-0.25 V.DC.	0.5 V.DC.
Compliant	Verification of the analogic output						
1.0000 "H2O	10.0000 V.DC.	9.9608 V.DC.	-0.0392 V.DC.	9.9608 V.DC.	-0.0392 V.DC.	+\-0.25 V.DC.	0.5 V.DC.
Compliant	Verification of the analogic output						
0.7500 "H2O	7.5000 V.DC.	7.4892 V.DC.	-0.0108 V.DC.	7.4892 V.DC.	-0.0108 V.DC.	+\-0.25 V.DC.	0.5 V.DC.
Compliant	Verification of the analogic output						
0.5000 "H2O	5.0000 V.DC.	4.9893 V.DC.	-0.0107 V.DC.	4.9893 V.DC.	-0.0107 V.DC.	+\-0.25 V.DC.	0.5 V.DC.
Compliant	Verification of the analogic output						
0.2500 "H2O	2.5000 V.DC.	2.4825 V.DC.	-0.0175 V.DC.	2.4825 V.DC.	-0.0175 V.DC.	+\-0.25 V.DC.	0.5 V.DC.
Compliant	Verification of the analogic output						
0.0000 "H2O	0.0000 V.DC.	0.0022 V.DC.	+0.0022 V.DC.	0.0022 V.DC.	+0.0022 V.DC.	+\-0.25 V.DC.	0.5 V.DC.
Compliant	Verification of the analogic output						

Environmental Conditions: Temperature: 22 °C Humidity: 47 %RH

Comments:

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CLAS 2010-02

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LAB Accrédité CCN

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CALIBRATION CERTIFICATE

CERTIFICATE #	CE-EM-006 2024-05-23

CALIBRATION DATE/ISSUANCE OF CERTIFICATE	
Calibration Date:	2024-05-23
Next Calibration:	2025-05-23
Certificate Date:	2024-05-23

CALIBRATION CONFORMITY		
	Before	**After**
Compliant:	X	X
Non Compliant:		

¤ Instrumentation St. Laurent Inc. Certify that the above instrument, meets or exceeds the specifications established by the manufacturer. The company's quality system complies with the requirements of ISO 17025 :2017 and the standards used to perform the calibration is traceable to NRC and / or NIST.
¤ Reported uncertainties represent a 95 % of confidence level assuming a normal distribution k=2.
¤ The declaration of conformity does not include Instrumentation St-Laurent Inc. uncertainty measurement. Decision rule is based on binary statement for simple acceptance rule against ILAC G8 standard and test tolerance limits are based on customer specifications, unless otherwise specified.
¤ The results presented in this certificate relate only to objects subject to calibration.
¤ It is the customer's responsibility to ensure that calibrated equipment meets its intended use.
¤ The date format used in this certificate is: YYYY-MM-DD.

Assessment Service Calibration Laboratory (ASCL) of the National Research Council of Canada (NRC) has assessed and certified calibration laboratory's ability and traceability to the International System of Units (SI) or to standards acceptable according to ASCL. This calibration certificate is issued in accordance with the terms of ASCL certification and accreditation requirements of the Standards Council of Canada (SCC). ASCL and SCC does not guarantee the accuracy of individual calibrations by accredited laboratories.

Marc Gingras - Technicien

May 28th 2024

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CALIBRATION CERTIFICATE

CERTIFICATE #	CE-EM-015/2 2024-12-02

CLIENT	
Company:	Services Polytests Inc
Address:	695 B rue Gaudette
	St-Jean-sur-Richelieu, Québec, J3B 7S7

CALIBRATION SPECIFICATION	
Service Procedure:	4IN9101
Required Accuracy:	+\- 4.0°F
Calibration Frequency:(days)	181

INSTRUMENT SPECIFICATION			
Instrument Type:	Recorder	Input Type:	Temp
Manufacturer:	Keithley	Output Type:	Digitale
Model #:	7700	Measurement Type:	Temperature
Serial #:	1213648	Range:	Divers
Location:	N/A	Version:	Machine: N.A.

CALIBRATORS SPECIFICATION			
Calibrator:	Thermometre digital 6412	Certification #:	6412-15020243
Serial #:	240300851	Certification Date:	2024-04-09
Certified by:	ITM-Control company	Next Certification:	2026-04-09
Comments:			

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Instrumentation Saint•Laurent inc.
Certified ISO 17025

CLAS ARC·CRC CLAS 2010-02

SCC Accredited LAB LAB Accredité CCN

80 rue de la montagne
St-Joseph du lac
(Québec), J0N 1M0
Phone: (450) 473-6169
Fax: (450) 473-5207
info@instrumentationsaintlaurent.com

CALIBRATION CERTIFICATE

CERTIFICATE #	CE-EM-015/2 2024-12-02

CALIBRATION RESULTS

Entry Source	Given Value	Initial Value	Ini. Deviation Error	Final Value	Fin. Deviation Error	Accuracy	Uncertainty
Conformity	Comment						
662.0 °F	662.0 °F	662.3 °F	+0.3 °F	662.3 °F	+0.3 °F	+/- 4.0 °F	+/- 0.5 °F
Compliant	ID. No. 201 (Flue) en type "K" En Loop avec EM-015						
482.0 °F	482.0 °F	480.6 °F	-1.4 °F	480.6 °F	-1.4 °F	+/- 4.0 °F	+/- 0.5 °F
Compliant	ID. No. 202 (Right) en type "K" En Loop avec EM-015						
482.0 °F	482.0 °F	480.9 °F	-1.1 °F	480.9 °F	-1.1 °F	+/- 4.0 °F	+/- 0.5 °F
Compliant	ID. No. 203 (Back) en type "K" En Loop avec EM-015						
482.0 °F	482.0 °F	481.0 °F	-1.0 °F	481.0 °F	-1.0 °F	+/- 4.0 °F	+/- 0.5 °F
Compliant	ID. No. 204 (Bottom) en type "K" En Loop avec EM-015						
482.0 °F	482.0 °F	480.5 °F	-1.5 °F	480.5 °F	-1.5 °F	+/- 4.0 °F	+/- 0.5 °F
Compliant	ID. No. 205 (Top) en type "K" En Loop avec EM-015						
482.0 °F	482.0 °F	480.1 °F	-1.9 °F	480.1 °F	-1.9 °F	+/- 4.0 °F	+/- 0.5 °F
Compliant	ID. No. 206 (Left) en type "K" En Loop avec EM-015						
662.0 °F	662.0 °F	664.1 °F	+2.1 °F	664.1 °F	+2.1 °F	+/- 4.0 °F	+/- 0.5 °F
Compliant	ID. No. 207 (Catalyst) en type "K" En Loop avec EM-015						
77.0 °F	77.0 °F	76.9 °F	-0.1 °F	76.9 °F	-0.1 °F	+/- 4.0 °F	+/- 0.4 °F
Compliant	ID. No. 209 (DGM 1st HR IN) en type "J" En Loop avec EM-015						
77.0 °F	77.0 °F	76.8 °F	-0.2 °F	76.8 °F	-0.2 °F	+/- 4.0 °F	+/- 0.4 °F
Compliant	ID. No. 210 (DGM out 1st hr) en type "J" En Loop avec EM-015						
80.0 °F	80.0 °F	79.9 °F	-0.1 °F	79.9 °F	-0.1 °F	+/- 4.0 °F	+/- 0.4 °F
Compliant	ID. No. 211 (wetbulb tunnel) en type "J" En Loop avec EM-015						
77.0 °F	77.0 °F	76.5 °F	-0.5 °F	76.5 °F	-0.5 °F	+/- 4.0 °F	+/- 0.4 °F
Compliant	ID. No. 215 (DGM 1 In) en type "J" En Loop avec EM-015						
77.0 °F	77.0 °F	76.1 °F	-0.9 °F	76.1 °F	-0.9 °F	+/- 4.0 °F	+/- 0.4 °F
Compliant	ID. No. 216 (DGM 1 out) en type "J" En Loop avec EM-015						
77.0 °F	77.0 °F	76.8 °F	-0.2 °F	76.8 °F	-0.2 °F	+/- 4.0 °F	+/- 0.4 °F
Compliant	ID. No. 217 (DGM 2 In) en type "J" En Loop avec EM-015						
77.0 °F	77.0 °F	77.1 °F	+0.1 °F	77.1 °F	+0.1 °F	+/- 4.0 °F	+/- 0.4 °F
Compliant	ID. No. 218 (DGM 2 out) en type "J" En Loop avec EM-015						
85.0 °F	85.0 °F	84.9 °F	-0.1 °F	84.9 °F	-0.1 °F	+/- 4.0 °F	+/- 0.5 °F
Compliant	ID. No. 220 (Filter 1st Hour) en type "T" En Loop avec EM-015						

Environmental Conditions: Temperature: 20 °C Humidity: 30 %RH

The calibration was carried out at the client on-site using the method of comparison to the standard measurement.

Comments:

CALIBRATION DATE/ISSUANCE OF CERTIFICATE

Calibration Date:	2024-12-02
Next Calibration:	2025-06-01
Certificate Date:	2024-12-02

CALIBRATION CONFORMITY

	Before	After
Compliant:	X	X
Non Compliant:		

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Instrumentation Saint•Laurent inc.
Certified ISO 17025

CLAS NRC·CNRC
CLAS 2010-02

SCC Accredited LAB
LAB Accréditée CCN

80 rue de la montagne
St-Joseph du lac
(Québec), J0N 1M0
Phone: (450) 473-6169
Fax: (450) 473-5207
info@instrumentationsaintlaurent.com

CALIBRATION CERTIFICATE

CERTIFICATE #	CE-EM-015/2 2024-12-02

- Instrumentation St. Laurent Inc. Certify that the above instrument, meets or exceeds the specifications established by the manufacturer. The company's quality system complies with the requirements of ISO 17025 :2017 and the standards used to perform the calibration is traceable to NRC and / or NIST.
- Reported uncertainties represent a 95 % of confidence level assuming a normal distribution k=2.
- The declaration of conformity does not include Instrumentation St-Laurent Inc. uncertainty measurement. Decision rule is based on binary statement for simple acceptance rule against ILAC G8 standard and test tolerance limits are based on customer specifications, unless otherwise specified.
- The results presented in this certificate relate only to objects subject to calibration.
- It is the customer's responsibility to ensure that calibrated equipment meets its intended use.
- The date format used in this certificate is: YYYY-MM-DD.

The Calibration Laboratory Assessment Service (CLAS) of the National Research Council of Canada (NRC) has assessed and certified specific calibration capabilities of this laboratory and traceability to the International System of Units (SI) or to standards acceptable to the CLAS program. This certificate of calibration is issued in accordance with the conditions of certification granted by CLAS and the conditions of accreditation granted by the accreditation body. Neither CLAS nor the accreditation body guarantee the accuracy of individual calibrations by accredited laboratories.

Benoit Larocque - Tech

Dec 4th 2024

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Calibration Certificate ID
CA0232-038-110524-ACC-USL

METTLER TOLEDO

Mettler-Toledo Inc.
Service Division
1900 Polaris Parkway
Columbus, OH, 43240
1-800-METTLER

Accredited by the American Association for Laboratory Accreditation (A2LA)
CALIBRATION CERT #1788.01
ISO 17025 Accredited
ANSI/NCSL Z540-1 Accredited

Accuracy Calibration Certificate

Customer

Company:	Services Polytests		
Address:	695-B Rue Gaudette		
City:	Saint-Jean-Sur-Richelieu	Contact:	Danick Power
Zip / Postal:	J3B 7S7		
State / Province:	Quebec		

Weighing Device

Manufacturer:	Ohaus	Instrument Type:	Weighing Instrument
Model:	AR2140	Asset Number:	EM-051
Serial No.:	M3658329010091	Terminal Model:	NA
Building:	N/A	Terminal Serial No.:	NA
Floor:	N/A	Terminal Asset No.:	NA
Room:	N/A		

Range	Max. Capacity	Readability (d)
1	210 g	0.0001 g

Procedure

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

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

The sensitivity/span of the weighing instrument was adjusted before As Left calibration with an external weight. As Left 100g, 200g

	Temperature		Humidity	
As Found	Start: 20.8 °C	End: 21.8 °C	Start: 49.7 %	End: 45.0 %
As Left	Start: 22.1 °C	End: 22.3 °C	Start: 44.8 %	End: 44.1 %

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

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

As Found Calibration Date:	05-11-2024
As Left Calibration Date:	05-11-2024
Issue Date:	05-11-2024
Date of next calibration by customer request:	30-11-2025

Authorized A2LA Signatory:

Vladimir Kriuchkov

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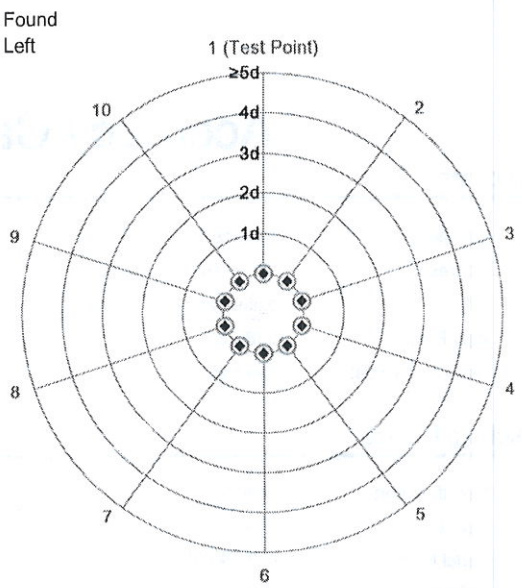
Measurement Results

Repeatability

Test Load: 100 g

	As Found	As Left
1	100.0008 g	100.0000 g
2	100.0008 g	100.0000 g
3	100.0008 g	100.0000 g
4	100.0008 g	100.0000 g
5	100.0008 g	100.0000 g
6	100.0008 g	100.0000 g
7	100.0008 g	100.0000 g
8	100.0008 g	100.0000 g
9	100.0008 g	100.0000 g
10	100.0008 g	100.0000 g

Standard Deviation	0.00000 g	0.00000 g



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

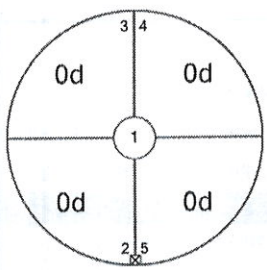
The results of this graph are based upon the absolute values of the differences from the mean value.

Eccentricity

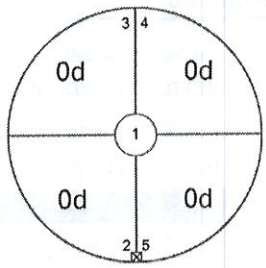
Test Load: 100 g

Position	As Found	As Left
1	0.0000 g	0.0000 g
2	0.0000 g	0.0000 g
3	0.0000 g	0.0000 g
4	0.0000 g	0.0000 g
5	0.0000 g	0.0000 g

Maximum Deviation	0.0000 g	0.0000 g



As Found



As Left

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

Error of Indication

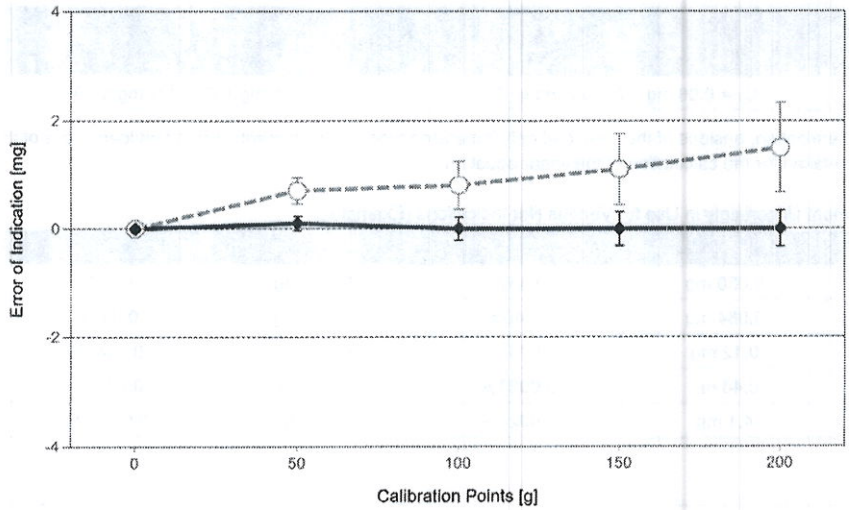
As Found

	Reference Value	Indication	Error of Indication	Expanded Uncertainty	k
1	0.0000 g	0.0000 g	0.0000 g	0.06 mg	2
2	50.0000 g	50.0007 g	0.0007 g	0.24 mg	2
3	100.0000 g	100.0008 g	0.0008 g	0.44 mg	2
4	150.0000 g	150.0011 g	0.0011 g	0.66 mg	2
5	200.0001 g	200.0016 g	0.0015 g	0.83 mg	2

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As Left

	Reference Value	Indication	Error of Indication	Expanded Uncertainty	k
1	0.0000 g	0.0000 g	0.0000 g	0.06 mg	2
2	50.0000 g	50.0001 g	0.0001 g	0.13 mg	2
3	100.0000 g	100.0000 g	0.0000 g	0.21 mg	2
4	150.0000 g	150.0000 g	0.0000 g	0.31 mg	2
5	200.0001 g	200.0001 g	0.0000 g	0.33 mg	2



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

The expanded measurement uncertainty is reported as the standard measurement uncertainty multiplied by the coverage factor k such that the coverage probability corresponds to approximately 95 %.

The user is responsible for maintaining environmental conditions and the settings of the weighing instrument when it was calibrated. The results of this calibration certificate relate only to the calibrated item.

Test Equipment

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

Weight Set 1: OIML E2

Weight Set No.:	2022-VladimirKriuchkov	Date of Issue:	17-07-2024
Certificate Number:	220803092-1	Calibration Due Date:	31-07-2025

Remarks

The balance is ready for use.

End of Accredited Section

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

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Measurement Uncertainty of the Weighing Instrument in Use

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

Temperature coefficient for the evaluation of the measurement uncertainty in use: $3.0 \cdot 10^{-6}$ / K

Temperature range on site for the evaluation of the measurement uncertainty in use: 4 K

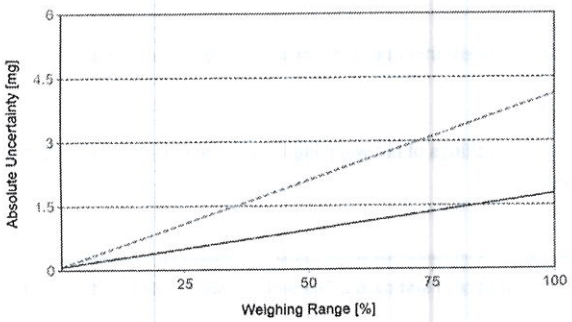
Linearization of Uncertainty Equation

	Range		As Found	As Left
	d	Max		
1	0.0001 g	210 g	$U_1 = 0.08$ mg + 0.0192 mg/g · R	$U_1 = 0.08$ mg + 0.00804 mg/g · R

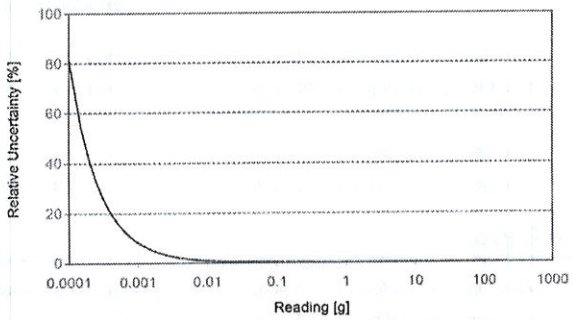
To optimize the stability of the linearization, besides of the zero load only increasing measurement points with a test load of 5% of the measurement range or larger are taken for the calculation of the linear equation.

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

Net Indication	As Found		As Left	
0.0210 g	0.080 mg	0.38%	0.080 mg	0.38%
0.2100 g	0.084 mg	0.040%	0.082 mg	0.039%
2.1000 g	0.12 mg	0.0057%	0.097 mg	0.0046%
21.0000 g	0.48 mg	0.0023%	0.25 mg	0.0012%
210.0000 g	4.1 mg	0.0020%	1.8 mg	0.00084%



As Found



As Left

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METTLER TOLEDO Service

Custom Tolerance Assessment

Assessment done without considering measurement uncertainty.
One or more of the measurements from the attached calibration certificate were assessed against customer-defined tolerances.

	As Found	As Left
Overall	✗	✓
Repeatability	✓	✓
Eccentricity	✓	✓
Error of Indication	✗	✓

Measurement Results

Repeatability

Test Load: 100 g

	As Found	As Left
1	100.0008 g	100.0000 g
2	100.0008 g	100.0000 g
3	100.0008 g	100.0000 g
4	100.0008 g	100.0000 g
5	100.0008 g	100.0000 g
6	100.0008 g	100.0000 g
7	100.0008 g	100.0000 g
8	100.0008 g	100.0000 g
9	100.0008 g	100.0000 g
10	100.0008 g	100.0000 g

Standard Deviation	0.00000 g	0.00000 g
Tolerance	0.00010 g ✓	0.00010 g ✓

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Eccentricity

Test Load: 100 g

Position	As Found	As Left
1	0.0000 g	0.0000 g
2	0.0000 g	0.0000 g
3	0.0000 g	0.0000 g
4	0.0000 g	0.0000 g
5	0.0000 g	0.0000 g

Maximum Deviation	0.0000 g	0.0000 g
Tolerance	0.0003 g ✓	0.0003 g ✓

Error of Indication

As Found

	Reference Value	Indication	Error of Indication	Tolerance
1	0.0000 g	0.0000 g	0.0000 g	0.0001 g ✓
2	50.0000 g	50.0007 g	0.0007 g	0.0002 g ✗
3	100.0000 g	100.0008 g	0.0008 g	0.0004 g ✗
4	150.0000 g	150.0011 g	0.0011 g	0.0006 g ✗
5	200.0001 g	200.0016 g	0.0015 g	0.0004 g ✗

As Left

	Reference Value	Indication	Error of Indication	Tolerance
1	0.0000 g	0.0000 g	0.0000 g	0.0001 g ✓
2	50.0000 g	50.0001 g	0.0001 g	0.0002 g ✓
3	100.0000 g	100.0000 g	0.0000 g	0.0004 g ✓
4	150.0000 g	150.0000 g	0.0000 g	0.0006 g ✓
5	200.0001 g	200.0001 g	0.0000 g	0.0004 g ✓

5 Nov 2024

Software Version: 1.24.0.346
Report Version: 2.19.21
Form Number: AF1702L

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TRANSCAT® CANADA
Trust in every measure

ACCREDITATION ISO 17025 TM
SCC Scope Number 668

CALIBRATION CERTIFICATE

9900 Chemin de la Côte-de-Liesse, Montréal, QC H8T 1A1
www.dispersion.ca 1.866.390.5066

Client :	Polytests	**Certificate Number :**	**157-77C603-223**
Address :	695 B rue Gaudette Saint-Jean-sur-Richelieu, QC J3B7S7	**Calibration date :**	04-03-2022

Technician:
Coutu, Daniel

David Llorens, Quality Manager

SERVICE DESCRIPTION:

Masses description :	ASTM E617	**Date approved :**	04-03-2022
Precision class :	ASTM 6	**Next Calibration :**	04-03-2027
Density :	7.95g/cm³	**CCN accreditation # :**	668
Identification (if unique) :	EM-090	**CLAS Certification # :**	2010-01

Test conditions :	Temp °C:	21.05	kPa Pressure:	102.3	Humidity:	49.4

NOTES:

For weight calibration, we use the procedure "Comparaison individuelle" PDL-09-MG-001 and the procedure "Détermination des incertitudes" PDL-09-MG-002. This certificate cannot be copied without written approval from Dispersion Laboratory. The results presented in these pages relate only to objects subjected to calibration.n

REMARKS:

March 2022

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ACCREDITATION ISO 17025 SCC Scope Number 668

CALIBRATION CERTIFICATE

9900 Chemin de la Côte-de-Liesse, Montréal, QC H8T 1A1
www.dispersion.ca 1.866.390.5066

Client :	Polytests	**Certificate Number :**	**157-77C603-223**
Address :	695 B rue Gaudette	**CCN Accreditation # :**	668
	Saint-Jean-sur-Richelieu, QC	**CLAS Certification # :**	2010-01
	J3B7S7	**Precision class :**	ASTM 6
		Calibration date :	04-03-2022
Mass :	2 kg	**Follow-up date :**	04-03-2027

CALIBRATION RESULTS, CONVENTIONAL MASS:

Nominal Mass	Serial #	Inventory #	Conventional mass	Conventional mass after adjustment	Tolerance ± (mg)	Uncertainties ± (mg)
2 kg		EM-090	2.0001384 kg		200 mg	2.0 mg

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ACCREDITATION
ISO 17025
SCC Scope Number 668

CALIBRATION CERTIFICATE

9900 Chemin de la Côte-de-Liesse, Montréal, QC H8T 1A1
www.dispersion.ca 1.866.390.5066

Client :	Polytests	**Certificate Number :**	**157-77C603-223**
Address :	695 B rue Gaudette	**CCN Accreditation # :**	668
	Saint-Jean-sur-Richelieu, QC	**CLAS Certification # :**	2010-01
	J3B7S7	**Precision class :**	ASTM 6
		Calibration date :	04-03-2022
Mass :	2 kg	**Follow-up date :**	04-03-2027

CALIBRATION RESULTS, CORRECTIONS:

Nominal Mass	Serial #	Inventory #	Conventional mass Corrections	Conventional mass Corrections after adjustment	Tolerance ± (mg)	Uncertainties ± (mg)
2 kg		EM-090	138.4 mg		200 mg	2.0 mg

CALIBRATION CERTIFICATE

9900 Chemin de la Côte-de-Liesse, Montréal, QC H8T 1A1
www.dispersion.ca 1.866.390.5066

BALANCES

The following balances are used for calibration purposes :

> 5 kg to 25 kg :	Mettler Toledo XP32003L, SNR 1123271214, max. 32100 g, d = 0.005 g
> 1 kg to 5 kg	Mettler Toledo PR5003, SNR 1115311634, max. 5100 g, d = 0.001 g
> 300 g to 2 kg :	Mettler Toledo XP2004S, SNR B131185222, max. 2100 g, d = 0.1 mg
> 100 g to 200 g :	Mettler Toledo AT201 SNR BA1115230146, max. 205 g, d = 0.01 mg
> 5 g to 100 g :	Mettler Toledo AX106 SNR 1127063924, max. 111 g, d = 1 µg
1 mg to 5 g :	Mettler UMX5, SNR 1121103055, max. 5.1 g, d = 0.1 µg

We are also using these balances in our automated procedure :

> 200 g to 1 kg :	Mettler Toledo AX1005 SNR 1127063210, max. 1109 g, d = 0.01 mg
> 5 g to 100 g :	Mettler Toledo AX106 SNR 1120143015, max. 111 g, d = 1 µg
1 mg to 5 g :	Mettler UMX5, SNR 1125140561, max. 5.1 g, d = 0.1 µg

Our balances are periodically verified, according to our PDL-11-MG-001 control procedure.

UNCERTAINTIES:

The following uncertainties exist :

1. *Uncertainty associated with the weighting process.*
2. *Uncertainty associated with air density.*
3. *Uncertainty associated with the measurement standard.*
4. *Uncertainty associated with the density of the mass being calibrated.*

The uncertainty of the weighing process includes long-term reproducibility.

Uncertainties specified in this report are expanded uncertainties representing a confidence level of approximately 95% obtained by multiplying the combined standard uncertainty by a coverage factor of k = 2. For more detailed information refer to the GUM (Guide to the Expression of Uncertainty in Measurement, 1995 Edition)

TRACEABILITY

The Calibration Laboratory Assessment Service (CLAS) of the National Research Council of Canada (NRC) has assessed and certified specific calibration capabilities of this laboratory and their traceability to recognized national measurement standards and to the International System of Units (SI). This certificate of calibration is issued in accordance with the conditions of certification granted by CLAS and the conditions of accreditation granted by the Standards Council of Canada (SCC). Neither the CLAS nor the SCC guarantees the accuracy of individual calibration by accredited laboratories.

CALIBRATION CERTIFICATE

9900 Chemin de la Côte-de-Liesse, Montréal, QC H8T 1A1
www.dispersion.ca 1.866.390.5066

USED REFERENCES

Item	Serial #	Manufacturer	Calibration date	Due date
300g Labo	96-0888-50-2	Denver Instrument Company	01-10-2020	31-03-2022
1kg-1mg Labo	MT-01	Mettler Toledo	01-10-2020	31-03-2022
2kg Labo	96-0888-50-3	Denver Instrument Company	01-10-2020	31-03-2022
1kg Labo	96-088850-1	Denver Instrument Company	01-10-2020	31-03-2022
5kg Labo	129099	Mettler Toledo	01-10-2020	31-03-2022
10kg Labo	DI000G991	Dispersion	23-03-2021	31-03-2022
20kg Labo	69976	Mettler Toledo	06-10-2021	31-10-2022
1 mg-10kg	4000028011	Troemner	15-10-2021	31-10-2022
2kg Labo	129098	Mettler Toledo	01-10-2020	31-03-2022

ENVIRONMENTAL CONDITIONS

Item	Serial #	Manufacturer	Calibration date	Due date
THE004	107080	Control Company	04-03-2021	31-03-2022

Calibration Certificate ID
CA0221-101-091224-ACC-USI

METTLER TOLEDO

Mettler-Toledo Inc.
Service Division
1900 Polaris Parkway
Columbus, OH 43240
1-800-METTLER

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

ISO 17025 Registered
ANSI/NCSL Z540-1 Accredited

Accuracy Calibration Certificate

Customer

Company:	Services Polytests		
Address:	695-B Rue Gaudette		
City:	Saint-Jean-Sur-Richelieu	**Contact:**	Danick Power
Zip / Postal:	J3B 7S7		
State / Province:	Quebec		

Weighing Device

Manufacturer:	RICE LAKE	**Instrument Type:**	Weighing Instrument
Model:	4X4HP-10K	**Asset Number:**	EM-114 EM-137
Serial No.:	C18395	**Terminal Model:**	IQ+355
Building:	N/A	**Terminal Serial No.:**	164851
Floor:	N/A	**Terminal Asset No.:**	N/A
Room:	N/A		

Range	Max. Capacity	Readability (d)
1	400 kg	0.05 kg

Procedure

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

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

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

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

The calibration was agreed with the user below the maximum capacity of the balance.

	Temperature		Humidity	
As Found	Start: 21.0 °C	End: 21.0 °C	Start: 61.2 %	End: 61.2 %
As Left	Start: 21.0 °C	End: 21.0 °C	Start: 61.2 %	End: 61.2 %

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

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

As Found Calibration Date:	11-09-2024	**Authorized A2LA Signatory:**	Angel Estrella Gonzalez
As Left Calibration Date:	11-09-2024		
Issue Date:	12-09-2024		
Requested Next Calibration Date:	30-09-2025		

16 sept 2024

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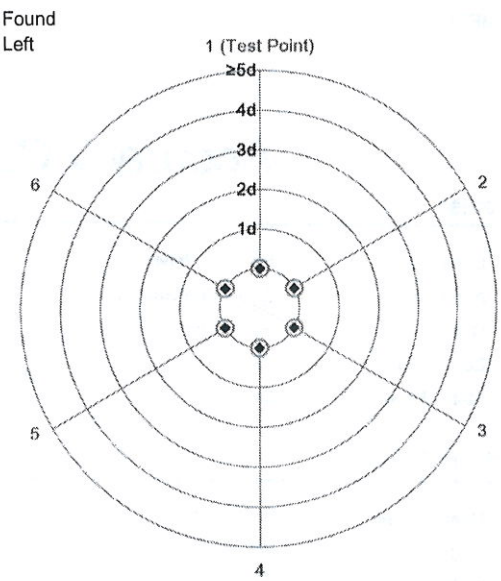
Measurement Results

Repeatability

Test Load: 70 kg

	As Found	As Left
1	69.95 kg	70.00 kg
2	69.95 kg	70.00 kg
3	69.95 kg	70.00 kg
4	69.95 kg	70.00 kg
5	69.95 kg	70.00 kg
6	69.95 kg	70.00 kg

Standard Deviation	**0.000 kg**	**0.000 kg**



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

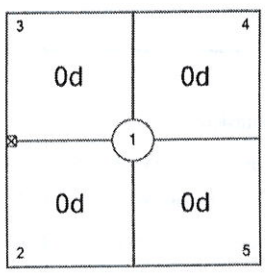
The results of this graph are based upon the absolute values of the differences from the mean value.

Eccentricity

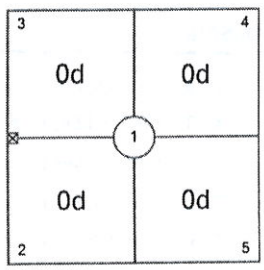
Test Load: 50 kg

Position	As Found	As Left
1	49.95 kg	50.00 kg
2	49.95 kg	50.00 kg
3	49.95 kg	50.00 kg
4	49.95 kg	50.00 kg
5	49.95 kg	50.00 kg

Maximum Deviation	**0.00 kg**	**0.00 kg**



As Found



As Left

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

Error of Indication

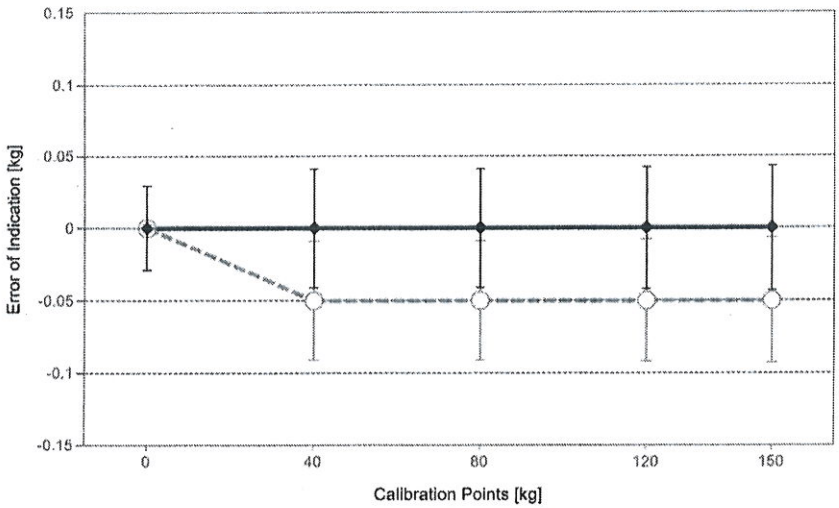
As Found

	Reference Value	Indication	Error of Indication	Expanded Uncertainty	k
1	0 kg	0.00 kg	0.00 kg	0.029 kg	2
2	40 kg	39.95 kg	-0.05 kg	0.041 kg	2
3	80 kg	79.95 kg	-0.05 kg	0.041 kg	2
4	120 kg	119.95 kg	-0.05 kg	0.042 kg	2
5	150 kg	149.95 kg	-0.05 kg	0.043 kg	2
6	0 kg	0.00 kg	0.00 kg	0.029 kg	2

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As Left

	Reference Value	Indication	Error of Indication	Expanded Uncertainty	k
1	0 kg	0.00 kg	0.00 kg	0.029 kg	2
2	40 kg	40.00 kg	0.00 kg	0.041 kg	2
3	80 kg	80.00 kg	0.00 kg	0.041 kg	2
4	120 kg	120.00 kg	0.00 kg	0.042 kg	2
5	150 kg	150.00 kg	0.00 kg	0.043 kg	2
6	0 kg	0.00 kg	0.00 kg	0.029 kg	2



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

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

The user is responsible for maintaining environmental conditions and the settings of the weighing instrument when it was calibrated. The results of this calibration certificate relate only to the calibrated item.

Test Equipment

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

Weight Set 1: OIML M1

Weight Set No.:	57071	Date of Issue:	10-01-2024
Certificate Number:	220736435-1	Calibration Due Date:	10-01-2025

Weight Set 2: OIML M1

Weight Set No.:	T01 à T50 (20 kg)	Date of Issue:	20-03-2024
Certificate Number:	1411302	Calibration Due Date:	20-03-2025

Remarks

N/A

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End of Accredited Section

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

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Measurement Uncertainty of the Weighing Instrument in Use

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

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

Temperature range on site for the evaluation of the measurement uncertainty in use: 21 K

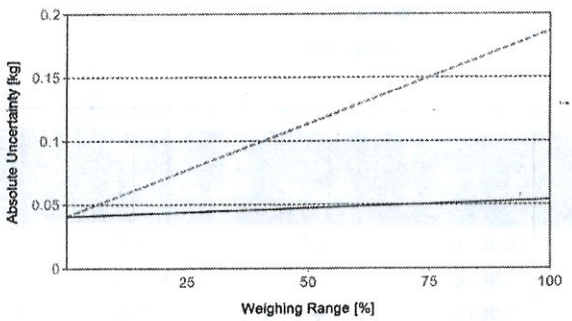
Linearization of Uncertainty Equation

Range			As Found	As Left
	d	Max		
1	0.05 kg	150 kg	$U_1 = 41\ g + 0.973\ g/kg \cdot R$	$U_1 = 41\ g + 0.0863\ g/kg \cdot R$

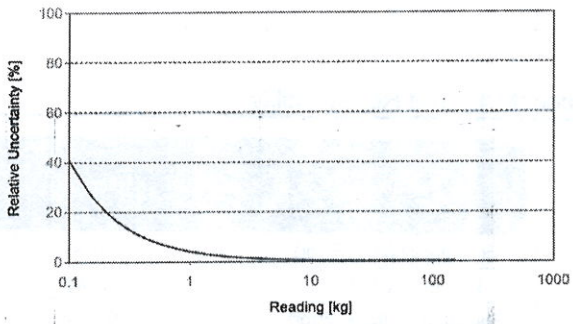
To optimize the stability of the linearization, besides of the zero load only increasing measurement points with a test load of 5% of the measurement range or larger are taken for the calculation of the linear equation.

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

Net Indication	As Found		As Left	
1.50 kg	0.042 kg	2.8%	0.041 kg	2.7%
15.00 kg	0.056 kg	0.37%	0.042 kg	0.28%
30.00 kg	0.070 kg	0.23%	0.044 kg	0.15%
75.00 kg	0.11 kg	0.15%	0.047 kg	0.063%
150.00 kg	0.19 kg	0.12%	0.054 kg	0.036%



As Found



As Left

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METTLER TOLEDO Service

Handbook 44 Tolerance Assessment (Maintenance)

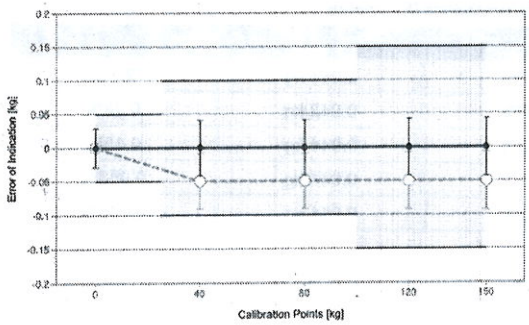
Assessment done without considering measurement uncertainty.
The measurements from the attached calibration certificate were assessed against the Tolerances defined by NIST Handbook 44.
The range of measurements for both Eccentricity and Repeatability (if performed) tests is assessed against Maintenance Tolerances.

	As Found	As Left
Overall	✓	✓

✓ = Passed
✗ = Failed

Weighing Device

Range	Max. Capacity	Readability (d)	Verification Scale Interval (e)	Class
1	400 kg	0.05 kg	0.05 kg	III



Tolerances according to NIST Handbook 44

Test Load		Tolerance
From	To	
0.00 kg	0.00 kg	0.0125 kg
0.05 kg	25.00 kg	0.05 kg
25.05 kg	100.00 kg	0.1 kg
100.05 kg	150.00 kg	0.15 kg

○ As Found
◆ As Left
— Tolerance

Eccentricity and Repeatability

Test	Test Load	Tolerance	As Found		As Left	
			Max. Error / Range	Result	Max. Error / Range	Result
Eccentricity (Max. Error)	50 kg	0.10 kg	0.05 kg	✓	0.00 kg	✓
Eccentricity (Range)	50 kg	0.1 kg	0.00 kg	✓	0.00 kg	✓
Repeatability (Max. Error)	70 kg	0.1 kg	0.05 kg	✓	0.00 kg	✓
Repeatability (Range)	70 kg	0.10 kg	0.00 kg	✓	0.00 kg	✓

Max. Error: Maximum of the absolute values of the individual errors.
Range: Difference between largest and smallest measurement value.

Error of Indication

	Reference Value	Tolerance	As Found		As Left	
			Error of Indication	Result	Error of Indication	Result
1	0 kg	0.05 kg	0.00 kg	✓	0.00 kg	✓
2	40 kg	0.10 kg	-0.05 kg	✓	0.00 kg	✓
3	80 kg	0.10 kg	-0.05 kg	✓	0.00 kg	✓
4	120 kg	0.15 kg	-0.05 kg	✓	0.00 kg	✓
5	150 kg	0.15 kg	-0.05 kg	✓	0.00 kg	✓
6	0 kg	0.05 kg	0.00 kg	✓	0.00 kg	✓

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CALIBRATION CERTIFICATE

CERTIFICATE #	CE-EM-126 2024-05-23

CLIENT	
Company:	Services Polytests Inc
Address:	695 B rue Gaudette
	St-Jean-sur-Richelieu, Québec, J3B 7S7

CALIBRATION SPECIFICATION	
Service Procedure:	4IN9106
Required Accuracy:	+\- 1"Hg
Calibration Frequency:(days)	365

INSTRUMENT SPECIFICATION			
Instrument Type:	Pressure Gauge	**Input Type:**	Pression
Manufacturer:	Dwyer	**Output Type:**	Digitale
Model #:	DPG200	**Measurement Type:**	Pressure
Serial #:	N.A.	**Range:**	0-28"Hg
Location:	N.A.	**Version:**	**Machine:** N.A.

CALIBRATORS SPECIFICATION			
Calibrator:	Crystal XP2i 300	**Certification #:**	2023007594
Serial #:	866756	**Certification Date:**	2023-09-22
Certified by:	Alpha Controls	**Next Certification:**	2024-09-22
Comments:			
Calibrator:	Fluke 744	**Certification #:**	AC24041903
Serial #:	8180008	**Certification Date:**	2024-05-09
Certified by:	alpha Controls	**Next Certification:**	2025-05-09
Comments:			

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CALIBRATION CERTIFICATE

CERTIFICATE #	CE-EM-126 2024-05-23

CALIBRATION RESULTS

Entry Source	Given Value	Initial Value	Ini. Deviation Error	Final Value	Fin. Deviation Error	Accuracy	Uncertainty
Conformity	Comment						
0.00 "Hg	0.00 "Hg	0.19 "Hg	+0.19 "Hg	0.19 "Hg	+0.19 "Hg	+\- 1.0 "Hg	± 0.5 "Hg
Compliant	Verification of the indicator						
-7.50 "Hg	-7.50 "Hg	-7.42 "Hg	+0.08 "Hg	-7.42 "Hg	+0.08 "Hg	+\- 1.0 "Hg	± 0.5 "Hg
Compliant	Verification of the indicator						
-15.00 "Hg	-15.00 "Hg	-15.04 "Hg	-0.04 "Hg	-15.04 "Hg	-0.04 "Hg	+\- 1.0 "Hg	± 0.5 "Hg
Compliant	Verification of the indicator						
-22.50 "Hg	-22.50 "Hg	-22.65 "Hg	-0.15 "Hg	-22.65 "Hg	-0.15 "Hg	+\- 1.0 "Hg	± 0.5 "Hg
Compliant	Verification of the indicator						
-28.00 "Hg	-28.00 "Hg	-28.50 "Hg	-0.50 "Hg	-28.50 "Hg	-0.50 "Hg	+\- 1.0 "Hg	± 0.5 "Hg
Compliant	Verification of the indicator						
-22.50 "Hg	-22.50 "Hg	-22.87 "Hg	-0.37 "Hg	-22.87 "Hg	-0.37 "Hg	+\- 1.0 "Hg	± 0.5 "Hg
Compliant	Verification of the indicator						
-15.00 "Hg	-15.00 "Hg	-15.04 "Hg	-0.04 "Hg	-15.04 "Hg	-0.04 "Hg	+\- 1.0 "Hg	± 0.5 "Hg
Compliant	Verification of the indicator						
-7.50 "Hg	-7.50 "Hg	-7.42 "Hg	+0.08 "Hg	-7.42 "Hg	+0.08 "Hg	+\- 1.0 "Hg	± 0.5 "Hg
Compliant	Verification of the indicator						
-7.50 "Hg	-7.50 "Hg	-7.42 "Hg	+0.08 "Hg	-7.42 "Hg	+0.08 "Hg	+\- 1.0 "Hg	± 0.5 "Hg
Compliant	Verification of the indicator						
0.00 "Hg	10.0000 V.DC.	10.0963	+0.0963 V.DC.	10.0963	+0.0963 V.DC.	+\- 0.5 V.DC.	0.5 V.DC.
Compliant	Verification of the analogic output						
-7.50 "Hg	8.0000 V.DC.	8.0805 V.DC.	+0.0805 V.DC.	8.0805 V.DC.	+0.0805 V.DC.	+\- 0.5 V.DC.	0.5 V.DC.
Compliant	Verification of the analogic output						
-15.00 "Hg	6.0000 V.DC.	6.0539 V.DC.	+0.0539 V.DC.	6.0539 V.DC.	+0.0539 V.DC.	+\- 0.5 V.DC.	0.5 V.DC.
Compliant	Verification of the analogic output						
-22.50 "Hg	4.0000 V.DC.	4.0068 V.DC.	+0.0068 V.DC.	4.0068 V.DC.	+0.0068 V.DC.	+\- 0.5 V.DC.	0.5 V.DC.
Compliant	Verification of the analogic output						
-28.00 "Hg	2.5333 V.DC.	2.5532 V.DC.	+0.0199 V.DC.	2.5532 V.DC.	+0.0199 V.DC.	+\- 0.5 V.DC.	0.5 V.DC.
Compliant	Verification of the analogic output						
-22.50 "Hg	4.0000 V.DC.	4.0065 V.DC.	+0.0065 V.DC.	4.0065 V.DC.	+0.0065 V.DC.	+\- 0.5 V.DC.	0.5 V.DC.
Compliant	Verification of the analogic output						
-22.50 "Hg	4.0000 V.DC.	4.0065 V.DC.	+0.0065 V.DC.	4.0065 V.DC.	+0.0065 V.DC.	+\- 0.5 V.DC.	0.5 V.DC.
Compliant	Verification of the analogic output						
-22.50 "Hg	4.0000 V.DC.	4.0065 V.DC.	+0.0065 V.DC.	4.0065 V.DC.	+0.0065 V.DC.	+\- 0.5 V.DC.	0.5 V.DC.
Compliant	Verification of the analogic output						
-22.50 "Hg	4.0000 V.DC.	4.0065 V.DC.	+0.0065 V.DC.	4.0065 V.DC.	+0.0065 V.DC.	+\- 0.5 V.DC.	0.5 V.DC.
Compliant	Verification of the analogic output						

Environmental Conditions: Temperature: 22 °C Humidity: 47 %RH

Comments:

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CALIBRATION CERTIFICATE

CERTIFICATE #	CE-EM-126 2024-05-23

CALIBRATION DATE/ISSUANCE OF CERTIFICATE	
Calibration Date:	2024-05-23
Next Calibration:	2025-05-23
Certificate Date:	2024-05-23

CALIBRATION CONFORMITY	Before	After
Compliant:	X	X
Non Compliant:		

¤ Instrumentation St. Laurent Inc. Certify that the above instrument, meets or exceeds the specifications established by the manufacturer. The company's quality system complies with the requirements of ISO 17025 :2017 and the standards used to perform the calibration is traceable to NRC and / or NIST.
¤ Reported uncertainties represent a 95 % of confidence level assuming a normal distribution k=2.
¤ The declaration of conformity does not include Instrumentation St-Laurent Inc. uncertainty measurement. Decision rule is based on binary statement for simple acceptance rule against ILAC G8 standard and test tolerance limits are based on customer specifications, unless otherwise specified.
¤ The results presented in this certificate relate only to objects subject to calibration.
¤ It is the customer's responsibility to ensure that calibrated equipment meets its intended use.
¤ The date format used in this certificate is: YYYY-MM-DD.

Assessment Service Calibration Laboratory (ASCL) of the National Research Council of Canada (NRC) has assessed and certified calibration laboratory's ability and traceability to the International System of Units (SI) or to standards acceptable according to ASCL. This calibration certificate is issued in accordance with the terms of ASCL certification and accreditation requirements of the Standards Council of Canada (SCC). ASCL and SCC does not guarantee the accuracy of individual calibrations by accredited laboratories.

Marc Gingras - Technicien

28 mai 2024

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Certified ISO 17025

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CALIBRATION CERTIFICATE

CERTIFICATE #	CE-EM-127 2024-05-23

CLIENT	
Company:	Services Polytests Inc
Address:	695 B rue Gaudette
	St-Jean-sur-Richelieu, Québec, J3B 7S7

CALIBRATION SPECIFICATION	
Service Procedure:	4IN9106
Required Accuracy:	+\- 1"Hg
Calibration Frequency:(days)	365

INSTRUMENT SPECIFICATION			
Instrument Type:	Pressure Gauge	Input Type:	Pression
Manufacturer:	Dwyer	Output Type:	Digitale
Model #:	DPG200	Measurement Type:	Pressure
Serial #:	N.A.	Range:	0-28"Hg
Location:	N.A.	Version:	Machine: N.A.

CALIBRATORS SPECIFICATION			
Calibrator:	Crystal XP2i 300	Certification #:	2023007594
Serial #:	866756	Certification Date:	2023-09-22
Certified by:	Alpha Controls	Next Certification:	2024-09-22
Comments:			
Calibrator:	Fluke 744	Certification #:	AC24041903
Serial #:	8180008	Certification Date:	2024-05-09
Certified by:	alpha Controls	Next Certification:	2025-05-09
Comments:			

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CALIBRATION CERTIFICATE

CERTIFICATE #	CE-EM-127 2024-05-23

CALIBRATION RESULTS

Entry Source	Given Value	Initial Value	Ini. Deviation Error	Final Value	Fin. Deviation Error	Accuracy	Uncertainty
Conformity	**Comment**						
0.00 "Hg	0.00 "Hg	0.00 "Hg	0.00 "Hg	0.00 "Hg	0.00 "Hg	+/-1.0 "Hg	± 0.5 "Hg
Compliant	Verification of the indicator						
-7.50 "Hg	-7.50 "Hg	-7.48 "Hg	+0.02 "Hg	-7.48 "Hg	+0.02 "Hg	+/- 1.0 "Hg	± 0.5 "Hg
Compliant	Verification of the indicator						
-15.00 "Hg	-15.00 "Hg	-15.01 "Hg	-0.01 "Hg	-15.01 "Hg	-0.01 "Hg	+/- 1.0 "Hg	± 0.5 "Hg
Compliant	Verification of the indicator						
-22.50 "Hg	-22.50 "Hg	-22.48 "Hg	+0.02 "Hg	-22.48 "Hg	+0.02 "Hg	+/- 1.0 "Hg	± 0.5 "Hg
Compliant	Verification of the indicator						
-28.00 "Hg	-28.00 "Hg	-28.01 "Hg	-0.01 "Hg	-28.01 "Hg	-0.01 "Hg	+/- 1.0 "Hg	± 0.5 "Hg
Compliant	Verification of the indicator						
-22.50 "Hg	-22.50 "Hg	-22.48 "Hg	+0.02 "Hg	-22.48 "Hg	+0.02 "Hg	+/- 1.0 "Hg	± 0.5 "Hg
Compliant	Verification of the indicator						
-15.00 "Hg	-15.00 "Hg	-15.01 "Hg	-0.01 "Hg	-15.01 "Hg	-0.01 "Hg	+/- 1.0 "Hg	± 0.5 "Hg
Compliant	Verification of the indicator						
-7.50 "Hg	-7.50 "Hg	-7.48 "Hg	+0.02 "Hg	-7.48 "Hg	+0.02 "Hg	+/- 1.0 "Hg	± 0.5 "Hg
Compliant	Verification of the indicator						
0.00 "Hg	0.00 "Hg	0.00 "Hg	0.00 "Hg	0.00 "Hg	0.00 "Hg	+/- 1.0 "Hg	± 0.5 "Hg
Compliant	Verification of the indicator						
0.00 "Hg	10.0000 V.DC.	10.0048	+0.0048 V.DC.	10.0048	+0.0048 V.DC.	+/- 0.5 V.DC.	0.5 V.DC.
Compliant	Verification of the analogic output						
-7.50 "Hg	8.0000 V.DC.	8.0248 V.DC.	+0.0248 V.DC.	8.0248 V.DC.	+0.0248 V.DC.	+\- 0.5 V.DC.	0.5 V.DC.
Compliant	Verification of the analogic output						
-15.00 "Hg	6.0000 V.DC.	6.0114 V.DC.	+0.0114 V.DC.	6.0114 V.DC.	+0.0114 V.DC.	+\- 0.5 V.DC.	0.5 V.DC.
Compliant	Verification of the analogic output						
-22.50 "Hg	4.0000 V.DC.	4.0157 V.DC.	+0.0157 V.DC.	4.0157 V.DC.	+0.0157 V.DC.	+\- 0.5 V.DC.	0.5 V.DC.
Compliant	Verification of the analogic output						
-28.00 "Hg	2.5333 V.DC.	2.5300 V.DC.	-0.0033 V.DC.	2.5300 V.DC.	-0.0033 V.DC.	+\- 0.5 V.DC.	0.5 V.DC.
Compliant	Verification of the analogic output						
-22.50 "Hg	4.0000 V.DC.	4.0136 V.DC.	+0.0136 V.DC.	4.0136 V.DC.	+0.0136 V.DC.	+\- 0.5 V.DC.	0.5 V.DC.
Compliant	Verification of the analogic output						
-15.00 "Hg	6.0000 V.DC.	6.0144 V.DC.	+0.0144 V.DC.	6.0144 V.DC.	+0.0144 V.DC.	+\- 0.5 V.DC.	0.5 V.DC.
Compliant	Verification of the analogic output						
-7.50 "Hg	8.0000 V.DC.	8.0208 V.DC.	+0.0208 V.DC.	8.0208 V.DC.	+0.0208 V.DC.	+\- 0.5 V.DC.	0.5 V.DC.
Compliant	Verification of the analogic output						
0.00 "Hg	10.0000 V.DC.	10.068 V.DC.	+0.0680 V.DC.	10.068 V.DC.	+0.0680 V.DC.	+\- 0.5 V.DC.	0.5 V.DC.
Compliant	Verification of the analogic output						

Environmental Conditions: Temperature: 22 °C Humidity: 47 %RH

Comments:

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Instrumentation Saint•Laurent inc.
Certified ISO 17025

CLAS 2010-02

SCC Accredited LAB
LAB Accrédité CCN

80 rue de la montagne
St-Joseph du lac
(Québec), J0N 1M0
Phone: (450) 473-6169
Fax: (450) 473-5207
info@instrumentationsaintlaurent.com

CALIBRATION CERTIFICATE

CERTIFICATE #	CE-EM-127 2024-05-23

CALIBRATION DATE/ISSUANCE OF CERTIFICATE	
Calibration Date:	2024-05-23
Next Calibration:	2025-05-23
Certificate Date:	2024-05-23

CALIBRATION CONFORMITY		
	Before	**After**
Compliant:	X	X
Non Compliant:		

¤ Instrumentation St. Laurent Inc. Certify that the above instrument, meets or exceeds the specifications established by the manufacturer. The company's quality system complies with the requirements of ISO 17025 :2017 and the standards used to perform the calibration is traceable to NRC and / or NIST.
¤ Reported uncertainties represent a 95 % of confidence level assuming a normal distribution k=2.
¤ The declaration of conformity does not include Instrumentation St-Laurent Inc. uncertainty measurement. Decision rule is based on binary statement for simple acceptance rule against ILAC G8 standard and test tolerance limits are based on customer specifications, unless otherwise specified.
¤ The results presented in this certificate relate only to objects subject to calibration.
¤ It is the customer's responsibility to ensure that calibrated equipment meets its intended use.
¤ The date format used in this certificate is: YYYY-MM-DD.

Assessment Service Calibration Laboratory (ASCL) of the National Research Council of Canada (NRC) has assessed and certified calibration laboratory's ability and traceability to the International System of Units (SI) or to standards acceptable according to ASCL. This calibration certificate is issued in accordance with the terms of ASCL certification and accreditation requirements of the Standards Council of Canada (SCC). ASCL and SCC does not guarantee the accuracy of individual calibrations by accredited laboratories.

Marc Gingras - Technicien

28 Nov. 2024

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TRANSCAT® CANADA
Trust in every measure

ACCREDITATION ISO 17025 SCC Scope Number 668

CALIBRATION CERTIFICATE

9900 Chemin de la Côte-de-Liesse, Montréal, QC H8T 1A1
www.dispersion.ca 1.866.390.5066

Client :	Polytests	**Certificate Number :**	**157-77C603-221**
Address :	695 B rue Gaudette Saint-Jean-sur-Richelieu, QC J3B7S7	**Calibration date :**	04-03-2022

Technician:
Coutu, Daniel

David Llorens, Quality Manager

SERVICE DESCRIPTION:

Masses description :	ASTM E617	**Date approved :**	04-03-2022
Precision class :	ASTM 1	**Next Calibration :**	04-03-2027
Density :	7.95g/cm³	**CCN accreditation # :**	668
Identification (if unique) :	1000026013	**CLAS Certification # :**	2010-01

Test conditions :	Temp °C:	21.05	kPa Pressure:	102.3	Humidity:	49.4

NOTES:

For weight calibration, we use the procedure "Comparaison individuelle" PDL-09-MG-001 and the procedure "Détermination des incertitudes" PDL-09-MG-002. This certificate cannot be copied without written approval from Dispersion Laboratory. The results presented in these pages relate only to objects subjected to calibration.n

REMARKS:

March 2022

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ACCREDITATION ISO 17025 SCC Scope Number 668

CALIBRATION CERTIFICATE

9900 Chemin de la Côte-de-Liesse, Montréal, QC H8T 1A1
www.dispersion.ca 1.866.390.5066

Client :	Polytests	**Certificate Number :**	**157-77C603-221**
Address :	695 B rue Gaudette	**CCN Accreditation # :**	668
	Saint-Jean-sur-Richelieu, QC	**CLAS Certification # :**	2010-01
	J3B7S7	**Precision class :**	ASTM 1
		Calibration date :	04-03-2022
Mass :	200 g	**Follow-up date :**	04-03-2027

CALIBRATION RESULTS, CONVENTIONAL MASS:

Nominal Mass	Serial #	Inventory #	Conventional mass	Conventional mass after adjustment	Tolerance ± (mg)	Uncertainties ± (mg)
200 g*	1000026013	EM-129	199.99954 g	199.99986 g	0.50 mg	0.10 mg

*Applicable only for adjusted masses **Falls outside of the specified class

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CANADA
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ACCREDITATION ISO 17025
SCC Scope Number 668

CALIBRATION CERTIFICATE

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www.dispersion.ca 1.866.390.5066

Client :	Polytests	**Certificate Number :**	**157-77C603-221**
Address :	695 B rue Gaudette	**CCN Accreditation # :**	668
	Saint-Jean-sur-Richelieu, QC	**CLAS Certification # :**	2010-01
	J3B7S7	**Precision class :**	ASTM 1
		Calibration date :	04-03-2022
Mass :	200 g	**Follow-up date :**	04-03-2027

CALIBRATION RESULTS, CORRECTIONS:

Nominal Mass	Serial #	Inventory #	Conventional mass Corrections	Conventional mass Corrections after adjustment	Tolerance ± (mg)	Uncertainties ± (mg)
200 g*	1000026013	EM-129	-0.46 mg	-0.14 mg	0.50 mg	0.10 mg

*Applicable only for adjusted masses **Falls outside of the specified class

CALIBRATION CERTIFICATE

9900 Chemin de la Côte-de-Liesse, Montréal, QC H8T 1A1
www.dispersion.ca 1.866.390.5066

BALANCES

The following balances are used for calibration purposes :

> 5 kg to 25 kg :	Mettler Toledo XP32003L, SNR 1123271214, max. 32100 g, d = 0.005 g
> 1 kg to 5 kg	Mettler Toledo PR5003, SNR 1115311634, max. 5100 g, d = 0.001 g
> 300 g to 2 kg :	Mettler Toledo XP2004S, SNR B131185222, max. 2100 g, d = 0.1 mg
> 100 g to 200 g :	Mettler Toledo AT201 SNR BA1115230146, max. 205 g, d = 0.01 mg
> 5 g to 100 g :	Mettler Toledo AX106 SNR 1127063924, max. 111 g, d = 1 µg
1 mg to 5 g :	Mettler UMX5, SNR 1121103055, max. 5.1 g, d = 0.1 µg

We are also using these balances in our automated procedure :

> 200 g to 1 kg :	Mettler Toledo AX1005 SNR 1127063210, max. 1109 g, d = 0.01 mg
> 5 g to 100 g :	Mettler Toledo AX106 SNR 1120143015, max. 111 g, d = 1 µg
1 mg to 5 g :	Mettler UMX5, SNR 1125140561, max. 5.1 g, d = 0.1 µg

Our balances are periodically verified, according to our PDL-11-MG-001 control procedure.

UNCERTAINTIES:

The following uncertainties exist :

1. *Uncertainty associated with the weighting process.*
2. *Uncertainty associated with air density.*
3. *Uncertainty associated with the measurement standard.*
4. *Uncertainty associated with the density of the mass being calibrated.*

The uncertainty of the weighing process includes long-term reproducibility.

Uncertainties specified in this report are expanded uncertainties representing a confidence level of approximately 95% obtained by multiplying the combined standard uncertainty by a coverage factor of k = 2. For more detailed information refer to the GUM (Guide to the Expression of Uncertainty in Measurement, 1995 Edition)

TRACEABILITY

The Calibration Laboratory Assessment Service (CLAS) of the National Research Council of Canada (NRC) has assessed and certified specific calibration capabilities of this laboratory and their traceability to recognized national measurement standards and to the International System of Units (SI). This certificate of calibration is issued in accordance with the conditions of certification granted by CLAS and the conditions of accreditation granted by the Standards Council of Canada (SCC). Neither the CLAS nor the SCC guarantees the accuracy of individual calibration by accredited laboratories.

CALIBRATION CERTIFICATE

9900 Chemin de la Côte-de-Liesse, Montréal, QC H8T 1A1
www.dispersion.ca 1.866.390.5066

USED REFERENCES

Item	Serial #	Manufacturer	Calibration date	Due date
300g Labo	96-0888-50-2	Denver Instrument Company	01-10-2020	31-03-2022
1kg-1mg Labo	MT-01	Mettler Toledo	01-10-2020	31-03-2022
2kg Labo	96-0888-50-3	Denver Instrument Company	01-10-2020	31-03-2022
1kg Labo	96-088850-1	Denver Instrument Company	01-10-2020	31-03-2022
5kg Labo	129099	Mettler Toledo	01-10-2020	31-03-2022
10kg Labo	DI000G991	Dispersion	23-03-2021	31-03-2022
20kg Labo	69976	Mettler Toledo	06-10-2021	31-10-2022
1 mg-10kg	4000028011	Troemner	15-10-2021	31-10-2022
2kg Labo	129098	Mettler Toledo	01-10-2020	31-03-2022

ENVIRONMENTAL CONDITIONS

Item	Serial #	Manufacturer	Calibration date	Due date
THE004	107080	Control Company	04-03-2021	31-03-2022

POLYCONTROLS

CLAS 2009-02

CERTIFICAT D'ÉTALONNAGE # 24942

Date d'étalonnage : 2025-01-06
Date d'émission du certificat : 2025-01-09

Services Polytests
695 B Gaudette street
St-Jean-sur-Richelieu, Québec, Canada
J3B 7S7

Étalonnage d'un
Débitmètre à déplacement positif American Meter Company DTM-200A S/N : 99A274209

CONFORMITÉ AU PROGRAMME DE QUALITÉ

Tous les étalonnages sont effectués conformément au manuel d'assurance qualité de Polycontrols qui est conforme à la norme ISO/IEC 17025: 2017, à la norme ISO 9001 – 2015 ainsi qu'à toutes autres exigences de qualité définies dans la description d'achat des clients. Les résultats ne sont valides que pour l'objet soumis à l'essai ou à l'étalonnage. Si applicable, la règle de décision est décrite au certificat.

TRAÇABILITÉ

La traçabilité des étalons de débit au National Institute of Standards and Technology, NIST, est maintenue par les laboratoires de Fluke Corporation de Phoenix, Arizona et est conforme aux normes ISO/IEC 17025, ANSI/NCSL Z540-1-1994, ISO-10012-1, MIL-STD 45662A.

Le Service d'évaluation des laboratoires d'étalonnage (CLAS) du Conseil national de recherches du Canada (CNRC) a évalué et certifié la capacité d'étalonnage du laboratoire et la traçabilité au Système international d'unités (SI) ou à des étalons acceptables selon le CLAS. Le présent certificat d'étalonnage est délivré conformément aux conditions de certification du CLAS et aux conditions d'accréditation du Conseil canadien des normes (CCN). Le CLAS et le CCN ne garantissent pas l'exactitude des étalonnages individuels effectués par les laboratoires accrédités.

ÉTALONNAGE DE MATÉRIEL DE MESURE ET D'ESSAI

Pour connaître la portée de mesurage du laboratoire d'étalonnage, veuillez consulter la page Web du Réseau canadien d'étalonnage du Conseil national de recherches du Canada. Ce laboratoire a été accrédité par le Conseil canadien des normes dans le cadre du programme du Service d'évaluation des laboratoires d'étalonnage (CLAS) et figure à: nrc.canada.ca.

Le présent document fait partie du certificat d'accréditation remis par le Conseil canadien des normes (CCN) à Polycontrols. La version originale est affichée dans le répertoire des organismes de certification accrédités par le CCN sur le site Web du CCN au www.ccn.ca.

SOMMAIRE DES CONDITIONS DE L'INSTRUMENT EN TEST

Conditions initiales	En bon état
Travail Effectué	Étalonnage de l'instrument
	Lectures Initiales = Lectures finales, aucun ajustement
Résultats	Lectures finales dans les tolérances
Remarques	Fréquence d'étalonnage aux 6 mois

B Poirier

Bernard Poirier
Métrologiste

Responsable du laboratoire

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Tel: (450) 444-3600 Fax: (450) 444-1088 www.polycontrols.com

POLYCONTROLS

CLAS 2009-02

Certificat d'étalonnage # 24942

Numéro de série:	99A274209	Station de mesure:	3
Date d'étalonnage:	2025-01-06	Procédure:	POS-CAL-005
Identification de l'instrument:	EM-130	Règle de décision:	Méthode #3

Instrument de mesure de référence utilisé pour l'étalonnage final

Description	Modèle	# Série	Traçabilité	Date dû
Fluke molbloc_30 slpm	3E4-VCR-V-Q	2359	1500371423	2025-02-13
Fluke molbloc_120 slpm	2E2-S	237	1500373170	2025-03-07
Fluke molbox1+	Molbox1+	2089	1500373373	2025-03-11
RTD Mist	M22	3061002	2024005919	2025-07-12
Module 44.5 PSI avec Baro 163671	Module 30	160659	2024004347	2025-05-22

Spécifications finales de l'appareil

Gaz	Air
Température d'opération	20 °C
Pression à l'entrée	
Pression à la sortie	
Température de référence	
Pression de référence	
Étendue d'échelle	0-200 ACFH
Signal de sortie	Afficheur
Alimentation	
Tolérance	±2 %O.R.

Condition d'étalonnage

Gaz	Air
Température ambiante	21 °C
Pression ambiante	1015.48 mbar
Orientation	Verticale
Élastomère	
Valve	

Lectures finales

Débit du test ACFH	Instrument en test ft³	Valeurs mesurées Pression PSIA	Température °C	Référence ft³	Référence calculée ft³	Erreur calculée ft³	Tolérance acceptable ft³	Incertitude k = 2 ft³	TUR
10.4624	1.740	14.736	21.10	1.746	1.741	-0.001	0.035	0.008	>4
118.8765	19.970	14.814	21.06	19.950	19.787	0.183	0.396	0.049	>4
197.5565	33.110	14.945	20.82	33.490	32.899	0.211	0.658	0.081	>4

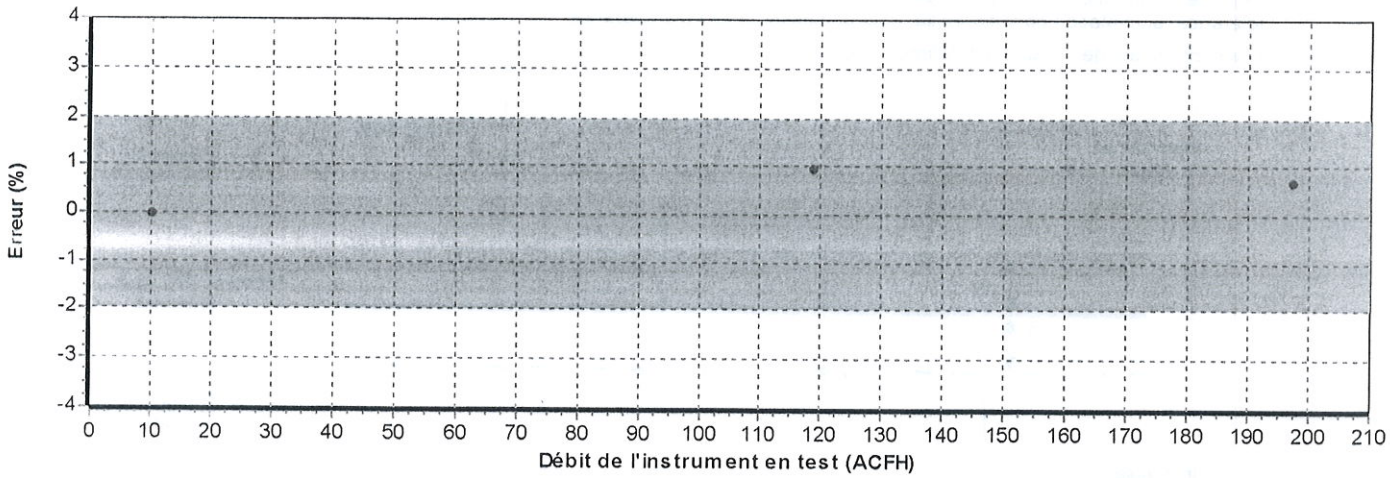
POLYCONTROLS

CLAS 2009-02

Certificat d'étalonnage # 24942

Numéro de série:	99A274209	Station de mesure:	3
Date d'étalonnage:	2025-01-06	Procédure:	POS-CAL-005
Identification de l'instrument:	EM-130	Règle de décision:	Méthode #3

Résultats finaux



Voir l'annexe pour la règle de décision

BSAM 2025

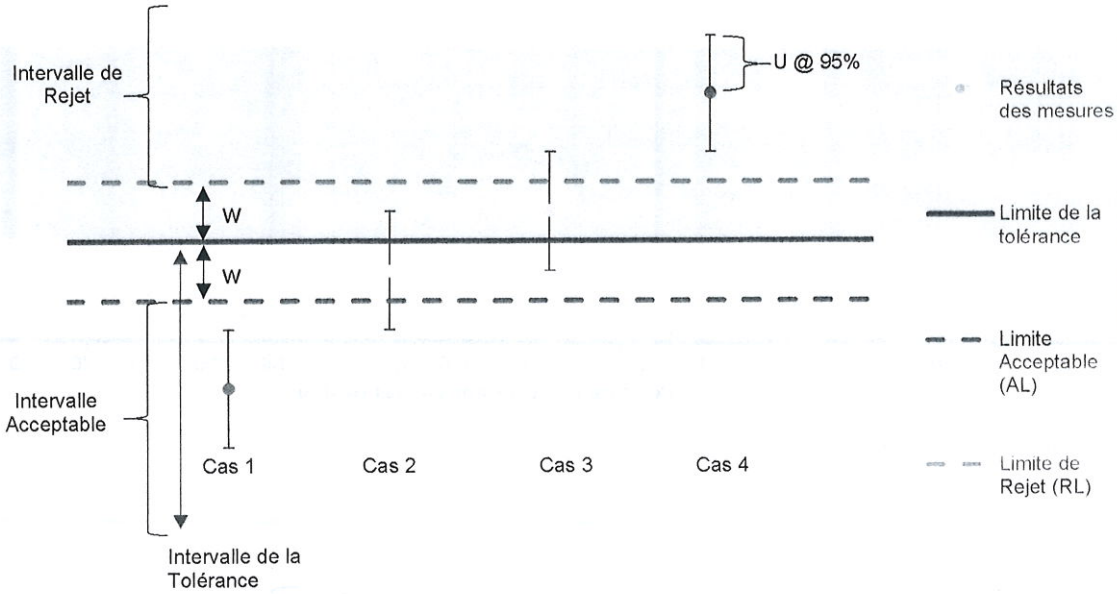
Fc : 1.00

Annexe pour la règle de décision

Méthode #3 Statut de Conformité Non-binaire avec Bande de Garde en considérant l'incertitude de la mesure directement

Cette méthode tient compte d'une bande de garde pour définir l'intervalle acceptable et de rejet. La limite acceptable résultat de la mesure est calculée selon la méthode mathématique suivante AL = TL – w et de rejet RL = TL + w, dont w = rU. Le multiple r de l'incertitude combiné élargie U peut être défini selon la table 1 section 5.2 du document ILAC G8 : 2019. L'incertitude de la mesure U est une incertitude combinée élargie ayant un niveau de confiance de 95% (k = 2). La règle de conformité non-binaire avec bande de garde est définie lorsqu'il y a quatre choix sur le statut de l'essai : dans la tolérance, acceptation conditionnelle, rejet conditionnel, et hors tolérance.

Les conformités de l'essai sont définies telles que :



Explication de la règle Non-Binaire avec Bande de Garde

Cas 1 – Inférieur à la limite acceptable AL

Statut : Dans les tolérances (In tolerance)

- Le résultat de la mesure est à l'intérieur de l'intervalle acceptable. Cependant, l'estimation du risque en assumant la probabilité d'une distribution normale d'être à l'extérieur de la limite de la tolérance est < 2.5%. L'incertitude de l'essai est directement prise en considération. *Couleur verte.*

Cas 2 – Inférieur à la limite de la tolérance TL, supérieur à la limite acceptable AL

Statut : Dans les tolérances-Conditionnel

- Le résultat de la mesure est à l'extérieur de l'intervalle acceptable mais inférieur à la limite de la tolérance. Cependant, la valeur observée est située dans la bande de garde w = TL-AL et le statut du résultat est conditionnel à l'évaluation du risque du client. L'incertitude de la mesure est directement prise en considération. *Couleur jaune.*

Cas 3 – Supérieur à la limite de la tolérance, inférieur à RL

Statut : Hors tolérance-Conditionnel

- Le résultat de la mesure est supérieur à la limite de la tolérance mais à l'extérieur de l'intervalle de rejet. Cependant, la valeur observée est située dans la bande de garde w = TL-RL et le statut du résultat est conditionnel à l'évaluation du risque du client. L'incertitude de la mesure est directement prise en considération. *Couleur jaune.*

Cas 4 – Supérieur à la limite de rejet RL

Statut : Hors-tolérance (Out of tolerance)

- Le résultat de la mesure est à l'intérieur de l'intervalle de rejet. L'incertitude de l'essai est directement prise en considération. *Couleur rouge.*

3650-A1, boul. Matte, Brossard, (Québec) J4Y 2Z2 Canada – CAN: (450) 444-3600 USA: 1-844-660-7659

Fox Valley Metrology
3114 Medalist Drive
Oshkosh, WI 54902
(920) 426-5894 • Fax (920) 426-8120
https://www.FoxValleyMetrology.com

CERTIFICATE OF CALIBRATION

ACCREDITED ISO/IEC 17025 CALIBRATION AND TESTING LABORATORY
Certificate No. ACT-1272

CERTIFICATION NUMBER	CP003-27831-690
FOR	Polytests Services Inc. 695 B rue Gaudette St-Jean-sur-Richelieu, QC, Canada J3B 7S7
TEST INSTRUMENT	Thermohygrometer
MAKE	Fluke
MODEL	971
RANGE	-4 to 100°F/ 5 to 95%RH
CUSTOMER LOCATION	
CONDITION RECEIVED	In Tolerance
CONDITION RETURNED	In Tolerance
CALIBRATED BY	Rodney Kalata
REVIEWED/ISSUED	D.P. 01/09/2025
CALIBRATION LOCATION	FVM
ENVIRONMENT	71.6°F, 37.7%RH, 29.38inHg
CALIBRATION DATE	01/03/2025
RECALIBRATION DUE	01/03/2026

IDENTIFICATION	EM-136
SERIAL NUMBER	10610860
PURCHASE ORDER #	100617

PROCEDURES FOLLOWED

EL-033A rev. 1
EL-034A rev. 1

STANDARDS USED

INSTRUMENT	SERIAL NUMBER	TRACE NUMBER	NEXT CAL
FVS-275E	16783134	CO134-20963-690	05/31/2025
FVS-471	1012820	CO310-32592-548	11/30/2025

CALIBRATION RESULTS

* DENOTES "OUT OF TOLERANCE"

FEATURE	NOMINAL	LOWER LIMIT	UPPER LIMIT	AS FOUND	AS LEFT	UNCERTAINTY
Temperature	(°F)	(°F)	(°F)	(°F)	(°F)	
	60.0	59.0	61.0	60.9	60.9	3.6E-1
	70.0	69.0	71.0	70.5	70.5	3.6E-1
	80.0	79.0	81.0	80.3	80.3	3.6E-1
Humidity	(RH)	(RH)	(RH)	(RH)	(RH)	
	25.0	22.5	27.5	27.0	27.0	9.0E-1
	50.0	47.5	52.5	49.8	49.8	9.0E-1
	75.0	72.5	77.5	72.7	72.7	9.0E-1

13 Jan 2025

■ This certificate shall not be altered in any form or reproduced, except in full, without prior written approval from originating lab. These results relate only to the item(s) calibrated. Form Revision 10: 06/04/2024
■ Total expanded measurement uncertainties expressed are based on a confidence level of 95%; coverage factor of (k=2). The statement of compliance in this certificate was issued without taking the uncertainty of measurement into consideration. The customer shall assess the results and uncertainty when determining if the results meet their needs. (This is considered "shared responsibility.") Uncertainties expressed in nominal units.
■ The calibrations within the certificate/report are traceable through NIST or another National Metrology Institute to the International System of Units (SI). Calibration was completed in accordance with ISO/IEC 17025:2017, ANSI/NCSL Z540-1-1994 and ANSI/NCSL Z540.3-2006. Other standards listed upon request.

Instrumentation Saint•Laurent Inc.
Certified ISO 17025

CLAS NRC-CNRC CLAS 2010-02

SCC Accredited LAB Accrédité CCN

80 rue de la montagne
St-Joseph du lac
(Québec), J0N 1M0
Phone: (450) 473-6169
Fax: (450) 473-5207
info@instrumentationsaintlaurent.com

CALIBRATION CERTIFICATE

CERTIFICATE #	CE-EM-147 2024-05-23

CLIENT	
Company:	Services Polytests Inc
Address:	695 B rue Gaudette
	St-Jean-sur-Richelieu, Québec, J3B 7S7

CALIBRATION SPECIFICATION	
Service Procedure:	4IN9101
Required Accuracy:	+\- 2.0C
Calibration Frequency:(days)	365

INSTRUMENT SPECIFICATION			
Instrument Type:	Recorder	**Input Type:**	Divers
Manufacturer:	Keithley	**Output Type:**	Digital
Model #:	2700	**Measurement Type:**	Temperature
Serial #:	1349443	**Range:**	Divers
Location:	N.A.	**Version:**	**Machine:** N.A.

CALIBRATORS SPECIFICATION

28/05/2024

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Instrumentation Saint•Laurent inc.
Certified ISO 17025

CLAS NRC·CNRC CLAS 2010-02

SCC Accredited LAB LAB Accrédité CCN

80 rue de la montagne
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(Québec), J0N 1M0
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Fax: (450) 473-5207
info@instrumentationsaintlaurent.com

CALIBRATION CERTIFICATE

CERTIFICATE #	CE-EM-147 2024-05-23

CALIBRATION RESULTS

Entry Source	Given Value	Initial Value	Ini. Deviation Error	Final Value	Fin. Deviation Error	Accuracy	Uncertainty
Conformity	**Comment**						
EntrySource	GivenValue	ActualValue	Initial Deviation	Post Calib	Final Deviation	Tolerance	Incertitude
Conformity	Voir Commentaire						

Environmental Conditions: Temperature: 22 °C Humidity: 47 %RH

Comments: Data Acquisition system Conforme

Les 2 slot de l'enregistreur ont été vérifié.

CALIBRATION DATE/ISSUANCE OF CERTIFICATE	
Calibration Date:	2024-05-23
Next Calibration:	2025-05-23
Certificate Date:	2024-05-23

CALIBRATION CONFORMITY	Before	After
Compliant:	X	X
Non Compliant:		

¤ Instrumentation St. Laurent Inc. Certify that the above instrument, meets or exceeds the specifications established by the manufacturer. The company's quality system complies with the requirements of ISO 17025 :2017 and the standards used to perform the calibration is traceable to NRC and / or NIST.
¤ Reported uncertainties represent a 95 % of confidence level assuming a normal distribution k=2.
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¤ The results presented in this certificate relate only to objects subject to calibration.
¤ It is the customer's responsibility to ensure that calibrated equipment meets its intended use.
¤ The date format used in this certificate is: YYYY-MM-DD.

Assessment Service Calibration Laboratory (ASCL) of the National Research Council of Canada (NRC) has assessed and certified calibration laboratory's ability and traceability to the International System of Units (SI) or to standards acceptable according to ASCL. This calibration certificate is issued in accordance with the terms of ASCL certification and accreditation requirements of the Standards Council of Canada (SCC). ASCL and SCC does not guarantee the accuracy of individual calibrations by accredited laboratories.

Marc Gingras - Technicien

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GRAFTEL
An AMETEK Company

CERTIFICATE OF CALIBRATION

Traceable to the SI through the National Institute of Standards and Technology

Calibration Certificate No: 121888

Customer Information

Customer: Services Polytests

Address: 695-B Gaudette St-Jean-sur-richelieu J3B 7S7

Customer PO #: 100620

ACCREDITED
CERT #5827.01

Calibration Procedure Information

Procedure: Air Velocity Calibration

Revision #: 1

Calibration Standards Information

Graftel ID	Model #	Description	CAL Due
10187	PTB210	Vaisala Ambient Pressure	11/30/2025
10100		Graftel Temperature	10/17/2025
10171	FC0332-2W	Furness DeltaP Meter, 0 to 0.4"H2O	11/30/2025
10086	FC0332	Furness Controls DeltaP Meter, 0 to 4"H2O	11/30/2025
T1830459	VAISALA / H MW95D	Vaisala Temp/RH Logger, Velocity Lab	6/30/2025
51203	760-100A	Paroscientific Absolute Pressure	2/28/2025

Calibrated Device Information

Manufacturer: Omega

Description: Anemometer

Method Used: Pitot Tube

Model #: HHF143

Rated Accuracy: See Attachments

Accuracy Specified By: Omega

Instrument ID: EM153

Range: 40 to 7800 fpm

Condition: Functional

Serial #: 1015949

Calibration Date: 01/27/2025

Calibration Due: 01/27/2026

Comments: Calibration Range: 100-5000 fpm

The calibrations within the certificate/report are traceable to the International System of Units (SI) through the National Institute of Standards and Technology (NIST) or another National Metrology Institute. The reported calibration uncertainty has a confidence level of 95% (k=2). A calibration uncertainty ratio of 4:1 was maintained unless required uncertainty is supported by analysis. Graftel Quality Assurance System complies with applicable requirements of ISO/IEC-17025-2017, ANSI/NCSL Z540-1-1994 and ISO 9001. All results contained within this certificate relate only to item(s) calibrated. This certificate shall not be reproduced except in full and with the written consent of Graftel. Acceptance Criteria per Simple Acceptance Rule: Measurement Uncertainty is not applied to the measured value when in/out of tolerance statement is made.

Performed By
Philip Davis
Calibration Technician
01/27/2025

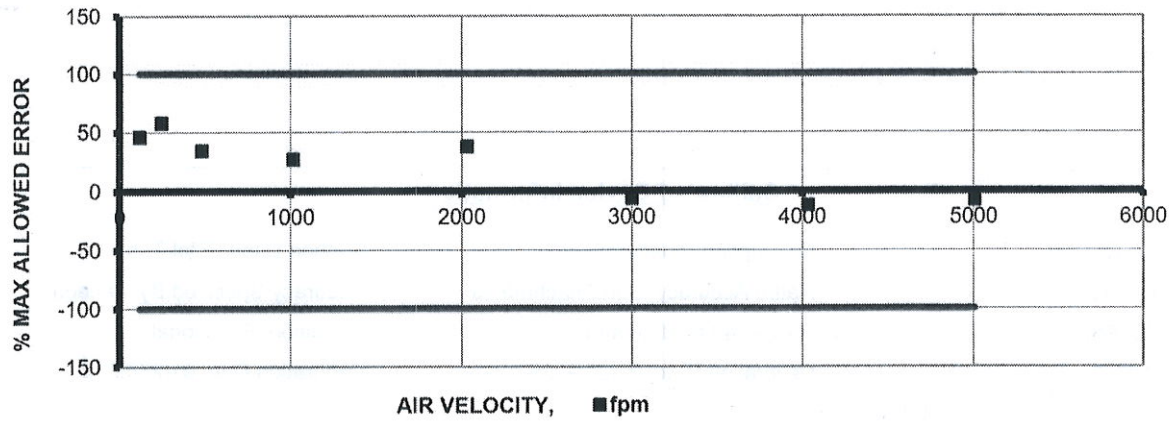
Approved/Issued By
Janelle Gabriel
QA Specialist
01/28/2025

95 Chancellor Drive | Roselle, Illinois 60172 | +1 (847) 364-2600 | Graftel.com

ATTACHMENT TO CALIBRATION CERTIFICATE 121888
AS FOUND / AS LEFT DATA

Reading From Standard,	Lower Limit of Meter Reading,	Measured Reading From Meter,	Upper Limit of Meter Reading,	Error,	Measurement Uncertainty (k=2)	CMC (k=2)	STATUS
Actual Air Velocity							
fpm	fpm	fpm	fpm	fpm	fpm	fpm	STATUS
118	116	119	120	1	3	3	Pass
246	243	248	249	2	4	4	Pass
481	475	483	487	2	6	6	Pass
1015	1004	1018	1026	3	11	11	Pass
2030	2009	2038	2051	8	20	20	Pass
3000	2969	2998	3031	-2	29	29	Pass
4034	3993	4029	4075	-5	38	38	Pass
5006	4955	5002	5057	-4	47	47	Pass

ERROR CHART



Instrument Specifications		
Test Fluid:	Air	
Lower Velocity Range:	40	fpm
Upper Velocity Range:	7800	fpm
Velocity Resolution:	1	
Velocity Accuracy:	+/-(1% Reading + 1 digit)	
Laboratory Ambient Conditions		
Pressure:	14.33	psia
Humidity:	21.01	%RH
Temperature:	70.04	°F

WATER FLOW • AIR FLOW • TEMPERATURE • PRESSURE • HUMIDITY

GRAFTEL An AIS Company

Traceable to SI through NIST

WWW.GRAFTEL.COM 95 CHANCELLOR DRIVE, ROSELLE, ILLINOIS 60172 PHONE: (847) 364-2600

2025-01-29

Instrumentation Saint•Laurent inc.
Certified ISO 17025

CLAS NRC·CNRC CLAS 2010-02

SCC Accredited LAB LAB Accredité SCC

80 rue de la montagne
St-Joseph du lac
(Québec), J0N 1M0
Phone: (450) 473-6169
Fax: (450) 473-5207
info@instrumentationsaintlaurent.com

CALIBRATION CERTIFICATE

CERTIFICATE #	CE-EM-154/2 2024-12-02

CLIENT	
Company:	Services Polytests Inc
Address:	695 B rue Gaudette
	St-Jean-sur-Richelieu, Québec, J3B 7S7

CALIBRATION SPECIFICATION	
Service Procedure:	4IN9101
Required Accuracy:	+\- 4.0°F
Calibration Frequency:(days)	181

INSTRUMENT SPECIFICATION			
Instrument Type:	Recorder	**Input Type:**	Temp
Manufacturer:	Keithley	**Output Type:**	Digitale
Model #:	7700	**Measurement Type:**	Temperature
Serial #:	1306774	**Range:**	Divers
Location:	N/A	**Version:**	**Machine:** N.A.

CALIBRATORS SPECIFICATION			
Calibrator:	Thermometre digital 6412	**Certification #:**	6412-15020243
Serial #:	240300851	**Certification Date:**	2024-04-09
Certified by:	ITM-Control company	**Next Certification:**	2026-04-09
Comments:			

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Instrumentation Saint•Laurent inc.
Certified ISO 17025

CLAS NRC·CNRC CLAS 2010-02

SOC Accredited LAB LAB Accrédité CCN

80 rue de la montagne
St-Joseph du lac
(Québec), J0N 1M0
Phone: (450) 473-6169
Fax: (450) 473-5207
info@instrumentationsaintlaurent.com

CALIBRATION CERTIFICATE

CERTIFICATE #	CE-EM-154/2 2024-12-02

CALIBRATION RESULTS

Entry Source	Given Value	Initial Value	Ini. Deviation Error	Final Value	Fin. Deviation Error	Accuracy	Uncertainty
Conformity	Comment						
85.0 °F	85.0 °F	84.7 °F	-0.3 °F	84.7 °F	-0.3 °F	+/- 4.0 °F	+/- 0.5 °F
Compliant	ID. No. 111 (Filter 1) en type "T" En Loop avec EM-154						
85.0 °F	85.0 °F	83.0 °F	-2.0 °F	83.0 °F	-2.0 °F	+/- 4.0 °F	+/- 0.5 °F
Compliant	ID. No. 112 (Filter 2) en type "T" En Loop avec EM-154						
125.0 °F	125.0 °F	124.2 °F	-0.8 °F	124.2 °F	-0.8 °F	+/- 4.0 °F	+/- 0.4 °F
Compliant	ID. No. 113 (Tunnel) en type "J" En Loop avec EM-154						
70.0 °F	70.0 °F	69.2 °F	-0.8 °F	69.2 °F	-0.8 °F	+/- 4.0 °F	+/- 0.4 °F
Compliant	ID. No. 114 (Room) en type "J" En Loop avec EM-154						
100.0 °F	100.0 °F	99.8 °F	-0.2 °F	99.8 °F	-0.2 °F	+/- 4.0 °F	+/- 0.4 °F
Compliant	ID. No. 115 (Dry bulb tunnel) en type "J" En Loop avec EM-154						
70.0 °F	70.0 °F	69.7 °F	-0.3 °F	69.7 °F	-0.3 °F	+/- 4.0 °F	+/- 0.4 °F
Compliant	ID. No. 116 (Analyzer gaz) en type "J" En Loop avec EM-154						

Environmental Conditions: Temperature: 20 °C Humidity: 31 %RH

The calibration was carried out at the client on-site using the method of comparison to the standard measurement.

Comments:

CALIBRATION DATE/ISSUANCE OF CERTIFICATE	
Calibration Date:	2024-12-02
Next Calibration:	2025-06-01
Certificate Date:	2024-12-02

CALIBRATION CONFORMITY	Before	After
Compliant:	X	X
Non Compliant:		

¤ Instrumentation St. Laurent Inc. Certify that the above instrument, meets or exceeds the specifications established by the manufacturer. The company's quality system complies with the requirements of ISO 17025 :2017 and the standards used to perform the calibration is traceable to NRC and / or NIST.
¤ Reported uncertainties represent a 95 % of confidence level assuming a normal distribution k=2.
¤ The declaration of conformity does not include Instrumentation St-Laurent Inc. uncertainty measurement. Decision rule is based on binary statement for simple acceptance rule against ILAC G8 standard and test tolerance limits are based on customer specifications, unless otherwise specified.
¤ The results presented in this certificate relate only to objects subject to calibration.
¤ It is the customer's responsibility to ensure that calibrated equipment meets its intended use.
¤ The date format used in this certificate is: YYYY-MM-DD.

The Calibration Laboratory Assessment Service (CLAS) of the National Research Council of Canada (NRC) has assessed and certified specific calibration capabilities of this laboratory and traceability to the International System of Units (SI) or to standards acceptable to the CLAS program. This certificate of calibration is issued in accordance with the conditions of certification granted by CLAS and the conditions of accreditation granted by the accreditation body. Neither CLAS nor the accreditation body guarantee the accuracy of individual calibrations by accredited laboratories.

Benoit Larocque - Tech

Dec 4th 2024

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Fox Valley Metrology
3114 Medalist Drive
Oshkosh, WI 54902
(920) 426-5894 • Fax (920) 426-8120
https://www.FoxValleyMetrology.com

CERTIFICATE OF CALIBRATION

ACCREDITED ISO/IEC 17025 CALIBRATION AND TESTING LABORATORY
Certificate No. ACT-1272

CERTIFICATION NUMBER	CP008-54054-682
FOR	Polytests Services Inc. 695 B rue Gaudette St-Jean-sur-Richelieu, QC, Canada J3B 7S7
TEST INSTRUMENT	Stopwatch
MAKE	Extech Instruments
MODEL	365510
CUSTOMER LOCATION	
CONDITION RECEIVED	In Tolerance
CONDITION RETURNED	In Tolerance
CALIBRATED BY	Wyatt LeBouton
REVIEWED/ISSUED	D.P. 01/09/2025
CALIBRATION LOCATION	FVM
ENVIRONMENT	72.9°F, 22.7°C, 40.0%RH
CALIBRATION DATE	01/08/2025
RECALIBRATION DUE	01/08/2026

IDENTIFICATION	EM-175
SERIAL NUMBER	
PURCHASE ORDER #	100617

PROCEDURES FOLLOWED

EL-019B rev. 1

STANDARDS USED

INSTRUMENT	SERIAL NUMBER	TRACE NUMBER	NEXT CAL
FVS-275E	16783134	CO134-20963-690	05/31/2025

CALIBRATION RESULTS

* DENOTES "OUT OF TOLERANCE"

FEATURE	NOMINAL	LOWER LIMIT	UPPER LIMIT	AS FOUND	AS LEFT	UNCERTAINTY
Time Interval	(s)	(s)	(s)	(s)	(s)	
1 minute	60.00	59.50	60.50	60.00	60.00	5.8E-1
	60.00	59.50	60.50	60.08	60.08	5.8E-1
5 minute	300.00	299.50	300.50	300.07	300.07	6.3E-1
	300.00	299.50	300.50	300.08	300.08	6.3E-1

13 JAN V

- This certificate shall not be altered in any form or reproduced, except in full, without prior written approval from originating lab. These results relate only to the item(s) calibrated. Form Revision 10: 06/04/2024
- Total expanded measurement uncertainties expressed are based on a confidence level of 95%; coverage factor of (k=2). The statement of compliance in this certificate was issued without taking the uncertainty of measurement into consideration. The customer shall assess the results and uncertainty when determining if the results meet their needs. (This is considered "shared responsibility.") Uncertainties expressed in nominal units.
- The calibrations within the certificate/report are traceable through NIST or another National Metrology Institute to the International System of Units (SI). Calibration was completed in accordance with ISO/IEC 17025:2017, ANSI/NCSL Z540-1-1994 and ANSI/NCSL Z540.3-2006. Other standards listed upon request.

POLYCONTROLS

CLAS 2009-02

CERTIFICAT D'ÉTALONNAGE # 24944

Date d'étalonnage : 2025-01-06
Date d'émission du certificat : 2025-01-09

Services Polytests
695 B Gaudette street
St-Jean-sur-Richelieu, Québec, Canada
J3B 7S7

Étalonnage d'un
Débitmètre à déplacement positif Shinigawa DCDa-2c S/N : 23544

CONFORMITÉ AU PROGRAMME DE QUALITÉ

Tous les étalonnages sont effectués conformément au manuel d'assurance qualité de Polycontrols qui est conforme à la norme ISO/IEC 17025: 2017, à la norme ISO 9001 – 2015 ainsi qu'à toutes autres exigences de qualité définies dans la description d'achat des clients. Les résultats ne sont valides que pour l'objet soumis à l'essai ou à l'étalonnage. Si applicable, la règle de décision est décrite au certificat.

TRAÇABILITÉ

La traçabilité des étalons de débit au National Institute of Standards and Technology, NIST, est maintenue par les laboratoires de Fluke Corporation de Phoenix, Arizona et est conforme aux normes ISO/IEC 17025, ANSI/NCSL Z540-1-1994, ISO-10012-1, MIL-STD 45662A.

Le Service d'évaluation des laboratoires d'étalonnage (CLAS) du Conseil national de recherches du Canada (CNRC) a évalué et certifié la capacité d'étalonnage du laboratoire et la traçabilité au Système international d'unités (SI) ou à des étalons acceptables selon le CLAS. Le présent certificat d'étalonnage est délivré conformément aux conditions de certification du CLAS et aux conditions d'accréditation du Conseil canadien des normes (CCN). Le CLAS et le CCN ne garantissent pas l'exactitude des étalonnages individuels effectués par les laboratoires accrédités.

ÉTALONNAGE DE MATÉRIEL DE MESURE ET D'ESSAI

Pour connaître la portée de mesurage du laboratoire d'étalonnage, veuillez consulter la page Web du Réseau canadien d'étalonnage du Conseil national de recherches du Canada. Ce laboratoire a été accrédité par le Conseil canadien des normes dans le cadre du programme du Service d'évaluation des laboratoires d'étalonnage (CLAS) et figure à: nrc.canada.ca.

Le présent document fait partie du certificat d'accréditation remis par le Conseil canadien des normes (CCN) à Polycontrols. La version originale est affichée dans le répertoire des organismes de certification accrédités par le CCN sur le site Web du CCN au www.ccn.ca.

SOMMAIRE DES CONDITIONS DE L'INSTRUMENT EN TEST

Conditions initiales	En bon état
Travail Effectué	Étalonnage de l'instrument
Résultats	Lectures finales dans les tolérances
Remarques	Fréquence d'étalonnage aux 6 mois
	Tolérance ajustée à la demande du client
	Valeur de l'instrument corrigée = Lecture de l'afficheur de l'instrument * K facteur (0.986)

Hassan Habli
Métrologiste

Responsable du laboratoire

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Tel: (450) 444-3600 Fax: (450) 444-1088 www.polycontrols.com

POLYCONTROLS

CLAS NRC·CNRC CLAS 2009-02

SCC Accredited LAB Accréditée CCN

Certificat d'étalonnage # 24944

Numéro de série:	23544	Station de mesure:	3
Date d'étalonnage:	2025-01-06	Procédure:	POS-CAL-005
Identification de l'instrument:	EM-178	Règle de décision:	Méthode #3

Instrument de mesure de référence utilisé pour l'étalonnage final

Description	Modèle	# Série	Traçabilité	Date dû
Fluke molbloc_30 slpm	3E4-VCR-V-Q	2359	1500371423	2025-02-13
Fluke molbloc_120 slpm	2E2-S	237	1500373170	2025-03-07
Fluke molbox1+	Molbox1+	2089	1500373373	2025-03-11
RTD Mist	M22	3061002	2024005919	2025-07-12
Module 44.5 PSI avec Baro 163671	Module 30	160659	2024004347	2025-05-22

Spécifications finales de l'appareil

Gaz	Air
Température d'opération	
Pression à l'entrée	
Pression à la sortie	
Température de référence	
Pression de référence	
Étendue d'échelle	10-2000 ALH
Signaux Entrée/Sortie	-
Alimentation	
Tolérance	±2 %O.R.

Condition d'étalonnage

Gaz	Air
Température ambiante	22 °C
Pression ambiante	1014.18 mbar
Orientation	Horizontale
Élastomère	
Valve	

Lectures finales

Débit du test ALH	Instrument en test L	Valeurs mesurées Pression PSIA	Température °C	Référence L	Référence calculée L	Erreur calculée L	Tolérance acceptable L	Incertitude k = 2 L	TUR
342.439	57.280	14.722	21.026	53.020	57.014	0.266	1.140	0.189	>4
1326.993	222.140	14.745	20.786	206.170	221.174	0.966	4.423	0.733	>4
2154.344	359.390	14.778	20.720	334.880	358.358	1.032	7.167	0.877	>4

POLYCONTROLS

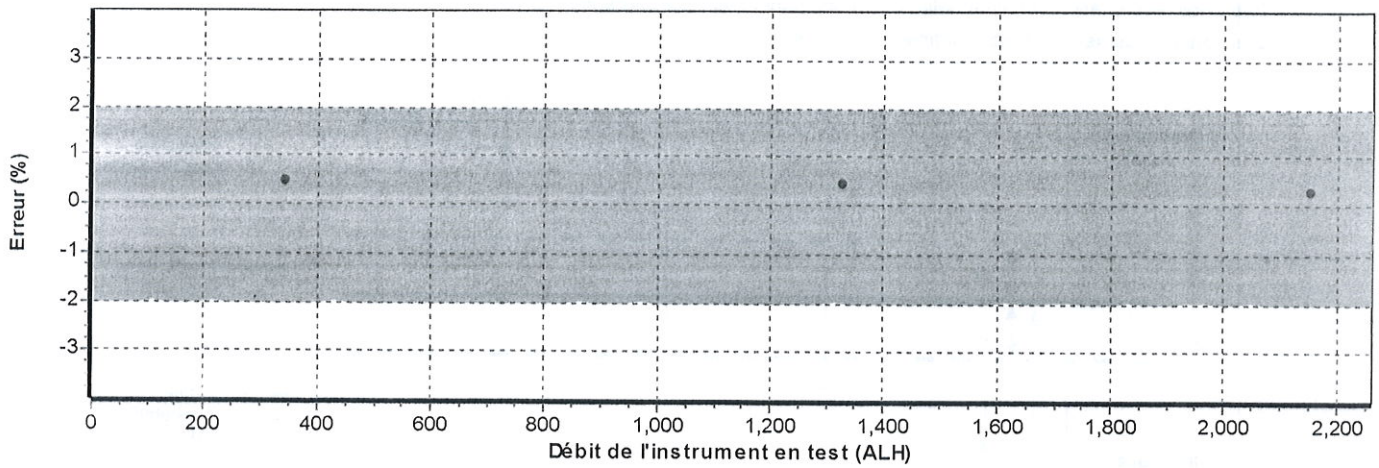
CLAS NRC·CNRC
CLAS 2009-02

SCC Accredited LAB
LAB Accrédité CCN

Certificat d'étalonnage # 24944

Numéro de série:	23544	Station de mesure:	3
Date d'étalonnage:	2025-01-06	Procédure:	POS-CAL-005
Identification de l'instrument:	EM-178	Règle de décision:	Méthode #3

Résultats finaux



Voir l'annexe pour la règle de décision

13 JAN 2025

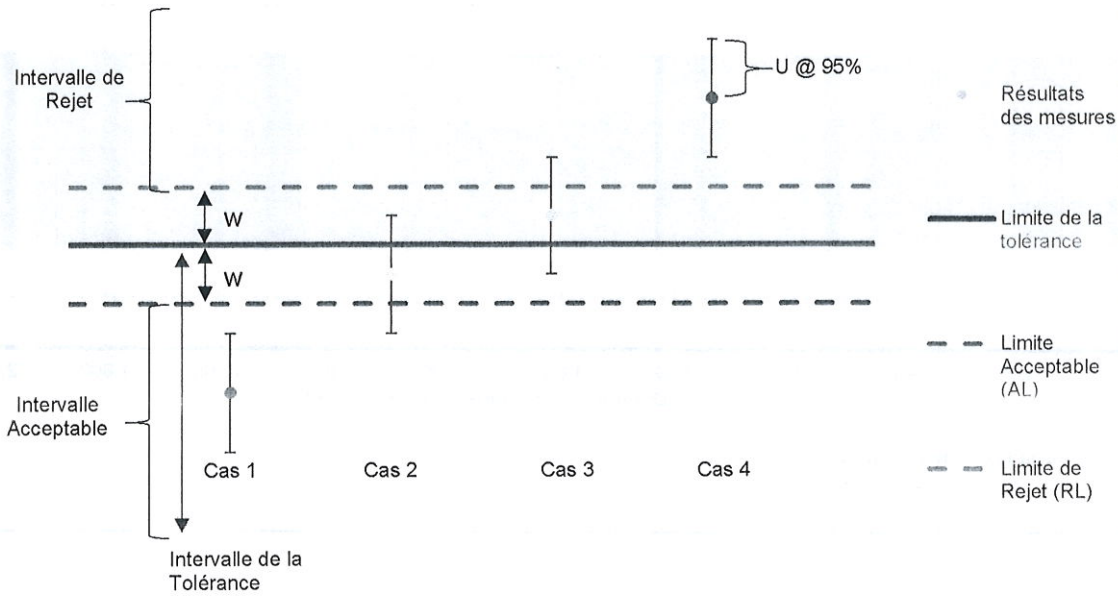
Fc : 0,986

Annexe pour la règle de décision

Méthode #3 Statut de Conformité Non-binaire avec Bande de Garde en considérant l'incertitude de la mesure directement

Cette méthode tient compte d'une bande de garde pour définir l'intervalle acceptable et de rejet. La limite acceptable du résultat de la mesure est calculée selon la méthode mathématique suivante AL = TL – w et de rejet RL = TL + w, dont w = rU. Le multiple r de l'incertitude combiné élargie U peut être défini selon la table 1 section 5.2 du document ILAC G8 : 2019. L'incertitude de la mesure U est une incertitude combinée élargie ayant un niveau de confiance de 95% (k = 2). La règle de conformité non-binaire avec bande de garde est définie lorsqu'il y a quatre choix sur le statut de l'essai : dans la tolérance, acceptation conditionnelle, rejet conditionnel, et hors tolérance.

Les conformités de l'essai sont définies telles que :



Explication de la règle Non-Binaire avec Bande de Garde

Cas 1 – Inférieur à la limite acceptable AL

Statut : Dans les tolérances (In tolerance)

- Le résultat de la mesure est à l'intérieur de l'intervalle acceptable. Cependant, l'estimation du risque en assumant la probabilité d'une distribution normale d'être à l'extérieur de la limite de la tolérance est < 2.5%. L'incertitude de l'essai est directement prise en considération. *Couleur verte.*

Cas 2 – Inférieur à la limite de la tolérance TL, supérieur à la limite acceptable AL

Statut : Dans les tolérances-Conditionnel

- Le résultat de la mesure est à l'extérieur de l'intervalle acceptable mais inférieur à la limite de la tolérance. Cependant, la valeur observée est située dans la bande de garde w = TL-AL et le statut du résultat est conditionnel à l'évaluation du risque du client. L'incertitude de la mesure est directement prise en considération. *Couleur jaune.*

Cas 3 – Supérieur à la limite de la tolérance, inférieur à RL

Statut : Hors tolérance-Conditionnel

- Le résultat de la mesure est supérieur à la limite de la tolérance mais à l'extérieur de l'intervalle de rejet. Cependant, la valeur observée est située dans la bande de garde w = TL-RL et le statut du résultat est conditionnel à l'évaluation du risque du client. L'incertitude de la mesure est directement prise en considération. *Couleur jaune.*

Cas 4 – Supérieur à la limite de rejet RL

Statut : Hors-tolérance (Out of tolerance)

- Le résultat de la mesure est à l'intérieur de l'intervalle de rejet. L'incertitude de l'essai est directement prise en considération. *Couleur rouge.*

3650-A1, boul. Matte, Brossard, (Québec) J4Y 2Z2 Canada – CAN: (450) 444-3600 USA: 1-844-660-7659

POLYCONTROLS

CLAS 2009-02

CERTIFICAT D'ÉTALONNAGE # 24943

Date d'étalonnage : 2025-01-06
Date d'émission du certificat : 2025-01-09

Services Polytests
695 B Gaudette street
St-Jean-sur-Richelieu, Québec, Canada
J3B 7S7

Étalonnage d'un
Débitmètre à déplacement positif Shinigawa DCDa-2c S/N : 23543

CONFORMITÉ AU PROGRAMME DE QUALITÉ

Tous les étalonnages sont effectués conformément au manuel d'assurance qualité de Polycontrols qui est conforme à la norme ISO/IEC 17025: 2017, à la norme ISO 9001 – 2015 ainsi qu'à toutes autres exigences de qualité définies dans la description d'achat des clients. Les résultats ne sont valides que pour l'objet soumis à l'essai ou à l'étalonnage. Si applicable, la règle de décision est décrite au certificat.

TRAÇABILITÉ

La traçabilité des étalons de débit au National Institute of Standards and Technology, NIST, est maintenue par les laboratoires de Fluke Corporation de Phoenix, Arizona et est conforme aux normes ISO/IEC 17025, ANSI/NCSL Z540-1-1994, ISO-10012-1, MIL-STD 45662A.

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ÉTALONNAGE DE MATÉRIEL DE MESURE ET D'ESSAI

Pour connaître la portée de mesurage du laboratoire d'étalonnage, veuillez consulter la page Web du Réseau canadien d'étalonnage du Conseil national de recherches du Canada. Ce laboratoire a été accrédité par le Conseil canadien des normes dans le cadre du programme du Service d'évaluation des laboratoires d'étalonnage (CLAS) et figure à: nrc.canada.ca.

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SOMMAIRE DES CONDITIONS DE L'INSTRUMENT EN TEST

Conditions initiales	En bon état
Travail Effectué	Étalonnage de l'instrument
Résultats	Lectures finales dans les tolérances
Remarques	Fréquence d'étalonnage aux 6 mois
	Tolérance ajustée à la demande du client
	Valeur de l'instrument corrigée = Lecture de l'afficheur de l'instrument * K facteur (0.988)

Hassan Habli
Métrologiste

Responsable du laboratoire

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Tel: (450) 444-3600 Fax: (450) 444-1088 www.polycontrols.com

POLYCONTROLS

CLAS 2009-02

Certificat d'étalonnage # 24943

Numéro de série:	23543	Station de mesure:	3
Date d'étalonnage:	2025-01-06	Procédure:	POS-CAL-005
Identification de l'instrument:	EM-179	Règle de décision:	Méthode #3

Instrument de mesure de référence utilisé pour l'étalonnage final

Description	Modèle	# Série	Traçabilité	Date dû
Fluke molbloc_30 slpm	3E4-VCR-V-Q	2359	1500371423	2025-02-13
Fluke molbloc_120 slpm	2E2-S	237	1500373170	2025-03-07
Fluke molbox1+	Molbox1+	2089	1500373373	2025-03-11
RTD Mist	M22	3061002	2024005919	2025-07-12
Module 44.5 PSI avec Baro 163671	Module 30	160659	2024004347	2025-05-22

Spécifications finales de l'appareil

Gaz	Air
Température d'opération	
Pression à l'entrée	
Pression à la sortie	
Température de référence	
Pression de référence	
Étendue d'échelle	10-2000 ALH
Signaux Entrée/Sortie	-
Alimentation	
Tolérance	±2 %O.R.

Condition d'étalonnage

Gaz	Air
Température ambiante	22 °C
Pression ambiante	1014.94 mbar
Orientation	Horizontale
Élastomère	
Valve	

Lectures finales

Débit du test ALH	Instrument en test L	Valeurs mesurées Pression PSIA	Température °C	Référence L	Référence calculée L	Erreur calculée L	Tolérance acceptable L	Incertitude k = 2 L	TUR
359.170	59.873	14.724	20.810	55.650	59.790	0.083	1.196	0.198	>4
1291.388	213.704	14.749	20.796	200.810	215.368	-1.664	4.307	0.714	>4
2215.875	366.548	14.792	20.839	345.360	369.379	-2.831	7.388	0.904	>4

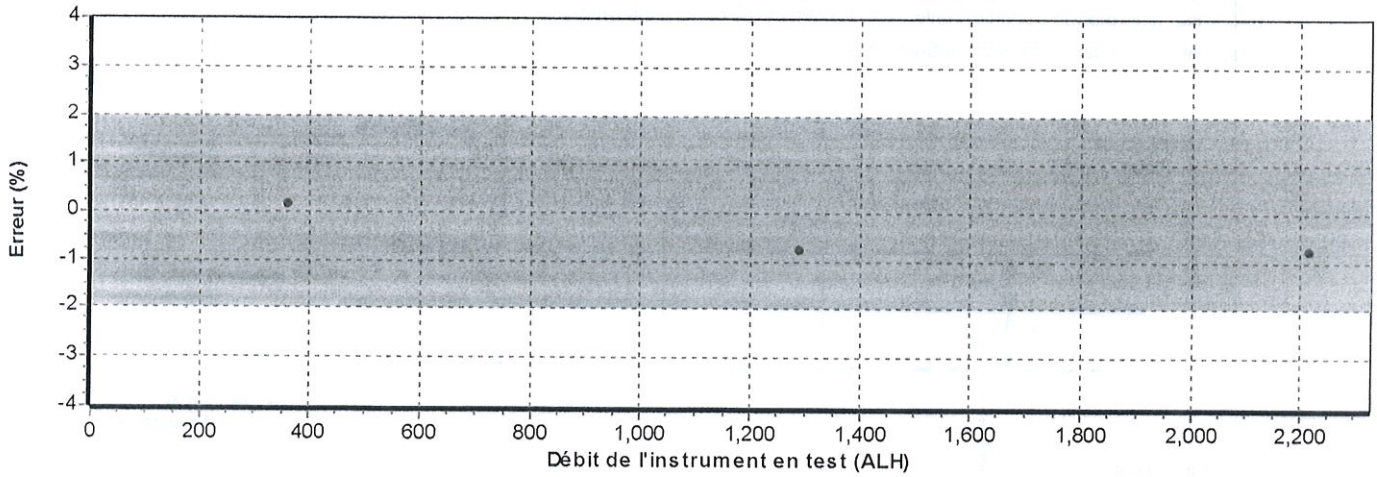
POLYCONTROLS

CLAS 2009-02

Certificat d'étalonnage # 24943

Numéro de série:	23543	Station de mesure:	3
Date d'étalonnage:	2025-01-06	Procédure:	POS-CAL-005
Identification de l'instrument:	EM-179	Règle de décision:	Méthode #3

Résultats finaux



Voir l'annexe pour la règle de décision

13 JANV 2025

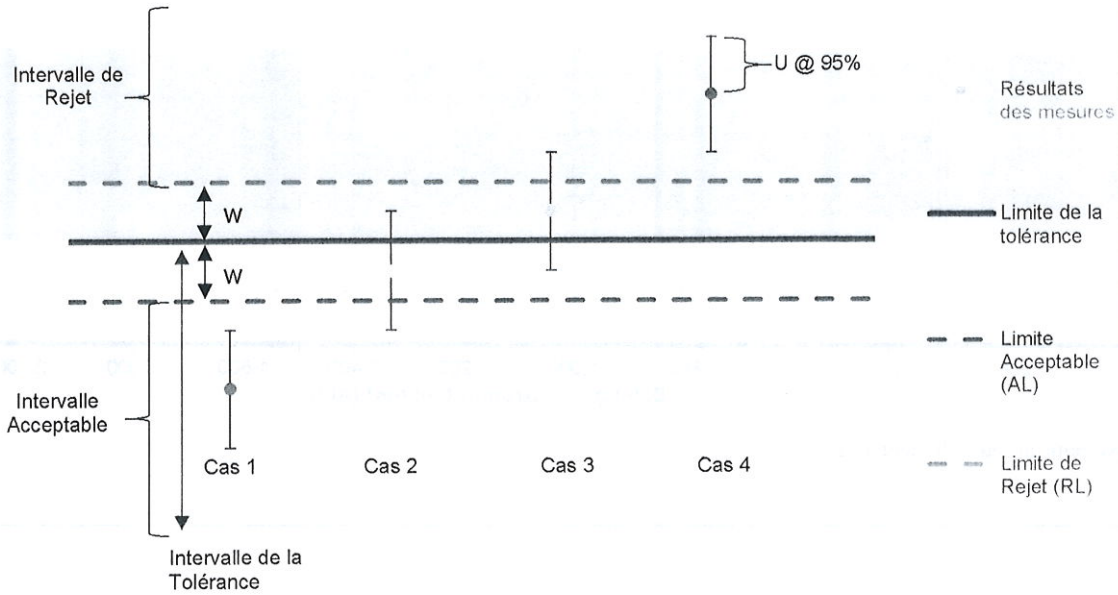
Fc : 0,988

Annexe pour la règle de décision

Méthode #3 Statut de Conformité Non-binaire avec Bande de Garde en considérant l'incertitude de la mesure directement

Cette méthode tient compte d'une bande de garde pour définir l'intervalle acceptable et de rejet. La limite acceptable du résultat de la mesure est calculée selon la méthode mathématique suivante AL = TL – w et de rejet RL = TL + w, dont w = rU. Le multiple r de l'incertitude combiné élargie U peut être défini selon la table 1 section 5.2 du document ILAC G8 : 2019. L'incertitude de la mesure U est une incertitude combinée élargie ayant un niveau de confiance de 95% (k = 2). La règle de conformité non-binaire avec bande de garde est définie lorsqu'il y a quatre choix sur le statut de l'essai : dans la tolérance, acceptation conditionnelle, rejet conditionnel, et hors tolérance.

Les conformités de l'essai sont définies telles que :



Explication de la règle Non-Binaire avec Bande de Garde

Cas 1 – Inférieur à la limite acceptable AL

Statut : Dans les tolérances (In tolerance)

- Le résultat de la mesure est à l'intérieur de l'intervalle acceptable. Cependant, l'estimation du risque en assumant la probabilité d'une distribution normale d'être à l'extérieur de la limite de la tolérance est < 2.5%. L'incertitude de l'essai est directement prise en considération. *Couleur verte.*

Cas 2 – Inférieur à la limite de la tolérance TL, supérieur à la limite acceptable AL

Statut : Dans les tolérances-Conditionnel

- Le résultat de la mesure est à l'extérieur de l'intervalle acceptable mais inférieur à la limite de la tolérance. Cependant, la valeur observée est située dans la bande de garde w = TL-AL et le statut du résultat est conditionnel à l'évaluation du risque du client. L'incertitude de la mesure est directement prise en considération. *Couleur jaune.*

Cas 3 – Supérieur à la limite de la tolérance, inférieur à RL

Statut : Hors tolérance-Conditionnel

- Le résultat de la mesure est supérieur à la limite de la tolérance mais à l'extérieur de l'intervalle de rejet. Cependant, la valeur observée est située dans la bande de garde w = TL-RL et le statut du résultat est conditionnel à l'évaluation du risque du client. L'incertitude de la mesure est directement prise en considération. *Couleur jaune.*

Cas 4 – Supérieur à la limite de rejet RL

Statut : Hors-tolérance (Out of tolerance)

- Le résultat de la mesure est à l'intérieur de l'intervalle de rejet. L'incertitude de l'essai est directement prise en considération. *Couleur rouge.*

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ACCREDITATION ISO 17025 TM
SCC Scope Number 668

CALIBRATION CERTIFICATE

9900 Chemin de la Côte-de-Liesse, Montréal, QC H8T 1A1
www.dispersion.ca 1.866.390.5066

Client :	Polytests	**Certificate Number :**	**157-77C603-222**
Address :	695 B rue Gaudette Saint-Jean-sur-Richelieu, QC J3B7S7	**Calibration date :**	04-03-2022

Technician:
Coutu, Daniel

David Llorens, Quality Manager

SERVICE DESCRIPTION:

Masses description :	NIST F	**Date approved :**	14-03-2022
Precision class :	NIST F	**Next Calibration :**	04-03-2026
Density :	7.7g/cm³	**CCN accreditation # :**	668
Identification (if unique) :	DI000D532	**CLAS Certification # :**	2010-01

Test conditions :	Temp °C:	21.05	kPa Pressure:	102.3	Humidity:	49.4

NOTES:

For weight calibration, we use the procedure "Comparaison individuelle" PDL-09-MG-001 and the procedure "Détermination des incertitudes" PDL-09-MG-002. This certificate cannot be copied without written approval from Dispersion Laboratory. The results presented in these pages relate only to objects subjected to calibration.n

REMARKS:

March 2022

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CALIBRATION CERTIFICATE

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www.dispersion.ca 1.866.390.5066

Client :	Polytests	**Certificate Number :**	**157-77C603-222**
Address :	695 B rue Gaudette	**CCN Accreditation # :**	668
	Saint-Jean-sur-Richelieu, QC	**CLAS Certification # :**	2010-01
	J3B7S7	**Precision class :**	NIST F
		Calibration date :	04-03-2022
Mass :	10 kg	**Follow-up date :**	04-03-2026

CALIBRATION RESULTS, CONVENTIONAL MASS:

Nominal Mass	Serial #	Inventory #	Conventional mass	Conventional mass after adjustment	Tolerance ± (mg)	Uncertainties ± (mg)
10 kg	DI000D532	EM205	9.999938 kg		1 000 mg	10 mg

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CALIBRATION CERTIFICATE

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www.dispersion.ca 1.866.390.5066

Client :	Polytests	**Certificate Number :**	**157-77C603-222**
Address :	695 B rue Gaudette	**CCN Accreditation # :**	668
	Saint-Jean-sur-Richelieu, QC	**CLAS Certification # :**	2010-01
	J3B7S7	**Precision class :**	NIST F
		Calibration date :	04-03-2022
Mass :	10 kg	**Follow-up date :**	04-03-2026

CALIBRATION RESULTS, CORRECTIONS:

Nominal Mass	Serial #	Inventory #	Conventional mass Corrections	Conventional mass Corrections after adjustment	Tolerance ± (mg)	Uncertainties ± (mg)
10 kg	DI000D532		-62 mg		1 000 mg	10 mg

CALIBRATION CERTIFICATE

9900 Chemin de la Côte-de-Liesse, Montréal, QC H8T 1A1
www.dispersion.ca 1.866.390.5066

BALANCES

The following balances are used for calibration purposes :

> 5 kg to 25 kg :	Mettler Toledo XP32003L, SNR 1123271214, max. 32100 g, d = 0.005 g
> 1 kg to 5 kg	Mettler Toledo PR5003, SNR 1115311634, max. 5100 g, d = 0.001 g
> 300 g to 2 kg :	Mettler Toledo XP2004S, SNR B131185222, max. 2100 g, d = 0.1 mg
> 100 g to 200 g :	Mettler Toledo AT201 SNR BA1115230146, max. 205 g, d = 0.01 mg
> 5 g to 100 g :	Mettler Toledo AX106 SNR 1127063924, max. 111 g, d = 1 µg
1 mg to 5 g :	Mettler UMX5, SNR 1121103055, max. 5.1 g, d = 0.1 µg

We are also using these balances in our automated procedure :

> 200 g to 1 kg :	Mettler Toledo AX1005 SNR 1127063210, max. 1109 g, d = 0.01 mg
> 5 g to 100 g :	Mettler Toledo AX106 SNR 1120143015, max. 111 g, d = 1 µg
1 mg to 5 g :	Mettler UMX5, SNR 1125140561, max. 5.1 g, d = 0.1 µg

Our balances are periodically verified, according to our PDL-11-MG-001 control procedure.

UNCERTAINTIES:

The following uncertainties exist :

1. *Uncertainty associated with the weighting process.*
2. *Uncertainty associated with air density.*
3. *Uncertainty associated with the measurement standard.*
4. *Uncertainty associated with the density of the mass being calibrated.*

The uncertainty of the weighing process includes long-term reproducibility.

Uncertainties specified in this report are expanded uncertainties representing a confidence level of approximately 95% obtained by multiplying the combined standard uncertainty by a coverage factor of k = 2. For more detailed information refer to the GUM (Guide to the Expression of Uncertainty in Measurement, 1995 Edition)

TRACEABILITY

The Calibration Laboratory Assessment Service (CLAS) of the National Research Council of Canada (NRC) has assessed and certified specific calibration capabilities of this laboratory and their traceability to recognized national measurement standards and to the International System of Units (SI). This certificate of calibration is issued in accordance with the conditions of certification granted by CLAS and the conditions of accreditation granted by the Standards Council of Canada (SCC). Neither the CLAS nor the SCC guarantees the accuracy of individual calibration by accredited laboratories.

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CALIBRATION CERTIFICATE

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www.dispersion.ca 1.866.390.5066

USED REFERENCES

Item	Serial #	Manufacturer	Calibration date	Due date
300g Labo	96-0888-50-2	Denver Instrument Company	01-10-2020	31-03-2022
1kg-1mg Labo	MT-01	Mettler Toledo	01-10-2020	31-03-2022
2kg Labo	96-0888-50-3	Denver Instrument Company	01-10-2020	31-03-2022
1kg Labo	96-088850-1	Denver Instrument Company	01-10-2020	31-03-2022
5kg Labo	129099	Mettler Toledo	01-10-2020	31-03-2022
10kg Labo	DI000G991	Dispersion	23-03-2021	31-03-2022
20kg Labo	69976	Mettler Toledo	06-10-2021	31-10-2022
1 mg-10kg	4000028011	Troemner	15-10-2021	31-10-2022
2kg Labo	129098	Mettler Toledo	01-10-2020	31-03-2022

ENVIRONMENTAL CONDITIONS

Item	Serial #	Manufacturer	Calibration date	Due date
THE004	107080	Control Company	04-03-2021	31-03-2022

Instrumentation Saint•Laurent inc.

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Fax: (450) 473-5207
info@instrumentationsaintlaurent.com

CALIBRATION CERTIFICATE

CERTIFICATE #	CE-EM-224 2024-05-30

CLIENT	
Company:	Services Polytests Inc
Address:	695 B rue Gaudette
	St-Jean-sur-Richelieu, Québec, J3B 7S7

CALIBRATION SPECIFICATION	
Service Procedure:	ISL-022
Required Accuracy:	+/- 1/32"
Calibration Frequency:(days)	365

INSTRUMENT SPECIFICATION			
Instrument Type:	Ruban à mesurer	**Input Type:**	Mesure
Manufacturer:	Stanley	**Output Type:**	N/A
Model #:	Leverlock 12'	**Measurement Type:**	Inch
Serial #:	N/A	**Range:**	0 à 12'
Location:	Portable	**Version:**	**Machine:** N/A

CALIBRATORS SPECIFICATION			
Calibrator:	tape a mesurer	**Certification #:**	TB-57338710
Serial #:	23036922	**Certification Date:**	2023-09-06
Certified by:	Starrett	**Next Certification:**	2024-09-06
Comments:			

Version: 2024.04.05

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CALIBRATION CERTIFICATE

CERTIFICATE #	CE-EM-224 2024-05-30

CALIBRATION RESULTS

Entry Source	Given Value	Initial Value	Ini. Deviation Error	Final Value	Fin. Deviation Error	Accuracy	
	Comment						
1.00 "	1.00 "	1.00 "	0.00 "	1.00 "	0.00 "	+/- 1/32 "	
36.00 "	36.00 "	36.00 "	0.00 "	36.00 "	0.00 "	+/- 1/32 "	
72.00 "	72.00 "	72.00 "	0.00 "	72.00 "	0.00 "	+/- 1/32 "	
108.00 "	108.00 "	108.00 "	0.00 "	108.00 "	0.00 "	+/- 1/32 "	
132.00 "	132.00 "	132.00 "	0.00 "	132.00 "	0.00 "	+/- 1/32 "	

Environmental Conditions: Temperature: 22 °C Humidity: 35 %RH

Comments:

CALIBRATION DATE/ISSUANCE OF CERTIFICATE	
Calibration Date:	2024-05-30
Next Calibration:	2025-05-30
Certificate Date:	2024-05-30

CALIBRATION CONFORMITY	Before	After
Compliant:	X	X
Non Compliant:		

¤ Instrumentation St. Laurent Inc. Certify that the above instrument, meets or exceeds the specifications established by the manufacturer. The company's quality system complies with the requirements of ISO 17025 :2017 and the standards used to perform the calibration is traceable to NRC and / or NIST.
¤ Reported uncertainties represent a 95 % of confidence level assuming a normal distribution k=2.
¤ The declaration of conformity does not include Instrumentation St-Laurent Inc. uncertainty measurement. Decision rule is based on binary statement for simple acceptance rule against ILAC G8 standard and test tolerance limits are based on customer specifications, unless otherwise specified.
¤ The results presented in this certificate relate only to objects subject to calibration.
¤ It is the customer's responsibility to ensure that calibrated equipment meets its intended use.
¤ The date format used in this certificate is: YYYY-MM-DD.

Martin Langlais - Technicien

JUN 3 2024

Version: 2024.04.05

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CALIBRATION CERTIFICATE

CERTIFICATE #	CE-EM-249 2024-05-23

CLIENT	
Company:	Services Polytests Inc
Address:	695 B rue Gaudette
	St-Jean-sur-Richelieu, Québec, J3B 7S7

CALIBRATION SPECIFICATION	
Service Procedure:	4IN9106
Required Accuracy:	+/- 0.25 "H2O
Calibration Frequency:(days)	365

INSTRUMENT SPECIFICATION			
Instrument Type:	Indicator	Input Type:	Pression
Manufacturer:	Dwyer	Output Type:	Voltage
Model #:	MS-321-LCD	Measurement Type:	Pressure
Serial #:	N/A	Range:	0 à 0.10 "H2O
Location:	Banc de test	Version:	Machine: N/A

CALIBRATORS SPECIFICATION			
Calibrator:	Fluke Pression	Certification #:	2023009508
Serial #:	3330050	Certification Date:	2023-11-23
Certified by:	Alpha Controls	Next Certification:	2024-11-23
Comments:			
Calibrator:	Fluke 744	Certification #:	AC24041903
Serial #:	8180008	Certification Date:	2024-05-09
Certified by:	alpha Controls	Next Certification:	2025-05-09
Comments:			

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CALIBRATION CERTIFICATE

CERTIFICATE #	CE-EM-249 2024-05-23

CALIBRATION RESULTS

Entry Source	Given Value	Initial Value	Ini. Deviation Error	Final Value	Fin. Deviation Error	Accuracy	Uncertainty
Conformity	Comment						
0.0000 "H2O	0.0000 "H2O	-0.0023 "H2O	-0.0023 "H2O	0.0002 "H2O	+0.0002 "H2O	+\- 0.25	± 0.10 "H2O
Compliant	Verification of the indicator						
0.1250 "H2O	0.1250 "H2O	0.1216 "H2O	-0.0034 "H2O	0.1294 "H2O	+0.0044 "H2O	+\- 0.25	± 0.10 "H2O
Compliant	Verification of the indicator						
0.2500 "H2O	0.2500 "H2O	0.2437 "H2O	-0.0063 "H2O	0.2585 "H2O	+0.0085 "H2O	+\- 0.25	± 0.10 "H2O
Compliant	Verification of the indicator						
0.3750 "H2O	0.3750 "H2O	0.3684 "H2O	-0.0066 "H2O	0.3616 "H2O	-0.0134 "H2O	+\- 0.25	± 0.10 "H2O
Compliant	Verification of the indicator						
0.5000 "H2O	0.5000 "H2O	0.4695 "H2O	-0.0305 "H2O	0.4998 "H2O	-0.0002 "H2O	+\- 0.25	± 0.10 "H2O
Compliant	Verification of the indicator						
0.3750 "H2O	0.3750 "H2O	0.3684 "H2O	-0.0066 "H2O	0.3684 "H2O	-0.0066 "H2O	+\- 0.25	± 0.10 "H2O
Compliant	Verification of the indicator						
0.2500 "H2O	0.2500 "H2O	0.0560 "H2O	-0.1940 "H2O	0.2598 "H2O	+0.0098 "H2O	+\- 0.25	± 0.10 "H2O
Compliant	Verification of the indicator						
0.1250 "H2O	0.1250 "H2O	0.1216 "H2O	-0.0034 "H2O	0.1274 "H2O	+0.0024 "H2O	+\- 0.25	± 0.10 "H2O
Compliant	Verification of the indicator						
0.0000 "H2O	0.0000 "H2O	-0.0023 "H2O	-0.0023 "H2O	0.0002 "H2O	+0.0002 "H2O	+\- 0.25	± 0.10 "H2O
Compliant	Verification of the indicator						
0.0000 "H2O	0.0000 V.DC.	0.0051 V.DC.	+0.0051 V.DC.	0.0007 V.DC.	+0.0007 V.DC.	+\- 0.5 V.DC.	0.5 V.DC.
Compliant	Verification of the analogic output						
0.1250 "H2O	2.5000 V.DC.	2.4066 V.DC.	-0.0934 V.DC.	2.5706 V.DC.	+0.0706 V.DC.	+\- 0.5 V.DC.	0.5 V.DC.
Compliant	Verification of the analogic output						
0.2500 "H2O	5.0000 V.DC.	4.8750 V.DC.	-0.1250 V.DC.	5.1851 V.DC.	+0.1851 V.DC.	+\- 0.5 V.DC.	0.5 V.DC.
Compliant	Verification of the analogic output						
0.3750 "H2O	7.5000 V.DC.	7.3406 V.DC.	-0.1594 V.DC.	7.7234 V.DC.	+0.2234 V.DC.	+\- 0.5 V.DC.	0.5 V.DC.
Non-	Verification of the analogic output						
0.5000 "H2O	10.0000 V.DC.	9.5053 V.DC.	-0.4947 V.DC.	9.6432 V.DC.	-0.3568 V.DC.	+\- 0.5 V.DC.	0.5 V.DC.
Non-	Verification of the analogic output						
0.3750 "H2O	7.5000 V.DC.	7.3406 V.DC.	-0.1594 V.DC.	7.7235 V.DC.	+0.2235 V.DC.	+\- 0.5 V.DC.	0.5 V.DC.
Non-	Verification of the analogic output						
0.2500 "H2O	5.0000 V.DC.	4.8750 V.DC.	-0.1250 V.DC.	5.1855 V.DC.	+0.1855 V.DC.	+\- 0.5 V.DC.	0.5 V.DC.
Compliant	Verification of the analogic output						
0.1250 "H2O	2.5000 V.DC.	2.4066 V.DC.	-0.0934 V.DC.	2.5705 V.DC.	+0.0705 V.DC.	+\- 0.5 V.DC.	0.5 V.DC.
Compliant	Verification of the analogic output						
0.0000 "H2O	0.00 V.DC.	0.0050 V.DC.	+0.0050 V.DC.	0.0050 V.DC.	+0.0050 V.DC.	+\- 0.5 V.DC.	0.5 V.DC.
Compliant	Verification of the analogic output						

Environmental Conditions: Temperature: 22 °C Humidity: 47 %RH

Comments:

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CLAS 2010-02

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LAB Accrédité CCN

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CALIBRATION CERTIFICATE

CERTIFICATE #	CE-EM-249 2024-05-23

CALIBRATION DATE/ISSUANCE OF CERTIFICATE	
Calibration Date:	2024-05-23
Next Calibration:	2025-05-23
Certificate Date:	2024-05-23

CALIBRATION CONFORMITY		
	Before	**After**
Compliant:	X	X
Non Compliant:		

¤ Instrumentation St. Laurent Inc. Certify that the above instrument, meets or exceeds the specifications established by the manufacturer. The company's quality system complies with the requirements of ISO 17025 :2017 and the standards used to perform the calibration is traceable to NRC and / or NIST.
¤ Reported uncertainties represent a 95 % of confidence level assuming a normal distribution k=2.
¤ The declaration of conformity does not include Instrumentation St-Laurent Inc. uncertainty measurement. Decision rule is based on binary statement for simple acceptance rule against ILAC G8 standard and test tolerance limits are based on customer specifications, unless otherwise specified.
¤ The results presented in this certificate relate only to objects subject to calibration.
¤ It is the customer's responsibility to ensure that calibrated equipment meets its intended use.
¤ The date format used in this certificate is: YYYY-MM-DD.

Assessment Service Calibration Laboratory (ASCL) of the National Research Council of Canada (NRC) has assessed and certified calibration laboratory's ability and traceability to the International System of Units (SI) or to standards acceptable according to ASCL. This calibration certificate is issued in accordance with the terms of ASCL certification and accreditation requirements of the Standards Council of Canada (SCC). ASCL and SCC does not guarantee the accuracy of individual calibrations by accredited laboratories.

Marc Gingras - Technicien

26 Avril 2024

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CALIBRATION CERTIFICATE

CERTIFICATE #	CE-EM-313 2024-05-23

CLIENT	
Company:	Services Polytests Inc
Address:	695 B rue Gaudette
	St-Jean-sur-Richelieu, Québec, J3B 7S7

CALIBRATION SPECIFICATION	
Service Procedure:	4IN9106
Required Accuracy:	+/- 0.25"H2O
Calibration Frequency:(days)	365

INSTRUMENT SPECIFICATION			
Instrument Type:	Indicator	Input Type:	Pression
Manufacturer:	Dwyer	Output Type:	Voltage
Model #:	MS-321-LCD	Measurement Type:	Pressure
Serial #:	N.A.	Range:	0 a 0.1 inchh20
Location:	N.A.	Version:	Machine: N.A.

CALIBRATORS SPECIFICATION			
Calibrator:	Fluke Pression	Certification #:	2023009508
Serial #:	3330050	Certification Date:	2023-11-23
Certified by:	Alpha Controls	Next Certification:	2024-11-23
Comments:			
Calibrator:	Fluke 744	Certification #:	AC24041903
Serial #:	8180008	Certification Date:	2024-05-09
Certified by:	alpha Controls	Next Certification:	2025-05-09
Comments:			

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Instrumentation Saint•Laurent inc.
Certified ISO 17025

CLAS NRC·CNRC CLAS 2010-02

SOC Accredited LAB
LAB Accrédité CCN

80 rue de la montagne
St-Joseph du lac
(Québec), J0N 1M0
Phone: (450) 473-6169
Fax: (450) 473-5207
info@instrumentationsaintlaurent.com

CALIBRATION CERTIFICATE

CERTIFICATE #	CE-EM-313 2024-05-23

CALIBRATION RESULTS

Entry Source	Given Value	Initial Value	Ini. Deviation Error	Final Value	Fin. Deviation Error	Accuracy	Uncertainty
Conformity	Comment						
0.0000 "H2O	0.0000 "H2O	0.0017 "H2O	+0.0017 "H2O	0.0000 "H2O	0.0000 "H2O	+\- 0.25	± 0.10 "H2O
Compliant	Verification of the indicator						
0.0250 "H2O	0.0250 "H2O	0.0334 "H2O	+0.0084 "H2O	0.0247 "H2O	-0.0003 "H2O	+\- 0.25	± 0.10 "H2O
Compliant	Verification of the indicator						
0.0500 "H2O	0.0500 "H2O	0.0588 "H2O	+0.0088 "H2O	0.0500 "H2O	0.0000 "H2O	+\- 0.25	± 0.10 "H2O
Compliant	Verification of the indicator						
0.0750 "H2O	0.0750 "H2O	0.0842 "H2O	+0.0092 "H2O	0.0752 "H2O	+0.0002 "H2O	+\- 0.25	± 0.10 "H2O
Compliant	Verification of the indicator						
0.1000 "H2O	0.1000 "H2O	0.1095 "H2O	+0.0095 "H2O	0.1003 "H2O	+0.0003 "H2O	+\- 0.25	± 0.10 "H2O
Compliant	Verification of the indicator						
0.0750 "H2O	0.0750 "H2O	0.0844 "H2O	+0.0094 "H2O	0.0750 "H2O	0.0000 "H2O	+\- 0.25	± 0.10 "H2O
Compliant	Verification of the indicator						
0.0500 "H2O	0.0500 "H2O	0.0585 "H2O	+0.0085 "H2O	0.0501 "H2O	+0.0001 "H2O	+\- 0.25	± 0.10 "H2O
Compliant	Verification of the indicator						
0.0250 "H2O	0.0250 "H2O	0.0331 "H2O	+0.0081 "H2O	0.0248 "H2O	-0.0002 "H2O	+\- 0.25	± 0.10 "H2O
Compliant	Verification of the indicator						
0.0000 "H2O	0.0000 "H2O	0.0018 "H2O	+0.0018 "H2O	0.0000 "H2O	0.0000 "H2O	+\- 0.25	± 0.10 "H2O
Compliant	Verification of the indicator						
0.0000 "H2O	0.0000 V.DC.	0.1873 V.DC.	+0.1873 V.DC.	0.0041 V.DC.	+0.0041 V.DC.	+\- 0.5 V.DC.	0.5 V.DC.
Compliant	Verification of the analogic output						
0.0250 "H2O	2.5000 V.DC.	3.3528 V.DC.	+0.8528 V.DC.	2.4985 V.DC.	-0.0015 V.DC.	+\- 0.5 V.DC.	0.5 V.DC.
Compliant	Verification of the analogic output						
0.0500 "H2O	5.0000 V.DC.	5.8866 V.DC.	+0.8866 V.DC.	5.0312 V.DC.	+0.0312 V.DC.	+\- 0.5 V.DC.	0.5 V.DC.
Compliant	Verification of the analogic output						
0.0750 "H2O	7.5000 V.DC.	8.5487 V.DC.	+1.0487 V.DC.	7.5149 V.DC.	+0.0149 V.DC.	+\- 0.5 V.DC.	0.5 V.DC.
Compliant	Verification of the analogic output						
0.1000 "H2O	10.0000 V.DC.	10.6707	+0.6707 V.DC.	10.0119	+0.0119 V.DC.	+\- 0.5 V.DC.	0.5 V.DC.
Compliant	Verification of the analogic output						
0.0750 "H2O	0.00 V.DC.	8.5489 V.DC.	+8.5489 V.DC.	7.5146 V.DC.	+7.5146 V.DC.	+\- 0.5 V.DC.	0.5 V.DC.
Compliant	Verification of the analogic output						
0.0500 "H2O	0.00 V.DC.	5.8863 V.DC.	+5.8863 V.DC.	5.0314 V.DC.	+5.0314 V.DC.	+\- 0.5 V.DC.	0.5 V.DC.
Compliant	Verification of the analogic output						
0.0250 "H2O	0.00 V.DC.	3.3529 V.DC.	+3.3529 V.DC.	2.4986 V.DC.	+2.4986 V.DC.	+\- 0.5 V.DC.	0.5 V.DC.
Compliant	Verification of the analogic output						
0.0000 "H2O	0.00 V.DC.	0.1870 V.DC.	+0.1870 V.DC.	0.0038 V.DC.	+0.0038 V.DC.	+\- 0.5 V.DC.	0.5 V.DC.
Compliant	Verification of the analogic output						

Environmental Conditions: Temperature: 22 °C Humidity: 47 %RH

Comments:

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Instrumentation Saint•Laurent inc.
Certified ISO 17025

CLAS NRC·CNRC
CLAS 2010-02

SCC Accredited LAB
LAB Accrédité CCN

80 rue de la montagne
St-Joseph du lac
(Québec), J0N 1M0
Phone: (450) 473-6169
Fax: (450) 473-5207
info@instrumentationsaintlaurent.com

CALIBRATION CERTIFICATE

CERTIFICATE #	CE-EM-313 2024-05-23

CALIBRATION DATE/ISSUANCE OF CERTIFICATE	
Calibration Date:	2024-05-23
Next Calibration:	2025-05-23
Certificate Date:	2024-05-23

CALIBRATION CONFORMITY	Before	After
Compliant:		X
Non Compliant:	X	

- Instrumentation St. Laurent Inc. Certify that the above instrument, meets or exceeds the specifications established by the manufacturer. The company's quality system complies with the requirements of ISO 17025 :2017 and the standards used to perform the calibration is traceable to NRC and / or NIST.
- Reported uncertainties represent a 95 % of confidence level assuming a normal distribution k=2.
- The declaration of conformity does not include Instrumentation St-Laurent Inc. uncertainty measurement. Decision rule is based on binary statement for simple acceptance rule against ILAC G8 standard and test tolerance limits are based on customer specifications, unless otherwise specified.
- The results presented in this certificate relate only to objects subject to calibration.
- It is the customer's responsibility to ensure that calibrated equipment meets its intended use.
- The date format used in this certificate is: YYYY-MM-DD.

Assessment Service Calibration Laboratory (ASCL) of the National Research Council of Canada (NRC) has assessed and certified calibration laboratory's ability and traceability to the International System of Units (SI) or to standards acceptable according to ASCL. This calibration certificate is issued in accordance with the terms of ASCL certification and accreditation requirements of the Standards Council of Canada (SCC). ASCL and SCC does not guarantee the accuracy of individual calibrations by accredited laboratories.

Marc Gingras - Technicien

28 Mai 2024

5F09106 Version: 2024.04.05

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POLYCONTROLS

CLAS 2009-02

CERTIFICAT D'ÉTALONNAGE # 24946

Date d'étalonnage : 2025-01-06
Date d'émission du certificat : 2025-01-09

Services Polytests
695 B Gaudette street
St-Jean-sur-Richelieu, Québec, Canada
J3B 7S7

Étalonnage d'un
Débitmètre à déplacement positif Shinigawa DCSDa-2C S/N : S8020

CONFORMITÉ AU PROGRAMME DE QUALITÉ

Tous les étalonnages sont effectués conformément au manuel d'assurance qualité de Polycontrols qui est conforme à la norme ISO/IEC 17025: 2017, à la norme ISO 9001 – 2015 ainsi qu'à toutes autres exigences de qualité définies dans la description d'achat des clients. Les résultats ne sont valides que pour l'objet soumis à l'essai ou à l'étalonnage. Si applicable, la règle de décision est décrite au certificat.

TRAÇABILITÉ

La traçabilité des étalons de débit au National Institute of Standards and Technology, NIST, est maintenue par les laboratoires de Fluke Corporation de Phoenix, Arizona et est conforme aux normes ISO/IEC 17025, ANSI/NCSL Z540-1-1994, ISO-10012-1, MIL-STD 45662A.

Le Service d'évaluation des laboratoires d'étalonnage (CLAS) du Conseil national de recherches du Canada (CNRC) a évalué et certifié la capacité d'étalonnage du laboratoire et la traçabilité au Système international d'unités (SI) ou à des étalons acceptables selon le CLAS. Le présent certificat d'étalonnage est délivré conformément aux conditions de certification du CLAS et aux conditions d'accréditation du Conseil canadien des normes (CCN). Le CLAS et le CCN ne garantissent pas l'exactitude des étalonnages individuels effectués par les laboratoires accrédités.

ÉTALONNAGE DE MATÉRIEL DE MESURE ET D'ESSAI

Pour connaître la portée de mesurage du laboratoire d'étalonnage, veuillez consulter la page Web du Réseau canadien d'étalonnage du Conseil national de recherches du Canada. Ce laboratoire a été accrédité par le Conseil canadien des normes dans le cadre du programme du Service d'évaluation des laboratoires d'étalonnage (CLAS) et figure à: nrc.canada.ca.

Le présent document fait partie du certificat d'accréditation remis par le Conseil canadien des normes (CCN) à Polycontrols. La version originale est affichée dans le répertoire des organismes de certification accrédités par le CCN sur le site Web du CCN au www.ccn.ca.

SOMMAIRE DES CONDITIONS DE L'INSTRUMENT EN TEST

Conditions initiales	En bon état
Travail Effectué	Étalonnage de l'instrument
Résultats	Lectures initiales dans les tolérances-conditionnelles
	Lectures finales dans les tolérances
Remarques	Fréquence d'étalonnage aux 6 mois
	Tolérance ajustée à la demande du client
	Valeur de l'instrument corrigée = Lecture de l'afficheur de l'instrument * 1.01 K facteur

Hassan Habli
Métrologiste

Responsable du laboratoire

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Tel: (450) 444-3600 Fax: (450) 444-1088 www.polycontrols.com

POLYCONTROLS

CLAS NRC·CNRC CLAS 2009-02

SCC Accredited LAB Accredité CCN

Certificat d'étalonnage # 24946

Numéro de série:	S8020	Station de mesure:	3
Date d'étalonnage:	2025-01-06	Procédure:	POS-CAL-005
Identification de l'instrument:	EM 318	Règle de décision:	Méthode #3

Instrument de mesure de référence utilisé pour l'étalonnage initial

Description	Modèle	# Série	Traçabilité	Date dû
Fluke molbloc_30 slpm	3E4-VCR-V-Q	2359	1500371423	2025-02-13
Fluke molbloc_120 slpm	2E2-S	237	1500373170	2025-03-07
Fluke molbox1+	Molbox1+	2089	1500373373	2025-03-11
RTD Mist	M22	3061002	2024005919	2025-07-12
Module 44.5 PSI avec Baro 163671	Module 30	160659	2024004347	2025-05-22

Spécifications initiales de l'appareil		Condition d'étalonnage	
Gaz	Air	Gaz	Air
Température d'opération		Température ambiante	22 °C
Pression à l'entrée		Pression ambiante	1012.82 mbar
Pression à la sortie		Orientation	
Température de référence		Élastomère	
Pression de référence		Valve	
Étendue d'échelle	10-2000 ALH		
Signaux Entrée/Sortie	-		
Alimentation			
Tolérance ±2 %O.R.			

Lectures initiales

Débit du test ALH	Instrument en test L	Valeurs mesurées Pression PSIA	Température °C	Référence L	Référence calculée L	Erreur calculée L	Tolérance acceptable L	Incertitude k = 2 L	TUR
336.688	66.000	14.669	20.792	62.310	67.191	-1.191	1.344	0.223	>4
1329.984	218.400	14.699	20.740	205.730	221.352	-2.952	4.427	0.734	>4
2136.539	354.200	14.754	20.693	332.150	355.984	-1.784	7.120	0.871	>4

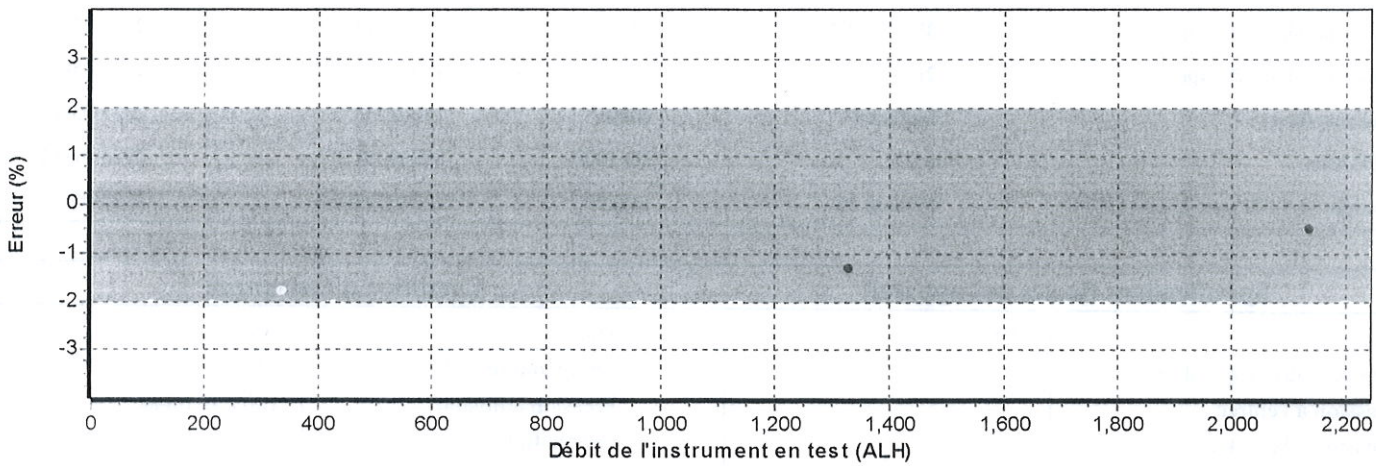
POLYCONTROLS

CLAS 2009-02

Certificat d'étalonnage # 24946

Numéro de série:	S8020	Station de mesure:	3
Date d'étalonnage:	2025-01-06	Procédure:	POS-CAL-005
Identification de l'instrument:	EM 318	Règle de décision:	Méthode #3

Résultats initiaux



Voir l'annexe pour la règle de décision

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CLAS 2009-02

Certificat d'étalonnage # 24946

Numéro de série:	S8020	Station de mesure:	3
Date d'étalonnage:	2025-01-06	Procédure:	POS-CAL-005
Identification de l'instrument:	EM 318	Règle de décision:	Méthode #3

Instrument de mesure de référence utilisé pour l'étalonnage final

Description	Modèle	# Série	Traçabilité	Date dû
Fluke molbloc_30 slpm	3E4-VCR-V-Q	2359	1500371423	2025-02-13
Fluke molbloc_120 slpm	2E2-S	237	1500373170	2025-03-07
Fluke molbox1+	Molbox1+	2089	1500373373	2025-03-11
RTD Mist	M22	3061002	2024005919	2025-07-12
Module 44.5 PSI avec Baro 163671	Module 30	160659	2024004347	2025-05-22

Spécifications finales de l'appareil

Gaz	Air
Température d'opération	
Pression à l'entrée	
Pression à la sortie	
Température de référence	
Pression de référence	
Étendue d'échelle	10-2000 ALH
Signaux Entrée/Sortie	-
Alimentation	
Tolérance	±2 %O.R.

Condition d'étalonnage

Gaz	Air
Température ambiante	22 °C
Pression ambiante	1009.92 mbar
Orientation	
Élastomère	
Valve	

Lectures finales

Débit du test ALH	Instrument en test L	Valeurs mesurées Pression PSIA	Température °C	Référence L	Référence calculée L	Erreur calculée L	Tolérance acceptable L	Incertitude k = 2 L	TUR
336.695	66.660	14.669	20.792	62.310	67.192	-0.532	1.344	0.223	>4
1330.013	220.584	14.699	20.740	205.730	221.356	-0.772	4.427	0.542	>4
2136.571	357.742	14.754	20.693	332.150	355.989	1.753	7.120	0.871	>4

POLYCONTROLS

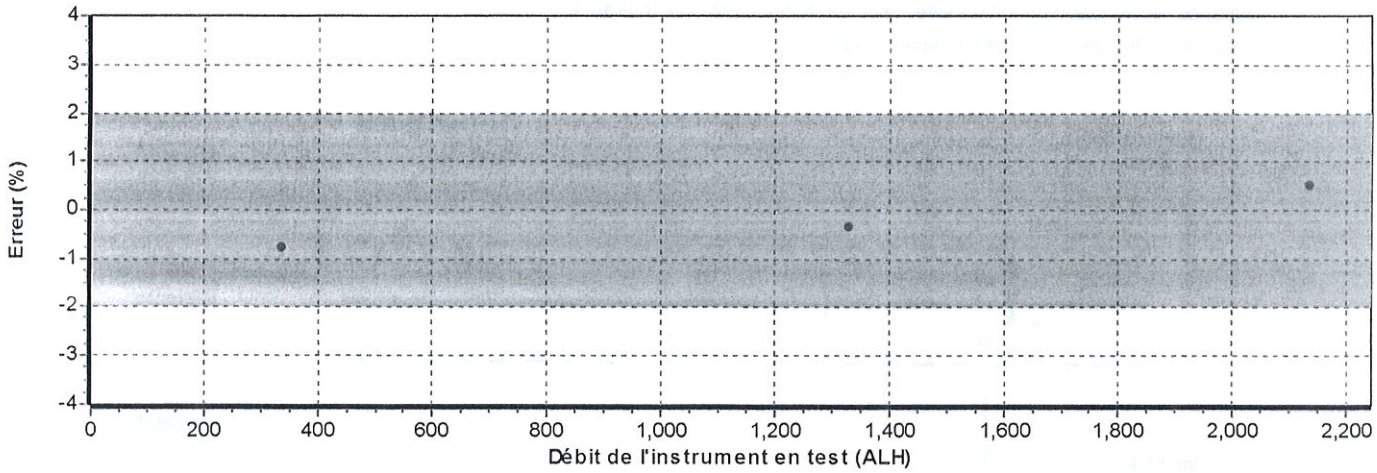
CLAS NRC·CNRC
CLAS 2009-02

SCC Accredited LAB
LAB Accredité CCN

Certificat d'étalonnage # 24946

Numéro de série:	S8020	Station de mesure:	3
Date d'étalonnage:	2025-01-06	Procédure:	POS-CAL-005
Identification de l'instrument:	EM 318	Règle de décision:	Méthode #3

Résultats finaux



Voir l'annexe pour la règle de décision

13 JAN 2025

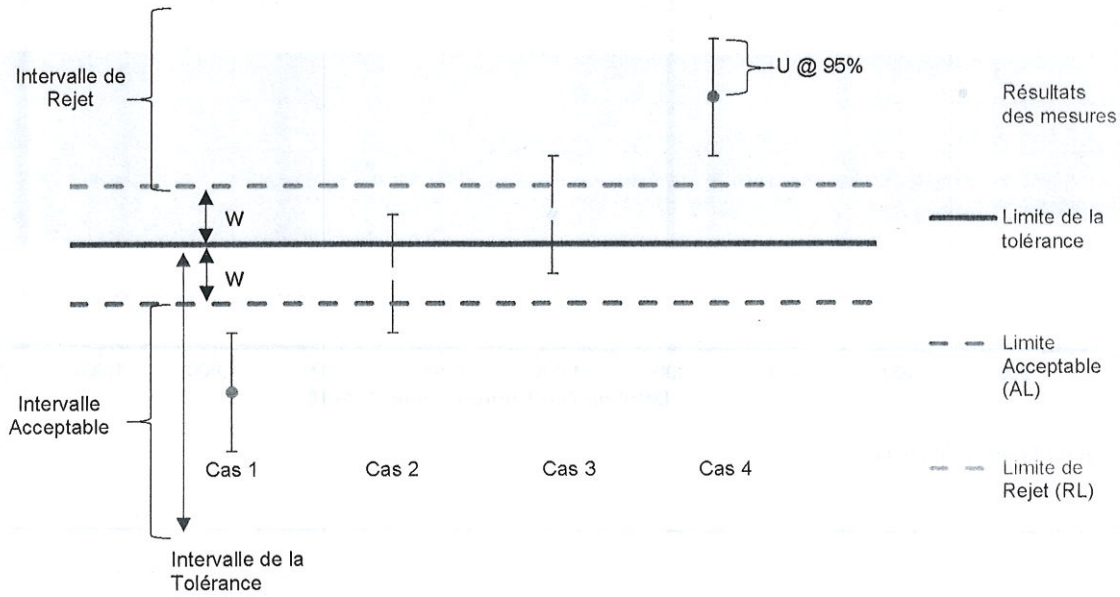
Fc : 1,01

Annexe pour la règle de décision

Méthode #3 Statut de Conformité Non-binaire avec Bande de Garde en considérant l'incertitude de la mesure directement

Cette méthode tient compte d'une bande de garde pour définir l'intervalle acceptable et de rejet. La limite acceptable du résultat de la mesure est calculée selon la méthode mathématique suivante AL = TL – w et de rejet RL = TL + w, dont w. = rU. Le multiple r de l'incertitude combiné élargie U peut être défini selon la table 1 section 5.2 du document ILAC G8 : 2019. L'incertitude de la mesure U est une incertitude combinée élargie ayant un niveau de confiance de 95% (k = 2). La règle de conformité non-binaire avec bande de garde est définie lorsqu'il y a quatre choix sur le statut de l'essai : dans la tolérance, acceptation conditionnelle, rejet conditionnel, et hors tolérance.

Les conformités de l'essai sont définies telles que :



Explication de la règle Non-Binaire avec Bande de Garde

Cas 1 – Inférieur à la limite acceptable AL

Statut : Dans les tolérances (In tolerance)

- Le résultat de la mesure est à l'intérieur de l'intervalle acceptable. Cependant, l'estimation du risque en assumant la probabilité d'une distribution normale d'être à l'extérieur de la limite de la tolérance est < 2.5%. L'incertitude de l'essai est directement prise en considération. *Couleur verte.*

Cas 2 – Inférieur à la limite de la tolérance TL, supérieur à la limite acceptable AL

Statut : Dans les tolérances-Conditionnel

- Le résultat de la mesure est à l'extérieur de l'intervalle acceptable mais inférieur à la limite de la tolérance. Cependant, la valeur observée est située dans la bande de garde w = TL-AL et le statut du résultat est conditionnel à l'évaluation du risque du client. L'incertitude de la mesure est directement prise en considération. *Couleur jaune.*

Cas 3 – Supérieur à la limite de la tolérance, inférieur à RL

Statut : Hors tolérance-Conditionnel

- Le résultat de la mesure est supérieur à la limite de la tolérance mais à l'extérieur de l'intervalle de rejet. Cependant, la valeur observée est située dans la bande de garde w = TL-RL et le statut du résultat est conditionnel à l'évaluation du risque du client. L'incertitude de la mesure est directement prise en considération. *Couleur jaune.*

Cas 4 – Supérieur à la limite de rejet RL

Statut : Hors-tolérance (Out of tolerance)

- Le résultat de la mesure est à l'intérieur de l'intervalle de rejet. L'incertitude de l'essai est directement prise en considération. *Couleur rouge.*

3650-A1, boul. Matte, Brossard, (Québec) J4Y 2Z2 Canada – CAN: (450) 444-3600 USA: 1-844-660-7659

CERTIFICATE OF CALIBRATION

ACCREDITED
CALIBRATION
CERT #2260.01

Certificate Number: 2024011524

Manufacturer:	Control Company	***RMA:***	AC24121479
Model:	4199	***PO:***	100618
Description:	Barometer	***Barcode:***	AL00042136
Serial:	210758578	***Received Conditions:***	Pass
ID:	EM 333	***Calibration Date:***	20-Dec-2024
Customer:	SERVICES POLYTESTS 695-B GUADETTE ST-JEAN-SUR-RICHELIEU QC J3B 7S7	***Calibration Due:***	20-Jun-2025
		Temperature:	23.83°C
		Humidity:	20.3%RH

STATEMENT OF UNCERTAINTY: The reported expanded uncertainty of measurement is stated as the standard measurement uncertainty multiplied by the coverage factor K = 2, which for a normal distribution corresponds to a coverage probability of approximately 95 percent. Alpha Controls & Instrumentation Inc. certifies this instrument was calibrated on the date shown using standards traceable to NIST /NRC or accepted intrinsic standards and in compliance with ISO/IEC-17025:2005 and ANSI/NCSL Z540-1.

Statement of compliance is made applying guardbanding strategy and taking measurement uncertainty directly into account as defined in ILAC G8. Guardbanding is limited and compliance to specification is indeterminate when TUR <1.

Tolerance is based on manufacturer specification if not stated otherwise . Calibration results relate to items calibrated only. Functional tests are not covered by our scope of accreditation.

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STANDARDS USED

Description	*Model*	*ID*	*Cal Date*	*Due Date*
Pressure Controller/Calibrator	DH Instruments PPC3	PRE-CAL-04	27-Jun-2024	30-Jun-2025
Reference Pressure Monitor	Fluke RPM4	PRE-MTR-04	26-Jun-2024	30-Jun-2025

Notes: None.

Performed by: Tony Wheaton
Technician
(digitally signed on 20-Dec-2024 3:19 pm)

QA Reviewed by: Slava Peciurov
Lab Manager
(signed and issued on 20-Dec-2024 3:46 pm)

Procedure:
Pressure/Vacuum: CAL VER /DHI PPC3 (2.3.A)

FOUND-LEFT
Pass

Test Description	True Value	Test Results	Specification	Lower Limit	Upper Limit	Status	Uncertainty
PRESSURE TEST							
MEASUREMENT UNITS: mmHg a							
747.544	747.54	747.2	±1.00	746.5	748.5	P	9.5e-002

END OF CERTIFICATE

JAN. 7th 2025

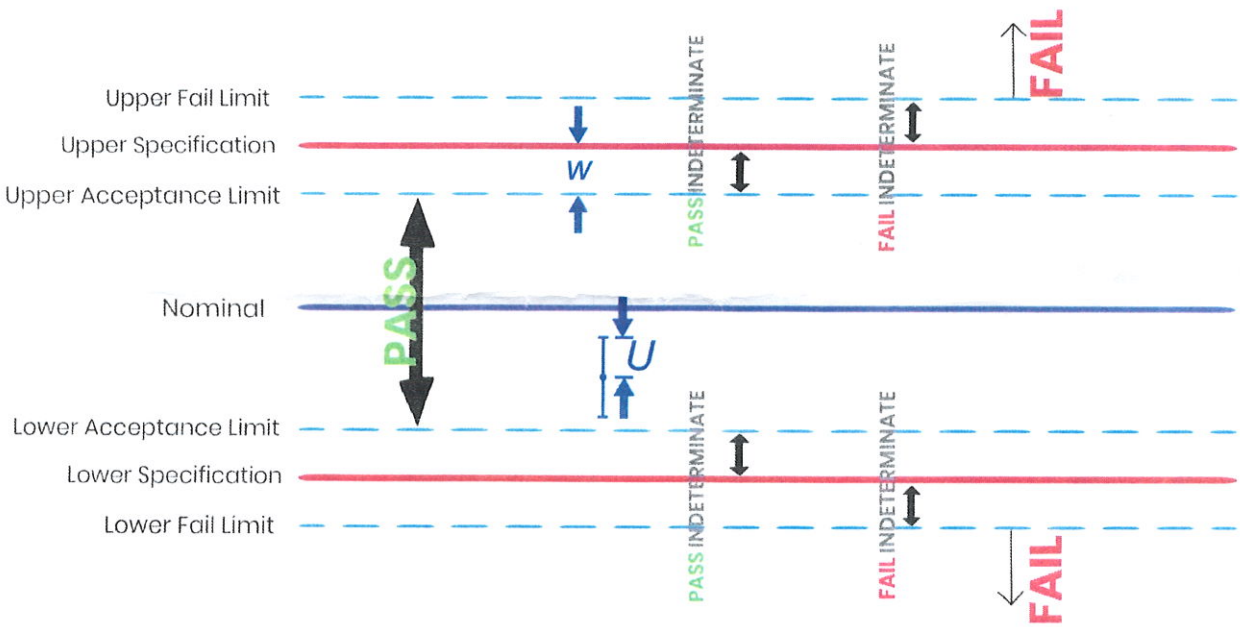
DECISION RULE EXPLANATION

When conformance to specification is made - measurement uncertainty is taken directly into account, as per ILAC-G8:09/2019. The decision rule is based on the Guard Banding approach, where the acceptance limits are reduced by guard band length of '*w*' proportional to the expanded uncertainty value '*U*' with 95% confidence level (k=2). When *w=1U*, then probability of a false acceptance is less than 2.5%.

Statements of conformity are reported as:

Symbol	Definition	Description
P	Pass	The measured result is within the Acceptance limit.
<P>	Pass Indeterminate	The measured result is within Specification, but outside of the Acceptance Limit.
<F>	Fail Indeterminate	The measured result is outside of Specification, but within the Fail Limit.
F	Fail	The measured result is outside of the Fail Limit.

Graphical Representation of Guard Banding:



Fox Valley Metrology
3114 Medalist Drive
Oshkosh, WI 54902
(920) 426-5894 • Fax (920) 426-8120
https://www.FoxValleyMetrology.com

CERTIFICATE OF CALIBRATION

ilac-MRA ANAB ACCREDITED ISO/IEC 17025 CALIBRATION AND TESTING LABORATORY
Certificate No. ACT-1272

CERTIFICATION NUMBER	CP008-53532-682
FOR	Polytests Services Inc. 695 B rue Gaudette St-Jean-sur-Richelieu, QC, Canada J3B 7S7
TEST INSTRUMENT	Resistance Standard
MAKE	Delmhorst Instrument Co.
MODEL	MCS-1
RANGE	(1.1M to 120M) ohms
CUSTOMER LOCATION	
CONDITION RECEIVED	In Tolerance
CONDITION RETURNED	In Tolerance
CALIBRATED BY	Wyatt LeBouton
REVIEWED/ISSUED	D.P. 01/09/2025
CALIBRATION LOCATION	FVM
ENVIRONMENT	72.9°F, 22.7°C, 40.0%RH
CALIBRATION DATE	01/08/2025
RECALIBRATION DUE	01/08/2026

IDENTIFICATION	EM-334
SERIAL NUMBER	
PURCHASE ORDER #	100617

PROCEDURES FOLLOWED

EL-010A rev. 1

STANDARDS USED

INSTRUMENT	SERIAL NUMBER	TRACE NUMBER	NEXT CAL
FVS-275E	16783134	C0134-20963-690	05/31/2025

CALIBRATION RESULTS

* DENOTES "OUT OF TOLERANCE"

FEATURE	NOMINAL	LOWER LIMIT	UPPER LIMIT	AS FOUND	AS LEFT	UNCERTAINTY
Resistance	(Mohm)	(Mohm)	(Mohm)	(Mohm)	(Mohm)	
12% 'Pad'	120.00	119.76	120.24	120.07	120.07	6.0E-3
22% 'Pad'	1.100	1.078	1.122	1.097	1.097	6.0E-4

13 JAN 2025

- This certificate shall not be altered in any form or reproduced, except in full, without prior written approval from originating lab. These results relate only to the item(s) calibrated. Form Revision 10: 06/04/2024
- Total expanded measurement uncertainties expressed are based on a confidence level of 95%; coverage factor of (k=2). The statement of compliance in this certificate was issued without taking the uncertainty of measurement into consideration. The customer shall assess the results and uncertainty when determining if the results meet their needs. (This is considered "shared responsibility.") Uncertainties expressed in nominal units.
- The calibrations within the certificate/report are traceable through NIST or another National Metrology Institute to the International System of Units (SI). Calibration was completed in accordance with ISO/IEC 17025:2017, ANSI/NCSL Z540-1-1994 and ANSI/NCSL Z540.3-2006. Other standards listed upon request.

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ACCREDITATION ISO 17025 SCC Scope Number 668

CALIBRATION CERTIFICATE

9900 Chemin de la Côte-de-Liesse, Montréal, QC H8T 1A1
www.dispersion.ca 1.866.390.5066

Client :	Polytests	**Certificate Number :**	**157-77C603-225**
Address :	695 B rue Gaudette Saint-Jean-sur-Richelieu, QC J3B7S7	**Calibration date :**	14-03-2022

Technician:
Coutu, Daniel

David Llorens, Quality Manager

SERVICE DESCRIPTION:

Masses description :	ASTM E617	**Date approved :**	14-03-2022
Precision class :	ASTM 1	**Next Calibration :**	14-03-2027
Density :	7.96g/cm³	**CCN accreditation # :**	668
Identification (if unique) :	DI000J378	**CLAS Certification # :**	2010-01

Test conditions :	Temp °C:	21.16	kPa Pressure:	100.64	Humidity:	47.97

NOTES:

For weight calibration, we use the procedure "Comparaison individuelle" PDL-09-MG-001 and the procedure "Détermination des incertitudes" PDL-09-MG-002. This certificate cannot be copied without written approval from Dispersion Laboratory. The results presented in these pages relate only to objects subjected to calibration.n

REMARKS:

March 2022

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CALIBRATION CERTIFICATE

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www.dispersion.ca 1.866.390.5066

Client :	Polytests	**Certificate Number :**	**157-77C603-225**
Address :	695 B rue Gaudette	**CCN Accreditation # :**	668
	Saint-Jean-sur-Richelieu, QC	**CLAS Certification # :**	2010-01
	J3B7S7	**Precision class :**	ASTM 1
		Calibration date :	14-03-2022
Mass :	100 mg	**Follow-up date :**	14-03-2027

CALIBRATION RESULTS, CONVENTIONAL MASS:

Nominal Mass	Serial #	Inventory #	Conventional mass	Conventional mass after adjustment	Tolerance ± (mg)	Uncertainties ± (mg)
100mg	DI000J378	EM-335	99.9999 mg		0.010 mg	0.002 mg

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CALIBRATION CERTIFICATE

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www.dispersion.ca 1.866.390.5066

Client :	Polytests	**Certificate Number :**	**157-77C603-225**
Address :	695 B rue Gaudette	**CCN Accreditation # :**	668
	Saint-Jean-sur-Richelieu, QC	**CLAS Certification # :**	2010-01
	J3B7S7	**Precision class :**	ASTM 1
		Calibration date :	14-03-2022
Mass :	100 mg	**Follow-up date :**	14-03-2027

CALIBRATION RESULTS, CORRECTIONS:

Nominal Mass	Serial #	Inventory #	Conventional mass Corrections	Conventional mass Corrections after adjustment	Tolerance ± (mg)	Uncertainties ± (mg)
100mg	DI000J378		-0.0001 mg		0.010 mg	0.002 mg

CALIBRATION CERTIFICATE

9900 Chemin de la Côte-de-Liesse, Montréal, QC H8T 1A1
www.dispersion.ca 1.866.390.5066

BALANCES

The following balances are used for calibration purposes :

> 5 kg to 25 kg :	Mettler Toledo XP32003L, SNR 1123271214, max. 32100 g, d = 0.005 g
> 1 kg to 5 kg	Mettler Toledo PR5003, SNR 1115311634, max. 5100 g, d = 0.001 g
> 300 g to 2 kg :	Mettler Toledo XP2004S, SNR B131185222, max. 2100 g, d = 0.1 mg
> 100 g to 200 g :	Mettler Toledo AT201 SNR BA1115230146, max. 205 g, d = 0.01 mg
> 5 g to 100 g :	Mettler Toledo AX106 SNR 1127063924, max. 111 g, d = 1 µg
1 mg to 5 g :	Mettler UMX5, SNR 1121103055, max. 5.1 g, d = 0.1 µg

We are also using these balances in our automated procedure :

> 200 g to 1 kg :	Mettler Toledo AX1005 SNR 1127063210, max. 1109 g, d = 0.01 mg
> 5 g to 100 g :	Mettler Toledo AX106 SNR 1120143015, max. 111 g, d = 1 µg
1 mg to 5 g :	Mettler UMX5, SNR 1125140561, max. 5.1 g, d = 0.1 µg

Our balances are periodically verified, according to our PDL-11-MG-001 control procedure.

UNCERTAINTIES:

The following uncertainties exist :

1. *Uncertainty associated with the weighting process.*
2. *Uncertainty associated with air density.*
3. *Uncertainty associated with the measurement standard.*
4. *Uncertainty associated with the density of the mass being calibrated.*

The uncertainty of the weighing process includes long-term reproducibility.

Uncertainties specified in this report are expanded uncertainties representing a confidence level of approximately 95% obtained by multiplying the combined standard uncertainty by a coverage factor of k = 2. For more detailed information refer to the GUM (Guide to the Expression of Uncertainty in Measurement, 1995 Edition)

TRACEABILITY

The Calibration Laboratory Assessment Service (CLAS) of the National Research Council of Canada (NRC) has assessed and certified specific calibration capabilities of this laboratory and their traceability to recognized national measurement standards and to the International System of Units (SI). This certificate of calibration is issued in accordance with the conditions of certification granted by CLAS and the conditions of accreditation granted by the Standards Council of Canada (SCC). Neither the CLAS nor the SCC guarantees the accuracy of individual calibration by accredited laboratories.

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ACCREDITATION ISO 17025 TM
SCC Scope Number 668

CALIBRATION CERTIFICATE

9900 Chemin de la Côte-de-Liesse, Montréal, QC H8T 1A1
www.dispersion.ca 1.866.390.5066

USED REFERENCES

Item	Serial #	Manufacturer	Calibration date	Due date
300g Labo	96-0888-50-2	Denver Instrument Company	01-10-2020	31-03-2022
1kg-1mg Labo	MT-01	Mettler Toledo	01-10-2020	31-03-2022
2kg Labo	96-0888-50-3	Denver Instrument Company	01-10-2020	31-03-2022
1kg Labo	96-088850-1	Denver Instrument Company	01-10-2020	31-03-2022
5kg Labo	129099	Mettler Toledo	01-10-2020	31-03-2022
10kg Labo	DI000G991	Dispersion	23-03-2021	31-03-2022
20kg Labo	69976	Mettler Toledo	06-10-2021	31-10-2022
1 mg-10kg	4000028011	Troemner	15-10-2021	31-10-2022
2kg Labo	129098	Mettler Toledo	01-10-2020	31-03-2022

ENVIRONMENTAL CONDITIONS

Item	Serial #	Manufacturer	Calibration date	Due date
THE004	107080	Control Company	04-03-2021	31-03-2022

Airgas
an Air Liquide company

Airgas Specialty Gases
Airgas USA LLC
6141 Easton Road
Plumsteadville, PA 18949
Airgas.com

CERTIFICATE OF ANALYSIS

Grade of Product: PRIMARY STANDARD

Customer:	AIR LIQUIDE CANADA		
Part Number:	X04NI77P15A0003	Reference Number:	160-402375016-1
Cylinder Number:	EB0118140	Cylinder Volume:	153.0 CF
Laboratory:	124 - Plumsteadville - PA	Cylinder Pressure:	2016 PSIG
Analysis Date:	Mar 07, 2022	Valve Outlet:	350
Lot Number:	160-402375016-1		

Expiration Date: Mar 07, 2030

Primary Standard Gas Mixtures are traceable to N.I.S.T. weights and/or N.I.S.T. Gas Mixture reference materials.

ANALYTICAL RESULTS

Component	Req Conc	Actual Concentration (Mole %)	Analytical Uncertainty
OXYGEN	2.000 %	2.005 %	+/- 0.02%
CARBON MONOXIDE	3.000 %	3.000 %	+/- 0.02%
CARBON DIOXIDE	18.00 %	18.00 %	+/- 0.02%
NITROGEN	Balance		

Notes:GROSS WEIGHT:29.581 KG
NET WEIGHT:5.442 KG
P/N A1336386
PO#89404761

EM-336

JUN 2022

Approved for Release

Air Liquide creative oxygen | Specialty Gases

Your complete laboratory solution



CERTIFICATE OF ANALYSIS

Customer: SERVICES POLYTESTS INC., (S2232)
695B, GAUDETTE
ST-JEAN SUR RICHELIEU QC
J3B 7S7

Analysis Date:	3/4/2022 9:44:18AM	**Servitrax barcode No:**	T2H6H8N
Product code:	A1334811	**Work order number:**	1607008
Grade:	PRIMARY	**Pressure:**	1450 psig
Size:	44		
CGA #:	590	**Volume:**	4.7M3
		Expiry date:	03/04/2025

COMPONENTS	NOMINAL CONCENTRATION	ANALYSIS RESULTS
CARBON DIOXIDE	10.0000 % Molar	10.00 % Molar
CARBON MONOXIDE	1.0000 % Molar	1.002 % Molar
OXYGEN	10.0000 % Molar	10.00 % Molar
NITROGEN	BALANCE	BALANCE

Analysis performed by:

TOBI ERINLE - LAB TECHNICIAN

Verified by:

AD

This Air Liquide Canada mixture is traceable to NIST

METHOD OF ANALYSIS:

Method of analysis is based on principles of gas chromatography and as documented in Air Liquide Canada operating procedure , where applicable, FID, TCD, PDHID, FT-IR, FPD,NO/NOx and SO2 chemiluminescence , hygrometer, and electrochemical cells and paramagnetic cell. Detectors were used in conjunction with packed or capillary columns calibrated flow meters and dilution calibrated system.

ANALYTICAL ACCURACY:

Qualitiy	Concentiration	Blend Tolerance	AA
PRIMARY	5%-50%	+/-1%	+/-1%
	0.5%-5%	+/-2%	
	1ppm-0.5%	+/-5%	
CERTIFIED	5%-50%	+/-5%	+/-2%
	0.5%-5%	+/-10%	+/-2%
	1ppm-0.5%	+/-20%	+/-5%
UNANALYZE	5%-50%	+/-10%	
	<5%	+/-20%	

EM-338

JUIN 2022

This mixture was certified by a combination of weight and analysis (depending on component) using scales certified against weights traceable to the Institute for National Measurement Standards (INMS) of the National Research Council of Canada (NRCC), Report # W-021221-13857(MTL) and CA3033-022-050621-ACC (Calgary) or calibration standards prepared in that manner.

How to contact us & order

E-mail within your region: specgas.atlantic@airliquide.com specgas.qc@airliquide.com specgas.on@airliquide.com specgas.ab@airliquide.com specgas.midwest@airliquide.com specgas.pacific@airliquide.com

Customer Solution Center: 1 800 217-2688 Online 24/7 through My.Airliquide.ca Air Liquide Mobile App

Instrumentation Saint•Laurent inc.
Certified ISO 17025

CLAS 2010-02

SCC Accredited LAB
Accrédité CCN

80 rue de la montagne
St-Joseph du lac
(Québec), J0N 1M0
Phone: (450) 473-6169
Fax: (450) 473-5207
info@instrumentationsaintlaurent.com

CALIBRATION CERTIFICATE

CERTIFICATE #	CE-EM-340 2024-05-23

CLIENT	
Company:	Services Polytests Inc
Address:	695 B rue Gaudette
	St-Jean-sur-Richelieu, Québec, J3B 7S7

CALIBRATION SPECIFICATION	
Service Procedure:	4IN9106
Required Accuracy:	+\- 1.0 inHg
Calibration Frequency:(days)	365

INSTRUMENT SPECIFICATION			
Instrument Type:	Pressure Gauge	Input Type:	Pression
Manufacturer:	Dwyer	Output Type:	Digitale
Model #:	DPG200	Measurement Type:	Pressure
Serial #:	S799031-0001	Range:	-29.93 to 0 inHg
Location:	N.A.	Version:	Machine: N.A.

CALIBRATORS SPECIFICATION			
Calibrator:	Crystal XP2i 300	Certification #:	2023007594
Serial #:	866756	Certification Date:	2023-09-22
Certified by:	Alpha Controls	Next Certification:	2024-09-22
Comments:			
Calibrator:	Fluke 744	Certification #:	AC24041903
Serial #:	8180008	Certification Date:	2024-05-09
Certified by:	alpha Controls	Next Certification:	2025-05-09
Comments:			

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CLAS NRC·CNRC CLAS 2010-02

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80 rue de la montagne
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(Québec), J0N 1M0
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Fax: (450) 473-5207
info@instrumentationsaintlaurent.com

CALIBRATION CERTIFICATE

CERTIFICATE #	CE-EM-340 2024-05-23

CALIBRATION RESULTS

Entry Source	Given Value	Initial Value	Ini. Deviation Error	Final Value	Fin. Deviation Error	Accuracy	Uncertainty
Conformity	**Comment**						
0.00 "Hg	0.00 "Hg	0.00 "Hg	0.00 "Hg	0.00 "Hg	0.00 "Hg	+\- 1.0 "Hg	+\- 0.5 "Hg
Compliant	Verification of the indicator						
-7.50 "Hg	-7.50 "Hg	-7.51 "Hg	-0.01 "Hg	-7.51 "Hg	-0.01 "Hg	+\- 1.0 "Hg	+\- 0.5 "Hg
Compliant	Verification of the indicator						
-15.00 "Hg	-15.00 "Hg	-15.03 "Hg	-0.03 "Hg	-15.03 "Hg	-0.03 "Hg	+\- 1.0 "Hg	+\- 0.5 "Hg
Compliant	Verification of the indicator						
-22.50 "Hg	-22.50 "Hg	-22.55 "Hg	-0.05 "Hg	-22.55 "Hg	-0.05 "Hg	+\- 1.0 "Hg	+\- 0.5 "Hg
Compliant	Verification of the indicator						
-28.00 "Hg	-28.00 "Hg	-28.06 "Hg	-0.06 "Hg	-28.06 "Hg	-0.06 "Hg	+\- 1.0 "Hg	+\- 0.5 "Hg
Compliant	Verification of the indicator						
-22.50 "Hg	-22.50 "Hg	-22.55 "Hg	-0.05 "Hg	-22.55 "Hg	-0.05 "Hg	+\- 1.0 "Hg	+\- 0.5 "Hg
Compliant	Verification of the indicator						
-15.00 "Hg	-15.00 "Hg	-15.03 "Hg	-0.03 "Hg	-15.03 "Hg	-0.03 "Hg	+\- 1.0 "Hg	+\- 0.5 "Hg
Compliant	Verification of the indicator						
-7.50 "Hg	-7.50 "Hg	-7.51 "Hg	-0.01 "Hg	-7.51 "Hg	-0.01 "Hg	+\- 1.0 "Hg	+\- 0.5 "Hg
Compliant	Verification of the indicator						
0.00 "Hg	0.00 "Hg	0.00 "Hg	0.00 "Hg	0.00 "Hg	0.00 "Hg	+\- 1.0 "Hg	+\- 0.5 "Hg
Compliant	Verification of the indicator						
0.00 "Hg	20.00 mA	19.99 mA	-0.01 mA	19.99 mA	-0.01 mA	+\- 0.5 mA	+\- 0.0045
Compliant	Verification of the analogic output						
-7.50 "Hg	16.00 mA	15.99 mA	-0.01 mA	15.99 mA	-0.01 mA	+\- 0.5 mA	+\- 0.0045
Compliant	Verification of the analogic output						
-15.00 "Hg	12.00 mA	11.97 mA	-0.03 mA	11.97 mA	-0.03 mA	+\- 0.5 mA	+\- 0.0045
Compliant	Verification of the analogic output						
-22.50 "Hg	8.00 mA	7.94 mA	-0.06 mA	7.94 mA	-0.06 mA	+\- 0.5 mA	+\- 0.0045
Compliant	Verification of the analogic output						
-28.00 "Hg	5.00 mA	5.08 mA	+0.08 mA	5.08 mA	+0.08 mA	+\- 0.5 mA	+\- 0.0045
Compliant	Verification of the analogic output						
-22.50 "Hg	8.00 mA	7.94 mA	-0.06 mA	7.94 mA	-0.06 mA	+\- 0.5 mA	+\- 0.0045
Compliant	Verification of the analogic output						
-15.00 "Hg	12.00 mA	11.97 mA	-0.03 mA	11.97 mA	-0.03 mA	+\- 0.5 mA	+\- 0.0045
Compliant	Verification of the analogic output						
-7.50 "Hg	16.00 mA	15.99 mA	-0.01 mA	15.99 mA	-0.01 mA	+\- 0.5 mA	+\- 0.0045
Compliant	Verification of the analogic output						
0.00 "Hg	20.00 mA	19.99 mA	-0.01 mA	19.99 mA	-0.01 mA	+\- 0.5 mA	+\- 0.0045
Compliant	Verification of the analogic output						

Environmental Conditions: Temperature: 22 °C Humidity: 47 %RH

Comments:

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Certified ISO 17025

CLAS NRC·CNRC
CLAS 2010-02

SCC Accredited LAB
LAB Accrédité CCN

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(Québec), J0N 1M0
Phone: (450) 473-6169
Fax: (450) 473-5207
info@instrumentationsaintlaurent.com

CALIBRATION CERTIFICATE

CERTIFICATE #	CE-EM-340 2024-05-23

CALIBRATION DATE/ISSUANCE OF CERTIFICATE	
Calibration Date:	2024-05-23
Next Calibration:	2025-05-23
Certificate Date:	2024-05-23

CALIBRATION CONFORMITY	Before	After
Compliant:	X	X
Non Compliant:		

¤ Instrumentation St. Laurent Inc. Certify that the above instrument, meets or exceeds the specifications established by the manufacturer. The company's quality system complies with the requirements of ISO 17025 :2017 and the standards used to perform the calibration is traceable to NRC and / or NIST.
¤ Reported uncertainties represent a 95 % of confidence level assuming a normal distribution k=2.
¤ The declaration of conformity does not include Instrumentation St-Laurent Inc. uncertainty measurement. Decision rule is based on binary statement for simple acceptance rule against ILAC G8 standard and test tolerance limits are based on customer specifications, unless otherwise specified.
¤ The results presented in this certificate relate only to objects subject to calibration.
¤ It is the customer's responsibility to ensure that calibrated equipment meets its intended use.
¤ The date format used in this certificate is: YYYY-MM-DD.

Assessment Service Calibration Laboratory (ASCL) of the National Research Council of Canada (NRC) has assessed and certified calibration laboratory's ability and traceability to the International System of Units (SI) or to standards acceptable according to ASCL. This calibration certificate is issued in accordance with the terms of ASCL certification and accreditation requirements of the Standards Council of Canada (SCC). ASCL and SCC does not guarantee the accuracy of individual calibrations by accredited laboratories.

Marc Gingras - Technicien

28 Mai 2024

5F09106 Version: 2024.04.05

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Calibration Certificate ID
CA0221-100-091124-ACC-USI

METTLER TOLEDO

Mettler-Toledo Inc.
Service Division
1900 Polaris Parkway
Columbus, OH 43240
1-800-METTLER

Accredited by the American Association for Laboratory Accreditation (A2LA)
CALIBRATION CERT #1902.01
ISO 17025 Registered
ANSI/NCSL Z540-1 Accredited

Accuracy Calibration Certificate

Customer

Company:	Services Polytests		
Address:	695-B Rue Gaudette		
City:	Saint-Jean-Sur-Richelieu	Contact:	Danick Power
Zip / Postal:	J3B 7S7		
State / Province:	Quebec		

Weighing Device

Manufacturer:	Ohaus	Instrument Type:	Weighing Instrument
Model:	Balance	Asset Number:	EM-204
Serial No.:	8336030305	Terminal Model:	N/A
Building:	N/A	Terminal Serial No.:	N/A
Floor:	N/A	Terminal Asset No.:	N/A
Room:	N/A		

Range	Max. Capacity	Readability (d)
1	30000 g	1 g

Procedure

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

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

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

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

	Temperature		Humidity	
As Found	Start: 21.0 °C	End: 21.0 °C	Start: 61.2 %	End: 61.2 %
As Left	Start: 21.0 °C	End: 21.0 °C	Start: 61.2 %	End: 61.2 %

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

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

As Found Calibration Date:	11-09-2024
As Left Calibration Date:	11-09-2024
Issue Date:	11-09-2024
Requested Next Calibration Date:	30-09-2025

Authorized A2LA Signatory:

Angel Estrella Gonzalez

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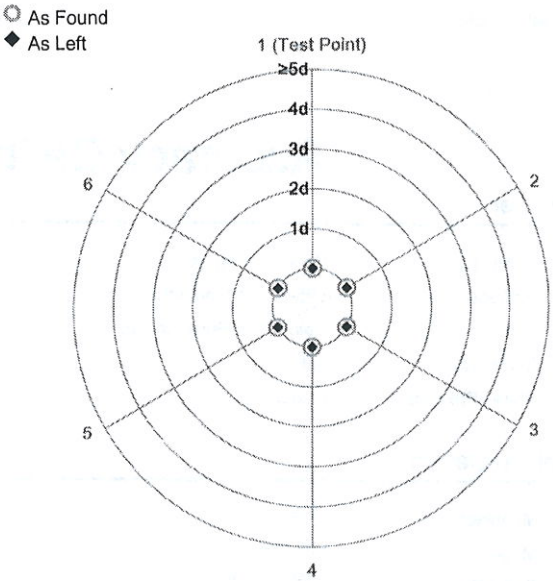
Measurement Results

Repeatability

Test Load: 15000 g

	As Found	As Left
1	14995 g	15000 g
2	14995 g	15000 g
3	14995 g	15000 g
4	14995 g	15000 g
5	14995 g	15000 g
6	14995 g	15000 g

Standard Deviation	**0.0 g**	**0.0 g**



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

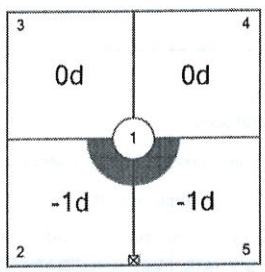
The results of this graph are based upon the absolute values of the differences from the mean value.

Eccentricity

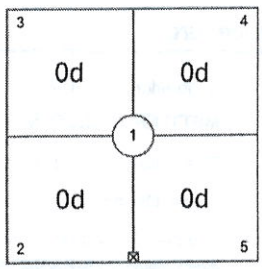
Test Load: 10000 g

Position	As Found	As Left
1	9997 g	10000 g
2	9996 g	10000 g
3	9997 g	10000 g
4	9997 g	10000 g
5	9996 g	10000 g

Maximum Deviation	**1 g**	**0 g**



As Found



As Left

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

Error of Indication

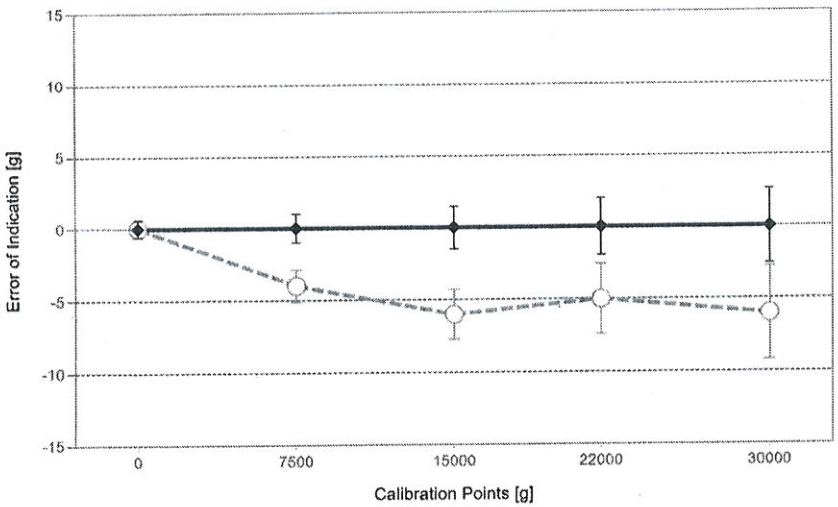
As Found

	Reference Value	Indication	Error of Indication	Expanded Uncertainty	k
1	0 g	0 g	0 g	0.6 g	2
2	7500 g	7496 g	-4 g	1.1 g	2
3	15000 g	14994 g	-6 g	1.7 g	2
4	22000 g	21995 g	-5 g	2.4 g	2
5	30000 g	29994 g	-6 g	3.2 g	2
6	0 g	0 g	0 g	0.6 g	2

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As Left

	Reference Value	Indication	Error of Indication	Expanded Uncertainty	k
1	0 g	0 g	0 g	0.6 g	2
2	7500 g	7500 g	0 g	1.0 g	2
3	15000 g	15000 g	0 g	1.5 g	2
4	22000 g	22000 g	0 g	2.0 g	2
5	30000 g	30000 g	0 g	2.6 g	2
6	0 g	0 g	0 g	0.6 g	2



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

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

The user is responsible for maintaining environmental conditions and the settings of the weighing instrument when it was calibrated. The results of this calibration certificate relate only to the calibrated item.

Test Equipment

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

Weight Set 1: OIML M1

Weight Set No.:	57071	Date of Issue:	10-01-2024
Certificate Number:	220736435-1	Calibration Due Date:	10-01-2025

Weight Set 2: OIML M1

Weight Set No.:	T01 à T50 (20 kg)	Date of Issue:	20-03-2024
Certificate Number:	1411302	Calibration Due Date:	20-03-2025

Remarks

N/A

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End of Accredited Section

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

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Measurement Uncertainty of the Weighing Instrument in Use

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

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

Temperature range on site for the evaluation of the measurement uncertainty in use: 21 K

Linearization of Uncertainty Equation

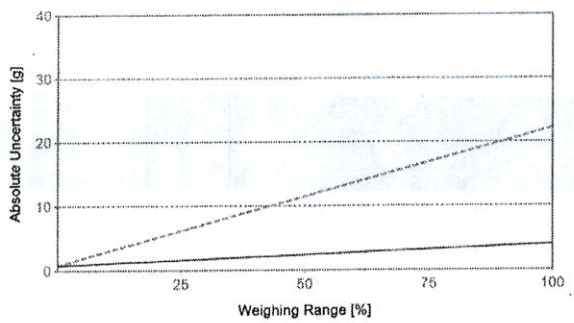
	Range		As Found	As Left
	d	Max		
1	1 g	30000 g	U_1 = 816 mg + 0.712 mg/g · R	U_1 = 816 mg + 0.107 mg/g · R

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

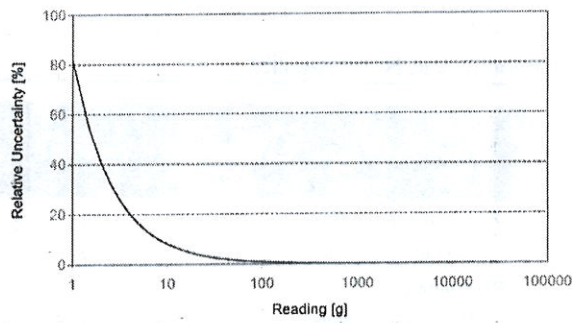
The linear approximation of the uncertainty in use should be regarded as information only. The underlying distribution of the errors of indication does not stipulate a stable approximation function [applies to As Found equation].

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

Net Indication	As Found		As Left	
30 g	0.84 g	2.8%	0.82 g	2.7%
300 g	1.0 g	0.34%	0.85 g	0.28%
3000 g	3.0 g	0.098%	1.1 g	0.038%
15000 g	11 g	0.077%	2.4 g	0.016%
30000 g	22 g	0.074%	4.0 g	0.013%



As Found



As Left

12 sept 2024

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METTLER TOLEDO Service

Handbook 44 Tolerance Assessment (Maintenance)

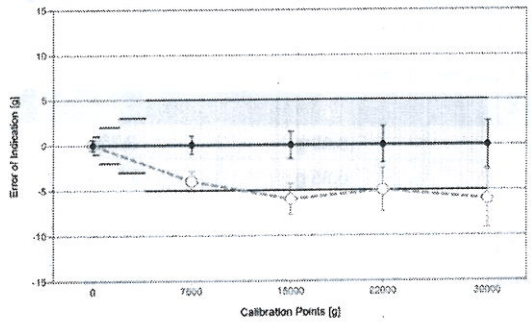
Assessment done without considering measurement uncertainty.
The measurements from the attached calibration certificate were assessed against the Tolerances defined by NIST Handbook 44.
The range of measurements for both Eccentricity and Repeatability (if performed) tests is assessed against Maintenance Tolerances.

	As Found	As Left
Overall	✗	✓

✓ = Passed
✗ = Failed

Weighing Device

Range	Max. Capacity	Readability (d)	Verification Scale Interval (e)	Class
1	30000 g	1 g	1 g	III



Tolerances according to NIST Handbook 44

Test Load		Tolerance
From	To	
0 g	0 g	0.25 g
1 g	500 g	1 g
501 g	2000 g	2 g
2001 g	4000 g	3 g
4001 g	30000 g	5 g

○ As Found
◆ As Left
— Tolerance

Eccentricity and Repeatability

Test	Test Load	Tolerance	As Found		As Left	
			Max. Error / Range	Result	Max. Error / Range	Result
Eccentricity (Max. Error)	10000 g	5 g	4 g	✓	0 g	✓
Eccentricity (Range)	10000 g	5 g	1 g	✓	0 g	✓
Repeatability (Max. Error)	15000 g	5 g	5 g	✓	0 g	✓
Repeatability (Range)	15000 g	5 g	0 g	✓	0 g	✓

Max. Error: Maximum of the absolute values of the individual errors.
Range: Difference between largest and smallest measurement value.

Error of Indication

	Reference Value	Tolerance	As Found		As Left	
			Error of Indication	Result	Error of Indication	Result
1	0 g	1 g	0 g	✓	0 g	✓
2	7500 g	5 g	-4 g	✓	0 g	✓
3	15000 g	5 g	-6 g	✗	0 g	✓
4	22000 g	5 g	-5 g	✓	0 g	✓
5	30000 g	5 g	-6 g	✗	0 g	✓
6	0 g	1 g	0 g	✓	0 g	✓

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APPENDIX 4: Unit pre burn

PRODUCT:	38ST-D	
MANUFACTURER:	FOYERS SUPREME INC.	
TEST:	38STD250211	
DATE:	11-02-2025	
TIME (MIN):	322	
WEIGHT/WET (LB):	23.8049603	
WEIGHT/DRY (KG):	8.724894952	
BURN RATE (KG/HR):	1.625756823	
STARTING WEIGTH RANGE [20% - 25%]:	4.76099206	5.951240075
STARTING WEIGHT [%]	19.79659718	
DELTA T° (F):	N/A	
CATCH (mg):	12	

LOAD CONFIGURATION							
	W (IN)	**H (IN)**	**L (IN)**	**HUMIDITY (%)**	**SPACERS**	**WEIGHT (LB)**	**SPECIES**
1	4	4	20	21	4	6	BC FIR
2	4	4	20	21	4	6	BC FIR
3	4	4	20	21	4	5.9	BC FIR
4	4	4	20	21	4	5.9	BC FIR
						23.8	

TIME	**TOP - T°**	**BOT - T°**	**RIGHT - T°**	**LEFT - T°**	**WEIGHT (LB)**
0	305.886688	n/a	424.330658	410.800018	4.7125721
0	303.09964	n/a	421.65451	408.503052	#34.788826
1	294.51944	n/a	417.274811	403.158325	23.8049603
2	286.2117	n/a	411.520111	396.842438	23.7486038
3	282.063293	n/a	405.800018	390.708313	23.6847134
4	283.76828	n/a	401.403534	385.721344	23.5659199
5	293.697784	n/a	397.742126	381.476166	23.4091339
6	311.520996	n/a	395.595184	377.911316	23.2820759
7	335.95871	n/a	394.287231	375.493896	23.027359
8	369.842834	n/a	394.212769	373.33728	22.8088856

9	404.204926	n/a	394.369476	372.276764	22.5705624
10	437.137878	n/a	394.417908	372.2146	22.3157558
11	469.295685	n/a	394.755066	373.114746	22.0424461
12	498.674988	n/a	394.498413	374.954956	21.78759
13	521.434021	n/a	393.209167	377.314026	21.5509052
14	540.462158	n/a	392.830902	379.925079	21.276783
15	562.416687	n/a	394.721405	382.94574	21.0045834
16	584.413208	n/a	397.103607	386.210205	20.7655525
17	604.501282	n/a	400.462433	390.354919	20.5484638
18	620.277954	n/a	404.326477	395.196564	20.3838654
19	623.358459	n/a	408.581238	400.074921	20.2276516
20	616.40033	n/a	413.254211	404.486969	20.0987644
21	603.562988	n/a	417.064697	408.197479	19.971117
22	588.193359	n/a	420.086945	411.085602	19.8799992
23	571.0672	n/a	422.35495	413.169678	19.7705383
24	554.8349	n/a	423.04895	414.033051	19.6791306
25	539.886902	n/a	422.590759	414.35141	19.5524769
26	527.492126	n/a	421.232422	413.731049	19.4606609
27	519.455322	n/a	419.495697	412.895844	19.3690891
28	516.559937	n/a	417.895477	412.05896	19.2598934
29	517.605286	n/a	415.951385	410.982544	19.1335049
30	520.513611	n/a	414.460327	409.816437	18.987299
31	525.988403	n/a	413.569489	408.574677	18.8417568
32	533.134644	n/a	413.00351	407.83316	18.6959858
33	540.678162	n/a	412.538818	406.695496	18.5500374
34	547.225708	n/a	412.499512	405.562286	18.4047489
35	552.544678	n/a	412.615448	404.597443	18.2407837
36	556.872131	n/a	412.97113	403.797272	18.1120453
37	559.314026	n/a	413.647034	403.144501	17.9487896
38	560.887939	n/a	414.899109	402.940796	17.8035431
39	561.50293	n/a	416.820801	402.450562	17.6401653
40	562.961243	n/a	418.997223	402.420258	17.4757938
41	565.288208	n/a	421.593994	402.250549	17.313097

42	568.549377	n/a	424.296509	402.373749	17.1482315
43	573.529236	n/a	427.46347	402.405945	16.9504833
44	579.882568	n/a	430.753265	402.751923	16.7673645
45	587.35144	n/a	434.497437	403.589874	16.5680199
46	596.715088	n/a	437.785675	404.396271	16.3846436
47	606.584106	n/a	441.99057	405.564484	16.1845989
48	617.827393	n/a	446.612274	407.222778	15.9847689
49	628.712769	n/a	451.968414	409.200623	15.7643404
50	639.536011	n/a	458.25766	411.434631	15.545414
51	650.067871	n/a	464.642395	413.813477	15.3458967
52	659.531982	n/a	471.730774	416.53714	15.1455851
53	668.533997	n/a	478.799561	419.138153	14.9272232
54	676.439514	n/a	485.46402	421.818634	14.7084818
55	683.829773	n/a	491.779968	425.087555	14.5074654
56	690.077698	n/a	498.081665	427.836395	14.3066225
57	695.974426	n/a	503.889221	430.812103	14.1061716
58	701.879578	n/a	509.374756	433.737152	13.9243708
59	706.275024	n/a	513.855713	436.557678	13.7315426
60	708.701355	n/a	518.474854	439.383179	13.5487089
61	710.013611	n/a	523.003418	442.412811	13.3664303
62	710.264893	n/a	527.157837	445.433167	13.2034674
63	709.84906	n/a	531.30835	448.656982	13.0209255
64	709.754517	n/a	535.00531	451.874634	12.8377581
65	709.327454	n/a	539.223083	454.851593	12.6735382
66	708.558411	n/a	542.253906	457.85849	12.4914341
67	708.062866	n/a	545.34906	460.882629	12.3278704
68	708.745483	n/a	548.351013	463.762573	12.1633253
69	709.834229	n/a	551.393188	466.53772	11.9828377
70	710.18396	n/a	554.115601	469.242767	11.8191347
71	711.80719	n/a	557.271851	472.085175	11.6363325
72	712.171997	n/a	559.793213	474.702942	11.4722509
73	713.507019	n/a	562.304321	477.210876	11.2903824
74	713.971558	n/a	564.654968	479.790771	11.1268539

75	713.898193	n/a	567.367554	482.391724	10.9447384
76	714.413452	n/a	569.50354	484.823212	10.7971382
77	714.544678	n/a	572.299683	487.716919	10.5988569
78	714.986511	n/a	574.706482	490.438324	10.4774971
79	714.453979	n/a	577.355347	493.463684	10.2943335
80	714.655029	n/a	580.117676	496.096497	10.1296072
81	714.05127	n/a	582.899475	498.43576	9.9664278
82	714.485229	n/a	585.143799	500.914764	9.80166054
83	715.443542	n/a	587.867676	503.721771	9.63751507
84	716.364685	n/a	590.029297	505.981934	9.47381496
85	716.270508	n/a	592.544556	508.411285	9.32990551
86	717.475769	n/a	594.286804	510.681335	9.18326473
87	717.934509	n/a	596.807983	513.120728	9.01850796
88	718.097961	n/a	599.356201	515.361084	8.8350668
89	717.698669	n/a	601.383911	517.668213	8.69126606
90	717.997925	n/a	604.312744	520.17804	8.54607487
91	718.235718	n/a	606.791687	522.49469	8.3815155
92	718.413208	n/a	607.966187	525.443909	8.25427246
93	719.052673	n/a	608.108704	528.626404	8.12597656
94	719.94696	n/a	607.75946	531.742188	7.98072958
95	717.779053	n/a	606.961548	534.869629	7.89021111
96	712.855042	n/a	605.304626	537.919739	7.76164436
97	708.056641	n/a	604.26593	540.71991	7.65298319
98	700.817078	n/a	602.024963	544.124207	7.54314804
99	689.591431	n/a	600.049011	547.675537	7.43508625
100	676.487	n/a	597.861572	550.646423	7.34440613
101	662.801208	n/a	595.580383	552.90802	7.23373938
102	649.165222	n/a	593.178955	554.73822	7.14824629
103	636.039673	n/a	591.478699	555.486877	7.07614803
104	625.707581	n/a	589.187378	555.932434	6.96701574
105	619.328918	n/a	587.591614	555.888977	6.87441969
106	617.384888	n/a	586.23114	555.455261	6.76586437
107	617.35498	n/a	585.529419	555.145691	6.67543697

108	618.613464	n/a	584.974304	555.136841	6.60169649
109	620.785278	n/a	584.516541	555.17926	6.4929533
110	623.985962	n/a	583.920593	555.384888	6.40241337
111	627.031555	n/a	583.894897	556.087708	6.31147432
112	630.99353	n/a	583.790039	556.756348	6.20129538
113	635.675354	n/a	583.865295	556.955322	6.09337854
114	638.741577	n/a	583.549072	557.638855	6.00121641
115	640.080322	n/a	583.889648	558.017029	5.89193726
116	640.31488	n/a	584.576843	558.189331	5.78269625
117	640.71228	n/a	586.065308	558.883179	5.69087458
118	638.5271	n/a	587.440552	559.506653	5.58256054
119	633.91571	n/a	588.170776	559.937988	5.50938845
120	627.764771	n/a	589.452148	561.129272	5.41921473
121	621.106934	n/a	589.550415	561.683044	5.328053
122	612.585876	n/a	589.586853	562.302612	5.27383232
123	604.176453	n/a	588.726685	562.657227	5.18332672
124	595.92688	n/a	586.802917	563.137939	5.12804747
125	587.544983	n/a	585.382996	563.49646	5.07310867
126	579.673706	n/a	583.681458	563.923584	5.00102997
127	572.277527	n/a	582.075806	564.319702	4.94723225
128	565.187561	n/a	580.312195	564.287659	4.89148808
129	558.194946	n/a	578.700745	563.84845	4.83726263
130	551.314026	n/a	576.793884	563.18866	4.80133963
131	544.718994	n/a	575.417969	562.666687	4.74548912
132	538.768616	n/a	573.49408	561.931213	4.67329073
133	532.611755	n/a	571.763733	561.147217	4.65502262
134	526.800659	n/a	570.3479	560.126404	4.58161306
135	521.945862	n/a	568.437317	558.952698	4.5465169
136	517.2677	n/a	566.850464	557.7724	4.50879812
137	512.764648	n/a	565.171875	556.789185	4.49114466
138	507.780914	n/a	563.321716	555.34198	4.45395517
139	503.766937	n/a	561.416504	553.947693	4.4179368
140	500.203583	n/a	559.266663	551.871643	4.38272142

141	496.108032	n/a	557.124756	550.012878	4.3281312
142	491.990479	n/a	554.939026	547.584717	4.31015635
143	487.014038	n/a	552.390076	545.776794	4.27180052
144	482.53241	n/a	550.350647	543.787781	4.23794889
145	477.331787	n/a	548.039063	542.045044	4.20044994
146	472.745544	n/a	545.648743	540.93335	4.16472578
147	467.869965	n/a	543.277588	539.963196	4.14706564
148	463.188477	n/a	540.866943	538.54364	4.11056137
149	459.114471	n/a	538.900757	537.121887	4.07522297
150	454.939789	n/a	536.779175	535.400574	4.03818369
151	451.120575	n/a	534.739807	533.858521	4.02012539
152	446.957245	n/a	532.70459	532.021667	3.98354888
153	442.791504	n/a	530.612061	530.637695	3.96503878
154	438.676605	n/a	528.458679	528.666626	3.93376255
155	434.871948	n/a	526.552612	527.03363	3.91499448
156	431.077148	n/a	524.601563	525.364258	3.87920523
157	427.134308	n/a	522.364685	523.565918	3.8616693
158	423.612915	n/a	520.442017	522.214783	3.82458687
159	420.488281	n/a	518.203186	520.674255	3.82436252
160	417.455017	n/a	516.117188	519.069519	3.7880652
161	414.652832	n/a	513.956665	517.172607	3.76954961
162	411.593689	n/a	512.350403	515.702454	3.73306823
163	409.116791	n/a	510.045959	513.778687	3.71521449
164	406.309845	n/a	507.88208	511.950439	3.6974833
165	403.58255	n/a	506.203705	509.968506	3.66077018
166	400.923431	n/a	503.857025	508.126862	3.64190125
167	398.339539	n/a	501.970337	506.6875	3.62348962
168	395.153503	n/a	500.113007	504.404572	3.58813047
169	392.90979	n/a	497.645752	502.530029	3.56934977
170	390.385132	n/a	495.790161	500.940552	3.55199528
171	388.279541	n/a	493.820892	499.090057	3.51697421
172	385.762695	n/a	491.90802	497.484528	3.47921801
173	383.76593	n/a	490.259125	496.098328	3.46056509

174	381.997925	n/a	488.633606	494.207123	3.46100926
175	380.412994	n/a	486.855621	492.481079	3.40723395
176	378.841797	n/a	485.399109	490.753326	3.38970256
177	377.198212	n/a	483.339294	489.17337	3.35385966
178	376.054352	n/a	481.979156	487.578949	3.33505201
179	374.50235	n/a	480.412598	486.063141	3.29925752
180	373.320465	n/a	478.994263	484.303284	3.26206088
181	372.280731	n/a	477.595795	483.038483	3.2440598
182	371.245392	n/a	476.133759	481.19986	3.20892406
183	370.114258	n/a	474.652802	479.789307	3.17779207
184	369.076385	n/a	473.527466	478.214905	3.15284705
185	368.150421	n/a	472.238922	477.124268	3.13723397
186	367.15271	n/a	470.771851	475.542969	3.10033321
187	366.437439	n/a	469.947327	474.240479	3.08113289
188	365.360138	n/a	468.35376	472.720825	3.06417108
189	364.315521	n/a	466.96698	471.259338	3.02621245
190	363.438538	n/a	466.040649	470.066956	3.00715327
191	362.50412	n/a	464.925629	468.83136	2.99090409
192	361.523804	n/a	463.875488	467.72171	2.95593214
193	360.454498	n/a	462.540466	466.594299	2.93620634
194	359.716339	n/a	461.629028	465.288269	2.93587136
195	359.08606	n/a	460.785522	464.360291	2.90079331
196	358.337219	n/a	459.907623	462.754456	2.86308503
197	357.615662	n/a	459.256287	461.674835	2.84502339
198	356.792908	n/a	457.83548	460.310089	2.82673836
199	355.945038	n/a	456.729828	459.204132	2.79045439
200	355.126495	n/a	455.696106	457.916412	2.75313497
201	354.417419	n/a	454.680573	457.06189	2.73460674
202	353.506836	n/a	454.129578	455.779846	2.71690774
203	352.790222	n/a	452.904968	454.606262	2.69764161
204	352.033905	n/a	451.943237	453.670532	2.66293216
205	351.220612	n/a	451.060211	452.579834	2.64522505
206	350.263977	n/a	450.103455	451.523193	2.60862851

207	349.605927	n/a	449.458923	450.617188	2.59015727
208	348.687469	n/a	448.34668	449.547333	2.57209182
209	347.711304	n/a	447.602661	448.525574	2.55369163
210	346.804047	n/a	446.640076	447.389801	2.5174644
211	346.046753	n/a	445.525879	446.417816	2.49969578
212	345.281067	n/a	444.555176	445.362183	2.48166347
213	344.335571	n/a	443.647156	444.208038	2.44545126
214	343.459503	n/a	442.82373	442.885406	2.42698216
215	342.525757	n/a	441.923035	441.816833	2.40881062
216	341.723267	n/a	441.020142	440.747894	2.39001703
217	341.096924	n/a	440.228149	439.836945	2.35464358
218	340.501709	n/a	439.495575	438.866882	2.33718848
219	339.919525	n/a	438.553802	438.076263	2.31920457
220	339.216187	n/a	437.578339	436.932556	2.30046487
221	338.590851	n/a	436.742523	436.087921	2.26497269
222	337.917084	n/a	436.067749	434.973816	2.2467339
223	337.481445	n/a	435.1185	434.042786	2.22883153
224	336.833313	n/a	434.51886	433.279205	2.21050954
225	336.105103	n/a	433.823151	432.352783	2.17465472
226	335.474884	n/a	432.686249	431.379517	2.15727735
227	334.88504	n/a	431.883301	430.616272	2.13842916
228	334.2435	n/a	431.057953	429.68042	2.12074661
229	333.983124	n/a	430.197601	429.066223	2.08389664
230	333.519318	n/a	429.328278	428.078339	2.06555462
231	333.01889	n/a	428.426697	427.118378	2.04768515
232	332.143585	n/a	427.703949	426.410492	2.03011703
233	331.439697	n/a	426.672852	425.629089	2.0116241
234	330.734589	n/a	426.006927	425.052399	1.99302781
235	330.210571	n/a	425.260834	424.274628	1.97468209
236	329.307617	n/a	424.149933	423.521942	1.93893051
237	328.771942	n/a	423.172546	422.611084	1.9218117
238	327.968048	n/a	422.215759	421.682434	1.9024446
239	327.297241	n/a	421.521851	420.922882	1.88518977

240	326.643036	n/a	420.47525	419.844696	1.86742425
241	326.431824	n/a	419.753021	419.096436	1.83015788
242	326.058868	n/a	418.986877	418.292908	1.81245053
243	326.0159	n/a	418.490051	417.397888	1.7935636
244	325.788971	n/a	417.910583	416.63736	1.77622569
245	325.9021	n/a	417.777893	415.760437	1.73989463
246	326.342804	n/a	417.298706	415.012421	1.72217691
247	326.809753	n/a	416.977295	414.280243	1.70422149
248	327.69223	n/a	416.828308	413.534241	1.66762865
249	328.527863	n/a	416.782379	413.081543	1.65018988
250	329.575226	n/a	416.926331	412.62796	1.61456382
251	330.390015	n/a	416.87677	412.399048	1.5777595
252	331.196777	n/a	416.885284	412.021698	1.55871999
253	331.694916	n/a	417.05304	411.56601	1.54126024
254	331.746948	n/a	416.947174	411.231964	1.52359414
255	331.53418	n/a	416.743011	411.211609	1.48541486
256	331.045532	n/a	416.468628	410.915588	1.46905112
257	330.091064	n/a	416.162354	410.602112	1.45110536
258	329.243042	n/a	415.86264	410.164825	1.43259072
259	328.426941	n/a	415.339569	409.774658	1.39717031
260	327.767731	n/a	414.864227	409.46463	1.37880516
261	327.340057	n/a	414.112091	409.03241	1.34117162
262	326.742432	n/a	413.772064	408.629303	1.32354438
263	326.093658	n/a	413.216156	408.182678	1.28742123
264	325.301697	n/a	412.660431	407.881134	1.26899695
265	324.381287	n/a	412.11676	407.53833	1.25038207
266	323.55661	n/a	411.509857	407.084015	1.23290288
267	322.797821	n/a	411.093445	406.469696	1.21400011
268	322.110779	n/a	410.722229	406.011505	1.17578423
269	321.255859	n/a	410.175415	405.449249	1.15959704
270	320.284241	n/a	409.877808	404.660889	1.14233613
271	319.43158	n/a	409.870117	403.943939	1.10487533
272	318.585663	n/a	409.559662	403.24823	1.10510194

273	317.791962	n/a	409.39444	402.362091	1.05195475
274	316.976929	n/a	409.107056	401.782196	1.0523839
275	316.165161	n/a	409.140411	400.961945	1.01486564
276	315.66864	n/a	408.569336	400.215515	0.997352719
277	315.325287	n/a	408.492401	399.231659	0.979195416
278	314.976685	n/a	408.071442	398.38739	0.960931182
279	314.661865	n/a	407.36438	397.371094	0.923182607
280	314.300049	n/a	407.101624	396.670715	0.904481709
281	313.96051	n/a	406.201355	395.944244	0.88605231
282	313.325287	n/a	405.840027	395.481964	0.865543604
283	312.911407	n/a	405.260376	394.754089	0.849367559
284	312.513824	n/a	404.782684	394.032806	0.830770671
285	312.08905	n/a	404.556427	393.211487	0.793422759
286	311.832062	n/a	403.703369	392.566498	0.775558531
287	311.398956	n/a	403.443237	391.828827	0.757687569
288	310.955597	n/a	403.227997	391.145813	0.739771008
289	310.334106	n/a	402.685272	390.34433	0.721488059
290	309.573425	n/a	402.33844	389.897552	0.710619569
291	308.847107	n/a	402.284241	389.456268	0.674797654
292	308.293182	n/a	402.037872	388.860352	0.655687094
293	307.807404	n/a	401.631775	388.643463	0.620196342
294	307.489532	n/a	401.512878	388.172485	0.61960721
295	306.871674	n/a	401.364227	387.915985	0.583095968
296	306.571777	n/a	401.069641	387.343353	0.583600581
297	306.096313	n/a	400.815033	386.983459	0.528640449
298	305.867615	n/a	400.599762	386.586365	0.528185904
299	305.502319	n/a	400.230774	386.35791	0.509800553
300	305.303711	n/a	400.407501	385.915588	0.492678702
301	304.96701	n/a	400.181335	385.432129	0.455331594
302	304.844147	n/a	400.414093	384.909821	0.437270731
303	304.666412	n/a	399.958862	384.610779	0.419472277
304	304.325378	n/a	399.595276	384.285004	0.400071621
305	304.066406	n/a	399.556519	383.705475	0.363579065

306	303.664368	n/a	399.438843	383.014984	0.346457988
307	303.197174	n/a	398.612946	382.393127	0.327882737
308	302.75473	n/a	397.878052	381.909149	0.317895681
309	302.052887	n/a	397.386536	381.325012	0.273727059
310	301.662537	n/a	396.976624	380.889557	0.273436964
311	301.048981	n/a	396.401398	380.321106	0.25636673
312	300.614777	n/a	395.978577	379.851746	0.236403853
313	299.878876	n/a	395.344116	379.426086	0.218612134
314	299.392303	n/a	394.753754	379.006134	0.183507949
315	298.76828	n/a	394.340149	378.416199	0.164271787
316	298.337006	n/a	393.704712	377.902161	0.164365992
317	297.976196	n/a	393.332306	377.469208	0.129034519
318	297.637238	n/a	392.698242	376.747742	0.111283168
319	297.129974	n/a	392.218994	376.524689	0.093060814
320	296.663208	n/a	391.454315	375.878845	0.092789419
321	295.899902	n/a	390.834015	375.364288	0.054613899
322	295.521698	n/a	390.238312	374.643616	0.037696932

PRODUCT:	38ST-D	
MANUFACTURER:	FOYERS SUPREME INC.	
TEST:	38STD250314	
DATE:	14-03-2025	
TIME (MIN):	235	
WEIGHT/WET (LB):	21.4041767	
WEIGHT/DRY (KG):	7.844969741	
BURN RATE (KG/HR):	2.002970998	
STARTING WEIGTH RANGE [20% - 25%]:	4.28083534	5.351044175
STARTING WEIGHT [%]	23.2227069	
DELTA T° (F):	13.20399475	
CATCH (mg):	3.30	

LOAD CONFIGURATION							
	W (IN)	**H (IN)**	**L (IN)**	**HUMIDITY (%)**	**SPACERS**	**WEIGHT (LB)**	**SPECIES**
1	4	4	20	19	4	5.6	BC FIR
2	4	4	20	22	4	5.3	BC FIR
3	4	4	20	21	4	5.3	BC FIR
4	4	4	20	20	4	5.2	BC FIR
						21.4	

TIME	**TOP - T°**	**BOT - T°**	**RIGHT - T°**	**LEFT - T°**	**FLUE - T°**	**WEIGHT (LB)**
0	378.552979	453.011963	486.241302	481.421722	322.310516	4.97062922
0	371.207397	450.61734	481.280151	477.453979	327.992981	5.68370771
1	357.896851	452.830109	475.269501	471.334869	324.272247	21.4041767
2	348.149963	452.771454	467.882843	464.415833	335.594543	21.3314095
3	343.212555	452.626099	461.138153	457.434601	351.115601	21.2029305
4	343.42572	452.462219	454.887207	451.063629	369.288055	21.0771046
5	350.273865	452.207977	448.95105	445.684998	389.492096	20.9685478
6	365.527039	451.850861	444.012451	441.00647	412.285187	20.8032665
7	382.885376	451.701111	440.391724	437.390167	429.583588	20.6389618
8	402.117371	451.533173	437.557922	434.418732	453.453217	20.438221

9	428.015869	451.291229	435.904602	432.907318	485.022461	20.2090492
10	457.913147	451.202118	434.951416	432.199127	515.991821	19.9534473
11	489.666382	450.800629	435.362915	432.391846	550.438965	19.6620426
12	521.588562	451.129089	436.107666	434.481934	581.791992	19.3705177
13	554.981506	451.21698	437.049835	437.936981	603.774414	19.0808239
14	585.720276	451.525177	439.058014	442.249817	615.62561	18.8069553
15	611.584045	451.65741	442.707703	447.092072	618.991943	18.5522346
16	631.498657	451.49823	446.670227	452.583832	608.842041	18.35256
17	643.263123	451.985779	450.769135	458.701752	588.935303	18.1883087
18	647.538452	452.404663	455.305389	463.81723	571.049561	18.0431194
19	645.555603	452.419464	459.516907	467.666809	556.012939	17.8974209
20	639.064148	452.632019	462.639099	470.567566	543.769287	17.7683086
21	632.67749	452.685974	464.150879	472.694	533.894592	17.6243591
22	627.510376	452.80481	464.598572	474.200043	527.243896	17.4942455
23	626.098572	452.709991	464.099854	475.340363	529.695435	17.3312473
24	629.37207	452.665924	463.859497	477.377838	537.170044	17.150383
25	634.63623	452.244812	463.620178	479.861603	544.011475	16.9528656
26	641.432922	451.855652	463.474152	482.579712	550.115723	16.7513275
27	647.930054	451.69278	464.141022	485.081482	364.745087	16.5687408
28	653.821167	451.09549	464.225006	487.52887	552.673523	16.4050903
29	658.447632	450.412872	464.704163	489.397583	551.050598	16.2426338
30	661.138306	449.687225	465.24707	490.973022	549.537903	16.0770473
31	662.851929	449.263123	466.352051	492.711914	549.2948	15.9130611
32	664.079407	448.543457	467.083496	494.775299	549.859924	15.7489347
33	666.453857	447.74942	468.131073	497.576019	551.483276	15.5861473
34	669.614807	447.019684	468.966827	500.601227	554.561218	15.4041204
35	672.250854	446.327728	470.127106	503.801117	557.142578	15.2224159
36	675.866333	445.308411	471.122009	506.660126	558.169006	15.0394735
37	678.83551	444.335449	472.084625	509.587006	557.175293	14.8754702
38	680.605225	443.645935	473.434784	511.573883	555.705444	14.7125015
39	680.875122	442.769592	474.529022	513.184265	553.434143	14.5485144
40	680.352173	441.897095	476.219635	515.030884	551.227051	14.3837566
41	678.660278	441.094696	477.742371	516.214478	548.414795	14.2378197

42	676.241943	440.416412	479.554749	517.731018	546.384033	14.0930843
43	674.492188	439.516541	481.195679	518.8974	544.146851	13.9287624
44	672.480896	438.805542	482.70575	519.841187	542.425171	13.7651987
45	670.468201	438.064209	484.950256	520.543579	541.151245	13.6276846
46	669.096741	437.301178	486.739777	521.507385	540.056702	13.4622374
47	667.859863	436.623291	488.776245	522.390442	539.59314	13.3168297
48	667.096008	435.855133	490.50943	523.358582	538.713135	13.154233
49	667.007935	435.058502	492.373016	524.30426	538.891479	13.0077505
50	666.671509	434.363953	494.463867	525.293762	538.787354	12.8445482
51	666.201355	433.574585	496.227509	526.16449	539.521301	12.6809607
52	665.660217	432.96814	498.403748	527.137695	540.094604	12.5353403
53	663.86853	432.191589	500.535248	528.249573	540.770203	12.3703957
54	661.654114	431.597656	503.122864	529.169678	541.903442	12.2249479
55	659.482788	431.014954	506.06369	529.776123	544.598022	12.0612736
56	657.61853	430.388306	508.780609	530.513977	545.213989	11.8803577
57	656.960144	429.902649	512.315063	530.579041	319.410797	11.7161283
58	657.520813	429.175537	515.988159	530.897705	243.123062	11.5337
59	658.978027	428.711182	519.279053	531.304871	204.359039	11.3706026
60	660.280945	428.192505	523.781128	531.898987	219.016769	11.2070313
61	662.013062	427.631439	527.53418	532.502625	214.497375	11.0249557
62	663.472229	426.944183	531.715881	533.580444	211.077362	10.8618317
63	665.463684	426.354187	536.219849	534.57428	208.050262	10.6797371
64	667.135254	425.617706	540.856812	535.806641	197.469193	10.4964743
65	668.989807	425.135559	546.187378	537.164063	202.523712	10.321085
66	670.720154	424.912048	551.19458	538.904236	193.743011	10.1568108
67	672.481567	424.681	556.483154	540.741272	201.233002	9.9750948
68	673.890991	424.424072	561.058899	542.40918	205.44249	9.79323006
69	675.353638	424.295563	565.275635	544.265686	200.282303	9.6106863
70	676.941956	424.179077	568.675659	546.508667	202.036652	9.42954254
71	679.021667	424.071167	571.68335	548.776489	201.674408	9.2659235
72	680.694336	423.873535	573.969788	551.395203	189.748016	9.10112667
73	682.082153	423.856873	575.29895	553.840027	191.201035	8.95559692
74	683.816833	423.952637	576.885132	556.406555	193.779526	8.80991459

75	684.722168	423.888763	577.848999	559.144897	207.838898	8.6464529
76	685.412109	424.200409	578.702576	561.635986	206.673157	8.50060654
77	686.263306	424.370819	579.744446	564.207764	220.172882	8.35460663
78	686.997437	424.553009	580.069214	567.113525	214.99411	8.22772789
79	688.310547	424.728729	580.544373	570.242432	236.4646	8.08205795
80	689.708618	424.847809	580.783325	573.268921	313.568237	7.93588591
81	691.218872	425.202728	581.157471	576.060669	312.182861	7.78900385
82	691.950989	425.524353	581.19281	579.055176	445.345764	7.66184425
83	693.112183	425.618713	581.28717	581.595764	542.625793	7.4992075
84	694.419617	426.00058	581.893738	584.274658	559.27832	7.37009192
85	695.564392	426.257996	581.754883	587.088318	559.370178	7.22477055
86	696.493774	426.319946	581.693604	589.769043	559.813904	7.08504772
87	697.782288	426.805878	581.687561	592.509155	560.127441	6.9399147
88	698.890198	427.241272	582.175293	595.440369	560.830444	6.81237268
89	700.130127	427.452881	582.884399	597.812622	561.059265	6.6668644
90	701.750366	427.891968	583.17334	600.492188	562.243835	6.52079821
91	702.855957	428.151459	583.757751	603.156555	563.127014	6.37653446
92	704.132935	428.588226	584.782654	606.385803	563.658447	6.23016644
93	705.015015	428.908691	585.693848	608.902893	563.587463	6.10196018
94	705.332703	429.512512	587.353027	610.893555	562.30957	5.97580528
95	702.944336	429.778687	588.898193	612.293213	560.045288	5.84793997
96	697.214417	430.273743	591.547729	612.533325	558.421509	5.71905947
97	690.140137	430.783081	594.642029	612.367737	557.249634	5.5927434
98	681.888855	431.223755	598.290771	611.894104	554.533936	5.48267031
99	673.216309	431.824982	602.321777	611.851501	551.804138	5.3662591
100	664.141602	432.456604	605.850098	611.374695	548.654236	5.26496506
101	655.117554	432.952057	609.571411	611.197754	544.745544	5.15579557
102	646.336731	433.535522	612.672791	610.573486	540.354614	5.06451845
103	637.893555	434.204407	616.017151	609.735046	535.876465	4.97497606
104	629.909546	435.158539	618.940308	609.230164	531.560669	4.86586142
105	622.271301	435.875519	622.044495	608.652344	528.047424	4.79250574
106	614.940918	436.773621	624.181946	608.211548	524.806458	4.68280363
107	608.728271	437.685028	626.409546	607.807495	522.114624	4.59179258

108	602.980774	438.489716	628.248291	607.29126	519.640442	4.4833498
109	598.124817	439.502808	630.608887	606.980103	517.396606	4.39191294
110	593.381165	440.340637	632.330627	606.252808	515.59845	4.31935835
111	589.551392	441.457642	633.101318	605.454773	514.824402	4.22885609
112	586.521301	442.346954	633.479248	604.580444	513.58667	4.1377306
113	583.526611	443.536255	634.080688	603.942993	511.047729	4.06678867
114	579.919189	444.499298	633.471802	603.149902	506.409485	4.01181746
115	575.309143	445.563507	633.802002	602.155579	500.20401	3.95653653
116	569.748657	446.617096	632.848022	600.823547	494.592957	3.90678596
117	564.526245	447.695648	630.473511	599.524231	489.691254	3.85302734
118	559.852661	449.116119	626.829285	598.386292	484.537079	3.79700708
119	555.62439	449.990112	623.751282	597.072571	479.753723	3.76072001
120	551.220947	451.192413	620.694885	596.024109	474.804993	3.70657635
121	547.338135	452.38623	618.613525	594.666748	469.598907	3.65144038
122	543.165955	453.780273	616.267822	593.408264	465.301361	3.61448359
123	538.932068	455.33606	613.612061	591.967346	460.709595	3.56061864
124	534.128906	456.494537	611.598633	590.712585	455.936951	3.52439904
125	529.313477	458.116272	609.325806	589.100464	451.035553	3.47082424
126	524.627075	459.586273	606.925293	587.296326	447.022278	3.43500233
127	519.80542	461.02948	604.592529	585.583923	443.078857	3.38001156
128	515.504028	462.912201	602.271606	583.758728	438.972961	3.36266088
129	510.848602	464.2146	599.725647	581.99585	435.32959	3.32567716
130	506.499023	465.813568	597.078064	580.513855	431.620697	3.28945231
131	502.215729	467.357391	594.792542	578.282715	428.322937	3.2527585
132	497.767242	468.450623	592.403992	576.416077	424.711914	3.19912171
133	493.802002	470.03299	590.179932	574.394287	421.68573	3.16032338
134	490.036072	471.706238	587.742432	572.302307	418.684784	3.12564087
135	486.131073	473.276855	585.355286	570.710632	415.869446	3.08920884
136	482.545807	474.369873	583.226624	568.566956	413.326569	3.05313349
137	478.640533	475.829651	580.807983	566.441406	410.982635	3.01570129
138	475.389099	476.539368	578.453308	564.738159	408.567474	2.99716783
139	472.153687	478.089355	576.278748	562.702332	406.247803	2.94462919
140	469.142487	479.530975	573.978943	560.937439	403.963196	2.90753627

141	466.409729	480.625366	571.958618	559.50293	401.802277	2.88952112
142	463.63208	481.940155	570.296082	557.896423	399.885132	2.83477998
143	460.848541	482.559631	568.045654	556.393738	398.051666	2.81646419
144	458.482666	484.076935	566.162109	554.829773	396.311401	2.78053975
145	455.98761	485.214294	564.305237	553.111633	394.787201	2.74334908
146	453.985657	486.338287	562.514038	551.49292	393.23645	2.70152187
147	452.015106	487.305939	560.636475	549.60968	391.919312	2.67083406
148	449.948822	488.400116	558.939819	547.997314	390.637268	2.63542414
149	447.985352	489.260834	557.113525	546.416992	389.128845	2.59842539
150	446.390594	489.840179	555.400513	544.791138	387.769226	2.56219006
151	444.460327	490.722839	553.322266	543.442017	386.769775	2.54349446
152	442.766754	491.531067	551.84259	541.834595	385.607056	2.48914051
153	441.323242	492.109924	550.240845	540.479187	384.717926	2.47123289
154	439.620758	492.685394	548.220215	539.040405	383.746582	2.43409586
155	438.235291	493.280762	546.953857	537.405518	382.665985	2.39746666
156	436.720825	493.807831	545.563904	535.982117	381.702209	2.36087465
157	435.335876	494.269135	544.190002	534.733154	380.608643	2.32512379
158	433.782562	494.679596	542.68103	533.277893	379.312195	2.30693936
159	432.188812	495.134277	540.63916	532.106323	377.897827	2.25255346
160	430.210846	495.501923	539.044067	530.383972	376.499023	2.2339828
161	428.723785	496.059692	537.562317	529.00647	375.450043	2.19804716
162	426.894928	496.176056	536.307495	527.579529	374.216003	2.16208911
163	425.274414	496.538361	534.662598	526.361877	373.183563	2.12492681
164	423.477478	496.779083	533.452393	524.960388	372.128937	2.1074512
165	422.102112	496.953552	531.594116	523.417175	371.043091	2.07118297
166	420.493439	497.103729	530.417725	522.292786	370.143127	2.03485036
167	419.091217	497.03244	529.147095	520.812744	369.149994	2.0175221
168	417.691711	497.072906	527.580139	519.384155	368.296509	1.96182191
169	416.356354	497.229034	526.009644	517.858948	367.799713	1.94418871
170	415.085693	497.290771	524.820068	516.916809	366.932739	1.88902736
171	414.032288	497.225616	523.447449	515.452026	365.955109	1.87147117
172	412.963409	497.400787	522.21637	513.880676	365.110809	1.85283983
173	411.467896	497.286377	520.987183	512.686768	364.324921	1.79752016

174	410.408203	497.207886	519.574097	511.480225	363.158264	1.77927387
175	409.409637	497.309784	518.39447	510.075958	362.312225	1.74381375
176	408.20166	497.302185	516.847473	508.748291	361.46109	1.70774066
177	407.161011	497.241333	515.861633	507.56781	360.575226	1.6725893
178	405.97406	497.253418	514.312683	506.216827	359.716797	1.63484967
179	404.989532	497.264008	512.981934	504.847565	358.683685	1.61646056
180	403.390167	497.286041	511.845886	503.829712	357.789459	1.59077072
181	402.213318	497.424957	510.529083	502.458954	356.790985	1.54343283
182	400.965546	497.505615	509.287231	500.974152	355.908478	1.52626693
183	399.643768	497.455231	507.916351	499.80484	355.240265	1.48915756
184	398.446625	497.580658	506.575043	498.604889	354.474792	1.45390463
185	397.056335	497.54303	505.302429	497.040436	353.625031	1.43596411
186	395.689362	497.673645	504.154968	495.753784	352.805573	1.39847338
187	394.3815	497.971222	503.339081	494.544891	352.96936	1.34488368
188	393.413635	498.036896	501.892456	493.191772	352.759033	1.32556903
189	392.297852	498.497223	500.944702	492.17804	352.370361	1.2899617
190	391.095673	498.862305	500.141174	491.414764	351.672119	1.25335848
191	389.870483	499.764496	498.819305	490.434723	350.960663	1.23466206
192	388.846802	500.503998	498.16748	489.699738	350.441437	1.19853067
193	387.944916	501.606201	497.102295	488.834198	350.084656	1.16020262
194	386.771179	502.725647	496.099579	488.143311	349.815491	1.12583113
195	385.742645	503.971344	495.325928	487.22113	349.119751	1.10861135
196	384.663269	505.109467	494.538025	486.370819	348.058289	1.07168889
197	383.420593	506.286804	493.865845	485.505463	347.13916	1.03633344
198	382.261902	507.490814	492.754639	484.911896	346.725647	1.01599228
199	381.23999	508.596802	492.364014	483.992798	345.897797	1.00001884
200	380.292053	509.494598	491.37616	483.162476	345.189514	0.964072049
201	379.289581	510.355316	490.782349	482.308685	344.297394	0.926553726
202	378.385529	511.25	490.246216	481.556946	343.479126	0.889908612
203	377.849792	511.983276	489.657684	481.145721	343.084961	0.851265073
204	377.217651	512.854919	488.953125	480.340698	342.902222	0.834748089
205	376.658264	513.70343	488.473328	479.874786	342.702301	0.81638819
206	376.049133	514.360962	487.728333	479.320496	342.594971	0.779134512

207	375.540314	515.154236	487.326874	478.854797	342.505463	0.743129432
208	375.14743	515.866943	486.812744	478.420715	342.235962	0.724957168
209	374.629456	516.717651	486.076599	477.851532	341.850403	0.695814669
210	373.98996	517.390503	485.333893	477.571869	341.155029	0.677291036
211	373.372314	518.395813	484.309174	477.009888	340.249481	0.640853763
212	372.60849	519.111145	483.601135	476.275757	339.538422	0.623269141
213	371.935028	519.949768	482.434082	475.738556	338.645569	0.58687377
214	371.193787	520.628967	481.804779	475.108429	337.65979	0.568776309
215	370.380829	521.411255	480.894012	474.379974	337.056244	0.549789071
216	369.641998	522.018738	480.05957	473.774384	336.327118	0.513691306
217	368.958374	522.537415	479.230896	472.897461	336.178711	0.494828194
218	368.302216	522.999634	478.434357	472.360809	335.872742	0.45919767
219	368.020844	523.192444	477.96344	471.873596	335.712311	0.422315568
220	367.705811	523.384888	477.411316	471.317322	335.47998	0.404960483
221	367.456207	523.423889	476.592194	470.892487	335.39743	0.385687679
222	367.401215	523.447571	476.17276	470.656586	335.283295	0.349115878
223	367.138092	523.468079	475.669891	470.215607	335.298004	0.330965281
224	367.069641	523.44751	475.05188	470.070129	335.232361	0.294610292
225	366.769592	523.340393	474.498383	469.635223	334.662781	0.25910908
226	366.140656	523.358582	473.832367	468.999512	334.083252	0.241756991
227	365.797089	523.368164	473.155792	468.513519	333.60672	0.221573561
228	365.166016	523.313843	472.482178	467.958801	333.140686	0.204309687
229	364.489075	523.228149	471.915161	467.204712	332.382172	0.16863355
230	363.803619	522.965088	470.909668	466.565308	331.51889	0.131846413
231	363.251129	522.695313	469.867523	465.890442	330.772125	0.113206863
232	362.642883	522.269653	469.507751	465.124908	329.872314	0.096096255
233	361.788452	521.953247	468.455414	464.219849	328.951019	0.05931285
234	361.004303	521.445496	467.791534	463.3284	327.870148	0.040856481
235	360.234009	520.902527	466.69928	462.311493	326.827332	0.023839325

PRODUCT:	38ST-D	
MANUFACTURER:	FOYERS SUPREME INC.	
TEST:	38STD250313	
DATE:	13-03-2025	
TIME (MIN):	258	
WEIGHT/WET (LB):	22.1393986	
WEIGHT/DRY (KG):	8.114440211	
BURN RATE (KG/HR):	1.887079119	
STARTING WEIGTH RANGE [20% - 25%]:	4.42787972	5.53484965
STARTING WEIGHT [%]	18.28451383	
DELTA T° (F):	-57.75567625	
CATCH (mg):	2.20	

LOAD CONFIGURATION							
	W (IN)	**H (IN)**	**L (IN)**	**HUMIDITY (%)**	**SPACERS**	**WEIGHT (LB)**	**SPECIES**
1	4	4	20	20	4	5.3	BC FIR
2	4	4	20	20	4	5.4	BC FIR
3	4	4	20	21	4	5.8	BC FIR
4	4	4	20	20	4	5.6	BC FIR
						22.1	

TIME	**TOP - T°**	**BOT - T°**	**RIGHT - T°**	**LEFT - T°**	**WEIGHT (LB)**
0	460.86026	526.384766	515.667419	507.628632	4.0480814
0	447.946991	523.681519	510.055664	503.200745	0.019331025
1	428.198486	520.592041	503.687958	497.387787	22.1393986
2	412.065002	519.122803	495.922577	489.980255	22.0319595
3	402.599213	517.283875	488.028564	482.810181	21.8689384
4	398.143433	515.077332	483.093872	475.840637	21.6671772
5	400.984161	513.456543	483.085175	469.650848	21.4124279
6	412.194183	510.954803	487.306702	464.866211	21.1407394
7	434.861389	508.938904	490.764771	461.87793	20.8306389
8	463.425598	507.945923	493.624969	459.182922	20.5385075

9	492.349304	506.50293	496.243713	457.43512	20.2842445
10	518.016663	505.245148	498.394623	457.171997	20.0717525
11	534.976013	503.914093	501.038422	457.446655	19.8897018
12	545.874146	502.450897	504.602783	458.528564	19.6895771
13	550.712524	500.777069	508.481323	459.34552	19.5467167
14	548.42572	499.50528	511.07016	459.499664	19.434185
15	541.114014	498.870483	512.5979	458.870728	19.3073845
16	532.103638	496.989899	513.219177	458.068207	19.1785297
17	523.172791	496.129456	514.047913	456.819733	19.0328159
18	516.596069	494.722595	515.748962	454.869415	18.8695278
19	512.774109	493.507294	517.70343	453.246887	18.7055435
20	511.021362	491.593262	518.221008	451.712921	18.5431137
21	510.49234	489.997925	518.304016	450.406525	18.377388
22	510.860382	489.177063	518.841919	448.946198	18.2328854
23	512.202759	487.620087	519.198853	447.891113	18.0692005
24	514.723694	485.754181	519.684204	446.953247	17.923418
25	516.568298	484.468506	520.494934	445.84903	17.7606735
26	517.878479	482.636139	520.442871	444.932251	17.5954494
27	519.023071	481.022766	521.881409	444.167114	17.4310398
28	521.18811	479.444458	523.397522	443.893433	17.268364
29	524.22937	477.878876	524.730652	443.200073	17.1057262
30	528.406982	476.394257	526.556213	442.863739	16.9247513
31	533.864807	474.953491	529.088684	443.01297	16.7610359
32	539.473511	473.134613	530.891846	442.988617	16.5791054
33	545.948059	471.420624	533.43042	443.610413	16.3972187
34	553.034058	470.055206	535.799805	444.251221	16.2152119
35	559.827393	468.427368	538.444641	444.982666	16.0320454
36	566.918762	466.933899	540.844177	445.764191	15.8499956
37	573.472168	465.441589	543.664063	446.927094	15.667902
38	580.120972	464.160614	546.349976	448.145325	15.4652424
39	586.966125	462.828735	549.110291	449.879913	15.2673855
40	594.502625	461.584534	552.169495	451.401001	15.0651608
41	602.725159	460.733948	555.239258	453.015686	14.8654289

42	610.537231	459.309021	557.898743	454.988342	14.6657372
43	617.782654	458.116089	560.839172	457.380005	14.4657717
44	624.74585	456.729401	564.208069	459.671509	14.2630272
45	631.272522	455.088654	567.553406	461.729736	14.0648594
46	636.805542	453.791931	570.302856	463.94754	13.8817568
47	641.839233	452.65802	573.047974	466.197113	13.6877947
48	645.747375	451.97345	574.701111	468.715027	13.5057669
49	648.534424	451.106415	575.979614	470.809875	13.3236256
50	650.690125	450.121674	577.325256	473.374634	13.159132
51	651.600281	448.799225	578.407776	475.649414	12.9965925
52	651.829956	447.826019	579.717712	478.261719	12.8306236
53	651.893799	447.435577	580.516968	481.381989	12.6666775
54	651.754883	446.5065	581.482056	483.975677	12.5028534
55	651.688782	445.634552	581.171631	487.145782	12.3578024
56	652.165771	445.157928	581.887451	490.142151	12.1930408
57	652.59552	444.336121	582.461914	492.710449	12.0484333
58	652.641357	443.833618	582.607605	495.62793	11.884038
59	652.245605	442.876221	582.962219	498.424011	11.7212152
60	652.499817	442.365479	583.48877	500.84964	11.5761232
61	652.690186	441.632416	584.087219	503.869324	11.4137678
62	652.518921	440.877228	584.384766	506.392242	11.2680779
63	652.257019	440.93692	585.085266	508.99765	11.1047325
64	651.960693	440.544739	585.651794	511.593872	10.9775915
65	651.165894	439.89093	585.53595	514.337158	10.8138809
66	650.45105	439.460266	585.663513	516.71698	10.6672688
67	649.522217	438.981384	586.139038	519.003845	10.5217113
68	648.971069	438.870667	586.330383	521.689087	10.3814611
69	648.266174	438.653687	586.63678	524.120422	10.2345324
70	647.852966	438.296234	586.692932	526.624023	10.0886421
71	647.419067	437.937378	586.971924	528.845276	9.96103001
72	646.89209	438.05307	587.766052	530.57074	9.79671955
73	646.821655	437.598572	588.235474	532.856384	9.66849899
74	647.846008	437.783905	589.141785	534.903809	9.52282143

75	648.786011	437.274231	590.037354	536.59845	9.37056637
76	649.954956	437.231873	591.360779	538.653931	9.23238182
77	651.676025	437.483521	592.292358	540.699158	9.06802845
78	652.717712	437.345734	593.352173	542.515015	8.92188931
79	654.061951	437.191101	594.822998	544.72406	8.77766895
80	654.562561	437.447968	595.712036	546.409363	8.63175583
81	654.388733	437.181763	596.995667	548.462708	8.48584461
82	654.258423	437.041779	598.260742	549.957642	8.33951569
83	654.091614	437.207214	598.899963	551.669617	8.21239376
84	653.979736	437.388733	600.316711	553.187134	8.06686497
85	653.334595	437.300507	601.492554	554.411072	7.92067432
86	652.954651	437.313782	602.997681	556.133301	7.77523804
87	652.945679	437.42392	604.240662	557.616577	7.62812853
88	652.940002	437.824829	605.910461	558.869995	7.50216341
89	652.862305	437.771271	607.038757	560.543701	7.35621119
90	652.930176	438.020203	609.016846	561.784729	7.22739792
91	652.732666	438.284546	610.702454	563.106445	7.10639477
92	652.514587	438.74649	612.418213	564.244446	6.96027184
93	652.77063	439.362122	613.996094	565.698792	6.83245277
94	652.931885	439.480255	615.680908	567.159973	6.68793011
95	652.900513	439.62381	617.482178	568.106995	6.55899096
96	653.229431	440.159943	620.072388	568.960327	6.41360092
97	653.466858	440.281616	621.915466	569.924927	6.28548145
98	654.20752	440.631683	624.034424	570.907471	6.14092112
99	654.915771	440.964874	626.39978	571.878723	6.01395893
100	655.569275	441.762604	628.705444	572.946716	5.88514137
101	655.917542	442.131073	630.30365	574.360229	5.74042845
102	655.881226	442.274506	631.469299	575.445923	5.61138821
103	655.935303	442.778687	631.922974	577.361206	5.50284815
104	656.459351	443.375519	632.275085	579.185059	5.37547588
105	657.375488	443.894073	632.131104	580.761292	5.24801445
106	659.243835	444.335449	631.341431	582.95874	5.1399169
107	662.432983	445.101776	630.240601	585.035339	5.02927589

108	666.294312	445.699799	629.428406	587.463013	4.88445568
109	670.047241	446.478943	628.152222	590.227966	4.83060122
110	674.211609	447.475891	627.250854	593.083435	4.73837471
111	676.637268	448.150085	625.742493	597.062866	4.59343624
112	676.950317	448.811127	623.956116	601.017761	4.30278921
113	674.857727	449.449402	622.934021	605.037659	4.06696081
114	670.569397	450.64212	621.096436	608.488831	4.01123142
115	664.259766	451.110962	618.854492	611.068176	4.02931976
116	654.896301	451.151306	616.589539	612.435547	4.1190176
117	644.061279	451.610504	613.800537	613.08606	4.02890873
118	633.207825	452.16861	610.892578	613.440063	3.92508149
119	622.339966	452.203186	607.82428	612.695984	3.81669474
120	611.347534	452.316437	604.574951	611.482178	3.90717626
121	600.23999	452.311218	601.384033	609.472717	4.02960396
122	589.54187	452.43103	598.260498	607.807251	3.68867326
123	578.637939	452.652039	595.443237	605.310059	3.7801013
124	568.777222	452.758362	593.229858	602.36792	3.54317093
125	558.927551	453.598602	590.32666	599.483643	3.65132523
126	549.052612	453.61496	587.799011	596.1026	3.52389669
127	539.839417	453.642395	585.165161	592.747375	3.56130815
128	530.879517	453.764435	582.642761	589.590942	3.43493795
129	522.942627	454.251495	580.112061	586.612549	3.45096016
130	515.354004	454.757599	577.715942	583.597107	3.37945604
131	508.224243	455.264099	574.971436	581.071838	3.50820947
132	500.929443	455.210693	572.348938	578.613892	3.16108465
133	493.964722	455.733856	570.325073	576.112854	3.32530928
134	487.412018	455.968506	567.954712	573.360657	3.3445394
135	481.467133	457.061554	565.957581	570.540955	3.01594424
136	475.888428	457.581421	563.247437	567.832397	2.97964835
137	470.759888	458.076294	560.935425	564.943726	3.16168261
138	465.629822	458.950623	558.49707	562.339417	2.96482396
139	461.153076	459.292786	556.117615	559.795044	3.03396177
140	456.612885	460.152832	553.584595	557.505981	2.97884965

141	452.421356	460.819977	551.578552	555.379028	3.14272833
142	448.720734	461.305176	549.008057	553.654846	3.12572241
143	444.953705	462.090912	546.458557	551.563965	3.12604308
144	441.074249	462.714478	544.236694	549.194153	3.05369878
145	437.614349	463.23938	542.644165	547.131104	3.12701511
146	434.040009	463.786163	540.393494	545.162415	2.99712896
147	430.845551	464.601166	538.450806	542.769043	2.94462919
148	427.977051	465.376892	536.385071	541.311096	2.90802073
149	424.667114	466.183197	534.810791	539.079651	2.90820026
150	422.353241	466.814819	532.582642	537.665283	2.72668624
151	419.98587	467.444092	530.719788	536.328003	2.67155027
152	418.265839	468.252594	529.008362	535.347778	2.67164087
153	416.524109	469.032379	527.399841	533.917419	2.67151737
154	414.765747	469.655884	525.65741	532.619263	2.63617039
155	413.63147	470.240326	523.859131	531.517822	2.48606706
156	412.268524	470.906189	522.442932	530.127625	2.43466187
157	411.440247	471.589935	521.053528	529.300537	2.34308958
158	409.940369	472.141266	519.581604	527.818237	2.27137685
159	408.796478	472.831482	517.936279	526.845154	2.25289297
160	407.277802	473.312134	516.483215	525.590027	2.23441553
161	406.192596	473.887268	515.383728	524.583374	2.25311279
162	405.007782	474.50296	513.763855	523.416199	2.12535429
163	403.913849	474.878479	512.674622	522.527832	2.2523315
164	402.276337	475.309753	511.56366	521.413025	2.26949954
165	400.473022	475.699738	510.405853	520.061218	2.1062932
166	398.747375	476.262634	509.631439	519.161133	2.15271902
167	397.568756	476.757751	508.472809	518.014954	2.21544123
168	397.146454	477.083496	506.986145	516.585205	2.325526
169	396.732361	477.682373	505.673828	515.364136	2.10686207
170	396.409088	478.280518	504.592987	514.417786	2.07030821
171	396.297852	478.908173	503.300507	513.312866	1.94280553
172	396.229767	480.20517	502.349213	512.218933	1.81466365
173	396.580841	481.16748	501.404114	511.563873	1.85155392

174	396.858398	482.079163	500.559601	511.047974	1.94368255
175	397.040863	483.250397	499.784271	510.244263	1.896631
176	397.163696	484.362793	499.22113	509.545074	1.8569721
177	397.149475	485.778595	498.520264	508.929352	1.9612118
178	397.143433	487.065247	497.536102	508.319061	1.81522131
179	396.749207	488.349365	496.898956	507.754089	1.8155241
180	396.362427	489.516479	496.410339	507.02301	1.79774809
181	396.232788	490.659088	495.776581	506.561523	1.72531772
182	395.967499	491.713684	494.855225	506.087402	1.59914517
183	395.776642	492.927551	494.03064	505.27356	1.4893235
184	395.47113	494.091156	493.80777	504.563019	1.52717233
185	395.145111	495.202209	493.21759	504.234406	1.45377898
186	395.083038	496.247772	492.840363	503.859344	1.47095084
187	395.179474	497.420013	492.164459	503.154877	1.50899327
188	395.131012	498.478455	492.147339	503.025421	1.46537268
189	394.897095	499.690857	492.252869	503.194122	1.45416248
190	394.534698	500.920776	491.627472	502.617371	1.38148165
191	393.898102	502.532135	491.165283	502.08728	1.47193849
192	393.020172	503.375061	490.37204	501.705963	1.36433446
193	392.064087	504.140869	489.597443	500.671539	1.40209198
194	391.615967	505.948273	489.210052	500.435181	1.63603616
195	391.228027	506.911072	488.163879	500.1008	1.61760521
196	390.079712	507.551727	487.458252	500.08197	1.56394005
197	388.873962	508.262146	486.923737	499.826569	1.41756678
198	387.544586	508.78598	486.041565	499.188385	1.36397481
199	386.440887	508.992462	485.057343	498.549042	1.17979908
200	385.002838	509.749268	484.135437	497.702057	1.34537411
201	383.387299	510.238037	483.171051	496.79541	1.17991877
202	382.204895	510.858459	482.397278	495.731384	1.23503137
203	380.902557	511.424072	481.367493	494.744354	1.199507
204	379.697662	512.100952	480.507111	493.906708	1.16065717
205	378.323181	513.273926	479.29483	492.609314	1.3091507
206	377.035187	513.890503	478.57016	491.326965	1.25478566

207	376.078033	514.887146	477.29303	490.052856	1.21845841
208	375.107697	515.609314	475.99115	488.839386	1.1994158
209	374.027252	516.478149	475.060486	487.868866	1.10919821
210	373.240173	517.333374	473.889648	486.683777	1.06787741
211	372.306976	518.142578	473.285339	485.623322	1.07372916
212	371.308594	518.796326	472.122559	484.583282	0.947060883
213	370.255157	519.726501	470.968964	483.230011	0.946707249
214	369.437042	520.445862	469.896912	481.730957	0.780341983
215	368.329987	521.062927	468.414734	480.413696	0.818080127
216	367.090302	521.524902	467.476959	479.401154	0.762750626
217	366.039825	522.239502	466.314392	478.268616	0.817102194
218	365.21225	523.168823	465.434692	477.034454	0.697738349
219	364.376953	523.916931	464.454773	475.52536	0.661202431
220	363.405029	524.242981	463.064484	474.129272	0.707493663
221	362.421936	524.947205	461.931	472.656555	0.679029286
222	361.43454	525.599121	460.871307	471.587921	0.605992556
223	360.531097	525.867554	459.636292	470.204803	0.725159764
224	359.703918	526.532043	458.796326	468.838257	0.659780443
225	358.694244	527.018921	457.466034	467.843109	0.550853729
226	357.741333	527.332031	456.367004	466.435425	0.568794966
227	356.780243	527.904175	455.302582	465.148956	0.623630285
228	356.157684	528.352295	453.888763	464.093262	0.659587562
229	355.237732	528.936157	452.862885	462.61972	0.568750858
230	354.281586	529.640015	451.720795	461.450989	0.604481578
231	353.62146	529.516541	450.521271	460.460876	0.569187522
232	352.596313	530.46875	449.68988	459.267761	0.499185473
233	351.715271	531.141113	448.394775	458.122406	0.533068776
234	350.731598	531.575378	447.470337	457.025177	0.496244222
235	349.835144	531.953491	446.350891	455.650269	0.478587091
236	348.785583	532.412354	445.275391	454.383392	0.423855722
237	347.84021	532.801514	444.353577	453.22525	0.460039496
238	346.724121	532.652832	443.043762	452.193756	0.3681539
239	345.897552	532.826965	441.295715	450.931427	0.315025479

240	344.890869	533.050903	440.807922	449.958801	0.350656748
241	343.78125	533.531372	439.342285	448.966431	0.350247055
242	342.657257	534.971375	438.827637	448.039032	0.40206933
243	341.493195	535.780151	437.776031	446.317657	0.424127877
244	340.573883	536.355591	436.793793	445.171295	0.424497962
245	340.043915	536.887939	435.429626	444.064697	0.278485805
246	339.425842	537.167297	434.041382	443.041931	0.243309855
247	339.134003	537.571289	432.690643	441.829926	0.223686412
248	338.687744	537.855835	432.248566	440.779327	0.060098626
249	338.317169	538.106506	430.967773	439.702637	0.133945048
250	338.009369	538.292419	430.144348	438.59137	0.024935374
251	337.480774	538.568909	429.083557	437.280609	0.07973852
252	336.807037	538.723694	428.035156	436.154663	0.115626246
253	336.085754	538.69519	427.038269	434.951416	0.115668856
254	335.226532	538.456909	425.979706	434.209625	0.080123559
255	334.372589	538.217468	425.211639	432.983704	0.098690584
256	333.224396	537.669067	424.157532	431.759644	0.025328634
257	332.038574	537.086243	423.091797	430.703888	0.080680557
258	330.892792	536.430298	422.050781	429.469696	0.02494584

PRODUCT:	38ST-D	
MANUFACTURER:	FOYERS SUPREME INC.	
TEST:	38STD250312	
DATE:	12-03-2025	
TIME (MIN):	244	
WEIGHT/WET (LB):	21.8513393	
WEIGHT/DRY (KG):	8.008861915	
BURN RATE (KG/HR):	1.969392274	
STARTING WEIGTH RANGE [20% - 25%]:	4.37026786	5.462834825
STARTING WEIGHT [%]	19.61601361	
DELTA T° (F):	-48.7828825	
CATCH (mg):	4.70	

LOAD CONFIGURATION							
	W (IN)	**H (IN)**	**L (IN)**	**HUMIDITY (%)**	**SPACERS**	**WEIGHT (LB)**	**SPECIES**
1	4	4	20	19	4	5.6	BC FIR
2	4	4	20	19	4	5.5	BC FIR
3	4	4	20	19	4	5.3	BC FIR
4	4	4	20	20	4	5.5	BC FIR
						21.9	

TIME	**TOP - T°**	**BOT - T°**	**RIGHT - T°**	**LEFT - T°**	**WEIGHT (LB)**
1	405.723083	503.409485	503.754791	503.450043	21.8513393
2	388.979736	503.060242	495.598938	495.123505	21.7984791
3	373.532379	502.386719	486.959381	486.649536	21.7258129
4	362.876129	501.29129	478.775116	478.342773	21.6160622
5	355.785461	500.145966	470.99588	470.216583	21.5244637
6	354.786438	498.786682	465.225891	463.017365	21.3805275
7	358.32196	497.682495	460.158203	457.178406	21.253828
8	371.003296	496.359344	455.183472	452.79248	21.0890636
9	389.272736	495.248627	451.457916	449.144989	20.8882809
10	410.91214	494.231476	450.606842	446.003693	20.6334076

11	437.722412	493.376953	453.446014	443.579834	20.3957672
12	465.684082	492.388367	457.45816	442.199219	20.1475601
13	496.975952	491.986755	459.909271	441.688629	19.8733997
14	529.070068	491.703156	462.411591	442.268341	19.6002045
15	558.998108	491.413757	464.23172	444.81604	19.3443985
16	584.926025	491.033508	466.836548	449.224426	19.090023
17	606.311646	491.044281	470.618164	455.054657	18.8526993
18	620.69574	490.978271	474.737305	460.69101	18.6512527
19	627.592529	490.839478	478.943481	465.154236	18.4695091
20	627.658569	490.545898	482.533875	468.872772	18.3052101
21	621.806946	490.055237	487.166656	471.177551	18.140728
22	611.530151	490.085327	491.381165	472.245392	17.976635
23	600.457703	489.558167	496.062378	472.34494	17.811636
24	592.389526	488.68222	499.609863	472.697479	17.6310196
25	588.34314	487.937653	503.10083	472.33844	17.4484692
26	587.951294	487.509735	506.881012	472.374786	17.2489738
27	591.494385	486.876953	510.403625	472.327301	17.029438
28	597.65564	485.867218	513.843018	472.578217	16.8132477
29	605.79541	484.891083	517.473755	473.4245	16.5952244
30	613.702148	483.725555	521.494507	474.508301	16.3941879
31	621.117737	482.577667	525.147034	475.921936	16.1937218
32	626.907288	481.333435	529.003357	477.415924	16.0047684
33	632.554199	480.33725	533.179016	479.001373	15.7920036
34	638.203796	479.174988	537.087463	480.503967	15.5911531
35	642.870361	477.866119	541.514771	482.092346	15.3905125
36	646.870483	476.704987	545.519897	483.943878	15.1910439
37	651.18988	475.171875	549.770447	485.711823	14.990428
38	654.19458	473.80249	553.832642	487.788422	14.7726116
39	657.592346	473.190735	557.570435	490.097748	14.571866
40	660.292419	471.697906	561.343689	492.177063	14.372139
41	662.879517	470.55661	565.070068	494.463989	14.152669
42	665.030884	469.367981	568.417358	496.709595	13.9715967
43	667.065125	468.230286	572.036682	499.112244	13.752593

44	670.242737	466.888397	575.674866	501.573792	13.557663
45	673.986572	466.077301	579.229309	504.407562	13.3394146
46	678.151489	465.175781	581.966125	507.222473	13.1577082
47	681.676208	464.452759	583.952942	510.07254	12.957263
48	684.482239	463.74115	585.516907	513.358032	12.757123
49	687.376709	462.704437	586.015259	517.500122	12.5741282
50	690.496216	462.00769	586.371887	522.167664	12.391716
51	692.977966	461.693115	586.420044	526.997253	12.2088509
52	695.986511	461.228088	586.31311	532.194519	12.025177
53	698.794067	460.18573	586.184204	537.297119	11.8598661
54	701.369324	459.942627	585.584839	542.33783	11.6805792
55	704.249329	459.640106	586.060547	546.981384	11.4995975
56	706.772095	459.02359	586.254944	551.607544	11.3359709
57	709.44635	458.50824	585.923218	556.222778	11.1719418
58	712.651611	458.041443	586.262512	560.285889	11.0084963
59	715.924988	457.649933	586.078491	563.699585	10.8446274
60	718.735229	457.788513	586.468689	566.574707	10.6614313
61	721.461792	457.679108	586.648132	569.384583	10.4969273
62	723.535645	457.266815	586.607178	572.013	10.3584929
63	724.776489	457.220551	586.570374	574.707214	10.1934776
64	726.040588	457.028564	587.166016	576.827698	10.0296745
65	726.802612	457.131805	587.590637	579.333252	9.88530827
66	726.317932	457.00946	587.66394	581.679382	9.72075939
67	725.320557	457.029938	588.179077	583.67688	9.5753746
68	723.875	456.723389	588.093933	585.532654	9.41061974
69	722.502197	456.687469	589.043518	587.407166	9.2651186
70	720.417358	456.735962	589.718445	588.962585	9.10111523
71	718.645996	456.766296	591.044983	590.487122	8.97228432
72	716.530334	456.918915	592.370544	591.610168	8.80955696
73	714.943481	457.131317	593.363464	593.023621	8.64565563
74	713.281616	457.309875	594.690552	594.497559	8.4866581
75	711.710876	457.655975	596.475769	596.322327	8.33635139
76	710.989563	457.949677	597.588135	597.76001	8.19025326

77	710.380554	458.179688	599.454956	599.479553	8.02668762
78	709.732178	458.447876	601.143494	601.411804	7.88175344
79	708.901184	458.824005	603.14386	602.790405	7.71653748
80	706.543518	459.350372	605.969055	605.576111	7.5724349
81	704.636292	459.721436	608.991211	608.58551	7.42670965
82	703.209839	460.478455	611.430481	611.994995	7.28110123
83	701.60199	460.731018	613.114319	615.770325	7.15845919
84	699.839539	461.335388	614.771301	619.259583	7.0128746
85	698.180969	461.813751	616.18219	622.522095	6.92092896
86	696.226624	462.372681	617.19635	625.40918	6.75770473
87	694.422974	462.638092	618.338196	628.467468	6.63130617
88	692.254211	463.216858	619.245728	630.892334	6.50362492
89	690.315308	463.773102	619.932312	632.937988	6.37611532
90	687.979065	464.300842	620.410278	635.380798	6.15724373
91	685.992432	464.863464	621.541443	637.445435	6.1016326
92	684.079468	465.562469	621.665527	639.285522	6.01124954
93	682.437622	465.448883	622.543945	641.19873	5.88354588
94	680.553528	466.091797	624.291443	642.050659	5.7568841
95	678.993164	466.584961	624.968994	643.570557	5.61055088
96	677.390442	466.441681	625.442749	645.165649	5.37368631
97	674.874329	467.04187	627.012085	645.792725	5.46522045
98	671.089417	467.447571	628.827087	645.526245	5.28398228
99	666.970947	467.957855	629.988037	645.433716	5.08279371
100	663.196716	468.118164	631.846008	644.850525	5.01072073
101	661.407349	468.547302	634.141663	645.013184	4.97437334
102	660.407104	469.061218	635.208679	645.002869	4.86524105
103	660.831238	468.408173	635.20166	645.505066	4.73648024
104	661.497253	469.110596	634.976379	645.647644	4.57264996
105	660.985962	469.266663	633.984375	645.728394	4.53779507
106	660.489624	469.764404	633.404541	645.264709	4.46450758
107	655.843018	470.190613	633.135315	643.968872	4.22799778
108	647.001221	470.406372	633.915344	642.355042	4.13758469
109	636.626465	470.81488	634.278442	639.376953	4.22932673

110	624.335083	471.312866	634.897278	636.630066	4.04640293
111	611.901184	471.843414	634.978943	633.66687	3.95581794
112	599.599548	472.381439	634.504822	630.770813	3.95550394
113	588.620972	473.134369	633.581543	627.76123	3.95522213
114	578.498352	473.76181	631.791626	625.540527	3.7977097
115	569.033569	474.403687	629.149658	623.362549	3.59657598
116	560.00708	475.406128	626.121582	621.319153	3.68799496
117	551.40509	476.222931	622.580505	618.562134	3.6505754
118	542.254517	477.260376	618.906067	614.569458	3.5069797
119	534.125916	478.099182	615.714355	610.614014	3.43514967
120	526.017883	478.558746	611.900391	606.725342	3.34357429
121	518.125916	479.573883	608.237366	602.661682	3.32449055
122	510.010864	480.718903	604.48822	598.349426	3.21599317
123	502.528992	481.694916	600.874817	594.410583	3.27205372
124	494.720581	482.397827	596.805725	590.37439	3.27221537
125	486.952026	483.263824	592.942322	586.285156	3.16127062
126	479.784027	483.894928	589.214844	582.656677	3.16213489
127	473.155029	484.734009	585.806274	578.559448	3.14318967
128	467.264801	485.449005	582.379211	574.713806	3.10942078
129	461.936554	486.412537	578.923645	571.058716	3.32712913
130	457.029053	487.339294	575.789307	568.211121	3.03559899
131	452.504578	488.291321	573.16571	565.054504	3.0338099
132	448.51413	489.160187	570.141541	561.932922	3.03635406
133	444.426605	489.922668	567.24292	558.633423	3.1280632
134	440.279694	490.734436	564.31189	555.922974	3.10925698
135	436.232513	491.573975	561.774414	553.181091	3.05399323
136	432.535309	492.113922	558.664978	550.705017	3.05435896
137	429.069183	492.664612	555.674255	548.170105	2.99813008
138	425.840637	493.451874	552.787903	545.875	2.96331978
139	422.470337	493.616821	550.166016	543.45752	2.94528866
140	419.211945	494.594299	548.007446	541.304077	2.90915728
141	416.083496	495.040924	544.709167	538.956909	2.89010429
142	413.27063	495.942963	542.255188	536.842957	2.81859279

143	410.123962	496.668396	539.713562	534.31897	2.76145554
144	408.2099	497.509888	537.260132	532.316345	2.78107214
145	405.760437	498.096893	535.36908	530.237427	2.72611189
146	403.429413	498.660828	532.917053	527.752319	2.72527313
147	401.238861	499.331818	530.816895	525.838013	2.70776939
148	399.473297	499.947113	528.927124	523.854797	2.67190838
149	397.551514	500.651611	527.297607	522.069092	2.63614488
150	395.890167	501.27182	525.444946	520.003784	2.65285182
151	394.296021	501.753265	523.653992	517.640869	2.57968783
152	392.894348	502.367828	522.053406	515.881531	2.54396105
153	391.45401	503.040955	520.309265	514.173401	2.50628185
154	390.504333	503.693115	518.906372	512.694458	2.4705615
155	389.113129	504.266876	517.281433	510.956665	2.45118856
156	388.086945	504.688812	515.916077	509.515137	2.41589451
157	387.126404	505.298279	514.688843	507.634247	2.37824321
158	386.060577	506.157562	513.145508	506.496704	2.34275603
159	385.343781	506.802948	512.113342	505.17511	2.325001
160	384.487274	507.586334	510.97464	504.013794	2.28836799
161	384.132568	508.462097	509.954315	502.683258	2.25219083
162	383.254608	509.156281	508.947266	501.646423	2.23304224
163	382.691315	509.839203	507.73288	500.448853	2.19771361
164	382.045807	510.809113	507.116119	499.535065	2.16191936
165	381.471191	511.550751	506.464355	498.409851	2.12524366
166	380.916504	512.607788	505.57254	497.741272	2.10712075
167	380.347473	513.337524	504.980164	496.812805	2.07044792
168	379.977234	514.342957	504.258972	495.977295	2.03786945
169	379.334839	515.090393	503.451843	495.224854	2.01629829
170	378.896912	515.940002	502.88269	494.547638	1.9794805
171	378.587463	516.547424	502.133606	493.9104	1.96116626
172	378.09549	517.146606	501.370819	493.12674	1.94036973
173	377.875488	517.753357	500.479706	492.380219	1.88913059
174	377.483826	518.192139	499.985657	491.649261	1.85334682
175	377.020264	518.7677	499.588715	491.036285	1.81566024

176	376.690857	519.369934	498.846283	490.03952	1.79719114
177	376.582977	519.920837	498.141266	489.291626	1.76161814
178	376.208527	520.390442	497.649902	488.650116	1.70700872
179	375.87915	520.807129	496.881378	487.843048	1.7067672
180	375.517639	521.017151	495.985657	487.116211	1.61577427
181	375.200226	521.054504	495.447327	486.342255	1.65218914
182	374.759613	521.155334	494.88504	485.467529	1.61498845
183	374.476654	521.268188	493.705261	484.773224	1.598387
184	374.065826	521.345825	493.025726	483.994568	1.54308975
185	373.653381	521.548767	492.318115	483.360657	1.52460492
186	372.724945	521.340942	491.723602	482.766235	1.52577722
187	372.175598	521.647339	491.097809	482.158966	1.46978533
188	371.841034	521.588623	489.998718	481.615845	1.45231962
189	371.387604	521.625122	489.423035	481.096252	1.4349966
190	371.041046	522.006042	488.927795	480.783905	1.28944504
191	370.35437	522.117126	488.366974	480.042908	1.45353305
192	370.00119	522.098206	487.585693	479.483154	1.23402953
193	369.502411	522.243042	486.935455	478.859131	1.29020834
194	369.045441	522.415283	486.355835	478.196625	1.27233446
195	368.70166	522.555359	485.691467	477.500427	1.29031682
196	368.303467	522.582214	485.066223	476.955078	1.17906344
197	367.704712	522.717651	484.400146	476.376434	1.2172389
198	367.635712	522.834167	484.139618	475.835815	1.12612939
199	367.25946	522.834595	483.628448	475.060028	1.08925402
200	366.956665	522.950134	482.641327	474.552368	1.08993363
201	366.348083	522.584412	482.256531	473.774933	1.1102823
202	365.888977	522.66803	481.724823	473.751495	1.05506945
203	365.713745	522.632141	481.315063	473.035858	0.983110845
204	365.524994	522.564514	480.868835	472.386444	1.01770067
205	365.226135	522.394287	480.297424	472.081573	0.965438783
206	364.940826	522.047485	479.407715	471.302765	0.965571105
207	364.773895	521.929871	478.982422	470.675964	0.893520534
208	364.368805	521.900452	478.378143	469.885376	0.91153276

209	363.930939	521.824768	477.410889	469.567749	0.854972661
210	363.800903	521.679565	476.637665	469.039032	0.929378331
211	363.183594	521.510925	475.781097	468.117004	0.837574244
212	362.876099	521.355835	474.675964	467.630493	0.764691532
213	362.489777	521.177063	473.899078	467.038025	0.764420867
214	361.936432	520.99176	473.039581	466.44751	0.681803048
215	361.326324	520.710571	471.83374	465.840057	0.681438982
216	360.387848	520.366638	470.754913	464.902954	0.69985497
217	359.563354	520.033813	469.616943	464.037964	0.663671911
218	358.580566	519.715881	468.561676	463.043488	0.648393035
219	357.747345	519.20752	467.439728	462.121613	0.627208531
220	356.790894	518.868286	466.115692	461.163147	0.609297156
221	355.70932	518.406616	465.108795	460.135315	0.573296547
222	354.568634	517.905334	463.882568	459.096375	0.573299527
223	353.512238	517.328979	462.956726	457.993805	0.518983841
224	352.283844	516.512939	461.593658	456.975311	0.500549912
225	351.157654	515.845825	460.268066	455.937775	0.463879406
226	350.463654	515.16394	459.257935	455.004974	0.46357736
227	349.792358	514.924011	457.965088	454.141815	0.410848945
228	349.161438	514.319397	456.690247	453.039612	0.391186625
229	348.544922	513.77948	455.98764	451.987762	0.390537649
230	348.122925	513.25946	454.597717	451.117218	0.336872429
231	347.528137	512.565979	453.779236	450.129852	0.319595098
232	347.006775	511.992737	452.809418	449.070068	0.31989789
233	346.3349	511.47049	451.76593	448.100586	0.247646943
234	345.676758	510.854706	450.809418	447.3302	0.247990862
235	344.993896	510.245148	449.607391	446.276978	0.210570469
236	344.316315	509.385132	448.598419	445.534424	0.210885972
237	343.693817	508.826263	447.547363	444.323975	0.175434873
238	342.836151	508.263214	446.763214	443.320068	0.156345248
239	342.207886	507.611328	445.651062	442.282593	0.138801754
240	341.385712	506.953033	444.923645	441.398346	0.120125569
241	340.685486	506.271423	444.386566	440.547211	0.084785871

242	339.873077	505.551544	443.012054	439.517914	0.065987825
243	338.846649	505.002075	441.982513	438.855469	0.047488093
244	337.94873	504.362885	441.135529	437.758728	0.030510563

PRODUCT:	38ST-D	
MANUFACTURER:	FOYERS SUPREME INC.	
TEST:	38STD250307	
DATE:	07-03-2025	
TIME (MIN):	252	
WEIGHT/WET (LB):	22.4768009	
WEIGHT/DRY (KG):	8.238103497	
BURN RATE (KG/HR):	1.961453214	
STARTING WEIGTH RANGE [20% - 25%]:	4.49536018	5.619200225
STARTING WEIGHT [%]	20.23364401	
DELTA T° (F):	-0.62402325	
CATCH (mg):	4.50	

LOAD CONFIGURATION							
	W (IN)	**H (IN)**	**L (IN)**	**HUMIDITY (%)**	**SPACERS**	**WEIGHT (LB)**	**SPECIES**
1	4	4	20	20	4	5.7	BC FIR
2	4	4	20	19	4	5.6	BC FIR
3	4	4	20	21	4	5.8	BC FIR
4	4	4	20	20	4	5.4	BC FIR
						22.5	

TIME	**TOP - T°**	**BOT - T°**	**RIGHT - T°**	**LEFT - T°**	**WEIGHT (LB)**
0	344.440552	423.501984	447.118622	452.200317	4.54787588
0	340.238342	422.874695	443.965973	449.086731	0.026101699
0	332.405029	421.951691	439.431396	445.846252	11.0345049
1	318.40976	421.709625	433.339783	439.259613	22.4768009
2	307.759613	421.266052	426.679688	432.064148	22.4037933
3	302.304626	420.918335	420.133575	425.093262	22.3117466
4	304.217133	420.692108	413.83783	419.060852	22.2036266
5	315.371582	420.17981	408.37085	414.407684	22.0568676
6	334.744812	419.901825	403.791077	410.9664	21.8748035
7	358.038513	419.386292	400.687317	408.371643	21.7110729

8	373.592163	419.30014	397.921417	405.966248	21.5835896
9	378.475616	418.892273	395.838745	403.269287	21.4378796
10	381.659058	418.827393	394.625397	400.56488	21.2914371
11	386.037415	418.608368	393.326355	397.769287	21.1467705
12	396.657501	418.552582	392.248322	396.242249	20.9269714
13	421.176483	418.407959	392.224457	395.297699	20.6530342
14	454.028625	418.556702	393.044769	396.370422	20.3437481
15	489.485657	418.69696	394.402283	398.810486	20.0220165
16	523.093628	418.831665	395.784607	402.636353	19.731329
17	554.930115	419.147095	397.222626	408.340637	19.4390202
18	583.433289	419.446472	399.767822	414.666016	19.1479149
19	608.061707	419.863403	402.694427	421.85849	18.8560715
20	629.537292	420.223419	406.995636	429.767639	18.6007938
21	646.34137	420.708069	412.391846	437.981689	18.3814907
22	657.826843	421.224762	418.74234	445.721313	18.1616268
23	663.516968	421.619141	425.215393	452.457092	17.9800262
24	666.249817	422.419403	431.250275	458.71579	17.7790508
25	665.481018	422.788208	436.991241	464.215454	17.5787201
26	664.114441	423.108978	442.034973	468.327606	17.3784389
27	663.005981	423.526489	446.73526	472.021088	17.160614
28	663.809021	423.499573	451.089355	475.30304	16.9442348
29	665.967102	423.53064	455.39328	478.259796	16.7427692
30	669.735657	423.387695	459.648865	481.132904	16.5052834
31	674.270325	423.441925	463.830292	484.122772	16.3058186
32	679.481079	423.083923	467.636566	486.969971	16.0848827
33	684.076538	422.910583	471.816956	490.29306	15.8866692
34	688.862915	422.595428	475.848969	493.741486	15.6666994
35	693.804626	422.149872	479.554871	497.124664	15.4462852
36	698.45166	421.738464	483.583466	500.994537	15.2295351
37	702.764465	421.547699	487.531219	505.104919	15.0287418
38	706.693787	420.758362	491.730774	508.881836	14.8092852
39	709.898438	420.575989	496.178192	512.80719	14.6098671
40	711.860107	420.317688	500.442261	516.496338	14.3897676

41	713.948242	419.793823	504.950592	520.103455	14.1906071
42	715.218567	419.315125	509.130615	523.883789	13.9902983
43	716.22168	418.917267	513.22699	527.28064	13.7894907
44	717.494934	418.59845	517.463013	530.703369	13.5958252
45	717.91748	418.236633	521.562256	533.636353	13.411335
46	718.581238	417.81311	525.372681	536.51709	13.212327
47	718.562805	417.368256	529.061951	539.210754	13.0124006
48	717.547668	417.272217	532.542969	541.691223	12.8486052
49	715.225891	416.964691	536.105835	543.851746	12.6650286
50	711.647461	416.507019	539.681763	545.546143	12.4647207
51	708.491455	416.139008	543.12439	547.450195	12.2822933
52	705.064636	415.804962	546.809082	549.326416	12.0990953
53	702.612976	415.56076	550.185913	550.628723	11.9185524
54	700.16748	415.290192	553.393311	551.974304	11.7179346
55	698.113403	415.054352	556.471619	553.906189	11.536027
56	695.519653	414.886597	560.077881	555.215576	11.3548803
57	693.183655	414.587524	563.223572	556.727661	11.1722746
58	690.422852	414.46814	566.332031	558.217773	10.9889259
59	687.875549	414.216949	569.297974	559.339722	10.8075066
60	685.331299	414.138458	572.764954	560.956726	10.6430168
61	682.894592	413.989197	575.555359	561.996094	10.4680347
62	681.491455	414.0672	578.36084	563.42749	10.2848616
63	680.242065	414.117065	581.859131	564.853027	10.1212692
64	679.679443	414.279602	584.91272	566.228149	9.93906116
65	678.579956	414.327057	588.149902	568.063293	9.77581406
66	677.752625	414.670319	591.060181	569.752136	9.59304523
67	676.5802	414.945068	594.248962	571.635071	9.42982006
68	675.119812	414.764648	598.272644	573.667603	9.26581669
69	673.407654	414.976563	602.272827	576.062317	9.10125446
70	671.584045	415.068939	605.955383	577.715942	8.95436764
71	669.765137	415.683685	609.701355	579.602539	8.80905247
72	667.261108	415.833618	612.710144	581.425415	8.64454651
73	664.324097	416.217316	615.520813	583.022217	8.49971962

74	661.481506	416.494751	617.567627	584.453674	8.37211132
75	658.855469	416.893402	620.231628	585.675171	8.22637272
76	656.275269	417.005646	622.033691	586.813904	8.09834671
77	653.997314	417.455444	623.772522	588.015503	7.95220852
78	651.601318	417.810333	625.579529	589.253662	7.8080821
79	649.592468	418.097595	627.058044	590.598267	7.66160631
80	647.607056	418.484009	628.740356	591.954407	7.51789856
81	646.423523	418.940247	629.894897	593.350647	7.38898373
82	645.311035	419.203186	631.2724	594.498901	7.24537563
83	645.400269	419.478638	632.349854	595.957397	7.1218648
84	644.796082	419.815521	633.127563	597.020508	6.97631168
85	645.3172	420.247131	634.612183	598.805054	6.83011103
86	645.689331	420.503723	636.002136	600.39856	6.68437862
87	646.810303	421.02533	637.156494	601.867004	6.53922176
88	647.982178	421.577972	639.162476	603.178467	6.37480736
89	649.252319	421.881744	641.402161	605.09967	6.22815943
90	650.258911	422.220978	643.690918	607.317749	6.06551361
91	651.952637	422.927032	645.603333	609.856934	5.91931009
92	654.461365	423.50769	648.245422	612.212524	5.77358246
93	657.568787	423.99585	649.844238	614.783264	5.61077356
94	661.07074	424.457031	651.149536	617.580383	5.48077154
95	662.498901	425.080811	653.217468	619.19751	5.35325623
96	660.387695	425.404816	654.582275	619.615112	5.24409246
97	655.889832	426.281342	655.700378	619.788147	5.13103628
98	651.058228	426.694092	656.328125	619.721008	5.02419806
99	646.557251	427.340149	656.130859	619.482056	4.93547344
100	642.384888	428.066345	655.937561	618.998535	4.84348297
101	638.267578	428.914764	655.332275	618.958923	4.75205517
102	634.509155	430.057861	654.38269	618.681641	4.66122055
103	630.584778	431.294281	653.286499	618.465698	4.58788395
104	626.21228	432.51828	651.732361	618.000427	4.49619007
105	621.799072	433.656342	648.676025	617.2854	4.42244387
106	616.309265	434.899231	645.493286	615.58313	4.3698349

107	609.125122	436.386475	643.178101	613.434021	4.297328
108	601.511597	437.783875	640.041809	611.418213	4.22455978
109	594.090027	439.111053	637.216675	609.972961	4.15263271
110	587.401245	440.614075	634.464294	608.052734	4.11465025
111	581.198364	442.325348	631.422607	606.632385	4.04199171
112	575.298889	444.282745	628.879333	605.364136	3.98839974
113	570.333374	446.400024	626.917297	603.655945	3.93842483
114	565.076111	448.388733	625.10614	602.331299	3.86664557
115	560.811462	450.552002	622.992676	600.990906	3.81020737
116	556.404724	452.870361	621.509155	599.954834	3.77392054
117	553.17395	455.165558	619.949768	598.934326	3.71897674
118	549.590515	457.353149	618.497864	597.726929	3.66494894
119	546.514648	459.579193	617.200989	596.84668	3.61002016
120	543.139648	462.027527	616.474548	595.478394	3.55615687
121	539.704651	464.13089	615.414673	594.472961	3.5030477
122	536.443604	466.600342	614.158081	593.201782	3.44739461
123	532.151367	468.766266	612.51886	591.910278	3.41162562
124	527.058105	471.023773	610.547058	590.245544	3.35840917
125	521.371887	472.90979	608.203003	588.393738	3.34044313
126	515.668579	475.025726	605.970032	586.711243	3.28629637
127	510.277435	476.856598	603.549988	584.939636	3.24935317
128	505.117432	478.635193	600.789429	583.152954	3.21385789
129	499.298737	480.390778	598.204285	581.268433	3.17888069
130	494.138916	481.926941	594.929749	579.820679	3.14019322
131	489.050232	483.374084	592.332397	577.621948	3.10609007
132	484.233368	484.622711	589.470276	575.832886	3.06879234
133	479.192322	485.979401	586.673096	574.038452	3.03340244
134	474.786652	486.992981	584.230408	572.28302	2.99631548
135	470.502838	488.052795	581.47583	570.196289	2.96148491
136	466.690399	489.14093	579.106079	568.232422	2.92463875
137	462.786255	489.989014	576.818665	566.422607	2.90787292
138	459.468201	490.948792	574.37854	564.414734	2.85284233
139	456.072998	491.769226	572.16449	562.650696	2.83462739

140	453.156006	492.520172	569.453857	560.612183	2.79992104
141	450.514801	493.151245	567.223206	558.859619	2.76205873
142	447.931824	493.86264	564.72052	557.27655	2.74527574
143	445.546967	494.614349	562.528931	555.643921	2.70862079
144	443.073303	495.18869	560.303284	553.580505	2.67191958
145	440.957184	495.854645	558.102966	552.192444	2.63693881
146	438.638458	496.314362	555.586914	550.767578	2.60002995
147	436.551636	497.048401	553.530151	549.399597	2.58223581
148	434.399109	497.417877	551.576782	548.054993	2.54576802
149	431.992737	498.151001	549.175415	546.243652	2.52710748
150	429.690643	498.43924	546.796387	544.596863	2.49161911
151	427.046875	498.967682	544.882202	542.930359	2.4738431
152	424.946075	499.127838	542.576355	541.039307	2.43663859
153	422.998108	499.575378	540.55188	538.981934	2.41930747
154	421.019958	499.7771	538.282043	537.211792	2.3820045
155	418.942749	500.110352	536.353638	535.143677	2.34664845
156	417.00824	500.425934	534.082886	533.219543	2.32961631
157	414.781677	500.4039	532.219116	531.146729	2.31074572
158	412.506927	500.619354	529.880127	529.166016	2.2745297
159	410.409393	500.861176	527.778137	527.097534	2.23783755
160	408.202484	501.093964	525.852844	525.181274	2.22032762
161	405.840851	501.110107	524.074768	522.846863	2.18517804
162	403.587494	501.267273	522.126709	520.804443	2.16700721
163	401.292358	501.364563	520.87085	518.784058	2.13070083
164	398.845245	501.543365	519.359192	516.973145	2.1124537
165	397.056244	501.679474	517.650269	515.03064	2.07652926
166	394.912811	502.001556	515.832153	513.051697	2.05807376
167	393.120697	502.439453	513.87085	511.321564	2.0225966
168	391.287048	502.576233	512.010498	509.325867	2.00409007
169	389.454071	502.889008	510.174011	507.216034	1.98593199
170	387.698181	503.189484	508.250854	504.946167	1.93151534
171	385.844849	503.346283	506.551483	503.083374	1.34543991
172	384.144592	503.673004	504.860291	501.127411	0.027811565

173	382.416473	504.007874	503.359894	499.181366	0.02785418
174	380.986145	504.330933	501.897675	497.323059	0.028503884
175	379.380188	504.839478	500.248962	495.407013	0.028379027
176	378.042633	504.681702	498.98761	493.531586	1.76819146
177	376.648895	505.078705	497.48056	491.835846	1.75066519
178	375.157349	505.549744	496.227356	490.003723	1.7322036
179	374.039886	506.056702	494.755798	488.189056	1.6961267
180	372.760498	506.397736	493.55658	486.922516	1.67881572
181	371.377625	506.758453	491.853271	485.466095	1.65984571
182	370.353363	506.977814	490.735901	483.957062	1.62309444
183	369.228851	507.432587	489.607239	482.776611	1.60670829
184	368.138702	507.732666	488.222839	481.220184	1.56958246
185	367.060608	507.959595	486.959595	479.749054	1.55106783
186	365.823456	508.268433	485.812256	478.404053	1.53358638
187	364.55603	508.72879	484.675629	476.870087	1.51585674
188	363.284363	508.981171	483.666809	475.34552	1.47770882
189	362.160858	509.27301	482.430542	474.030548	1.4608345
190	360.463806	509.634583	481.256134	472.792236	1.42355323
191	359.096863	510.058929	479.905029	471.208344	1.40510798
192	357.843353	510.258423	478.887909	469.800659	1.3700614
193	356.560028	510.420105	477.680359	468.463165	1.35236084
194	355.307831	510.547913	476.717468	467.138214	1.33310378
195	354.038086	510.770721	475.060913	465.837982	1.29740596
196	352.778412	510.893616	473.012329	464.671692	1.27907002
197	351.355499	510.919647	471.330536	463.021515	1.27917385
198	349.865814	510.538513	469.076263	461.398895	1.26016426
199	348.420349	510.302582	467.295807	459.477051	1.22468328
200	346.845917	509.890442	465.669403	457.730194	1.20630467
201	345.257568	509.549927	463.590668	455.864929	1.1872344
202	343.821106	508.896179	462.085663	454.008514	1.16832125
203	342.447754	508.598572	460.147369	452.245605	1.15203011
204	341.277557	508.195923	458.477966	450.373016	1.13370311
205	339.860718	507.565338	456.417114	448.593475	1.11751425

206	338.651428	507.05481	454.735138	446.702606	1.09788108
207	337.394745	506.601624	453.141174	445.020508	1.0804348
208	336.478516	505.95163	451.309845	443.557098	1.04483867
209	335.361847	505.48587	449.766693	441.833893	1.02539766
210	334.114777	504.779663	448.134003	440.252563	1.00791323
211	333.204498	504.156067	446.68985	438.37265	1.0084635
212	332.38623	503.594452	445.319824	436.757324	0.99042058
213	331.505219	502.863861	443.741791	435.280396	0.954511166
214	330.412354	502.301208	441.985504	433.886139	0.934680641
215	329.39209	501.80368	440.562195	432.492798	0.916232467
216	328.389191	501.442505	439.150452	431.213928	0.897772372
217	327.223602	500.965759	438.081726	429.525146	0.859336674
218	326.351074	500.83139	436.834625	428.199097	0.842602849
219	325.751434	500.741974	435.61554	426.54422	0.824034333
220	324.997864	500.498627	434.750061	425.307373	0.806374252
221	324.160156	500.306305	433.538635	423.894745	0.769245386
222	323.172852	500.44281	432.641052	422.330444	0.750549078
223	322.258698	500.338226	431.533356	421.052795	0.750359178
224	321.390747	500.322845	430.708527	419.953827	0.713515162
225	320.2258	500.145416	429.440399	418.40097	0.703343451
226	319.377441	500.041046	428.51178	417.161041	0.684999228
227	318.467773	499.5784	427.319183	416.009064	0.667481184
228	317.390045	499.090607	426.371307	414.720703	0.648928344
229	316.438873	498.700806	425.283508	413.627258	0.613454819
230	315.505981	498.297882	424.441193	412.641479	0.59547025
231	314.643158	497.914124	423.154663	411.479614	0.577022076
232	313.801239	497.2854	421.967194	410.33429	0.558136582
233	312.92572	497.135376	421.199677	409.491028	0.521634281
234	312.319611	496.856323	420.16275	408.111145	0.521800995
235	311.785706	496.593201	419.312988	407.362732	0.503228724
236	310.959778	496.300293	418.539734	406.546082	0.466174692
237	310.31958	496.147522	417.388184	405.682831	0.448676795
238	309.794617	495.93219	416.509644	404.786713	0.430260062

239	309.046539	495.786957	415.699615	404.126678	0.393348813
240	308.557617	495.553711	415.186951	403.460602	0.356990814
241	308.16568	495.407104	414.745575	402.406342	0.33863464
242	308.399261	495.246002	414.760254	402.110291	0.302727461
243	308.8927	495.27066	414.96637	401.897858	0.267141789
244	309.862976	495.119812	415.087341	401.884338	0.249564648
245	310.966736	495.088348	415.930176	402.223572	0.211975291
246	312.02124	494.916901	416.512665	402.391235	0.176318586
247	313.286621	494.918335	417.079254	402.944427	0.157005414
248	314.562408	494.719025	417.832458	403.335052	0.121288158
249	315.71701	494.724152	418.466797	403.778961	0.103847839
250	316.973145	494.570435	419.047211	404.572449	0.066786312
251	318.166443	494.434479	419.71228	404.825073	0.047974061
252	319.353058	494.430267	420.214935	405.219543	0.030768503

PRODUCT:	38ST-D	
MANUFACTURER:	FOYERS SUPREME INC.	
TEST:	38STD250306	
DATE:	06-03-2025	
TIME (MIN):	259	
WEIGHT/WET (LB):	22.2846088	
WEIGHT/DRY (KG):	8.167662049	
BURN RATE (KG/HR):	1.892122482	
STARTING WEIGTH RANGE [20% - 25%]:	4.45692176	5.5711522
STARTING WEIGHT [%]	N/A	
DELTA T° (F):	-53.93019125	
CATCH (mg):	5.70	

LOAD CONFIGURATION							
	W (IN)	**H (IN)**	**L (IN)**	**HUMIDITY (%)**	**SPACERS**	**WEIGHT (LB)**	**SPECIES**
1	4	4	20	19	4	5.6	BC FIR
2	4	4	20	19	4	5.6	BC FIR
3	4	4	20	19	4	5.4	BC FIR
4	4	4	20	20	4	5.7	BC FIR
						22.3	

TIME	**TOP - T°**	**BOT - T°**	**RIGHT - T°**	**LEFT - T°**	**WEIGHT (LB)**
0	395.600281	480.738586	477.485229	475.412872	6.30447006
1	382.832611	481.820038	475.319336	471.794098	22.1930676
2	374.224396	482.229309	471.426575	466.427216	22.1567383
3	372.34613	482.475037	465.885864	460.555115	22.1030216
4	377.933655	482.673096	461.082001	454.646362	22.1392879
5	393.014862	482.593292	456.374054	449.626465	22.2846088
6	414.546814	482.607666	452.527008	445.571075	22.2126884
7	433.315063	482.551636	449.181519	442.042084	21.1943932
8	446.546692	482.438446	446.445984	438.680237	21.0851059
9	461.145203	482.554382	444.683044	436.421753	20.8112907

10	481.225708	482.475586	442.944275	434.543457	20.7398357
11	507.761017	482.631531	442.070068	433.635162	20.5036373
12	536.503601	482.657562	441.763336	433.617615	20.1638393
13	564.112671	482.433289	441.886047	435.227783	19.7271023
14	590.052551	482.359283	443.143982	437.4599	19.4902306
15	613.57843	482.482422	444.083862	440.039612	19.180006
16	631.765442	482.603577	445.160217	442.932037	18.9811783
17	642.108765	482.564026	447.586121	446.188202	18.8168964
18	640.672607	482.698486	450.034454	449.42392	18.6712399
19	631.040039	482.482971	452.908813	451.86911	18.5430431
20	615.833862	482.441895	455.529144	453.36496	18.4522324
21	598.579346	482.152252	457.996674	454.014435	18.3786621
22	581.389954	481.384735	460.002899	453.775177	18.1235085
23	565.421143	480.943176	461.542572	452.673767	17.9783669
24	553.040344	480.460876	461.908203	451.446075	17.8871002
25	546.677063	479.652679	462.207458	450.074982	17.9420872
26	549.077332	478.713318	462.913574	449.243958	17.7062798
27	559.102295	477.649261	463.585815	449.24295	17.6683998
28	573.494812	476.499176	463.640839	449.303131	17.5218506
29	589.054932	475.346222	463.985748	449.790283	17.0314236
30	604.68927	474.11496	464.828674	450.640717	16.8331356
31	618.955505	472.819489	465.818512	451.790222	16.5052414
32	632.40564	471.584686	466.650726	453.668579	16.1969337
33	644.170471	470.43515	467.917297	455.940826	16.1233273
34	654.182068	469.505463	469.145203	459.110016	16.141367
35	662.850098	468.456024	470.618347	462.66684	15.8081856
36	669.45166	467.211517	472.276825	466.222473	15.8125725
37	674.150024	466.463623	473.93399	470.335785	15.3382311
38	678.375305	465.331726	475.848083	474.642212	15.4122562
39	682.191589	464.358276	477.264008	478.808807	15.2314787
40	684.752014	463.158752	478.951355	482.748901	14.7938824
41	686.593689	461.99408	480.823334	487.239685	14.8109064
42	688.389404	461.130066	482.962524	491.280182	14.6298189

43	690.732666	460.046051	484.994751	495.276154	14.5944901
44	693.847839	459.078583	486.570038	499.281097	14.1004124
45	696.52301	458.274628	488.763947	502.14447	14.0654182
46	698.810364	457.239716	490.980255	505.177734	13.7254972
47	698.70874	456.412354	494.144897	507.953705	13.5249805
48	698.29834	455.519318	497.644806	510.165771	13.19736
49	695.916626	454.662354	501.407684	511.613647	13.1793289
50	693.058899	453.749481	505.112488	513.14978	12.9247122
51	689.424072	452.92749	509.018402	514.509888	12.7954493
52	684.561218	452.076294	513.183655	515.659668	12.9047995
53	679.253784	451.177094	517.61554	516.123108	12.6307945
54	675.005005	450.264618	522.689026	516.517883	12.6141281
55	672.207947	449.696228	527.302368	517.152039	12.0844536
56	671.048462	448.757263	531.947693	517.577576	12.3032951
57	671.037048	448.038391	535.913147	518.385986	12.1014366
58	671.868896	447.468597	540.38739	519.242065	11.9759188
59	673.116638	446.753082	543.920044	519.81311	11.8298321
60	675.298462	446.109253	547.8573	521.022095	11.5930452
61	678.065369	445.384216	551.576294	522.258118	11.4660044
62	681.645386	444.887177	554.805603	524.116028	11.2473879
63	684.827698	444.365387	558.519775	525.07605	10.9201374
64	688.082825	443.897247	561.91217	526.84552	10.9202023
65	689.598083	443.594543	565.975647	528.357056	10.7030945
66	690.917603	443.282593	569.724792	530.032837	10.4525633
67	692.723938	443.027374	573.416565	532.034424	9.9422369
68	693.746948	442.567505	577.407043	533.467102	9.72601223
69	694.430847	442.530518	580.801208	535.093872	9.57320976
70	695.054016	442.044556	583.807007	536.932312	9.12204647
71	694.865234	441.980103	587.414612	538.672363	9.06684494
72	694.544617	441.700775	590.572327	540.565552	8.79417229
73	694.355164	441.594971	593.539307	541.99939	8.82978249
74	693.840393	441.03479	596.330811	544.133362	8.51989746
75	693.790527	441.104645	599.015015	546.489868	8.46725082

76	693.953552	441.284546	601.520447	548.255981	8.52749157
77	694.143677	441.194672	604.309998	550.130005	8.28426743
78	694.264832	441.386261	606.894775	552.331238	8.17512226
79	695.099487	441.300323	609.484497	554.752869	7.70086527
80	695.390076	441.650177	612.018555	556.366211	8.21224308
81	696.117065	441.688263	614.46521	559.334961	7.86519003
82	696.164978	441.947021	616.674622	561.347473	7.35550547
83	696.386047	442.313171	619.098816	563.719788	6.68641663
84	696.232727	442.513977	621.083923	566.260681	6.74120998
85	696.808838	442.876465	622.831482	568.810974	6.72215271
86	698.10907	443.304657	624.670105	571.396851	6.65040112
87	699.206055	443.721924	626.583618	574.330261	6.5955224
88	700.337585	444.067261	628.828003	577.051575	6.97815228
89	701.711304	444.559906	630.631409	580.170471	6.30528212
90	702.946472	445.143127	632.449951	583.23999	5.95669985
91	704.458496	445.47934	634.559631	585.853516	5.70307159
92	707.05011	446.096649	636.114929	588.968018	5.28588724
93	708.869202	446.66156	637.55481	591.911682	4.95758867
94	708.614563	447.25647	638.128479	594.583801	5.10317039
95	706.533325	447.240631	638.911377	597.667175	5.28560448
96	703.305115	447.923401	639.466736	600.787231	4.94133663
97	700.333801	448.504913	640.218079	603.125183	4.84917116
98	697.414307	449.252472	641.243286	606.186462	5.03034353
99	695.282593	450.210327	641.316223	610.140381	4.54078674
100	693.215698	451.163757	641.050598	614.534912	4.2130146
101	689.718018	451.954895	640.1875	618.898376	4.10242987
102	685.921387	452.697144	639.901245	622.775146	3.92604828
103	680.945679	453.809143	638.312683	624.96582	3.94433188
104	675.744141	454.69458	636.516907	626.178406	4.15745258
105	670.096191	455.488434	634.588013	626.663269	3.97506309
106	664.622314	456.55072	632.363586	626.390625	3.57448745
107	658.738831	457.233429	629.902832	625.797363	3.43544865
108	653.632446	457.775452	628.022766	624.887939	3.38016033

109	648.428955	458.664642	626.421326	623.829041	3.38060737
110	643.371399	459.89679	624.969666	622.787109	3.32542682
111	637.645142	460.721497	623.556641	621.255249	3.28990531
112	630.973145	461.570343	622.746765	619.634583	3.25353456
113	623.042114	462.596924	621.098511	618.097473	3.08940792
114	614.284607	463.34314	619.401489	615.771057	3.01561213
115	603.889526	463.863098	617.737366	613.211731	2.99720669
116	593.608093	465.402679	616.092957	610.313049	3.07032347
117	582.466797	466.327271	613.600281	607.369202	3.0892148
118	572.581238	467.551849	611.20105	604.549072	3.0899694
119	562.725586	468.614655	608.626526	601.659119	3.03519607
120	553.886841	469.306274	606.418091	598.70282	3.03605819
121	545.803589	470.530731	603.776123	595.909668	3.05495548
122	537.887146	471.723083	600.746216	592.888306	3.05570984
123	530.108704	472.976349	597.922791	590.605652	3.11117935
124	523.242554	474.116058	595.347351	587.263733	3.0923295
125	516.614685	475.244751	592.815491	584.531128	3.03838325
126	510.313751	475.878937	590.119812	581.832947	2.92801881
127	504.122467	477.341248	587.233765	578.996643	2.87504959
128	498.320465	478.379272	584.490479	576.423218	2.89265513
129	493.137665	479.395966	581.840698	573.907227	2.82007074
130	488.22522	480.373566	579.202271	571.250916	2.89269328
131	483.388916	481.392914	576.361511	568.699097	2.82014632
132	478.763611	482.228577	573.698364	566.103027	2.80237174
133	474.399658	483.132965	571.343567	563.374756	2.69106078
134	469.934082	483.625854	568.425659	561.231079	2.65575409
135	466.259949	484.68692	565.910461	558.664734	2.60131502
136	462.627838	485.214813	563.86145	556.35022	2.60158038
137	459.118195	486.241028	561.263611	554.457947	2.5466907
138	455.660675	486.978333	558.559937	551.993225	2.56522107
139	452.178009	487.774689	556.301697	550.297546	2.58385158
140	448.26062	488.478302	553.968018	548.542053	2.47465491
141	444.314636	489.146149	551.62439	546.45874	2.41983843

142	441.013824	489.681183	549.280457	544.651672	2.31117415
143	438.115173	490.180847	546.832642	542.736633	2.33778572
144	435.136597	490.401428	544.665527	540.63385	2.49346352
145	432.046143	490.970734	542.481018	539.156799	2.45566249
146	429.628662	491.429443	540.493652	537.071411	2.31084824
147	427.244446	491.923492	538.166504	535.356812	2.4557426
148	425.402161	492.289246	536.578674	533.407227	2.29211736
149	423.264313	492.612671	534.910767	531.247437	2.20138311
150	421.229095	492.971832	532.575745	529.539063	2.23793554
151	419.411346	493.38382	530.920593	527.907104	2.07419968
152	417.717499	493.663361	529.601318	526.248413	2.05666304
153	415.755554	493.842499	528.120972	524.660461	2.14876246
154	413.816467	494.08783	526.313599	522.960083	2.14847898
155	412.065826	494.339417	525.028503	521.678223	2.14918923
156	410.211029	494.569855	523.786072	520.292603	2.0933156
157	408.420715	494.832916	522.778198	518.556702	1.85764802
158	406.971191	495.222534	521.136353	517.080627	2.11236405
159	405.555145	495.486603	520.020752	515.950195	1.78396237
160	404.379181	495.822601	518.503235	514.572021	1.84026372
161	403.495575	496.205109	517.366333	513.290955	2.02243495
162	402.475494	496.585052	515.664063	512.208252	1.82151127
163	401.699524	496.952332	514.146851	510.993073	1.93626213
164	400.809113	497.366791	512.915283	509.995789	1.89472222
165	399.808899	497.798126	511.539154	509.00412	1.89451659
166	397.556	498.264038	510.212769	507.974579	1.73145819
167	395.440979	498.661469	507.685822	506.989349	1.60532141
168	392.986755	499.18927	506.420807	505.635376	1.84228158
169	390.698853	499.820526	504.667694	504.927429	1.87920785
170	388.514648	500.245697	502.575623	503.797638	1.62270939
171	386.56958	500.660156	500.739502	502.56488	1.56940675
172	384.506287	501.233917	499.111053	501.570648	1.55140722
173	382.270935	501.816101	497.377686	500.370026	1.55117548
174	380.445404	502.474731	495.768555	499.115601	1.73348129

175	378.849518	503.017822	493.798828	497.773895	1.46032989
176	377.221863	503.494751	492.318115	496.620056	1.60764658
177	375.607117	504.01123	490.722351	495.293579	1.53460014
178	374.138885	504.627502	489.195923	493.898346	1.3707118
179	372.918762	504.802673	487.522614	492.837738	1.58859217
180	371.705078	505.417084	485.863281	491.805725	1.40630579
181	370.354065	505.98172	484.6138	490.743591	1.42495131
182	369.071442	506.172455	482.791473	489.72406	1.28010321
183	367.613342	506.575256	481.170441	488.539246	1.29828823
184	366.486176	506.927551	479.619141	487.334717	1.38951957
185	365.103119	507.046783	478.495239	486.279633	1.33386564
186	364.009918	507.359192	476.750854	485.025879	1.27994621
187	363.063232	507.347443	475.632996	483.906921	1.29899466
188	362.127838	507.541138	473.934509	482.651642	1.35406101
189	360.944214	507.65863	472.454102	481.643463	1.28108716
190	360.180634	507.744476	471.0737	480.595276	1.09724259
191	359.181976	507.908722	469.499512	479.369507	1.26210511
192	358.25592	507.90329	468.663818	478.284912	1.18790805
193	357.479858	507.955475	467.079865	477.07196	1.02476144
194	356.580566	507.992432	465.723358	476.315308	1.04463828
195	355.766266	508.046875	464.406433	475.126526	1.04487526
196	355.05899	507.903778	463.278778	474.151062	1.15274262
197	354.15509	507.988037	462.157776	473.052063	1.1353935
198	353.36795	507.850769	461.052277	471.886078	0.972266972
199	352.442932	507.881866	459.854919	470.633942	0.818614662
200	351.711487	507.815186	458.977295	469.827118	0.935284734
201	350.828674	507.798248	457.871155	468.661682	0.954245031
202	350.084534	507.512451	456.369873	467.569763	0.879855037
203	349.340057	507.386993	455.315002	466.255219	0.752279878
204	348.575775	507.138916	453.870453	465.103668	0.897673666
205	348.090607	506.872833	452.600555	463.767792	0.734161437
206	347.522949	506.578735	451.723145	462.584076	0.715357363
207	346.806305	506.262878	450.890411	461.135529	0.734384954

208	346.2995	505.993744	449.534729	460.126251	1.11632633
209	345.793121	505.578583	448.978302	458.94754	1.24286306
210	345.354553	505.249268	447.591156	457.795929	1.27989984
211	344.824738	504.665405	447.029297	456.844727	1.04366863
212	343.987122	504.380524	446.413574	455.593384	1.06209433
213	343.18396	503.97052	445.134735	454.418091	1.02484894
214	342.179108	503.549255	444.806183	453.058044	1.13506377
215	341.379242	503.031677	443.579865	451.793243	1.09833717
216	340.496063	502.57724	442.916565	450.405396	0.918688476
217	339.622314	502.125977	442.030792	449.367584	0.653110683
218	338.542328	501.693115	440.549225	447.909332	0.789384007
219	337.533325	501.346985	439.5578	446.793732	0.525390446
220	336.336334	500.963623	438.533325	445.208313	0.652582109
221	335.321014	500.442413	437.588989	443.920074	0.670400739
222	334.606415	500.127106	436.430023	442.745453	0.525357544
223	333.584991	499.758911	435.15918	441.352142	0.434117913
224	332.861694	499.256561	433.858643	439.904663	0.507040203
225	331.915863	498.848694	432.858276	438.824493	0.530422091
226	330.673798	498.619415	431.634094	437.568024	0.396730393
227	329.765045	498.157593	430.341919	436.081055	0.396704972
228	328.775574	497.809875	429.111084	434.688263	0.341881663
229	327.699097	497.385101	427.934418	433.450256	0.346334636
230	326.839294	497.134888	426.586853	432.025055	0.28727138
231	325.712738	496.600677	425.449097	430.912811	0.432996422
232	324.771393	496.145294	424.106018	429.563843	0.615520597
233	323.949677	495.565491	422.992706	428.08432	0.688653767
234	322.847931	495.052307	422.047089	426.882233	0.469358176
235	321.843201	494.635254	420.612305	425.627106	0.433539212
236	321.088593	493.991638	419.322571	424.515503	0.287888199
237	320.195679	493.605804	418.187439	423.328247	0.324282825
238	319.121246	492.901398	417.075897	421.87915	0.359313011
239	318.513336	492.519348	415.782135	420.869629	0.341516048
240	317.592468	491.897827	414.882294	419.686707	0.252518594

241	316.682159	490.802948	413.836914	418.436829	0.324341893
242	315.909882	490.541412	412.857239	417.046448	0.305938601
243	314.9245	490.0224	411.540344	416.142059	0.123963982
244	313.794342	489.670624	410.777557	415.128296	0.106895238
245	312.895081	488.758331	409.714691	414.085785	0.034079824
246	311.974426	488.60199	409.296692	413.211914	0.06968718
247	311.209961	487.854614	408.628571	412.327576	0.161024004
248	310.660645	487.613525	408.094147	411.586761	0.034096271
249	310.285767	487.040588	407.941772	410.894135	0.124534436
250	310.164001	486.630676	407.287537	410.47403	0.08860933
251	309.905548	485.797058	406.624786	410.100006	0.034497008
252	309.796875	485.567444	406.042633	409.478821	0.034135897
253	309.352051	485.067261	405.494232	409.137848	0.050876424
254	309.131104	484.654785	404.378906	408.72406	0.088578679
255	308.757446	484.123352	404.050415	408.080933	0.033896651
256	308.474854	483.539063	403.414612	407.485107	0.033320215
257	308.204071	482.846741	402.881287	406.883179	0.106639549
258	307.735504	482.256042	402.483521	406.34549	0.03376282
259	307.282104	481.654144	401.477234	405.631836	0.033538528

PRODUCT:	38ST-D	
MANUFACTURER:	FOYERS SUPREME INC.	
TEST:	38STD250303	
DATE:	03-03-2025	
TIME (MIN):	236	
WEIGHT/WET (LB):	21.8933964	
WEIGHT/DRY (KG):	8.024276509	
BURN RATE (KG/HR):	2.040070299	
STARTING WEIGTH RANGE [20% - 25%]:	4.37867928	5.4733491
STARTING WEIGHT [%]	18.34841957	
DELTA T° (F):	-8.9947585	
CATCH (mg):	1.10	

LOAD CONFIGURATION							
	W (IN)	**H (IN)**	**L (IN)**	**HUMIDITY (%)**	**SPACERS**	**WEIGHT (LB)**	**SPECIES**
1	4	4	20	20	4	5.6	BC FIR
2	4	4	20	19	4	5.5	BC FIR
3	4	4	20	19	4	5.5	BC FIR
4	4	4	20	19	4	5.3	BC FIR
						21.9	

TIME	**TOP - T°**	**BOT - T°**	**RIGHT - T°**	**LEFT - T°**	**WEIGHT (LB)**
0	381.561676	536.643738	485.410187	493.79718	4.01709223
0	377.755157	533.958374	482.327362	491.832001	5.46964073
1	366.269684	531.244202	477.86676	486.481445	21.8933964
2	358.220398	531.810791	472.094696	478.452728	21.7478123
3	356.724152	532.098999	467.217834	471.143616	21.5663738
4	361.204163	532.426758	463.775177	464.949005	21.3832035
5	375.063263	532.39563	461.014832	459.625702	21.2016296
6	401.234436	532.639526	458.528381	455.750793	20.9833508
7	434.653687	532.509827	457.407227	452.977234	20.7098522
8	467.270813	532.552551	457.906403	451.048645	20.4718437

9	495.807831	532.592468	459.256683	449.669678	20.2071514
10	524.240234	532.639221	461.426636	448.911896	19.8961811
11	552.34137	532.848755	463.778046	448.883636	19.6225891
12	575.99176	533.056946	468.265442	449.513733	19.3673458
13	591.727295	533.343628	473.228088	450.947754	19.1496449
14	599.356689	533.497986	478.427551	452.845612	18.9845028
15	600.123596	533.457642	483.618683	455.117767	18.8197689
16	594.048096	533.177917	489.228088	456.656158	18.6745625
17	583.894592	532.509338	494.180603	458.12439	18.5464134
18	572.82251	531.664734	498.041565	458.70755	18.4008789
19	562.777222	530.360107	500.935059	458.607941	18.2370796
20	555.192261	529.131042	503.734741	458.367981	18.0553894
21	551.535645	528.024048	507.005859	457.943909	17.8734684
22	550.959351	526.705933	510.836029	457.25769	17.6720505
23	553.387085	525.242676	515.268677	457.131439	17.4530659
24	558.412964	523.739014	519.278809	457.006744	17.2542191
25	565.818726	522.137939	522.434143	457.319366	17.0522251
26	573.446655	520.554871	524.694519	457.394196	16.8549938
27	581.770813	518.788635	527.430176	458.274841	16.6725616
28	589.5802	517.304565	530.594116	459.088715	16.4722614
29	596.945129	515.598755	533.894714	459.841919	16.2530918
30	604.374268	514.059204	537.93512	460.665527	16.0528545
31	611.408142	512.430054	541.213562	461.801575	15.8340168
32	618.839417	510.91156	544.037109	463.000519	15.6335287
33	625.808899	509.413208	547.057617	464.590942	15.4145412
34	632.50824	507.821045	550.740356	465.885895	15.1953573
35	638.965759	506.641937	553.20752	467.690277	14.9948549
36	644.561401	505.022827	557.128662	469.414551	14.7767458
37	649.942749	503.82901	560.87439	471.546936	14.5580587
38	654.687256	502.685272	564.739319	473.466217	14.357728
39	659.256653	501.163879	568.642517	475.482544	14.1390438
40	663.411987	500.246033	572.273865	477.691833	13.9371662
41	666.557312	499.333679	575.720215	479.646179	13.7372589

42	669.865906	497.958618	578.566589	482.040466	13.525465
43	673.493164	497.170258	581.907715	484.125458	13.3246222
44	677.322693	495.908966	584.489502	486.392761	13.1061392
45	680.462769	495.244446	586.650391	488.724762	12.9053345
46	683.567078	494.464264	588.817017	490.717529	12.7234955
47	686.165039	493.572998	590.708923	493.366455	12.5240765
48	688.600403	492.851593	592.659119	495.836792	12.322197
49	690.703491	492.039154	594.023865	498.419617	12.1400776
50	692.486694	491.298462	595.181152	501.249817	11.9594278
51	694.320251	490.463745	596.043396	504.055756	11.7769575
52	695.820801	489.756683	596.643982	506.904144	11.5939331
53	698.049194	489.016144	596.673889	509.626099	11.4128685
54	700.209412	488.148468	597.363281	513.105774	11.2124462
55	702.944092	487.669922	597.78241	515.956665	11.0301847
56	705.358948	486.872742	598.222412	518.968811	10.8496065
57	707.765503	486.465057	598.791382	521.98761	10.6656494
58	709.002502	485.845184	599.568359	525.009583	10.4844341
59	709.451416	485.236145	601.0495	528.293762	10.3082666
60	708.161011	484.916962	603.302979	531.442627	10.1247091
61	705.578064	484.65332	605.032654	534.50354	9.92499828
62	702.531067	484.507507	607.41687	537.86615	9.72500896
63	700.084351	484.467285	609.082642	541.083984	9.54195404
64	698.032471	484.489624	611.267334	544.199829	9.34243965
65	695.070679	484.470306	613.277222	547.494141	9.15928459
66	691.612488	484.636078	615.06665	550.831848	8.99491978
67	688.039185	484.810577	617.216675	553.892151	8.81321144
68	685.151428	485.06134	618.606567	556.438965	8.63105869
69	683.255859	485.355103	620.189331	559.104431	8.46134567
70	682.321228	485.709259	621.653137	561.550964	8.2864809
71	682.358765	486.158478	623.148499	563.863525	8.10455036
72	682.399231	486.290283	624.125061	566.312622	7.94024944
73	681.656067	486.786133	625.16748	568.504761	7.77569246
74	679.478333	487.4617	625.861084	570.405029	7.61150217

75	677.993713	487.79715	626.812134	572.790771	7.4663558
76	676.445068	488.426727	627.483887	574.933838	7.32028532
77	674.722595	489.053436	628.320374	577.036438	7.12576437
78	673.295166	489.694397	629.250183	579.124329	6.99828339
79	672.120605	490.321167	629.801025	581.277588	6.88918877
80	670.616272	491.018433	630.750854	583.535767	6.7614398
81	669.528259	491.512268	631.45575	585.686096	6.63485336
82	669.465698	492.073883	632.629272	587.485291	6.47113371
83	668.326172	492.871643	633.023071	589.289612	6.32501554
84	668.59082	493.521637	633.858643	590.787476	6.19661188
85	668.38916	494.141144	634.74823	592.605713	6.01472759
86	668.742126	494.921295	635.898926	594.492554	5.88666821
87	668.502197	495.22879	636.608215	595.907654	5.75920343
88	669.017334	496.207245	637.963196	597.656433	5.63794279
89	669.307129	496.860931	639.330994	599.700867	5.48518562
90	669.546387	497.76358	641.064697	601.257202	5.33943367
91	670.311646	498.648132	641.661743	603.69989	5.23043442
92	671.147705	499.468811	642.189209	605.74884	4.9935236
93	672.016907	500.197327	642.210083	607.30304	4.9400177
94	673.741821	500.830505	642.714783	609.032471	4.81201601
95	674.099915	501.779175	642.256104	610.701538	4.72068977
96	672.404907	502.63739	642.658142	612.516235	4.57458067
97	669.716187	503.640717	642.572449	613.847656	4.48525763
98	665.7052	504.595367	642.383484	615.507019	4.37692118
99	661.105896	505.56958	642.041809	616.517273	4.33954906
100	654.260498	506.672211	641.084473	616.769043	4.26585674
101	645.817383	507.695587	639.513367	616.667358	4.21354103
102	636.331299	508.843567	637.944336	615.615417	4.15739679
103	626.940552	509.767792	636.561462	614.990356	4.08507299
104	617.834106	510.80127	634.313599	613.780396	4.01255322
105	608.801697	512.074707	632.240112	612.639587	3.94552302
106	600.448914	513.078064	630.015442	611.714661	3.90845251
107	592.416626	514.521851	627.775391	610.243347	3.72638822

108	584.926208	515.798889	625.781616	608.693298	3.70905852
109	577.915894	516.991577	623.606445	607.415588	3.59830379
110	571.196716	517.97052	621.70166	606.140015	3.67242002
111	565.401794	519.642944	619.91925	604.453491	3.58197308
112	559.189209	521.114075	617.907959	603.030029	3.43683267
113	553.36438	522.555298	616.075378	601.453979	3.41712689
114	547.738159	523.892517	614.443237	599.491333	3.34565043
115	542.289917	525.281921	612.173889	597.662476	3.25425768
116	537.120544	526.266663	609.768555	595.058472	3.32658625
117	531.32312	527.584412	607.703674	593.497437	3.38148665
118	526.098145	528.953674	605.787231	591.160095	3.29063797
119	520.379395	530.473816	603.563599	588.85498	3.25466967
120	515.272034	531.605713	601.745483	586.886719	3.19991732
121	509.941864	533.082947	599.641235	584.871399	3.16306281
122	505.708923	534.513977	597.693909	583.059998	3.10904622
123	502.154694	535.751648	596.449219	581.730225	3.09036994
124	498.99881	537.148926	595.37854	580.536133	3.10986567
125	495.502594	538.396545	593.755981	579.023499	3.07226586
126	491.596802	540.112793	592.260803	577.197021	3.0553391
127	488.159729	541.822449	591.113281	575.061401	2.98203921
128	484.295044	543.670044	589.228516	572.694153	2.94649386
129	480.41864	545.369507	587.325256	570.235474	2.94629812
130	476.603088	547.339294	585.602722	567.858704	2.90963054
131	472.668732	549.005188	583.904663	565.487305	2.80015063
132	468.867462	550.829956	581.948547	563.195557	2.74468565
133	465.193604	552.520691	580.303406	560.947632	2.67144489
134	461.906128	554.155273	578.346985	558.898743	2.68844867
135	458.021118	555.988281	576.764343	557.165894	2.65408087
136	455.113586	557.531433	574.943542	555.292297	2.63621974
137	452.263824	558.921997	573.142273	554.074524	2.58109641
138	449.458099	560.08075	570.822937	553.188965	2.67255282
139	446.662994	561.014709	569.224915	551.601807	2.60005164
140	443.921021	561.57196	567.723022	549.886047	2.54560041

141	441.00589	561.782837	565.766052	548.423645	2.50900841
142	438.369476	561.85498	563.957642	546.503479	2.50870132
143	435.224609	561.957886	561.952881	544.593506	2.45355415
144	432.101318	561.935059	559.221069	542.699524	2.41787124
145	429.211426	561.931702	557.17688	540.763916	2.3804307
146	426.218628	561.851685	554.707825	538.747375	2.34456396
147	423.69519	561.803284	552.372009	536.77478	2.34533787
148	420.93335	561.641357	550.07251	535.173584	2.3809011
149	418.682739	561.552063	547.917542	533.456726	2.32781816
150	416.309998	561.397522	545.814331	531.451233	2.32739735
151	413.663452	561.327759	543.910522	529.806458	2.27255964
152	411.672791	561.437256	541.679443	527.91156	2.199929
153	409.534058	561.494629	539.639282	526.119629	2.19997168
154	407.88559	561.649109	537.734314	524.210327	2.14617705
155	406.046539	561.585754	535.430786	522.322327	2.14607692
156	404.001923	561.852417	533.410889	520.540527	2.14668918
157	402.287689	561.873474	531.697998	518.816223	2.10920906
158	400.434174	562.048584	529.582947	517.211792	2.01902795
159	398.411285	561.888489	527.993225	515.175842	1.94668281
160	396.335663	561.72937	525.910217	513.33728	1.89153421
161	394.102692	561.337219	523.608765	511.318787	2.01986384
162	392.03302	560.882996	521.46875	509.608429	1.98264229
163	389.863281	560.2547	519.208252	507.612854	1.96478856
164	387.772705	559.499512	517.331238	506.099762	1.94711351
165	385.500763	558.821167	515.312683	504.066162	1.91225076
166	383.647919	558.147095	513.377197	502.650848	1.89337718
167	381.59137	557.468445	511.644257	500.898132	1.87597573
168	379.923035	556.693726	509.947723	499.272858	1.83993995
169	378.174225	556.033386	508.209412	497.557465	1.80291963
170	376.870056	555.28186	505.918488	496.101379	1.80315804
171	375.560791	554.77417	504.57251	494.555176	1.76757622
172	374.702454	554.370117	503.050781	493.112518	1.73148358
173	373.580872	554.127686	501.411072	491.461304	1.69585907

174	372.796051	554.109253	499.689148	489.952606	1.64149404
175	371.918732	553.995239	498.17099	488.348511	1.65936875
176	370.716797	553.979126	496.583038	486.564758	1.62340248
177	369.599091	554.293701	495.319153	485.397034	1.58720672
178	368.403748	554.702637	494.499542	484.253906	1.55061471
179	367.654297	555.398132	493.628418	482.96933	1.53400135
180	366.653625	556.241577	492.418213	481.849365	1.49687552
181	366.075012	557.548157	491.683716	481.044281	1.47823298
182	365.524811	559.045898	491.092346	480.446747	1.46144462
183	365.525879	560.313293	490.134918	479.900635	1.42515385
184	365.338867	561.926392	489.959717	479.378662	1.3899188
185	365.124146	563.552246	489.361084	478.565063	1.35396683
186	365.171143	565.232666	488.541565	478.134979	1.28061986
187	364.750336	567.134033	487.608612	477.462402	1.28080595
188	364.753235	568.824463	487.196808	477.01947	1.24401736
189	364.521027	570.544067	486.472931	476.468719	1.18861759
190	364.268646	572.081482	485.636688	476.254639	1.20808101
191	364.116028	573.595581	485.10733	475.625	1.17039073
192	363.95694	575.097473	484.157501	475.067749	1.17083108
193	363.826691	576.414124	483.614655	474.655273	1.13631606
194	363.477661	577.509644	482.974579	474.164856	1.11932886
195	363.185791	578.71991	482.416473	473.813934	1.08289385
196	362.902893	579.761597	481.645538	473.373505	1.04703903
197	362.778046	580.653931	480.881897	472.905945	1.02763915
198	362.624878	581.345825	480.333313	472.615601	1.01056659
199	362.539642	582.177002	479.558228	472.362	0.992545366
200	362.404236	582.887817	479.107452	472.195129	0.956304789
201	362.293243	583.321472	478.790131	472.172302	0.900229156
202	362.081268	583.795593	478.476776	471.743256	0.899776816
203	361.898987	584.086914	477.342957	471.588776	0.826858938
204	361.664948	584.392822	476.772095	471.382782	0.82682085
205	361.66687	584.40509	476.021057	470.94516	0.789553702
206	361.715271	584.533325	475.541321	470.721832	0.753550112

207	361.648865	584.581787	474.693024	470.274963	0.753895521
208	361.425354	584.843201	473.72644	469.99292	0.717027605
209	361.676422	584.767883	473.127014	469.628876	0.689372241
210	361.630615	584.773865	471.898865	469.373993	0.670563698
211	361.684418	584.882813	471.6362	468.880829	0.634074152
212	361.532593	585.034912	470.996216	468.765961	0.616424501
213	361.927734	585.07843	470.72168	468.615051	0.589286447
214	362.148987	585.469177	470.425476	468.418457	0.561259449
215	362.136536	585.70813	469.827423	468.365906	0.524883509
216	362.435944	585.772766	469.15451	468.046356	0.489318788
217	362.600891	586.331604	468.947449	467.944885	0.469548821
218	362.543427	586.532837	468.064301	467.72644	0.43395716
219	362.546021	586.896118	467.937256	467.399597	0.416578144
220	362.405884	586.968933	467.10022	467.080994	0.37921682
221	362.194946	586.745239	466.138275	466.497864	0.360239327
222	361.850311	586.567505	465.234741	465.920074	0.343352258
223	361.547974	586.254822	464.538208	465.184998	0.307048112
224	361.17218	585.816956	463.715576	464.486053	0.289469481
225	360.736664	585.279663	462.671875	463.261261	0.253575772
226	360.198578	584.951965	461.690491	462.593903	0.233484298
227	359.548706	584.613647	460.802307	461.599854	0.215790525
228	359.000671	584.322754	459.515076	460.890594	0.180562228
229	358.370941	583.926941	458.142303	460.073395	0.160890177
230	357.042847	583.416138	457.186859	459.145569	0.125342637
231	355.330627	582.810791	455.994232	458.185242	0.108375579
232	353.630981	582.038574	454.986786	457.245209	0.090201818
233	351.666321	581.159973	453.523651	456.189941	0.071117424
234	349.780029	579.958618	451.860138	454.947968	0.052593764
235	348.106842	578.90741	450.686554	454.104736	0.035344839
236	346.180115	577.492676	449.464661	452.745605	0.035192318

PRODUCT:	38ST-D	
MANUFACTURER:	FOYERS SUPREME INC.	
TEST:	38STD250220	
DATE:	20-02-2025	
TIME (MIN):	249	
WEIGHT/WET (LB):	23.0705166	
WEIGHT/DRY (KG):	8.455709704	
BURN RATE (KG/HR):	2.037520411	
STARTING WEIGTH RANGE [20% - 25%]:	4.61410332	5.76762915
STARTING WEIGHT [%]	17.73162873	
DELTA T° (F):	-16.994191	
CATCH (mg):	1 to 2	

LOAD CONFIGURATION							
	W (IN)	**H (IN)**	**L (IN)**	**HUMIDITY (%)**	**SPACERS**	**WEIGHT (LB)**	**SPECIES**
1	4	4	20	20	4	5.8	BC FIR
2	4	4	20	20	4	5.7	BC FIR
3	4	4	20	21	4	5.8	BC FIR
4	4	4	20	21	4	5.8	BC FIR
						23.1	

TIME	**TOP - T°**	**BOT - T°**	**RIGHT - T°**	**LEFT - T°**	**WEIGHT (LB)**
0	403.499084	n/a	483.541443	471.302032	4.09077835
0	393.962463	n/a	479.572479	467.92691	0.023925304
1	377.893677	n/a	474.987854	463.36792	23.0705166
2	363.899384	n/a	468.073486	456.734497	22.473362
3	356.151306	n/a	461.526947	450.347626	22.3099422
4	356.021088	n/a	455.327759	444.450531	22.2187862
5	363.189148	n/a	450.313171	439.137817	22.1635475
6	372.341431	n/a	448.220642	434.609253	21.8902092
7	387.56842	n/a	447.38913	431.08725	21.9260502
8	406.526428	n/a	447.517029	427.883392	21.6167488

9	430.331268	n/a	447.635193	425.793762	21.4526443
10	458.637726	n/a	447.513489	424.263245	21.7088356
11	488.539307	n/a	447.438538	424.104919	21.8534927
12	517.963135	n/a	447.652863	424.576111	21.7820473
13	546.125732	n/a	448.609833	426.423523	21.5807037
14	571.313477	n/a	450.300842	429.447021	21.2710953
15	592.724976	n/a	451.943634	433.2453	21.0164661
16	607.820618	n/a	454.299957	437.571411	20.8697033
17	617.952454	n/a	457.425354	441.027405	20.706049
18	623.525879	n/a	460.492981	444.088715	20.5238171
19	626.513428	n/a	462.520935	446.229736	20.4563198
20	626.499023	n/a	463.718872	447.467743	20.2020607
21	625.245728	n/a	464.38446	448.838379	20.0911922
22	621.398499	n/a	464.516479	449.476837	20.0547695
23	617.03302	n/a	463.909485	449.728943	19.6357231
24	616.345764	n/a	463.449127	449.765594	19.582243
25	620.567444	n/a	462.715912	450.643402	19.2895756
26	625.368896	n/a	462.744934	451.598083	19.1263313
27	631.152161	n/a	463.675568	453.154968	19.1251717
28	637.19635	n/a	466.150696	455.061676	18.9434834
29	641.365173	n/a	468.238129	457.200104	18.8145752
30	644.150879	n/a	469.711731	458.687897	18.687727
31	645.30542	n/a	471.850891	460.000366	18.2872467
32	644.567993	n/a	473.953491	460.812653	18.361311
33	643.443665	n/a	476.09314	461.503235	18.2878056
34	642.943481	n/a	478.533478	461.613495	18.1228752
35	643.103821	n/a	481.853394	462.381287	17.9224014
36	643.501221	n/a	485.41626	462.743103	17.3390827
37	644.681091	n/a	489.31601	463.481201	17.3765907
38	645.880493	n/a	492.67804	464.225189	17.173296
39	646.302856	n/a	495.185852	465.03598	16.8874321
40	646.309143	n/a	498.217407	465.586761	16.8666153
41	645.60907	n/a	501.596191	466.806793	16.5894909

42	645.664124	n/a	505.431244	467.764221	16.4859829
43	646.925964	n/a	509.030334	469.067352	16.3040714
44	648.720581	n/a	511.9841	470.598022	16.0654812
45	651.434998	n/a	515.090393	472.560638	15.8482771
46	655.165161	n/a	517.826721	474.663452	15.7214174
47	659.461609	n/a	520.374084	476.71991	15.4839125
48	664.293274	n/a	522.98468	479.341431	15.4113808
49	669.59021	n/a	525.368713	482.043152	15.174861
50	674.65271	n/a	527.308594	484.993042	14.992321
51	679.436646	n/a	530.113281	488.136597	14.7740231
52	683.900513	n/a	532.613647	491.683472	14.5932407
53	688.490356	n/a	534.880737	494.994293	14.3003693
54	691.979492	n/a	537.195251	498.938599	14.0814972
55	695.631836	n/a	539.823059	503.023224	13.8633375
56	698.903442	n/a	542.771851	507.016846	13.6527634
57	701.512512	n/a	546.07251	511.204681	13.5241919
58	704.388977	n/a	549.016724	515.134399	13.4141836
59	708.161194	n/a	552.162048	518.660645	13.2874126
60	712.04248	n/a	554.761597	521.706299	13.1054573
61	714.715271	n/a	557.755859	524.626404	12.8875046
62	715.614014	n/a	560.659424	527.048401	12.7608624
63	714.625122	n/a	563.192078	529.150818	12.6151304
64	712.360596	n/a	565.685669	531.353882	12.1398592
65	709.564697	n/a	567.368347	533.683533	12.0679274
66	708.133728	n/a	570.115112	535.249329	12.0306425
67	707.338318	n/a	572.848206	536.610718	11.8658743
68	704.925476	n/a	575.06604	538.342773	11.6062841
69	703.523926	n/a	577.670593	540.091064	11.4674587
70	701.865967	n/a	580.203796	541.625122	11.2854576
71	701.206116	n/a	582.46637	543.13269	10.9212379
72	700.856445	n/a	584.772217	544.957642	10.8845558
73	700.832397	n/a	587.287964	546.533264	10.7763128
74	699.652832	n/a	589.251343	547.789917	10.6116219

75	698.397339	n/a	591.381287	549.002258	10.4340258
76	696.871338	n/a	593.163879	550.983765	10.2532339
77	695.705017	n/a	594.968262	552.842896	10.1430655
78	695.642578	n/a	596.681946	554.353027	10.0155077
79	694.686096	n/a	598.359985	555.509827	9.85455513
80	693.166687	n/a	600.15509	556.67511	9.63336372
81	692.382385	n/a	601.246704	558.506836	9.48830986
82	690.944336	n/a	602.925171	560.000061	9.26985741
83	690.211731	n/a	604.456848	561.416443	9.12313938
84	689.220154	n/a	605.790894	562.998596	9.1041851
85	688.642273	n/a	607.152283	565.027466	8.8307457
86	689.175964	n/a	608.722168	566.522583	8.74104309
87	690.934753	n/a	609.814636	568.434692	8.52181911
88	694.346924	n/a	611.243164	570.218872	8.4499712
89	698.651917	n/a	612.771423	572.028687	8.26734829
90	701.982788	n/a	613.797363	574.368896	8.15862274
91	703.717163	n/a	615.057922	576.462341	7.95794153
92	703.645569	n/a	616.238342	578.157959	7.86732244
93	701.667175	n/a	617.546814	579.239258	7.70240259
94	699.287109	n/a	617.843567	579.844116	7.16154385
95	695.02063	n/a	617.970154	580.289124	7.08931828
96	689.739563	n/a	617.894043	580.750793	6.90687656
97	685.020447	n/a	617.872803	581.455933	6.83370304
98	680.389465	n/a	618.35376	581.999023	6.56118155
99	676.140625	n/a	618.099609	582.437744	6.47105455
100	672.16333	n/a	617.98114	583.315796	6.32577372
101	668.488342	n/a	617.921509	584.01886	6.16152477
102	664.82135	n/a	617.799133	584.017822	6.08831692
103	662.004822	n/a	617.335449	584.896179	5.97917557
104	658.609192	n/a	616.980103	585.000549	5.94151545
105	655.100037	n/a	616.239075	585.369019	5.79508448
106	651.248535	n/a	615.950928	585.021057	5.54139805
107	647.298279	n/a	614.839233	584.886719	5.42195702

108	643.087769	n/a	613.212708	584.384827	5.22897959
109	639.02832	n/a	612.146667	584.577637	5.15928698
110	636.767883	n/a	611.181396	584.437927	5.10524845
111	634.969055	n/a	610.638	584.677002	4.99557638
112	635.038147	n/a	609.966248	584.671997	4.97763586
113	636.01709	n/a	609.914429	585.095215	4.75927877
114	637.445618	n/a	609.732422	585.315247	4.85011148
115	640.927856	n/a	609.102539	585.729858	4.6864419
116	644.988586	n/a	608.0448	586.354065	4.87021875
117	647.923157	n/a	607.379883	587.305542	4.88687181
118	648.759399	n/a	607.467957	588.135376	4.81471968
119	646.611694	n/a	607.634399	588.000793	4.66908884
120	641.657104	n/a	607.820801	587.531189	4.44898367
121	634.713318	n/a	607.118408	586.732178	4.14104033
122	625.86676	n/a	605.537415	585.783508	3.97728658
123	617.069946	n/a	603.688721	584.754089	3.89173436
124	608.408325	n/a	601.845337	583.492249	3.80042434
125	600.297729	n/a	599.795654	583.25824	3.74615884
126	592.004578	n/a	597.778687	582.559937	3.7097075
127	583.717468	n/a	595.602112	581.619385	3.59955382
128	574.986023	n/a	593.058533	580.158203	3.67380166
129	565.549744	n/a	590.451721	578.317749	3.54551172
130	555.930542	n/a	587.802246	575.87616	3.47310376
131	546.288513	n/a	584.820862	573.680115	3.43785548
132	537.43811	n/a	582.556824	571.155762	3.41835451
133	528.54126	n/a	580.21106	568.837708	3.37491941
134	520.432007	n/a	577.901123	566.536743	3.27435875
135	512.715881	n/a	575.552002	564.016663	3.29232407
136	505.397583	n/a	573.718811	561.743713	3.25635695
137	498.2211	n/a	571.507202	559.72644	3.22379184
138	491.815094	n/a	569.26709	557.696411	3.20200396
139	485.737122	n/a	566.872375	555.728882	3.18447685
140	480.146179	n/a	565.338745	553.586243	3.11152244

141	474.870087	n/a	562.769531	551.342102	3.03823233
142	469.732422	n/a	560.976257	549.602234	3.01898932
143	465.270081	n/a	559.013062	547.621094	3.0193429
144	461.059265	n/a	557.030945	546.119324	2.96571589
145	457.129944	n/a	555.159546	544.851929	2.94856715
146	452.965149	n/a	553.411743	543.590759	3.00126266
147	449.153961	n/a	551.583496	541.968994	2.98406672
148	445.864716	n/a	549.821899	540.313538	2.94874358
149	442.728455	n/a	547.789368	538.400879	2.9295702
150	439.653229	n/a	546.332886	536.727112	2.83900189
151	436.807617	n/a	544.655457	534.959473	2.78489256
152	433.920929	n/a	542.961609	533.326111	2.74829388
153	431.094849	n/a	541.112976	531.57666	2.91286635
154	428.987793	n/a	539.94873	529.616638	2.73046565
155	426.604706	n/a	538.317993	528.143738	2.6922183
156	424.219269	n/a	536.502258	526.517395	2.62022161
157	421.960388	n/a	534.855225	524.925232	2.58474874
158	419.951935	n/a	533.722656	523.464355	2.56663632
159	417.909576	n/a	532.494568	522.087952	2.62046671
160	416.141235	n/a	530.892883	520.404053	2.62031865
161	414.29715	n/a	529.292847	518.438965	2.63994884
162	412.690216	n/a	528.207214	517.145447	2.54850435
163	411.324524	n/a	526.572144	515.377869	2.41999006
164	409.806488	n/a	525.893494	514.009216	2.49410272
165	408.213837	n/a	524.527161	512.618103	2.47577119
166	406.956421	n/a	523.425903	511.20813	2.40188432
167	405.586273	n/a	522.09314	509.834961	2.38303471
168	404.199097	n/a	520.965393	508.474854	2.34797239
169	402.928223	n/a	520.192627	507.051575	2.23917055
170	401.756042	n/a	518.885071	505.782928	2.34790444
171	400.868347	n/a	517.615234	504.404846	2.22098422
172	399.894867	n/a	516.661743	503.473999	2.18540525
173	398.930847	n/a	515.483826	501.830597	2.2037344

174	397.650787	n/a	514.175476	501.094574	2.5681839
175	397.022278	n/a	513.081116	499.873932	2.45765424
176	395.990021	n/a	512.209351	498.809753	2.54988003
177	395.232025	n/a	510.692383	497.545776	2.36695528
178	394.204163	n/a	510.08786	496.621582	2.38441205
179	393.208679	n/a	508.801086	496.088196	2.18663216
180	392.090942	n/a	508.11731	494.776703	2.20458078
181	391.261841	n/a	507.004181	493.775818	2.15107775
182	390.577423	n/a	506.174927	492.930298	1.91457367
183	389.777771	n/a	505.221405	491.773132	2.25989985
184	388.390839	n/a	504.494904	490.810699	1.98660409
185	387.049103	n/a	504.487427	490.050507	1.8225745
186	386.25647	n/a	504.468536	488.990448	1.76846516
187	385.641449	n/a	504.635742	488.43866	1.84173441
188	385.241638	n/a	504.908417	488.133911	1.69676447
189	384.620056	n/a	505.401215	487.586761	1.78619027
190	384.439728	n/a	505.039215	487.491638	1.55028796
191	384.080994	n/a	505.502625	487.282104	1.60628891
192	384.23526	n/a	505.8284	487.271912	1.64534664
193	383.994446	n/a	505.762451	487.276672	1.5697664
194	383.867126	n/a	505.98111	487.461548	1.78669572
195	384.187622	n/a	506.510162	487.638763	1.64205694
196	383.809021	n/a	506.060455	487.214386	1.88034272
197	383.359467	n/a	505.801208	487.258759	1.69815874
198	382.595184	n/a	505.991394	487.176086	1.62380552
199	381.932159	n/a	505.9758	486.824554	1.42442489
200	381.134094	n/a	505.876251	486.381927	1.3526293
201	380.219604	n/a	505.542938	485.784821	1.35319448
202	379.63913	n/a	505.202515	485.12796	1.60802042
203	378.808319	n/a	504.964172	484.7005	1.44453812
204	378.322998	n/a	504.615967	483.860321	1.24214447
205	377.776337	n/a	504.201782	483.178864	1.44493878
206	377.222076	n/a	503.557922	482.608582	1.18717539

207	376.613525	n/a	503.52475	481.870483	1.15192914
208	375.79834	n/a	503.297211	481.266937	1.04413366
209	375.230865	n/a	502.464294	480.511139	1.07984424
210	374.48877	n/a	502.196594	479.655457	1.05277193
211	373.861145	n/a	501.391022	479.025208	1.20803022
212	373.403015	n/a	501.101257	478.25647	1.00815248
213	372.802643	n/a	500.703125	477.503784	0.990117013
214	372.387482	n/a	500.100189	476.924042	0.916738629
215	371.926117	n/a	499.564117	476.317749	0.898790658
216	371.321136	n/a	498.592041	475.494293	0.86044842
217	370.835724	n/a	498.158569	474.712219	0.770355642
218	370.492096	n/a	497.199371	474.112427	0.787837088
219	369.941956	n/a	496.550964	473.820557	0.75259608
220	369.619202	n/a	495.400574	473.156891	0.77050668
221	368.918121	n/a	494.345001	472.453796	0.705907881
222	368.402649	n/a	493.349976	472.166016	0.668831408
223	367.914063	n/a	492.450195	471.54245	0.614327312
224	367.225525	n/a	491.461395	470.863098	0.897596657
225	366.861725	n/a	490.568176	470.557495	0.650733173
226	366.373199	n/a	489.395081	469.752411	0.770350456
227	366.000183	n/a	488.770996	469.450531	0.733353198
228	365.286133	n/a	487.979797	468.89743	0.577600777
229	364.670441	n/a	487.198792	468.380402	0.503973365
230	364.159271	n/a	486.074524	467.876221	0.394625783
231	363.63858	n/a	485.417694	467.693695	0.340067118
232	363.239471	n/a	484.310944	467.117981	0.340392351
233	362.751831	n/a	483.269348	466.606445	0.304444045
234	362.16156	n/a	482.869385	466.298492	0.231070146
235	361.678802	n/a	481.928955	465.477417	0.240908414
236	361.242432	n/a	480.908295	465.051697	0.268059164
237	361.098877	n/a	480.396454	464.676849	0.213299364
238	360.465149	n/a	479.791962	464.325348	0.178362653
239	360.212158	n/a	478.902985	463.764771	0.17858097

240	359.931458	n/a	478.32193	463.25647	0.141156837
241	359.740082	n/a	477.801575	462.8591	0.065488398
242	359.377594	n/a	477.157654	462.535217	0.087202266
243	359.133759	n/a	476.771729	462.162201	0.049654771
244	358.805328	n/a	476.340088	461.549957	0.231370702
245	358.588806	n/a	476.168732	461.18045	0.115733154
246	357.926056	n/a	475.534241	460.842743	0.141828224
247	357.68277	n/a	475.23584	460.373291	0.087439269
248	357.348694	n/a	474.435944	459.941528	0.033042092
249	357.240784	n/a	473.812378	459.426117	0.032621168

PRODUCT:	38ST-D	
MANUFACTURER:	FOYERS SUPREME INC.	
TEST:	38STD250219	
DATE:	19-02-2025	
TIME (MIN):	246	
WEIGHT/WET (LB):	22.30266	
WEIGHT/DRY (KG):	8.1742781	
BURN RATE (KG/HR):	1.993726366	
STARTING WEIGTH RANGE [20% - 25%]:	4.460532	5.575665
STARTING WEIGHT [%]	11.97081985	
DELTA T° (F):	-39.733836	
CATCH (mg):	2.00	

LOAD CONFIGURATION							
	W (IN)	**H (IN)**	**L (IN)**	**HUMIDITY (%)**	**SPACERS**	**WEIGHT (LB)**	**SPECIES**
1	4	4	20	21	4	5.7	BC FIR
2	4	4	20	20	4	5.6	BC FIR
3	4	4	20	20	4	5.4	BC FIR
4	4	4	20	20	4	5.6	BC FIR
						22.3	

TIME	**TOP - T°**	**BOT - T°**	**RIGHT - T°**	**LEFT - T°**	**WEIGHT (LB)**
0	405.772705	n/a	507.826599	506.774384	2.66981125
0	401.257111	n/a	506.175293	505.490356	0.583078027
0	387.599335	n/a	503.964142	502.962036	#27.2526398
1	376.200714	n/a	498.076721	497.2995	#21.6301537
2	376.049896	n/a	492.138428	491.374207	22.30266
3	387.340271	n/a	486.632507	485.957153	21.5396767
4	409.194855	n/a	482.238831	482.440186	21.3218098
5	437.864319	n/a	480.155396	480.708099	21.2291908
6	469.997009	n/a	478.605713	479.816895	21.6666565
7	502.936707	n/a	479.116577	479.540161	21.3564434

8	535.137634	n/a	480.649628	480.754791	21.2300854
9	565.091919	n/a	481.045471	484.137268	21.1588802
10	593.877869	n/a	481.326416	488.852234	20.9031639
11	620.762451	n/a	481.926117	493.589264	20.7383862
12	642.633667	n/a	484.005524	498.26181	20.5373497
13	658.678406	n/a	487.7229	503.251831	20.1801186
14	669.901184	n/a	492.200562	508.427612	20.1064262
15	679.686157	n/a	496.62439	513.650818	19.8150139
16	687.796936	n/a	501.276001	518.722595	19.5958576
17	695.214905	n/a	504.956696	523.45282	19.4318466
18	701.163208	n/a	507.945648	527.866089	19.0862789
19	707.709106	n/a	510.392181	531.975525	18.904047
20	714.21582	n/a	512.686829	536.127686	18.3936062
21	721.287964	n/a	514.990173	541.241638	18.2843323
22	726.954224	n/a	517.27948	545.872498	18.1563091
23	731.482117	n/a	519.016418	551.084534	17.7549343
24	735.231934	n/a	521.269653	556.402588	17.6452847
25	737.784241	n/a	523.735779	561.693176	17.4271126
26	739.510071	n/a	525.818115	566.865173	16.902256
27	741.251282	n/a	527.592957	571.533264	16.9916782
28	742.773315	n/a	529.60376	575.939636	16.8093224
29	744.664185	n/a	531.854248	581.029053	16.4992352
30	745.612793	n/a	534.375122	585.81189	16.2260075
31	747.835876	n/a	537.066528	590.559326	15.971488
32	751.031189	n/a	541.150391	594.348022	15.7715902
33	753.99353	n/a	545.757751	597.346924	15.4968166
34	756.825439	n/a	551.852356	599.903198	15.3879004
35	759.032104	n/a	556.996277	602.440063	15.1265306
36	761.211304	n/a	562.815369	604.545898	14.7874985
37	762.780396	n/a	568.386902	606.866333	14.5151052
38	763.818848	n/a	573.032471	608.721619	14.3687849
39	764.3125	n/a	577.886902	610.843628	14.094862
40	765.215515	n/a	581.940308	613.266541	13.7857542

41	765.603088	n/a	585.424255	615.036072	13.731122
42	766.203308	n/a	588.249512	617.120605	13.5005817
43	766.296936	n/a	591.489685	619.395935	13.2449303
44	766.856567	n/a	593.881226	620.577576	12.9356461
45	766.864563	n/a	596.251343	621.798157	12.7899122
46	766.763306	n/a	598.575745	623.188354	12.682394
47	767.008484	n/a	600.49408	624.546509	12.4801006
48	767.350464	n/a	601.380249	625.952209	12.2698345
49	767.417053	n/a	602.792175	627.315308	12.0435753
50	766.577026	n/a	604.188354	628.159241	11.807539
51	766.292969	n/a	604.972046	629.313538	11.6799889
52	765.56958	n/a	606.164612	629.956909	11.3705521
53	764.563965	n/a	607.470154	631.24939	11.3175564
54	764.255493	n/a	607.947632	631.465759	11.0617323
55	763.05835	n/a	609.061768	632.196228	10.7876158
56	762.008179	n/a	610.459778	632.72168	10.7149763
57	760.857727	n/a	611.865356	633.702759	10.4784527
58	759.11853	n/a	613.637939	634.510254	10.3394489
59	757.952087	n/a	614.604797	635.123596	10.1747065
60	756.551941	n/a	615.933838	636.163025	9.95641708
61	755.073669	n/a	617.467529	636.821594	9.77525234
62	753.512878	n/a	619.178833	637.815552	9.5372448
63	752.554871	n/a	620.445496	638.608093	9.3197031
64	751.768677	n/a	622.160828	639.500671	9.22707558
65	751.127747	n/a	623.678589	640.825806	8.93589783
66	750.113037	n/a	625.026978	641.411804	8.82624817
67	748.973755	n/a	626.205688	642.292114	8.68213654
68	748.111267	n/a	627.349487	643.22113	8.66228294
69	747.672424	n/a	628.132385	644.728271	8.44382286
70	747.105774	n/a	629.507874	646.410278	8.18907928
71	746.460754	n/a	630.67804	648.544983	8.02533436
72	746.873962	n/a	631.732666	650.765625	7.93473911
73	746.561829	n/a	632.444946	652.934082	7.75218964

74	747.091614	n/a	633.628784	655.339111	7.51622057
75	746.745544	n/a	634.768982	658.532227	7.35282898
76	747.100586	n/a	635.327454	662.015686	7.08402967
77	747.532104	n/a	636.415161	665.393433	6.90149641
78	748.232239	n/a	637.329468	669.130859	6.88295937
79	748.925964	n/a	638.077148	672.696655	6.62925053
80	750.42926	n/a	639.110901	676.333496	6.57362986
81	751.614563	n/a	640.30658	679.427429	6.22827482
82	752.657837	n/a	641.68573	682.519348	6.15496206
83	753.472412	n/a	643.314331	683.91449	5.99132347
84	752.62915	n/a	645.215332	684.773071	5.78936052
85	748.080261	n/a	646.972656	684.66571	5.60794878
86	739.299927	n/a	648.968567	683.195251	5.46326923
87	728.683533	n/a	650.773254	682.294983	5.28283978
88	718.23761	n/a	651.951721	680.299866	5.15412235
89	707.600159	n/a	652.184753	678.312988	5.08082438
90	697.705444	n/a	652.597534	676.586609	4.8444953
91	689.15387	n/a	652.264099	674.588135	4.79004002
92	680.854492	n/a	651.353943	672.41748	4.64334011
93	672.407593	n/a	650.606323	670.216187	4.7897377
94	666.407959	n/a	649.456055	668.430481	4.58863306
95	661.314758	n/a	647.876831	666.368591	4.47950077
96	656.661987	n/a	646.539612	663.934143	4.29801178
97	651.287659	n/a	644.918579	661.663818	4.1522994
98	645.835205	n/a	643.652588	659.477295	4.06240988
99	640.600159	n/a	643.355591	656.952087	4.0070405
100	634.857117	n/a	642.90033	654.333008	4.00701666
101	627.522644	n/a	642.223633	651.427002	3.90169001
102	619.196594	n/a	642.043518	648.584839	3.77526093
103	611.166748	n/a	641.029541	645.762329	3.92094564
104	603.185181	n/a	640.329102	642.572083	3.86621046
105	595.00885	n/a	639.503113	639.919617	3.66740036
106	586.858154	n/a	638.104919	637.319092	3.55651331

107	578.373291	n/a	636.914673	634.775696	3.5387187
108	571.195557	n/a	635.22876	631.946472	3.50357556
109	564.473511	n/a	633.068604	628.978027	3.44798374
110	557.310425	n/a	630.638489	626.496521	3.37620449
111	550.565002	n/a	628.35199	623.811646	3.32175946
112	544.455872	n/a	626.024658	620.73822	3.34066892
113	538.506165	n/a	623.347046	618.093933	3.23084068
114	532.512451	n/a	621.049316	615.816223	3.267663
115	526.815063	n/a	618.746704	612.937622	3.24940467
116	521.482605	n/a	616.223267	610.269714	3.1580565
117	516.448486	n/a	613.800903	607.946289	3.15463614
118	511.757507	n/a	611.481201	605.253174	3.10529518
119	508.059906	n/a	609.241699	602.378357	3.10499024
120	504.237579	n/a	606.66571	599.785034	3.36117005
121	500.990082	n/a	604.281738	597.673462	3.2514689
122	497.399963	n/a	601.526978	595.026306	3.23262143
123	494.039429	n/a	599.351563	592.594116	3.01316214
124	490.42569	n/a	596.960388	589.989685	2.92310238
125	486.950226	n/a	594.448853	587.748108	2.90603733
126	483.810364	n/a	592.256897	585.099854	3.01353979
127	481.324829	n/a	590.577454	583.248291	2.92240548
128	478.604462	n/a	587.770935	581.050293	2.7756741
129	476.228912	n/a	585.47821	578.416626	2.74059916
130	473.014343	n/a	583.672729	576.369202	2.84845519
131	469.901184	n/a	581.557373	574.738892	2.75783157
132	467.1297	n/a	579.317261	572.913818	2.63224745
133	464.407013	n/a	577.866455	571.559326	2.6494956
134	462.114014	n/a	575.862854	569.80188	2.5221417
135	459.468811	n/a	574.287231	568.527954	2.72251582
136	456.819458	n/a	572.565552	566.883972	2.46720982
137	454.431732	n/a	570.985107	565.357605	2.44818687
138	452.100037	n/a	568.816406	564.022278	2.48562813
139	449.881378	n/a	567.39917	562.055908	2.49407053

140	447.867828	n/a	565.046326	560.656555	2.39434886
141	445.603271	n/a	563.676514	559.095459	2.39478111
142	444.049255	n/a	561.868164	557.627014	2.28576088
143	441.981232	n/a	559.980286	556.009766	2.32259297
144	440.40625	n/a	558.580933	554.491028	2.21280122
145	438.868195	n/a	557.02594	552.940308	2.1952517
146	437.10202	n/a	555.761353	551.491577	2.28612208
147	435.346832	n/a	554.096924	549.842041	2.10427451
148	433.462494	n/a	552.515991	548.34082	2.14124489
149	431.849854	n/a	550.611511	547.029419	2.01419973
150	429.731171	n/a	549.203186	545.685547	1.94082582
151	427.886993	n/a	547.925232	543.877686	1.95939279
152	426.130859	n/a	546.138245	541.798279	1.99564314
153	424.439209	n/a	544.256592	539.951782	1.86892176
154	422.467896	n/a	542.596924	538.254272	2.10495043
155	420.802246	n/a	540.945984	536.57489	1.81356156
156	418.872406	n/a	539.199158	534.811951	1.77701819
157	417.359314	n/a	537.724182	533.151184	1.97835302
158	415.774994	n/a	536.104126	531.584839	1.86941588
159	414.10556	n/a	534.718506	529.875366	1.75985754
160	412.924561	n/a	533.112122	528.320129	1.65018618
161	411.291901	n/a	531.576904	526.475037	1.52372038
162	409.676331	n/a	530.371277	524.821411	1.54192483
163	408.17157	n/a	528.904053	523.152405	1.54179323
164	406.363892	n/a	527.388367	521.595398	1.46862495
165	404.597229	n/a	525.79425	519.761353	1.4512161
166	402.652222	n/a	524.64093	517.990417	1.45117569
167	400.913757	n/a	523.000061	516.289551	1.41488194
168	399.090668	n/a	521.489014	514.510071	1.37898302
169	397.113464	n/a	519.552002	513.115723	1.41484904
170	395.237183	n/a	518.149536	511.084991	1.46915209
171	393.163574	n/a	516.419739	509.577118	1.32418358
172	391.190338	n/a	514.652771	507.917633	1.41604161

173	388.856018	n/a	512.982117	506.012054	1.25243807
174	386.911285	n/a	510.836639	504.231323	1.36195397
175	384.596741	n/a	508.830688	502.185577	1.19752729
176	382.645447	n/a	506.996216	500.183258	1.19766259
177	380.479431	n/a	505.806976	498.400879	1.10709286
178	378.472656	n/a	503.769897	496.702026	1.08775353
179	376.561646	n/a	501.58252	495.237549	1.08835018
180	374.93869	n/a	499.459625	493.637695	1.10845876
181	373.656219	n/a	497.528076	491.877258	1.15985191
182	372.228668	n/a	495.901764	490.630066	1.3630178
183	371.107758	n/a	494.229919	489.26825	1.41687226
184	369.907745	n/a	492.829712	488.002136	1.32607067
185	368.732971	n/a	491.301208	486.219025	1.25319028
186	367.709564	n/a	489.895966	484.573669	1.25333977
187	366.35965	n/a	488.669586	483.149048	1.39900875
188	365.143768	n/a	487.470703	482.018585	0.834366798
189	364.232483	n/a	486.221619	480.441895	0.761894584
190	363.372589	n/a	484.986847	479.421783	0.779165149
191	362.421112	n/a	484.173523	477.822113	0.811454475
192	361.672455	n/a	483.058105	476.388336	0.696239352
193	360.953308	n/a	482.015839	474.973145	0.742794454
194	359.674133	n/a	481.061035	473.663971	0.677747846
195	358.718384	n/a	480.370087	472.229126	0.604469657
196	357.570038	n/a	479.383972	470.850677	0.640829861
197	356.357483	n/a	478.301056	469.384979	0.797098219
198	355.173615	n/a	477.041168	468.041107	0.94270736
199	353.958679	n/a	475.595215	466.676819	0.77754426
200	353.038727	n/a	474.416718	465.387207	0.458106101
201	351.811188	n/a	473.316895	464.302856	0.676958323
202	350.73996	n/a	472.124481	462.935242	0.378926724
203	349.833282	n/a	471.44696	461.839813	0.329784006
204	349.020508	n/a	471.255371	460.650391	0.312067062
205	348.62146	n/a	470.427765	460.157104	0.257069528

206	348.138062	n/a	470.070984	459.142456	0.311378479
207	347.881836	n/a	469.459167	458.393585	0.167264611
208	347.901764	n/a	468.755981	457.680786	0.183422714
209	347.633362	n/a	467.985413	457.097595	0.437106252
210	347.559601	n/a	467.522308	456.481842	0.421095401
211	347.747101	n/a	466.910553	456.128174	0.638795495
212	347.91272	n/a	466.710022	455.541504	0.476896673
213	347.96286	n/a	466.477509	455.252258	0.275134116
214	348.124207	n/a	466.163452	454.920471	0.383429796
215	348.556702	n/a	465.860199	454.70401	0.49320057
216	348.90509	n/a	465.743469	454.521973	0.257391006
217	348.8797	n/a	465.662323	454.298035	0.257701278
218	349.127502	n/a	465.51297	454.115723	0.366291523
219	349.400635	n/a	465.090393	454.064209	0.548491955
220	349.592957	n/a	464.842529	453.980164	0.166911721
221	349.706268	n/a	464.854248	453.700439	0.038298037
222	349.677673	n/a	464.584808	453.180786	0.111384101
223	349.859192	n/a	464.110046	452.401611	0.312215835
224	349.476379	n/a	463.150391	451.94516	0.167023122
225	349.310608	n/a	462.615845	451.51416	0.108448848
226	348.866028	n/a	461.810608	450.874603	0.020780709
227	348.5047	n/a	461.213379	450.527496	0.420971304
228	348.080872	n/a	460.259033	449.99295	0.239826575
229	347.949188	n/a	459.995575	449.570282	0.621590734
230	347.479248	n/a	459.385986	449.052429	0.05687777
231	347.055237	n/a	458.99585	448.660675	0.494126916
232	346.701843	n/a	458.515228	448.230072	0.220028177
233	346.485565	n/a	458.062805	447.827057	0.548270643
234	345.922272	n/a	457.258026	447.165344	0.220330223
235	345.562866	n/a	456.750946	446.68811	0.166913956
236	345.317963	n/a	456.123047	446.172211	0.166888535
237	344.511017	n/a	455.860199	445.327698	0.220081255
238	343.870728	n/a	455.131897	444.500031	0.329183638

239	343.3526	n/a	454.264679	444.026978	0.383396149
240	342.848938	n/a	453.550354	443.124573	0.402847648
241	342.203278	n/a	452.917786	442.197876	0.202062264
242	341.72049	n/a	452.124664	441.553406	0.02067529
243	341.372681	n/a	451.716461	440.672119	0.111571759
244	340.806335	n/a	450.729187	439.732574	0.256831765
245	340.055634	n/a	449.932739	438.874939	0.07543657
246	339.274384	n/a	449.095245	437.940002	0.020207265

PRODUCT:	38ST-D	
MANUFACTURER:	FOYERS SUPREME INC.	
TEST:	38STD250218	
DATE:	18-02-2025	
TIME (MIN):	234	
WEIGHT/WET (LB):	22.4034691	
WEIGHT/DRY (KG):	8.211226231	
BURN RATE (KG/HR):	2.105442623	
STARTING WEIGTH RANGE [20% - 25%]:	4.48069382	5.600867275
STARTING WEIGHT [%]	18.09251037	
DELTA T° (F):	25.24443533	
CATCH (mg):	2.00	

LOAD CONFIGURATION							
	W (IN)	**H (IN)**	**L (IN)**	**HUMIDITY (%)**	**SPACERS**	**WEIGHT (LB)**	**SPECIES**
1	4	4	20	20	4	5.6	BC FIR
2	4	4	20	20	4	5.6	BC FIR
3	4	4	20	20	4	5.6	BC FIR
4	4	4	20	20	4	5.6	BC FIR
						22.4	

TIME	**TOP - T°**	**BOT - T°**	**RIGHT - T°**	**LEFT - T°**	**WEIGHT (LB)**
0	349.546783	n/a	462.372223	445.630981	4.05334997
0	345.224457	n/a	458.519012	441.660583	4.20030642
0	339.391541	n/a	454.472534	438.650513	#29.3802032
1	327.956512	n/a	448.86673	433.602814	#21.9484711
2	318.464783	n/a	442.627625	428.044922	22.4034691
3	314.342621	n/a	436.681946	422.521729	21.9728985
4	314.298767	n/a	431.667114	417.48941	21.8199539
5	316.076843	n/a	427.413483	413.098755	21.6908436
6	325.091766	n/a	424.071259	409.697937	21.5829353
7	338.859009	n/a	423.035553	406.878937	21.1834736

8	359.693085	n/a	423.666443	405	21.4191685
9	389.182922	n/a	425.534637	403.965302	21.5758705
10	427.924377	n/a	427.027222	403.358582	21.5834999
11	466.576904	n/a	429.003937	402.538025	20.9877071
12	505.024536	n/a	431.799774	402.876617	21.3572292
13	541.738708	n/a	435.429596	405.448364	20.7806511
14	573.93512	n/a	439.71109	409.531097	19.9931278
15	593.835327	n/a	444.705078	414.220551	19.9491177
16	602.196411	n/a	449.995117	419.508728	19.4041653
17	606.765869	n/a	455.536346	424.098511	19.1490479
18	607.201904	n/a	460.33728	428.505493	18.8370609
19	603.842041	n/a	463.44632	432.412262	18.5113506
20	597.311157	n/a	465.17746	435.236816	18.1638584
21	589.830383	n/a	465.71344	438.071381	18.0911198
22	582.132141	n/a	466.76123	441.163666	17.7298164
23	574.604492	n/a	467.652222	443.170898	17.690527
24	569.526123	n/a	470.093842	443.934174	17.5637493
25	567.938232	n/a	473.059662	444.720703	17.5270252
26	570.004822	n/a	475.707642	444.899078	17.2546692
27	574.526123	n/a	479.389252	445.532623	17.0903435
28	581.353271	n/a	483.171631	446.648132	16.8003807
29	588.151245	n/a	486.203857	447.36554	16.7825794
30	594.800781	n/a	489.756226	448.475281	16.453949
31	601.312439	n/a	492.836151	449.78656	16.3267822
32	606.294678	n/a	497.07193	451.796112	16.2722549
33	611.630493	n/a	501.576263	453.739807	15.9079094
34	615.826294	n/a	505.292816	455.97226	15.5976858
35	618.502014	n/a	509.1203	458.04245	15.342308
36	620.820313	n/a	512.681946	460.791321	15.123023
37	623.366882	n/a	516.340942	463.52179	15.0146875
38	625.390198	n/a	519.490479	466.233093	14.7963657
39	627.293335	n/a	522.473206	469.002747	14.6324043
40	630.598145	n/a	525.438293	471.778412	14.4130449

41	635.329346	n/a	528.137756	474.678131	14.2664366
42	640.805603	n/a	530.38623	477.725159	14.0843449
43	644.05719	n/a	532.540588	480.909912	13.9378033
44	645.663086	n/a	535.076233	483.607269	13.9938297
45	647.872498	n/a	537.373535	486.841766	13.5992346
46	651.563843	n/a	539.952271	490.020782	13.6355648
47	658.582031	n/a	541.75946	493.443909	13.4343958
48	665.039185	n/a	543.812073	496.817108	13.1433134
49	670.03717	n/a	545.683411	500.408844	13.0882463
50	675.864075	n/a	548.128052	504.230286	12.9261074
51	680.433105	n/a	550.667603	508.334503	12.7970171
52	683.845459	n/a	553.382568	512.101318	12.5057468
53	686.776062	n/a	556.464478	516.279236	12.2144699
54	688.571716	n/a	558.869446	520.530396	12.0145712
55	691.01947	n/a	561.833801	524.423828	11.7951574
56	693.867371	n/a	564.146667	528.282227	11.5952063
57	696.13092	n/a	566.880005	532.130737	11.6144905
58	697.847595	n/a	569.13269	535.603149	11.4140921
59	699.48053	n/a	571.311401	538.323364	11.032012
60	701.230957	n/a	573.291077	541.075256	10.8306665
61	702.152771	n/a	574.982544	543.780029	10.6308317
62	701.859375	n/a	577.111938	545.85614	10.5222502
63	699.959717	n/a	578.839844	548.104248	10.309
64	697.796753	n/a	581.20752	550.238647	10.1249199
65	696.170349	n/a	583.52179	552.135559	9.96229649
66	693.824646	n/a	585.255859	554.153442	9.78108025
67	692.362183	n/a	587.089478	556.040771	9.61681843
68	691.988831	n/a	588.68219	557.924744	9.47040367
69	692.753967	n/a	590.752625	559.536072	9.32612038
70	693.502502	n/a	592.305786	561.430908	9.14670181
71	692.827515	n/a	594.197937	563.235535	9.05141449
72	691.04541	n/a	595.757813	564.886169	8.85096455
73	689.679321	n/a	597.347168	567.00769	8.68787384

74	687.164124	n/a	599.194824	568.370178	8.54171467
75	684.093384	n/a	600.809265	569.801392	8.50402737
76	681.401184	n/a	603.063721	571.267883	8.32242012
77	679.016907	n/a	605.559448	573.323914	8.13983727
78	677.038635	n/a	607.264893	574.32666	7.94052458
79	675.287292	n/a	609.489319	575.691895	7.77630711
80	674.378052	n/a	612.232056	577.164307	8.03126907
81	672.598938	n/a	615.113098	578.675781	7.5219121
82	670.461975	n/a	618.320801	581.028015	7.4875741
83	669.211914	n/a	620.584961	582.741638	7.25006676
84	668.390503	n/a	622.925598	585.361267	7.09015846
85	667.698425	n/a	624.17334	588.08905	7.01810217
86	667.324097	n/a	624.977356	590.752319	6.85399389
87	667.602356	n/a	625.661621	593.228149	6.72584772
88	668.233887	n/a	626.220764	595.21936	6.58039474
89	668.103821	n/a	626.47644	597.489502	6.48934507
90	667.039185	n/a	626.717834	599.491333	6.398633
91	666.680603	n/a	627.925598	601.336182	6.27018166
92	667.021606	n/a	628.072571	603.143494	6.12513685
93	668.096863	n/a	628.693542	605.03595	5.99747658
94	670.469849	n/a	628.268738	607.206543	5.90721655
95	672.170349	n/a	628.056396	609.151306	5.79638863
96	675.208862	n/a	627.637695	610.873901	5.72326708
97	678.651123	n/a	627.567322	612.536316	5.5963769
98	680.447632	n/a	627.780273	614.873352	5.45096588
99	680.499329	n/a	627.961609	616.646851	5.32384539
100	680.776611	n/a	627.920837	618.149109	5.2326622
101	681.043274	n/a	627.695984	619.622681	5.15958309
102	680.441772	n/a	626.834229	621.342468	5.05094862
103	678.501953	n/a	624.933533	623.070251	4.92340946
104	676.061401	n/a	623.033447	624.565613	4.97837496
105	673.315979	n/a	621.527832	625.578857	4.7402854
106	671.551331	n/a	619.92749	626.18335	4.65051413

107	668.967285	n/a	619.345398	625.460815	4.57638836
108	664.843872	n/a	618.729004	624.690979	4.54153442
109	659.274719	n/a	618.756287	623.313416	4.43075132
110	652.963745	n/a	618.680359	621.744934	4.34138107
111	646.8573	n/a	619.204468	620.417114	4.28657866
112	640.282471	n/a	618.721741	619.078735	4.21536827
113	633.367737	n/a	617.680786	617.891785	4.15982723
114	625.6828	n/a	617.029968	616.48114	4.05011463
115	617.192078	n/a	615.431702	614.712219	4.03215694
116	607.314941	n/a	613.314331	612.74054	3.99674416
117	596.07135	n/a	611.203247	610.555176	3.90984154
118	585.278931	n/a	609.493896	607.575073	3.92850661
119	574.141479	n/a	607.246826	604.609009	3.85687327
120	563.609558	n/a	605.43396	601.314697	3.75580645
121	553.410767	n/a	603.529419	598.101074	3.72861981
122	544.74115	n/a	602.179504	595.431641	3.69268513
123	536.355713	n/a	600.783447	593.060242	3.63747072
124	529.217285	n/a	599.230957	590.328918	3.6007762
125	522.375	n/a	597.950073	588.186523	3.54684114
126	515.554749	n/a	596.658447	585.814209	3.52859259
127	509.408844	n/a	595.129211	583.77594	3.51231122
128	503.552551	n/a	593.478394	581.401245	3.42080092
129	498.174835	n/a	592.259521	578.989563	3.38438535
130	492.912292	n/a	590.596313	577.110046	3.34908819
131	488.608582	n/a	589.398193	575.258728	3.29409885
132	483.900482	n/a	587.846802	573.36499	3.27588248
133	479.926727	n/a	586.344116	571.283569	3.25698876
134	476.232605	n/a	584.550537	569.350037	3.22132611
135	472.441345	n/a	582.800964	567.137268	3.23947001
136	468.615356	n/a	581.332642	565.356262	3.16620898
137	464.984253	n/a	579.027405	563.533386	3.11238146
138	461.781403	n/a	577.667664	561.182251	3.09403348
139	458.474823	n/a	576.231689	559.467407	3.05864596

140	455.270996	n/a	574.19043	557.409668	3.02057433
141	452.4104	n/a	572.356873	554.995972	2.98508286
142	449.371887	n/a	570.901611	552.904602	2.94891405
143	446.767273	n/a	569.436279	550.744995	2.91231823
144	443.863861	n/a	567.751404	548.830933	2.89418793
145	441.055603	n/a	566.207214	546.866211	2.83929801
146	438.904327	n/a	564.178955	544.917175	2.78578305
147	436.757935	n/a	562.396912	543.314941	2.74832225
148	434.56662	n/a	560.967896	542.085876	2.72982407
149	432.643372	n/a	559.65094	540.777039	2.71174312
150	431.123566	n/a	558.123047	539.507202	2.67572665
151	429.271606	n/a	556.687866	538.276794	2.63977313
152	427.61261	n/a	555.125183	536.755127	2.60250449
153	425.972473	n/a	553.483643	535.311707	2.56662965
154	424.596649	n/a	552.431091	533.912292	2.54843783
155	423.348816	n/a	550.949219	532.794189	2.47650838
156	421.967255	n/a	549.783081	531.172424	2.4569366
157	420.668518	n/a	548.340576	529.943481	2.4210577
158	419.317413	n/a	547.500183	528.674866	2.38365078
159	418.30365	n/a	546.042419	527.360229	2.36591434
160	417.468506	n/a	544.941406	525.962036	2.49513888
161	415.911041	n/a	543.944519	524.978333	2.31290269
162	414.993073	n/a	542.694885	523.978149	2.23974705
163	413.894897	n/a	541.277649	523.211304	2.22200608
164	412.717773	n/a	540.223999	522.268982	2.16828942
165	411.964233	n/a	539.020508	521.867371	2.15034819
166	411.038391	n/a	537.970032	520.98291	2.1140461
167	410.249146	n/a	536.796387	520.308044	2.0953095
168	409.644165	n/a	535.470703	519.483948	2.04080153
169	409.146576	n/a	534.169434	518.455688	2.00464702
170	408.419067	n/a	533.081421	517.552368	1.9865607
171	408.086334	n/a	531.813171	516.989502	1.98648
172	407.493683	n/a	531.112183	516.084839	1.87768042

173	407.022034	n/a	530.142822	515.177002	1.96939933
174	406.594208	n/a	529.251526	514.484619	1.87905681
175	405.865021	n/a	528.360291	513.439819	1.76923668
176	405.513428	n/a	527.499695	512.852356	1.76917458
177	404.737518	n/a	526.314575	512.197876	1.71499503
178	404.215668	n/a	525.429138	511.717529	1.66043484
179	403.520935	n/a	524.354004	511.276306	1.6424495
180	402.863708	n/a	523.710938	510.929688	1.60804367
181	402.281738	n/a	522.98291	510.366913	1.57094693
182	401.687988	n/a	521.524292	509.908966	1.57083035
183	401.258606	n/a	520.433228	509.52005	1.55211973
184	400.240234	n/a	519.219238	508.94281	1.51598155
185	399.61908	n/a	518.01593	508.580994	1.46128082
186	398.78363	n/a	517.169312	507.979248	1.38867247
187	397.948792	n/a	516.324829	507.19693	1.37060797
188	397.094116	n/a	514.992554	506.284119	1.35323858
189	396.097717	n/a	514.089661	505.50415	1.297948
190	395.466187	n/a	512.884155	504.615845	1.27992678
191	394.606384	n/a	511.707794	503.789581	1.38931477
192	393.475128	n/a	510.934631	503.109344	1.18773019
193	392.769165	n/a	509.909668	502.04538	1.16886711
194	391.939331	n/a	508.714752	501.230621	1.1345681
195	391.157715	n/a	508.073639	500.221649	1.11711657
196	390.459229	n/a	506.855743	499.580597	1.09781754
197	389.369781	n/a	505.796112	498.735046	1.04489481
198	388.398773	n/a	504.387451	498.19165	1.08032489
199	387.579773	n/a	503.206696	497.39624	1.00757301
200	386.737152	n/a	501.801086	496.566284	0.989533842
201	386.047394	n/a	500.79007	495.285278	0.938480139
202	385.11792	n/a	499.91629	494.076508	0.916615248
203	384.142273	n/a	498.69455	492.768433	0.879784048
204	383.225037	n/a	498.058929	491.758331	0.879538774
205	382.17511	n/a	497.139771	490.598267	0.824445546

206	381.197021	n/a	496.344971	489.597015	0.878707409
207	379.954102	n/a	495.647064	488.717987	0.76950413
208	379.050171	n/a	494.579407	488.149811	0.750692606
209	377.860138	n/a	493.742401	486.529327	0.732808948
210	377.018463	n/a	493.040833	485.737305	0.685311794
211	376.18103	n/a	492.109436	485.06897	0.667732358
212	375.248077	n/a	490.997131	484.014832	0.750913918
213	374.357239	n/a	490.410828	483.13324	0.595601797
214	373.531219	n/a	489.753845	482.382782	0.577144682
215	372.677979	n/a	488.801483	481.419647	0.5769279
216	371.840363	n/a	487.909821	480.430908	0.540003181
217	370.878601	n/a	486.928802	479.742706	0.503259361
218	369.903198	n/a	486.113617	478.71701	0.522305667
219	369.018402	n/a	485.295868	477.845001	0.522701144
220	368.122742	n/a	484.667725	476.803925	0.50351882
221	367.328735	n/a	483.646362	476.084442	0.431113124
222	366.686249	n/a	482.795898	475.153198	0.467912972
223	366.165466	n/a	481.95462	474.328827	0.321666807
224	365.158661	n/a	480.661194	473.324005	0.284903616
225	364.462769	n/a	479.51413	472.227478	0.267221779
226	363.492889	n/a	478.613159	471.001465	0.229772985
227	362.631775	n/a	477.874359	470.191406	0.212274343
228	361.564514	n/a	476.763794	469.463806	0.177090168
229	360.679871	n/a	475.8573	468.483093	0.158054367
230	359.57489	n/a	474.868164	467.467255	0.121836931
231	358.603027	n/a	473.4216	466.427368	0.105177149
232	357.838806	n/a	471.796326	464.983002	0.086825453
233	356.686829	n/a	470.12146	463.885437	0.06748312
234	355.409515	n/a	468.066162	462.683685	0.032217439

PRODUCT:	38ST-D	
MANUFACTURER:	FOYERS SUPREME INC.	
TEST:	38STD250217	
DATE:	17-02-2025	
TIME (MIN):	236	
WEIGHT/WET (LB):	24.2591877	
WEIGHT/DRY (KG):	8.891376487	
BURN RATE (KG/HR):	2.260519446	
STARTING WEIGTH RANGE [20% - 25%]:	4.85183754	6.064796925
STARTING WEIGHT [%]	14.34403976	
DELTA T° (F):	-120.6121517	
CATCH (mg):	5.00	

LOAD CONFIGURATION							
	W (IN)	**H (IN)**	**L (IN)**	**HUMIDITY (%)**	**SPACERS**	**WEIGHT (LB)**	**SPECIES**
1	4	4	20	22	4	6.2	BC FIR
2	4	4	20	21	4	6	BC FIR
3	4	4	20	22	4	6.1	BC FIR
4	4	4	20	21	4	6	BC FIR
						24.3	

TIME	**TOP - T°**	**BOT - T°**	**RIGHT - T°**	**LEFT - T°**	**WEIGHT (LB)**
0	473.977264	n/a	556.936401	560.59314	3.47974753
0	458.005402	n/a	550.856018	553.655762	4.07546282
0	441.69809	n/a	544.722046	546.004578	0.053042349
1	424.199951	n/a	538.290955	538.811646	24.2591877
2	408.318024	n/a	528.86084	529.019653	23.7685318
3	395.730774	n/a	519.552612	519.005981	23.8585968
4	386.940277	n/a	510.26886	509.329437	23.6389904
5	384.058929	n/a	501.543427	500.554108	23.5339184
6	387.698761	n/a	493.260315	491.89209	23.4833355
7	399.635895	n/a	486.211029	484.75412	23.3018646

8	422.975677	n/a	480.634949	479.19986	23.1565495
9	450.387177	n/a	476.512817	475.025879	23.1661034
10	476.29895	n/a	473.834534	471.835571	22.847311
11	503.118134	n/a	472.542145	469.978363	22.4825916
12	527.661804	n/a	472.573029	469.152039	22.2278633
13	544.128601	n/a	471.516846	468.601196	21.9535332
14	565.048035	n/a	470.816315	468.917114	21.7358913
15	589.097046	n/a	473.288269	471.3284	21.4270058
16	611.592346	n/a	476.800781	475.447998	21.1730099
17	632.203491	n/a	480.228943	479.836121	20.9355793
18	648.703308	n/a	482.96698	483.615631	20.7885208
19	656.889648	n/a	485.956299	486.257568	20.7506599
20	657.152344	n/a	488.500336	488.296265	20.4609852
21	651.282959	n/a	491.624054	490.52063	20.4062099
22	642.657959	n/a	494.109955	492.308868	20.2797241
23	631.923767	n/a	497.237762	494.156219	20.1772938
24	620.635498	n/a	501.029541	496.028931	19.9211712
25	609.952271	n/a	505.173859	497.528748	19.6847801
26	602.571838	n/a	509.135284	498.613098	19.4121437
27	604.510803	n/a	512.823792	499.586914	19.1746712
28	614.296265	n/a	515.049133	501.72876	18.939291
29	628.103455	n/a	516.327698	504.642487	18.7117023
30	643.348511	n/a	516.871582	508.530334	18.4472351
31	657.350952	n/a	517.684448	512.98999	18.1928329
32	670.067017	n/a	518.262878	517.471191	17.9737549
33	682.001465	n/a	518.835327	521.867004	17.7729683
34	692.601074	n/a	519.73999	526.32251	17.5991611
35	701.939758	n/a	520.801758	530.927917	17.4094925
36	709.922913	n/a	521.932129	536.405884	17.1681938
37	717.51825	n/a	522.949036	541.464661	16.8845463
38	723.468994	n/a	524.194153	547.597717	16.6828079
39	729.020752	n/a	525.579834	553.145996	16.4297276
40	734.289673	n/a	526.77179	558.748535	16.1926765

41	739.419861	n/a	528.186279	563.96991	15.9737768
42	743.885193	n/a	530.166443	568.856018	15.7723351
43	747.277222	n/a	532.625977	573.511475	15.5722637
44	749.806946	n/a	535.264221	577.926086	15.408082
45	752.150269	n/a	538.449768	582.614075	15.1520281
46	754.546387	n/a	541.736328	586.406982	14.9352665
47	755.790771	n/a	545.433533	590.010681	14.7161093
48	756.390259	n/a	549.095276	593.326538	14.4970636
49	757.191956	n/a	552.490356	596.973572	14.2787056
50	758.109131	n/a	556.071594	600.518372	14.0250864
51	759.384888	n/a	559.863708	603.950806	13.7881756
52	760.692322	n/a	563.546143	607.911987	13.538764
53	762.023865	n/a	567.538574	611.555847	13.3021584
54	763.394958	n/a	571.043762	615.401611	13.0653925
55	764.765259	n/a	574.642639	618.995239	12.8283691
56	766.031799	n/a	578.019592	623.041199	12.592865
57	766.365967	n/a	580.80426	627.091919	12.3746157
58	767.347046	n/a	583.676514	631.187683	12.0994673
59	767.610718	n/a	586.00238	635.199219	11.8621798
60	767.497192	n/a	588.163818	639.487427	11.6269417
61	766.761169	n/a	590.447388	643.478638	11.3546648
62	766.956665	n/a	592.240234	647.698364	11.1174936
63	767.208923	n/a	594.654663	651.760132	10.880415
64	768.590149	n/a	597.167419	655.820129	10.6264448
65	769.836731	n/a	599.619385	660.153931	10.39569
66	771.974426	n/a	602.171448	663.880615	10.212944
67	773.698669	n/a	605.089417	668.00238	9.97562218
68	774.291687	n/a	608.259521	672.092896	9.75840187
69	775.637207	n/a	610.981567	675.989929	9.5767107
70	776.546936	n/a	614.268372	679.226685	9.37598419
71	778.153137	n/a	617.394409	682.494751	9.17515182
72	779.489319	n/a	621.264404	685.59668	8.97462559
73	780.354004	n/a	625.248352	688.575073	8.77476692

74	780.9599	n/a	628.628235	691.530701	8.59146881
75	781.803101	n/a	632.315674	694.254028	8.37413883
76	781.799316	n/a	636.151001	696.658325	8.15590572
77	782.735962	n/a	640.184143	699.269226	7.97374249
78	783.533813	n/a	644.336426	701.976746	7.79024601
79	783.540649	n/a	648.255737	705.215271	7.60778475
80	783.918152	n/a	652.01355	707.488525	7.39016008
81	784.296021	n/a	655.855896	710.07196	7.19583511
82	784.199402	n/a	658.780518	711.960632	7.01418447
83	785.332886	n/a	661.930847	714.259949	6.85001516
84	786.952698	n/a	665.201172	716.447327	6.66758823
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236	341.449402	n/a	442.053986	446.166962	0.025366018

APPENDIX 5: Participants

Danick Power ing.
v-p operation
Services Polytests inc.
450.741.3636
www.polytests.com

Maxime Martin
Technicien
Services Polytests inc.
450.741.3636
www.polytests.com

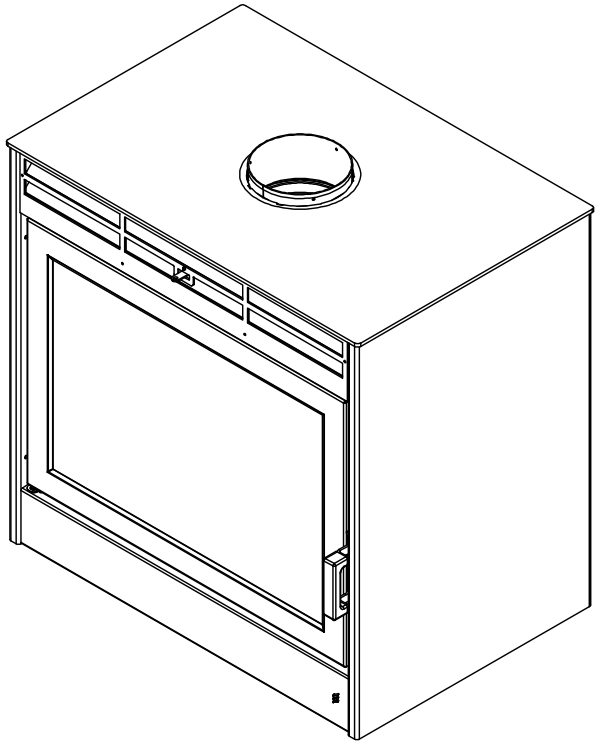
Alexander Markakis
Foyer Supreme representative
(witness only)

APPENDIX 6: Drawings and specifications

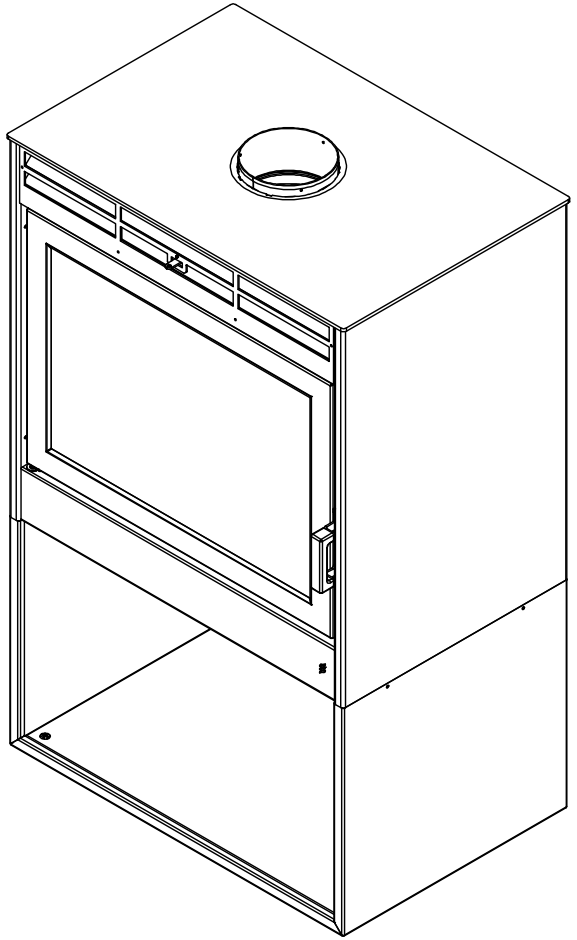
ENGINEERING DRAWINGS APPLICABLE FOR THE FOLLOWING MODEL NUMBER & MODEL NAMES:

Model Number: 38ST_D_II, 38SFC_D_II
Model Names: Elegance ST 42 II, Astra Duo 38 II, Monarch See-Through 38 II, Wayland See-Through 38 II, Novo Duo 38 II - Cast Iron, Novo Duo 38 II - Soapstone

38ST_D_II



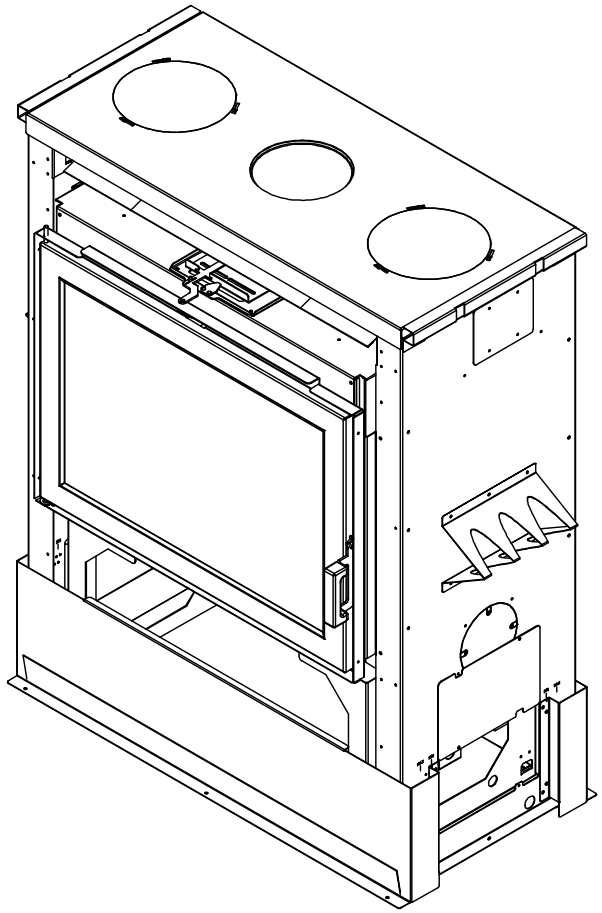
Model Name: NOVO DUO 38 II
Cast Iron - Soapstone



Model Name: NOVO DUO 38 II
Cast Iron - Soapstone

REVISION: 3 December 2025

38SFC_D_II



Model Names: Elegance ST 42 II, Astra Duo 38 II,
Monarch See-Through 38 II, Wayland See-Through 38 II

REVISION: 3 December 2025

Knitted Fiberglass Rope

Technical Data Sheet

Description:

Knitted ropes are constructed of high quality type E glass that will not burn and will withstand continuous exposure to temperatures of 540°C/1000°F. This material resists most acids and alkalis; is unaffected by most bleaches and solvents; and is highly flexible and conformable.

Applications:

Applications include boiler, coke oven, industrial oven, and wood stove doors; crucible packing and pollution control equipment; high temp tying and lacing cords; tadpole tape core ropes; and pipe wrap.

Technical Data:

Physical Properties:

Product	½" 06
Feet per box	1000
Yarn Used	E-glass 1.75
ROHS Compliant	ASTM D-578, ASTM committee D13, and subcommittee D13.18
Density	800 g/m^2
Yarn Tension	Tight
Continuous Operating Temperature	540°C
Design Build	Knit Braid
Coating	Graphite
Resistance	Resists most acids & bases Unaffected by solvents & oils
Design Capabilities	Excellent thermal protection; very flexible

Specialty Gaskets INC
Toronto • Montreal
www.specialtygaskets.com

DISCLAIMER: The information in this Technical Data Sheet is believed to be correct as of the date issued. Specialty Gaskets Inc. MAKES NO WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR COURSE OF PERFORMANCE OR USAGE OF TRADE. User is responsible for determining whether the Specialty Gaskets Inc. product is fit for a particular purpose and suitable for user's method of use or application. Given the variety of factors that can affect the use and application of a Specialty Gaskets Inc. Product it is essential that the user evaluate the Specialty Gaskets Inc. product to determine whether it is fit for a particular purpose and suitable for user's method of use or application.

Certified System ISO 9001

APPENDIX 7: Operator's manual

AMBIANCE

FIREPLACES | GRILLS

Elegance ST 42

Owner's Manual

Model Number: 38SFC_D_II

This product is proudly developed and manufactured in North America by **SUPREME FIREPLACES INC.**

3594 Jarry East, Montreal, QC H1Z 2G4
T: 877-593-4722, F: 514-593-4424
www.supremem.com

Revised: December 2025 **(DRAFT)**

IMPORTANT: Keep the owner's manual for future use.

Astra Duo 38 II

Owner's Manual

Model Number: 38SFC_D_II

This product is proudly developed and manufactured in North America by **SUPREME FIREPLACES INC.**

3594 Jarry East, Montreal, QC H1Z 2G4
T: 877-593-4722, F: 514-593-4424
www.supremem.com

Revised: December 2025 **(DRAFT)**

IMPORTANT: Keep the owner's manual for future use.

Monarch See-Through 38 II

Owner's Manual

Model Number: 38SFC_D_II

This product is proudly developed and manufactured in North America by **SUPREME FIREPLACES INC.**

3594 Jarry East, Montreal, QC H1Z 2G4
T: 877-593-4722, F: 514-593-4424
www.supremem.com

Revised: December 2025 **(DRAFT)**

IMPORTANT: Keep the owner's manual for future use.

Wayland See-Through 38 II

Owner's Manual

Model Number: 38SFC_D_II

This product is proudly developed and manufactured in North America by **SUPREME FIREPLACES INC.**

3594 Jarry East, Montreal, QC H1Z 2G4
T: 877-593-4722, F: 514-593-4424
www.supremem.com

Revised: December 2025 **(DRAFT)**

IMPORTANT: Keep the owner's manual for future use.

Novo Duo 38 II

Cast Iron - Soapstone

Owner's Manual

Model Number: 38ST_D_II

This product is proudly developed and manufactured in North America by **SUPREME FIREPLACES INC.**

3594 Jarry East, Montreal, QC H1Z 2G4
T: 877-593-4722, F: 514-593-4424
www.supremem.com

Revised: December 2025 **(DRAFT)**

IMPORTANT: Keep the owner's manual for future use.

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1 SAFETY

SUPREME FIREPLACES INC. congratulates you on purchasing an Astra Duo wood burning fireplace. This manual describes the installation and operation of the Astra Duo non-catalytic wood heater. The Astra Duo 38 II model meets the 2020 U.S. Environmental Protection Agency's cordwood emission limits for wood heaters sold after May 15, 2015. Under specific test conditions, this heater has been shown to deliver heat at a rate of 25,403 Btu/hr. In addition, this fireplace complies with the ULC-S610 and UL-127 standards.

SAFETY NOTICE: Carefully read this manual before installation and operation of this fireplace. A house fire may result if not properly installed. To reduce the risk of a fire, follow the installation instructions. Failure to follow instructions presented in this manual can lead to property damage, bodily injury or even death. Alterations or modifications made on the unit or the installation is strictly forbidden as it may predispose the user to hazardous risks. Contact your local building or fire officials for restrictions and installation inspection requirements in your area and the need to obtain a permit.

WARNING: This unit is hot during operation; keep children, pets, flammable liquids, or combustible materials at a safe distance. Ensure that all clearances to combustible materials are respected. Contact with the unit during operation may cause severe harm. Install a safety screen to keep children and pets away. To avoid the risk of damaging fireplace materials and increasing the risk of spreading a fire, do not use this fireplace to cook or warm food.

CAUTION:

- Do not connect this unit to a chimney flue serving another appliance.
- Do not connect to any air distribution duct or system.
- Never use chemicals to ignite the fire.
- Never burn waste or flammable fluids (such as gasoline, naphtha, or engine oil).
- Only burn dry natural cordwood.
- Never leave the unit unattended with the door open or unlatched.
- Only refuel this unit when the wood is reduced to embers.
- Always keep the door closed during operation.
- Do not operate this unit with a fireplace grate.
- Do not install an unvented gas log set into the firebox.
- Do not install this unit in a mobile home.
- Do not clean or service the unit while it is hot.
- Do not use a fireplace insert or other products not specified for use with this fireplace.
- Allow proper air flow by keeping the louvers/openings clear of any obstructions.

Note: Failure to respect the above cautions may cause damages to the unit, damages to personal property, bodily harm and will void the warranty. "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."

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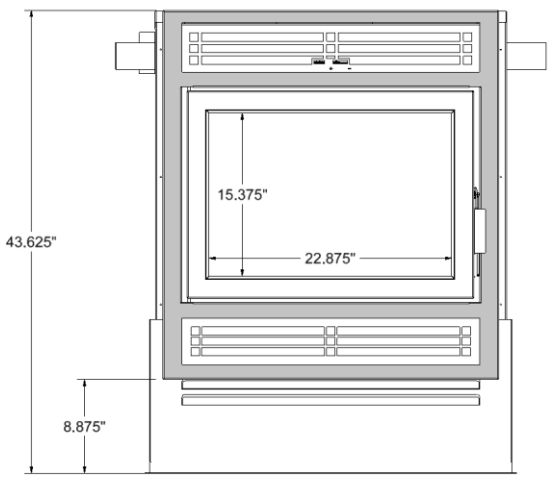
We recommend that our woodburning hearth products be installed and serviced by professionals who are certified in the U.S. by the National Fireplace Institute® (NFI) as NFI Woodburning Specialists or who are certified in Canada by Wood Energy Technical Training (WETT).

Wood Energy Technical Training www.wettinc.ca

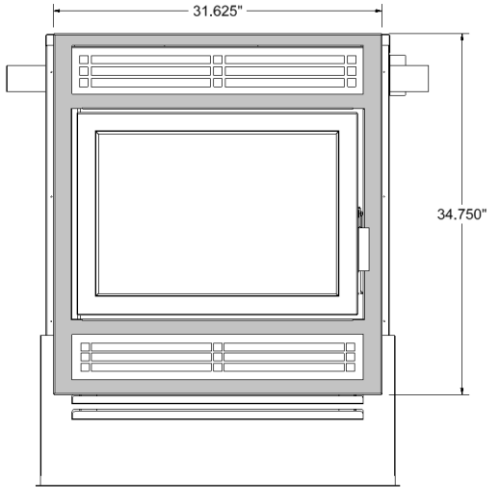
This product can expose you to chemicals including carbon monoxide, which is known to the State of California to cause cancer, birth defects or other reproductive harm. For more information go to www.P65warnings.ca.gov/

2 GENERAL INFORMATION

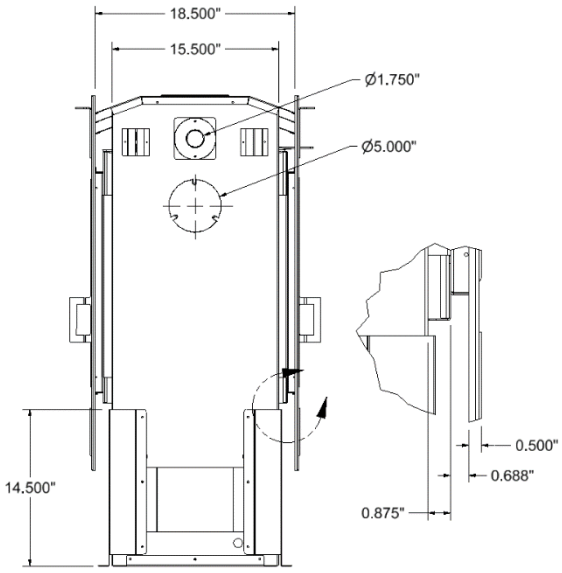
2.1 Dimensions – Astra Duo 38 II Traditional



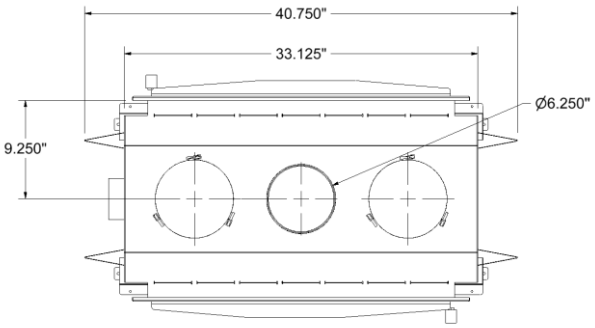
FRONT VIEW



BACK VIEW

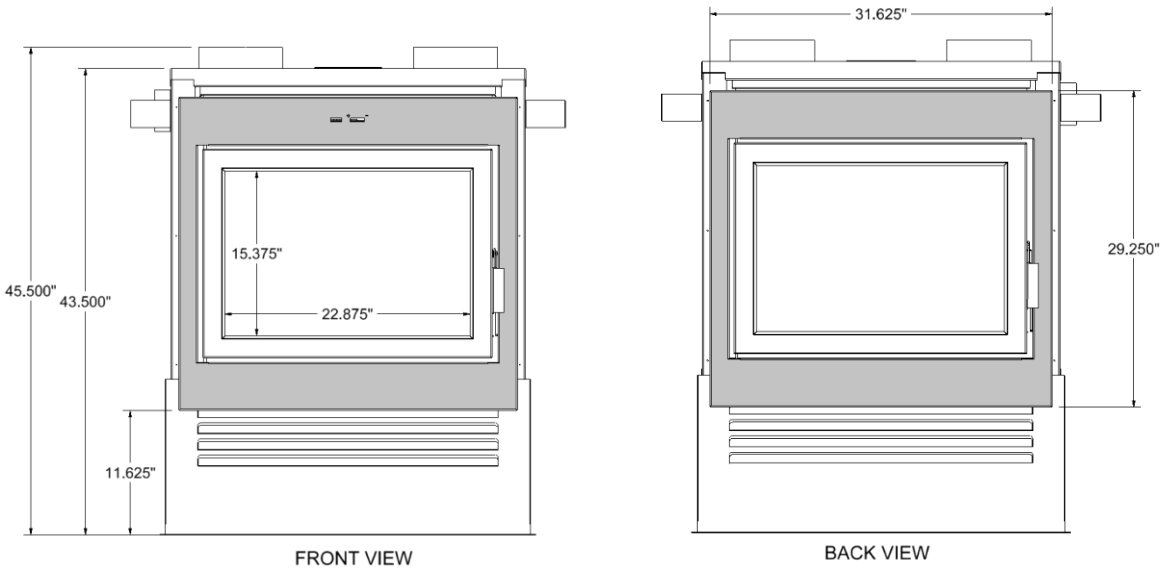


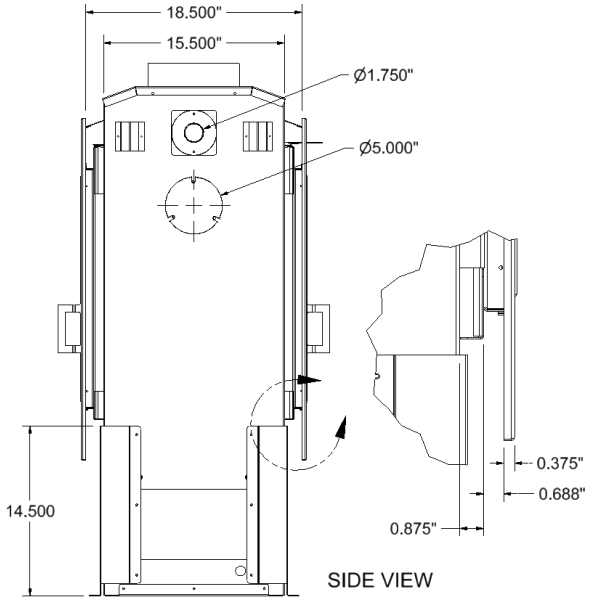
SIDE VIEW

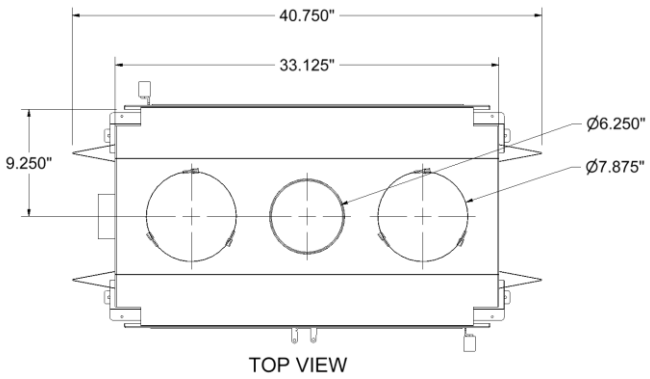


TOP VIEW

2.2 Dimensions – Astra Duo 38 II Contemporary







2.3 Specifications

Model:	Astra Duo 38 II
Appliance Type	Single Burn Rate Wood Heater – Non-Catalytic
Fuel Type:	Dry Cordwood
Maximum Log Length:	24 in (60.9 cm)
Burn Time[1]:	6 hrs
Firebox Volume[2]:	4.48 ft^3 (0.127 m^3)
Heating Area:	1,500 to 2,500 ft^2 (139 to 232 m^2)
Average Particulate Emissions Rate[3]:	1.4 g/hr
Average CO Emissions Rate:	2.15 g/min
EPA Protocol:	Method 28R, ASTM2780-10, and ASTM2515-11
Efficiency (Crib Wood):	HHV[4]: 70% | LHV[5]: N/A
Heat Output (Crib Wood):	25,289 BTU/hr (7,411 W)
Optimum Efficiency:	75%
Optimum Heat Output:	125,000 BTU (36.6 kWh)
Efficiency Protocol:	CSA B415.1-10

WARRANTY REGISTRATION

Please register your SUPREME product online at http://www.supremem.com/warranty.php to ensure full warranty coverage. Proof of purchase is required for all warranty claims.

[1] Depending on combustion air control setting (see Section 5.3 for further details).
[2] Usable volume according to ASTM E2780-10 standard is calculated at 3.49 ft^3 - figure used in EPA Method 28R testing.
[3] Officially tested and certified by an independent laboratory.
[4] Higher Heating Value.
[5] Lower Heating Value.

2.4 Combustion Air Control

The Combustion Air Control is a patented mechanism (Patent No: US 7,325,541 B2) that regulates the air flow into the firebox based on the temperature of the unit. It is located on the top of the firebox, at the front center of the unit. The combustion air control of the Astra Duo is a single burn rate mechanism with an Activator lever (see Figure 2-1). When starting a fire or adding a new load of wood, the Activator must be pushed in to allow a primary source of air to enter the firebox. The Activator will retract automatically with heat.

WARNING: Never manipulate the Combustion Air Control with bare hands as it gets hot when the Astra Duo is in operation. Use the Cold Hand Key (see Section 2.5) to adjust the Combustion Air Control.

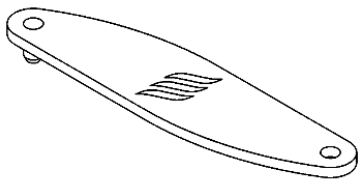


Figure 2-1: Cold Hand Key

2.5 Cold Hand Key

The Cold Hand Key is an accessory that comes standard with the Astra Duo fireplace (Figure 2-2). The Cold Hand Key is a tool used to manipulate the Combustion Air Control Levers when they are hot.

2.6 Baffle Secondary Burn Technology

The baffle system (38SFD1150) of the Astra Duo fireplace is located within the upper portion of the firebox and is fastened by 8 bolts (3/8 Hex). SUPREME baffle systems are constructed out a specific grade of stainless steel capable of withstanding high-temperature conditions. The secondary combustion air is drawn into the baffle system, pre-heated, and distributed below the lower plate, allowing for a cluster of small flames flowing downwards. This effect is more visible in the minimum burn rates. For optimal performance, it is recommended to clean any creosote build-up on the lower plate of the baffle system.

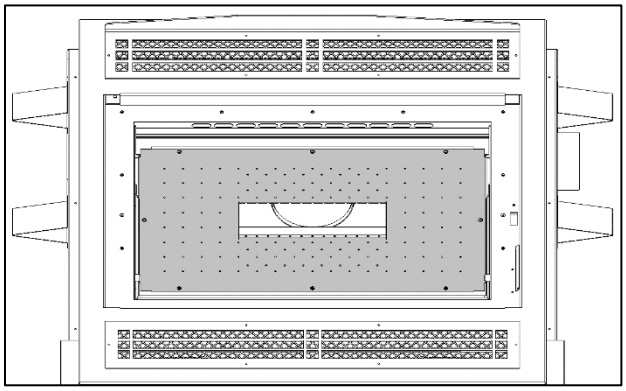


Figure 2-2: Baffle Secondary Burn Technology

2.7 Bypass System

The bypass system is located at the baffle of the Astra Duo, which permits direct access to the chimney (Figure 2-4). When the door (side of primary air control) is closed, a push rod actuates the bypass system cap to block the baffle opening. When the door (side of primary air control) is open, the push rod springs forward and opens the bypass system cap in the baffle opening, which reduces the risk of smoke spillage into the dwelling during refueling of the unit.

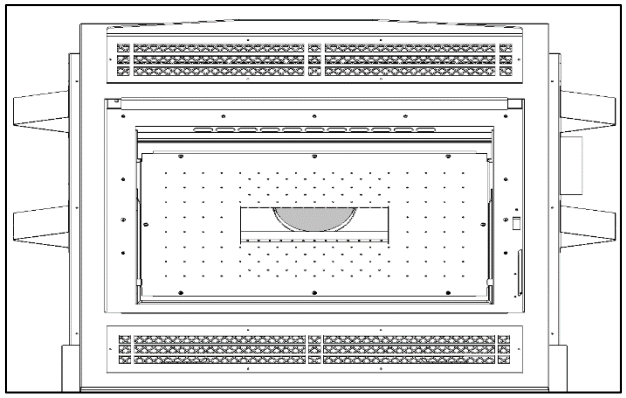


Figure 2-3: Bypass System Cap

WARNING: The bypass system cap should be always blocking the access to the chimney during combustion. A bypass system cap that is not blocking the baffle hole during combustion is a safety hazard, will overheat the fireplace and void the warranty.

2.8 Door

The Astra Duo wood burning fireplace comes with a Pyroceramic glass panel door. Pyroceramic is the highest grade available for fireplaces and stoves and can withstand temperatures up to 1300ºF. To remove the door, open the door, lift it and pull it towards the bottom until the rod exits from the hinge holes.

2.9 Certification Label

The certification label contains important information regarding the installation and operation of the Astra Duo fireplace. In addition, the serial number of the unit is permanently embossed onto the top right corner. See Figure 2-5 for the location of the certification label.

2.10 Removable Ash Lip

The Ash Lip is a removable accessory that comes standard with the Astra Duo fireplace. It is installed on the door holder (under the two small pins below the door) and prevents ashes from falling onto the front of the hearth (Figure 2-6). The Ash Lip can be installed with the door open or closed. It is safe to operate the unit without the Ash Lip.

NOTE: The door of the Astra Duo must always remain closed during operation.

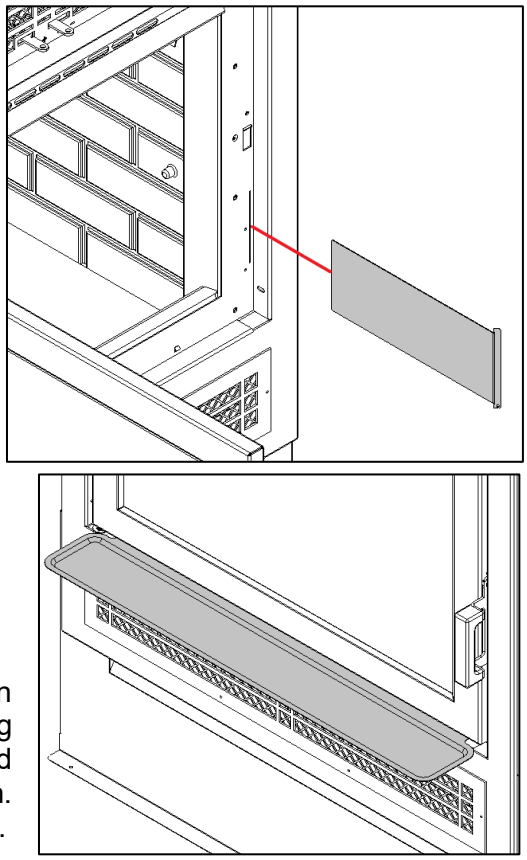


Figure 2-5: Removable Ash Lip

2.11 Cast Iron Interior

The Astra's stainless steel firebox is lined with cast iron panels for an extra layer of durability and strength. Designed to provide long-lasting heat and thermal protection, these industry-first, decoratively stamped panels also provide the added benefit of the timeless beauty of cast iron. Forged in fire, tempered with time, the Astra offers a lifetime of warmth.

2.12 Optional Fresh Air Kit

The Optional Fresh Air Kit (kit number UPEA4) allows for exterior air (outdoors) to be drawn into the fireplace during operation of the unit. Note that a 4 inch insulated duct is required for the installation (item ordered separately). Refer to Section 4.2 for installation instructions. Contact your local building official regarding mandatory fresh air kit installations within your area.

CAUTION: Only a fresh air kit provided by SUPREME FIREPLACES INC. can be installed onto the fireplace. Substituting the fresh air kit may result in overheating and will void the warranty.

2.13 SUPREME Rafter Radiation Plate

The SUPREME Rafter Radiation Plate (SFD7010) is a standard component for the Astra Duo fireplace. Prior to installing the chimney, the SUPREME Rafter Radiation Plate is fastened at the center of the four sides of the chimney opening in roof, giving a thermal protection to the rafters. The SUPREME Rafter Radiation Plate kit is included with the unit, which consists of 4 plates (Item 4 in Figure 3-4).

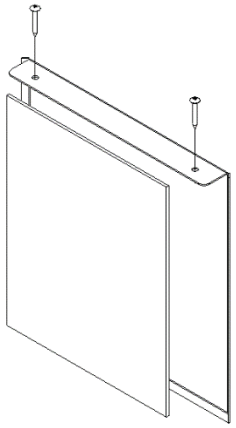


Figure 2-6: SUPREME Rafter Radiation Plate

3 INSTALLATION INSTRUCTIONS

Before installing the unit, consult an authority having jurisdiction (such as your municipal building department, your fire department, your fire prevention department...) for any local codes and whether a permit is required. In the absence of local codes, refer to the CSA B365 Installation Code for Solid Burning Appliances and Equipment (Canada) or the ANSI NFPA 211 Standard for Chimneys, Fireplaces, Vents and Solid Fuel-Burning Appliances (USA). **CAUTION: Modifications/alterations to the unit/installation without written authorization from SUPREME FIREPLACES INC. are strictly forbidden and will void the warranty.** Refer to Section 1 for further safety information. Carefully read the instructions below before installing your Astra Duo.

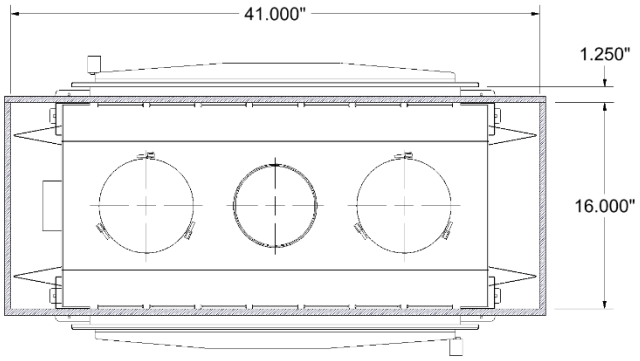


Figure 3-1: Straight Wall Installation

3.1 Location

Determine the location of the Astra Duo by taking into consideration the following criteria:

- The size of the room with respect to the heat output of the fireplace.
- The proximity of windows, doors, and traffic flow.
- The necessary amount of space in front of the unit for the hearth extension and mantel (Refer to Sections 3.6 and 3.8).
- The clearances to combustible materials.
- The passage of the chimney.

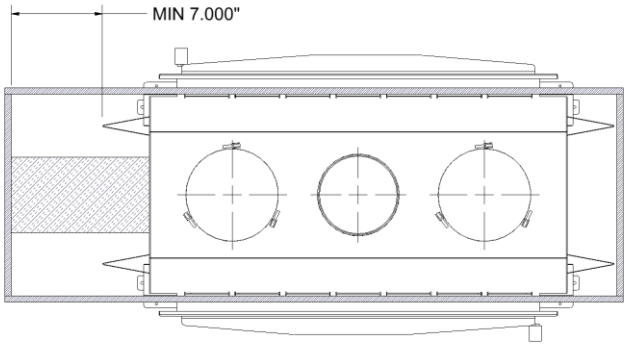


Figure 3-2: Space Requirement for Fresh Air Kit
Refer to Section 4.2

If possible, select a location for the fireplace that will minimize the number of offsets in the chimney course. Offsets will reduce the draft, complicate the chimney sweeper's work, and increase installation costs. Do not install an offset directly onto the unit/anchor plate. Technical drawings outlining the chimney route should be prepared prior to the installation. NOTE: The cutting of joists and rafters for floor, ceiling, and roof chimney penetrations will affect the load bearing capacities of the dwelling structure. To determine whether additional support is required, consult your local building codes. Improper cutting of chimney openings in the attic and roof will affect the bearing and thermal insulating capacity, as well as the weather tightness of the dwelling. Avoid incorrect workmanship by consulting a professional engineer or a certified installer.

Through examination of the floor construction, ensure that the fireplace and chimney system is resting on a surface capable of withstanding its weight. Consult your building codes to see whether additional structural supports are required (applicable for rare and isolated cases).

Avoid having the chimney outlet near any obstructions (such as trees and roof offsets) as the draft of the chimney may be affected by wind turbulence. Ideally position the outlet of the chimney at the highest area of the roof.

NOTE: Install a carbon monoxide (CO) and smoke detector near the location of the unit with respect to the requirements of the authority having jurisdiction in your area.

3.2 Chimney Installation

The Astra Duo is approved with a 6” chimney that is listed under the UL 103 / ULC S629 standards (refer to Table 3-1). **WARNING: Mixing chimney components from different brands is a safety hazard and will void the warranty on the unit.** When connecting the unit to an existing chimney, thoroughly inspect the condition of the chimney and that the installation conforms to the requirements of the chimney manufacturer and the building codes. **Note that to avoid any unnecessary risk, it is often recommended to replace the chimney system.** Always respect the clearances to combustibles from the chimney manufacturers; a minimum clearance of 2 inches is usually required for prefabricated chimneys.

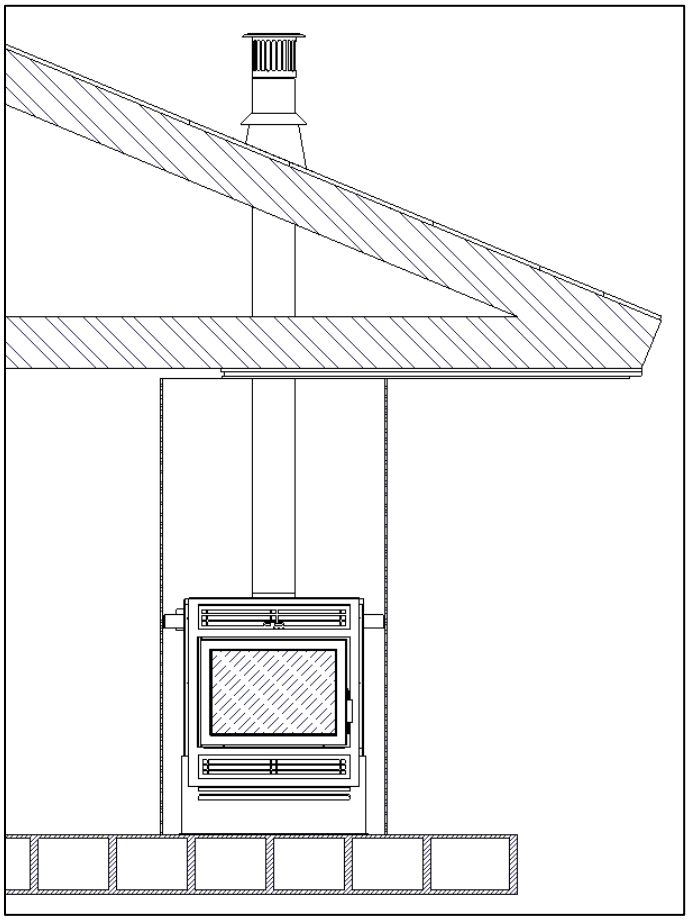


Figure 3-3: Straight Interior Installation

3.2.1 General Rules and Guidelines

1. Carefully read the instructions from the chimney manufacturer prior to installation (manuals can be obtained from the chimney manufacturer’s website or from the vendor). Unless specified, follow the chimney manufacturer’s instructions for proper installation.
2. For optimal performance of the unit, it is recommended to install the chimney system in an interior setting. To prevent drafting issues and creosote buildups, avoid exterior installations of the chimney system in regions that experience extreme cold conditions.
3. The minimum and the maximum height of the chimney from the base of the unit are 15 and 35 feet respectively.
4. A minimum length of 12 inches of straight chimney is required from the top of the unit before having an offset.
5. Only chimneys approved under the UL 103 / ULC S629 standards can be installed onto the unit (refer to Table 3-1 in Section 3.2.2).
6. A 6 inch anchor plate is required to connect the fireplace to the chimney system. The anchor plate can be secured onto the unit with 4 self-tapping screws.
7. The chimney installed onto the unit cannot be connected to another appliance.
8. Enclose any portion of the chimney that extends to accessible spaces.
9. The clearance of the chimney to any combustible material cannot be less than 2 inches. **WARNING: The 2 inch clearance cannot be filled with insulation or any non-combustible material.**
10. At least one support is to be incorporated in any chimney installation.
11. A firestop is required in the joists/frames where the chimney goes through (ceilings, floors, walls, and attic). Assure that the joist opening is constructed in a way that the firestop is overlapping by a minimum 1” (25 mm) on all 4 sides. A spacer shall provide for substantial continuous interference with the framed joist opening for a height or depth of not less than 1” (25 mm). A joint between factory-made parts which provide for firestopping is not to have a through opening greater than 1/8” (3 mm) wide. Refer to chimney manufacturer’s installation instructions.
12. A roof assembly shall resist the accumulation of soot and debris therein when such accumulation obstructs flue-gas or cooling-air passages. An opening, other than one for flue gas passage, shall not have an entrance of a ½” (12.7 mm) diameter rod.
13. A roof and a vented flashing are required in the installation of the Astra Duo. A roof flashing assembly that provides for ventilation shall be constructed so that soot or debris shall not accumulate on the assembly to the extent that ventilation openings intended to remain open are obstructed. The ventilation shall be provided by one or more fixed openings surrounding the chimney and the assembly shall comply with all of the following:

a. The openings shall not permit entrance of a ¼" (6.4 mm) diameter rod.
b. The lowest portion of the opening in the flashing shall not be less than 6" (152 mm) above the roof, measured perpendicular to the roof.
c. The assembly shall incorporate a storm collar.
d. The intended openings shall be maintained by means of spacers factory-attached to the flashing, or designed openings in the assembly.

14. To prevent drafting issues, avoid deviations wherever possible.
15. The chimney shall extend at least 3 feet above its point of contact with the roof and at least 2 feet higher than any wall, roof, or adjacent building within a 10 foot radius.
16. A secure brace is to be installed if the chimney extends a minimum of 5 feet above the contact point with the roof.
17. A rain cap must be installed on top of the chimney to resist the entrance of debris and excess rain into the flue-gas-conveying conduit and into any cooling-air passage terminating exterior to the building.
18. A cap shall be constructed so that leaves and debris falling or blown onto it are not retained, obstructing the flue-gas or cooling-air passages. A cap shall be constructed to resist accumulation of soot that obstructs flue-gas or cooling-air passages. An opening, other than one for flue gas passage, shall not have an entrance of a ½" (12.7 mm) diameter rod.
19. A cap shall be removable and replaceable, without bending or deforming the chimney or parts thereof, using common hand tools, such as flat blade or Phillips head screwdrivers, hand pliers, wrenches, and other tools, to meet the intent of the requirement for chimney cleaning in accordance with the operating instructions.
20. Consult the chimney manufacturer for clearances to combustibles when installing a combustible chimney enclosure above the roof.

3.2.2 Listed UL 103 / ULC S629 Approved Chimney Models (Reference Table)

Note that only chimney models listed in Table 3-1 can be installed for the Astra Duo.

Table 3-1: List of Approved Chimney Models

Manufacturer	**Models**
American Metal	• HS, AC Triple Wall, 6" inner diameter • HSS, AC Triple Wall, 6" inner diameter
FMI (US only)	• AC, AC Triple Wall, 6" inner diameter
ICC	• Excel 2100, 1" Solid Pack, 6" inner diameter
Metal Fab	• Temp Guard, 1" Solid Pack, 6" inner diameter
Olympia Chimney	• Ventis, 1" Solid Pack, 6" inner diameter
Security Chimney	• ASHT+, 1" Solid Pack, 6" inner diameter • S-2100+, 2" Solid Pack, 6" inner diameter
Selkirk	• Super Pro (SPR), 1" Solid Pack, 6" inner diameter • Super Pro 2100 (ALT), 2" Solid Pack, 6" inner diameter • Hart & Cooley (TLC), 1" Solid Pack, 6" inner diameter • Sure-Temp (ST), 1" Solid Pack, 6" inner diameter • Super Vent (JSC), 1" Solid Pack, 6" inner diameter • Super Vent 2100 (JM), 2" Solid Pack, 6" inner diameter • Ultra-Temp (UT), 1" Solid Pack, 6" inner diameter • UltimateOne, 1" Solid Pack, 6" inner diameter • CF Sentinel (CF), 2" Solid Pack, 6" inner diameter
Simpson Dura-Vent	• Dura Tech, 1" Solid Pack, 6" inner diameter • Dura Plus HTC, 2" Solid Pack, 6" inner diameter • Dura Plus, AC Triple Wall, 6" inner diameter

3.2.3 Chimney Installation Instructions

1. Cut and frame square openings in the floors, ceilings, and roof where the chimney will pass through while taking into consideration the minimum clearance to combustibles (refer to chimney manufacturer's manual).
2. In the ceiling/floor openings, install a chimney manufacturer's firestop and firestop spacer assembly from below. Install the chimney manufacturer's attic radiation shield and attic insulation shield from above in the chimney opening to the attic. **CAUTION: Maintain proper clearances between the chimney and the attic insulation. Please refer to the chimney manufacturer's manual and National Building Codes regarding proper and safe installation of the attic radiation shield and attic insulation shield.**
3. Install the chimney manufacturer's roof radiation shield in the opening of the roof, as well as the 4 SUPREME roof radiation plates (Figure 2-7 and Item 4 in Figure 3-4) – adjust the shield so that it is extruding approximately 1" above the roof surface. Ensure to install the appropriate firestop for ceilings and walls.
4. Install the chimney manufacturer's anchor plate onto the unit.
5. Install the chimney lengths according to the manufacturer's instructions and ensure proper fastening/locking of the joints.
6. Install the roof support once the desired height has been reached.
7. Position the vented roof flashing. Note that for sloping roofs, position the upper portion of the vented flashing under the shingles and position the lower portion of the vented flashing above the shingles. Seal the joint between the roof and the vented flashing with roofing cement or silicone. Secure the vented flashing to the roof with roofing nails.
8. Install the storm collar over the vented flashing by tightening the supplied bolt or through the flange mechanism (depends on chimney brand). Seal the joint between the storm collar and the chimney using a silicone caulking. **WARNING: Do not seal, caulk, or obstruct the ventilation openings.**
9. Install the chimney rain cap.

Refer to Figures 3-3 and 3-4 for typical chimney installations.

3.2.4 Offset Installation

An offset installation (Figure 3-4) consists of the use of elbows to deviate from unavoidable obstacles or to extend the chimney outside. The following list is a few general rules to take note when installing offsets:

- A maximum of 2 offsets (2 elbows per offset) is permitted per installation.
- A minimum length of 12 inches of straight chimney is required from the top of the unit before having an offset.
- The maximum deviation is 45º in Canada and 30º in the US.
- Secure the elbows and the chimney components according the instructions from the chimney manufacturer.
- A support strap, a wall support, or a roof support must be installed above each offset to allow adequate support to the vertical chimney lengths.
- **Never install an elbow in an opening of a floor, wall, ceiling, or roof.** In addition, only vertical chimney sections can be installed within ceiling/floor openings.
- Install a support for the first 15 feet of chimney.

The following are instructions for offset installations:

1. Rotate the elbow in the required direction and secure it to the adjacent chimney section according to the chimney manufacturer's instructions.
2. Follow the chimney manufacturer's instructions to install the chimney length(s) necessary for the offset.
3. Once the desired offset length has been achieved, install the second elbow to redirect the venting to the vertical position.
4. Cut an opening in the floor/ceiling to allow the chimney to pass through.
5. Install the appropriate firestop and firestop-spacer assembly.

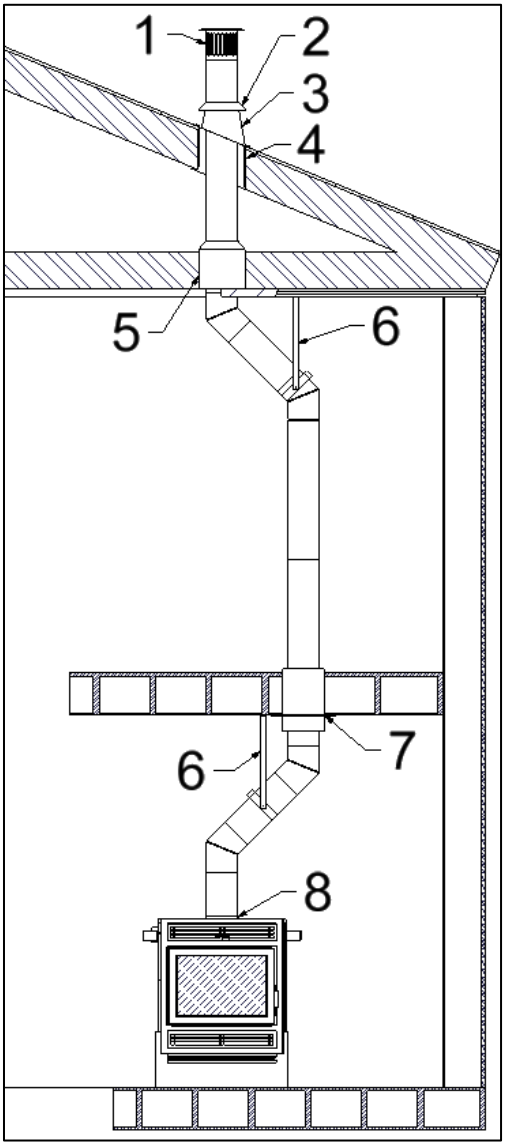


Figure 3-4: Standard Offset Installation

CAUTION: For offset installations, always install a ventilated flashing and a roof firestop unless otherwise specified by the chimney manufacturer. Never install an elbow directly onto the unit.

Table 3-2: Standard Offset Installation - Item Description

Item	Description
1	Rain Cap
2	Storm Collar
3	Vented Roof Flashing
4	Rafter Radiation Plates
5	Attic Radiation Shield
6	Offset Support
7	Radiation Shield
8	Anchor Plate[6]

3.2.5 Angled Wall Radiation Shield

For chimney installations requiring to pass through a combustible wall at a 30º (Canada) or 45º (Canada and US) angle, an angled firestop or an angled wall radiation shield from the chimney manufacturer must be installed within the wall opening. Install the angled firestop and angled wall radiation shield according to the manufacturer's instructions. It is recommended to use an insulated angled wall radiation shield in areas that experience cold climates.

[6] Note that the anchor plate is not included with the unit.

3.2.6 Connecting to a Masonry Chimney

The Astra Duo fireplace can be connected to a masonry chimney that complies with current national and municipal building codes. A 6 inch chimney liner that complies with ULC S635 M2000 (Canada) or UL 1777 (US) standards must be installed within the existing masonry chimney. Note that the 6CON connector (manufactured by SUPREME FIREPLACES INC.) must be installed to connect the prefabricated chimney to the liner (6CON sold separately). Refer to Figure 3-5 and Figure 3-6.

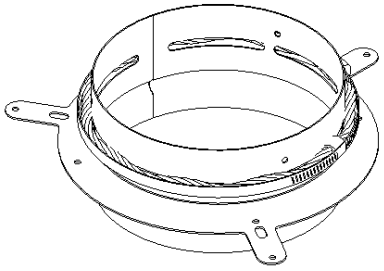


Figure 3-5: 6CON Liner Connector

Note that prior to installation, an inspection from an authority having jurisdiction is required to determine whether the masonry chimney:

- Is constructed in accordance with national and municipal building codes.
- Is in good condition. Note that repairs must be performed on any cracked or missing bricks.
- Is thoroughly cleaned of any soot or creosote.
- Is not connected to another appliance such as a furnace, hot water heater, or another fireplace.
- Has a flue of adequate size for proper installation of the venting.
- Respects minimum clearances to combustibles.

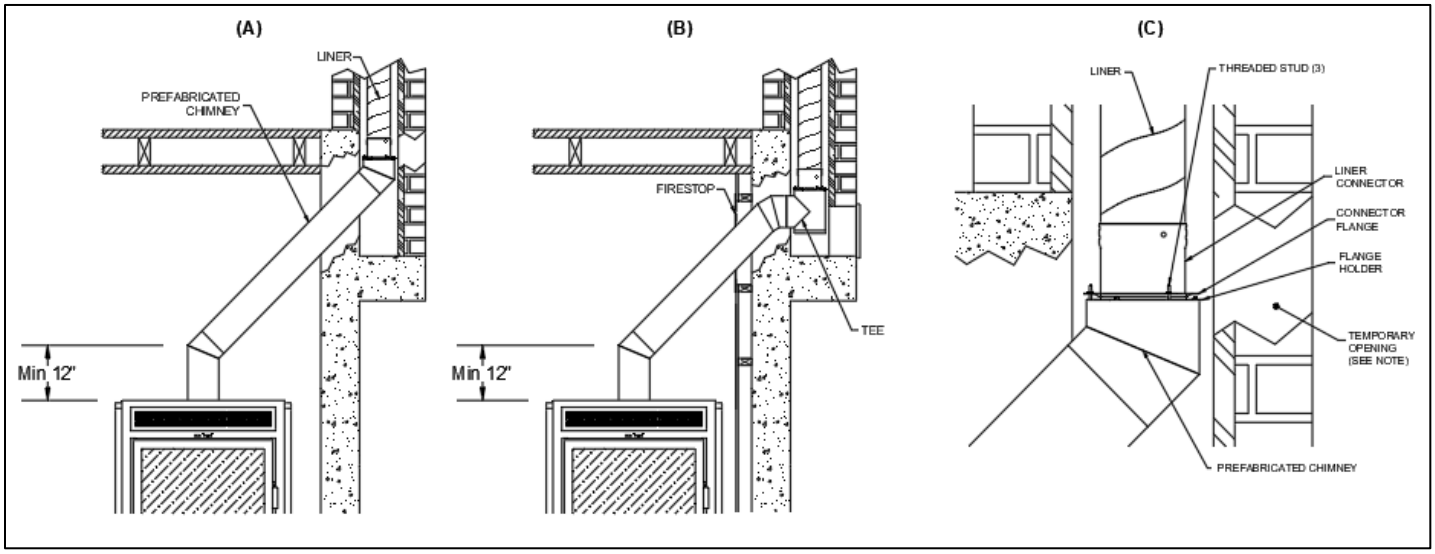


Figure 3-6: (A) Connection into a masonry chimney through an elbow/liner; (B) connection into a masonry chimney through a tee/liner; (C) detailed drawing of masonry chimney connection.

It is recommended to position the fireplace as close as possible to the masonry chimney to ensure proper venting. The prefabricated chimney must penetrate at least 3 inches within the masonry chimney before connecting the liner. Elbows can be used within the masonry chimney, with a maximum deviation of 30° in US and 45° in the Canada. **Note: A minimum length of 12 inches of straight chimney is required from the top of the unit before having an offset.**

The installation of the prefabricated chimney and the liner must comply with the manufacturer's instructions. The following are instructions in installing the venting of the Astra Duo running through a masonry chimney:

1. Install the anchor plate onto the unit.
2. Position the fireplace to the recommended location.
3. Install the initial prefabricated chimney lengths and elbows.
4. Mark the area where the prefabricated chimney will penetrate the masonry chimney.
5. Remove the fireplace to allow for sufficient space to work.

6. Make a hole to the required size to allow for the prefabricated chimney to be inserted freely in the masonry chimney. Note that the appropriate firestops need to be installed if running the prefabricated chimney through a combustible wall.
7. Install the remaining prefabricated chimney components center with the masonry chimney.
8. Align the flange holder of the 6CON connector with the studs facing upwards to the center of the prefabricated chimney section (elbow or tee) and secure it with three self-tapping screws.
9. Reposition the fireplace to its initial position.
10. Overlap by 1 inch the lower end of the liner in the expanded portion of the 6CON connector and secure the joint with 3 #8 stainless steel self-tapping screws.
11. From the roof, slide the liner down the masonry chimney until it reaches the upper end of the prefabricated chimney.
12. Install the upper portion of the 6CON liner connector to the flange holder by aligning the threaded studs to the holes and complete the connection by tightening the wing nuts.
13. Seal any openings around the prefabricated chimney and the 6CON connector with refractory cement resistant to high temperatures.

3.3 Surround Installation

The Astra Duo can be installed with either the traditional surround or the clean face surround.

3.3.1 Traditional Surround

The Traditional surround comprises louvers below (intake) and above (outtake) the door. All components and fasteners are included in the surround kit. Refer to Figure 3-7 and Table 3-3 for the instructions below.

1. Remove the door of the unit and place it on a soft surface, such as a carpet or cardboard, to avoid any scratches or damages.
2. Place the Front Traditional surround (Item 1 in Figure 3-7) within the door holder and secure it in place with four black screws (one on each corner). Make sure that the handles of the Combustion Air Control pass through the slots of the surround.
3. Repeat Step 2 with the Back Traditional surround (Item 2 in Figure 3-7).
4. Fasten the Lower Framing Brackets to the side exterior casing of the unit as illustrates in Figure 3-7. Note that these brackets can be adjusted for framing purposes.
5. Reinstall the door onto the unit.
6. Secure the Intake Swivel Covers on the bottom sides of the unit to the closed position (Figure 3-7). **WARNING: For Traditional surround installations only.**

Table 3-3: 3238ATFA-11 Components

TRADITIONAL SURROUND		
ITEM	**DESCRIPTION**	**QTY**
1	Front Traditional Surround	1
2	Back Traditional Surround	1
3	Lower Framing Brackets	2

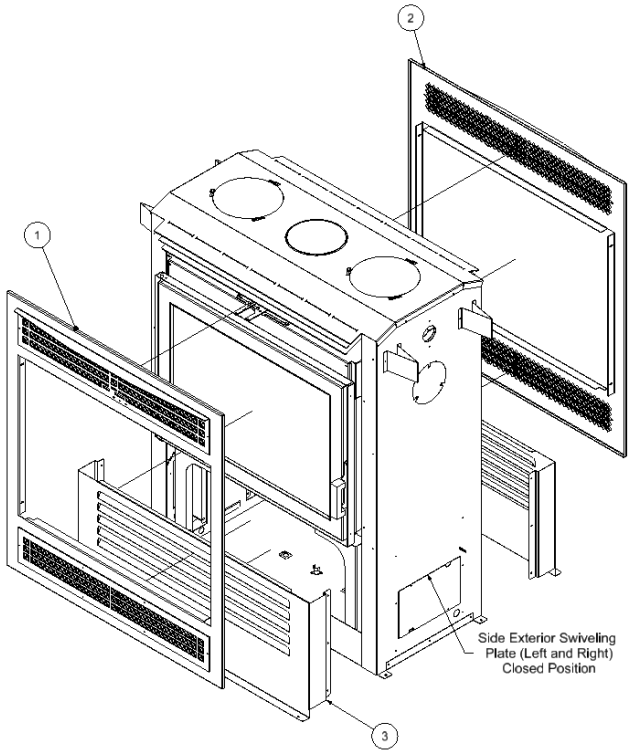


Figure 3-7: Traditional Surround

3.3.2 Contemporary Surround

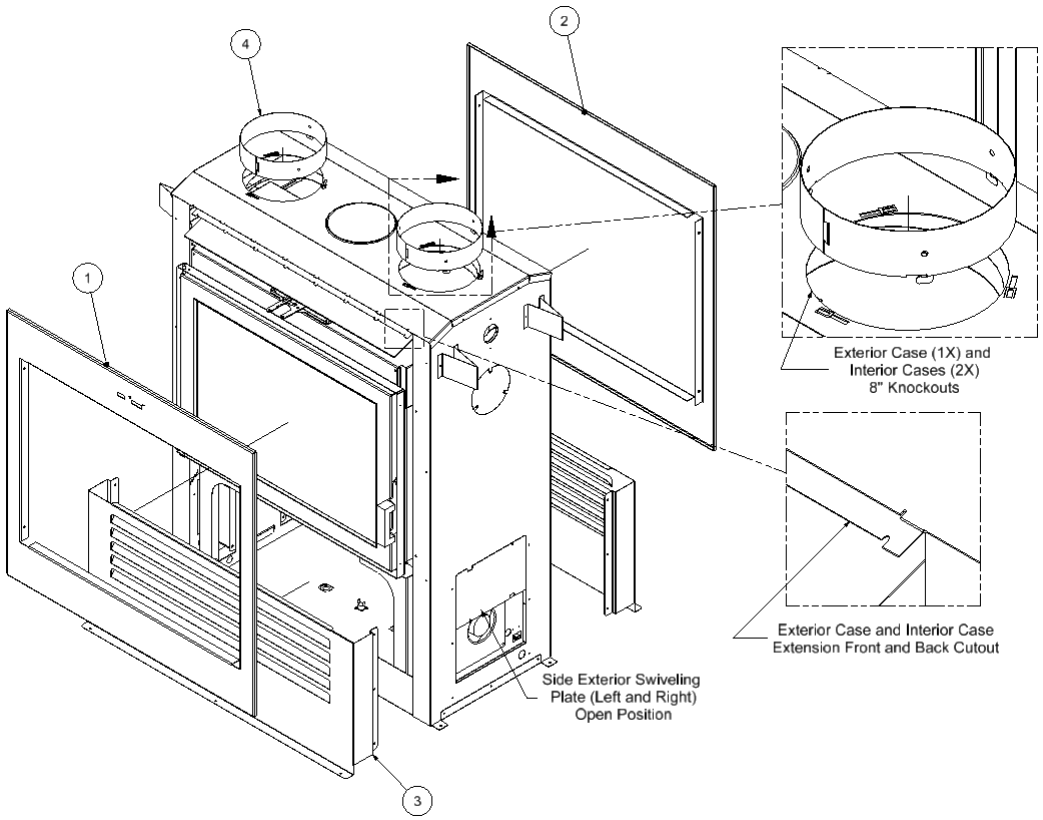


Figure 3-8: Contemporary Surround

The Contemporary surround comprises no louvers; however, an intake into the chase and an outtake through gravity ducts is required for this configuration. The instructions below describe the installation of the Contemporary surround. Refer to Figure 3-8 and Table 3-4 for the instructions below. Refer to Section 3.5 for Gravity Kit installation instructions.

Table 3-4: 3238ATFA-12 Components

CONTEMPORARY SURROUND		
ITEM	**DESCRIPTION**	**QTY**
1	Contemporary Front Surround	1
2	Contemporary Back Surround	1
3	Lower Framing Brackets	2
4[7]	Duct Adapter	2

1. Remove the door of the unit and place it on a soft surface, such as a carpet or cardboard, to avoid any scratches or damages.
2. Bend upwards the exterior and interior case extensions at the front and back of the unit. Note that these extensions can be removed by swiveling back and forth until the metal shears off.
3. Place the Front Contemporary surround (Item 1 in Figure 3-8) within the door holder and secure it in place with 4 black screws (one on each corner). Make sure that the handles of the Combustion Air Control pass through the slots of the surround.
4. Repeat Step 3 with the Contemporary Back surround (Item 2 in Figure 3-8).
5. Reinstall the door onto the unit.
6. Secure the Intake Swivel Covers on the bottom sides of the unit to the **open** position (Figure 3-8).
7. Remove the 8 inch knockouts at the top exterior case (2X), the top interior case (2X) and the top interior shield (2X) of the unit using a flat head screwdriver (Figure 3-8).
8. Install the 8 inch duct adapters (Item 4 in Figure 3-8) on the newly cut knockouts of the exterior case by aligning/inserting the tabs to the slots and turning counter clockwise to lock in place (Figure 3-8).

[7] Note that the 8” Duct Adapter is included in the KG550 kit.

3.4 Framing

The Astra Duo can be placed directly onto or against normal, combustible construction materials such as lumber, plywood, millboard, particleboard, drywall, and decorative wood paneling. **WARNING: The fireplace should NOT be placed directly against or be in contact with an insulation material.** The framing on the face of the chase, as well as above the unit, must be constructed with nominal 2" x 3" or 2" x 4" metal studs. Note that any framing exceeding the 2.75" lateral standoffs can be constructed of 2" x 3" or 2" x 4" lumber. Refer to Figure 3-9 for examples of a framing design based on the surround configuration. The framing must be nailed or screwed onto the floor and to the ceiling.

Note a minimum distance from the ceiling to the top louver frame of 2" and from the base of the unit to the bottom louver frame of 76.5".

CAUTION: Respect the minimum framing requirements outlined in Figure 3-9 as well as the chimney manufacturer's clearances to combustibles.

WARNING: Do not nail or screw framing components onto the fireplace.

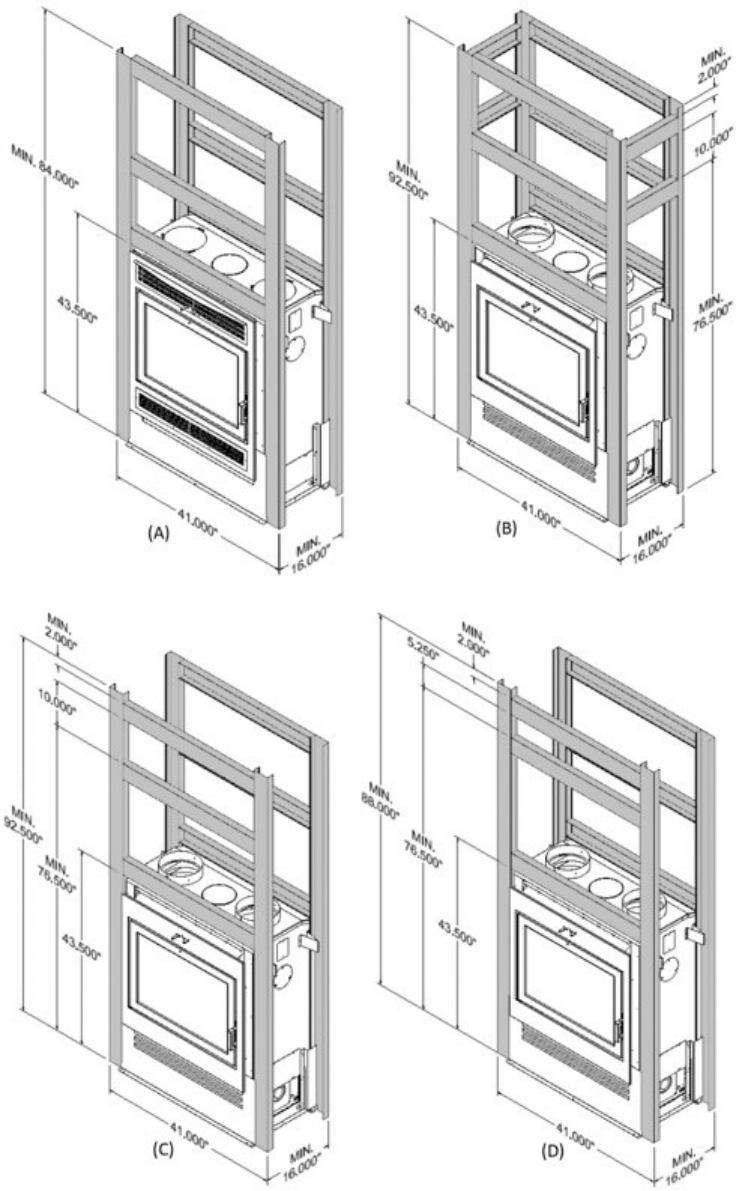


Figure 3-9: Astra Duo 38 II Framing Design for (A) Traditional Surround Configuration, (B) Contemporary Surround with Dual Louver Side Wall 8" Gravity Ducts, (C) Contemporary Surround Configuration with Dual Louver Front or Back Wall 8" Gravity Ducts, and (D) Contemporary Surround Configuration with Single Linear Louver Front or Back Wall 8" Gravity Ducts

3.5 Gravity Kit Installation

The Clean Face surround comprises no louvers; however, an intake into the chase and an outtake through gravity ducts is required for this configuration. The instructions below describe the installation of the intake openings, and the gravity ducts/outtakes. Please note that the SUPREME KG550 kit is required for the Gravity Kit installation (Figure 3-10). Note that openings for the inttake and the outtake are to be incorporated in the construction of the chase (refer to Section 3.7). Note that the duct adaptors are included in the Gravity Duct kits.

3.5.1 Dual Louver Gravity Ducts

1. Assure that Contemporary Surround assembly (Section 3.3.2) has been completed prior to continuing with installation of Dual Louver Gravity Ducts.
2. Determine the two locations of the air outtakes within the framing and permit 2 rectangular opening of 10" (W) and 10" (H). Note that a minimum distance of 76.5" is required from the floor and a minimum of 2" is required from the ceiling (Figure 3-9B and Figure 3-9C). Please note that the air outtakes can be installed in the same room or in different rooms from each other. It is recommended to install both outtakes at the same height for a more uniform heat output.
3. Within the outtake opening, fasten the 10" Louver Diffuser (Item 1 of Figure 3-10) to the framing with the 8" duct adapter facing the downward position. Repeat for the other outtake opening.

4. Measure the distance between the Duct Adapter on top of the unit to the Duct Adapter on the 10” Louver Diffuser and cut the 8” Insulated Flex Duct (Item 3 of Figure 3-10) to the necessary length. Repeat for the other outtake.
5. Complete the connections by sliding the 8” Insulated Flex Ducts over the Duct Adapters and secure the connections with the 8” Worm Gear Clamps (Item 3 of Figure 3-10).

WARNINGS:

- The gravity ducts must extend upwards from the top of the unit and cannot exceed 10 feet.
- The ducts should never extend downwards; only upwards.
- The air outtakes must be installed at a minimum of 76.5” from the floor.
- The gravity ducts must not be connected to a central heating system.
- A clearance must be maintained between the gravity ducts and the chimney.
- The intake swivel covers at the bottom sides must remain open for all Contemporary Surround installations (refer to Figure 3-8).

Refer to Section 3.7 and Section 3.8 for clearances to combustibles.

Table 3-4: KG550 Kit

DUAL LOUVER GRAVITY DUCTS			
ITEM	**PART #**	**DESCRIPTION**	**QTY**
1	LV3100	10” Louver Diffuser Assembly	2
2	UCAC8	8” Insulated Flex Duct	2
3	WG_CLAMP_8”	8” Worm Gear Clamp	4

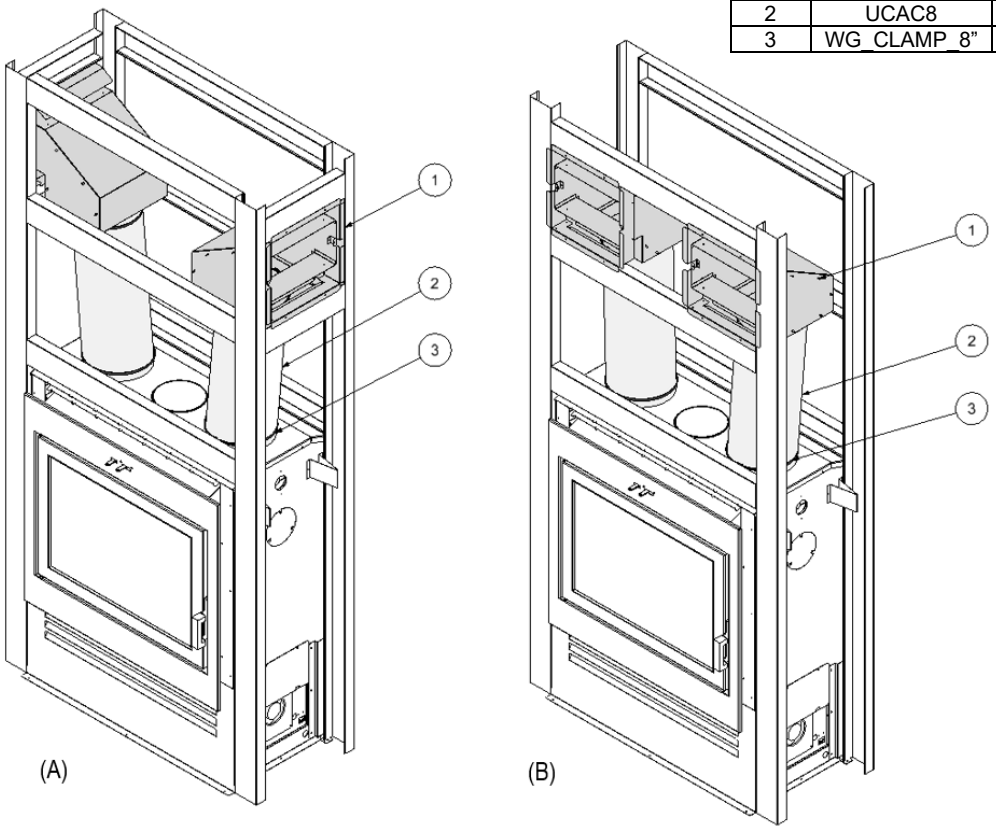


Figure 3-10: Astra Duo 8” Dual Gravity Duct Installation with Outtakes at (A) Side Wall and (B) Front or Back Wall

3.5.2 Single Linear Louver Gravity Ducts

1. Assure that Contemporary Surround assembly (Section 3.3.2) has been completed prior to continuing with installation of Single Linear Louver Gravity Ducts.
2. Determine the location of the air outtake within the framing and permit 2 rectangular opening of 10” (W) and 10” (H). Note that a minimum distance of 76.5” is required from the floor and a minimum of 2” is required from the ceiling (Figure 3-9D). Please note that the air outtake can be installed in the same room or in different rooms from each other.
3. Within the outtake opening, fasten the 32” Wide Louver Diffuser (Item 1 of Figure 3-11) to the framing with the 8” duct adapter facing the downward position. Repeat for the other outtake opening.
4. Measure the distance between the Duct Adapter on top of the unit to the Duct Adapter on the 32” Louver Diffuser and cut the 8” Insulated Flex Duct (Item 3 of Figure 3-11) to the necessary length. Repeat for the other outtake.
5. Complete the connections by sliding the 8” Insulated Flex Ducts over the Duct Adapters and secure the connections with the 8” Worm Gear Clamps (Item 3 of Figure 3-11).

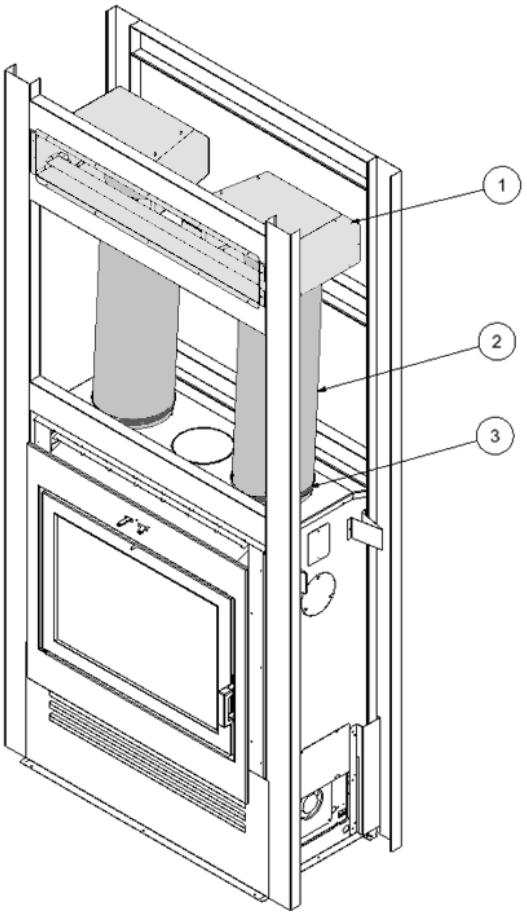


Figure 3-11: Astra Duo 8” Single Linear Gravity Duct Installation with Outtakes

WARNINGS:

- The gravity ducts must extend upwards from the top of the unit and cannot exceed 10 feet.
- The ducts should never extend downwards; only upwards.
- The air outtakes must be installed at a minimum of 76.5” from the floor.
- The gravity ducts must not be connected to a central heating system.
- A clearance must be maintained between the gravity ducts and the chimney.
- The intake swivel covers at the bottom sides must remain open for all Contemporary Surround installations (refer to Figure 3-8).

Table 3-5: LV32 Kit

SINGLE LINEAR LOUVER GRAVITY DUCTS			
ITEM	**PART #**	**DESCRIPTION**	**QTY**
1	LV3200	32” Louver Diffuser Assembly	1
2	UCAC8	8” Insulated Flex Duct	2
3	WG_CLAMP_8”	8” Worm Gear Clamp	4

3.6 Hearth Extension

The hearth extension of the Astra Duo must comprise of a non-combustible material, such as steel, cement or mortar, bricks, or ceramic tiles. Note that unidentified materials may be combustible; verify product specifications prior to installation. The hearth extension must extend a minimum of 18” from the front of the door, a minimum of 16.5” from the outer edge of the door to the floor, 8” from side of the outer frame of the door and extended all the way to the unit (Figure 3-12 and Figure 3-13). Note that a hearth extension is required for the front and back of the unit.

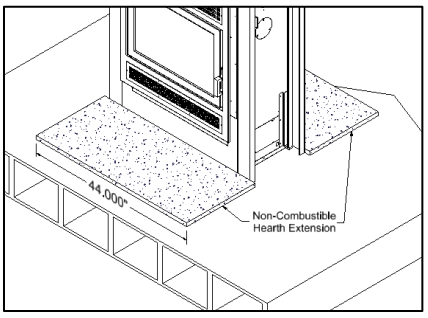


Figure 3-12: Astra Duo Hearth Extension Isometric View

A sealing strip of non-combustible material must be installed under the Astra Duo and the hearth extension (front and back). The sealing strip must cover the full length of the bottom exterior case of the fireplace and overlap a minimum of 2” of the fireplace and hearth extension (Figure 3-13); the minimum dimension of the sealing strip is 33.125” X 4.000”. Note that sand-cement grout can substitute a sealing strip when installed between the fireplace and an on-site constructed hearth extension.

CAUTION: Make sure to remove any carpet or fabric under the hearth extension.

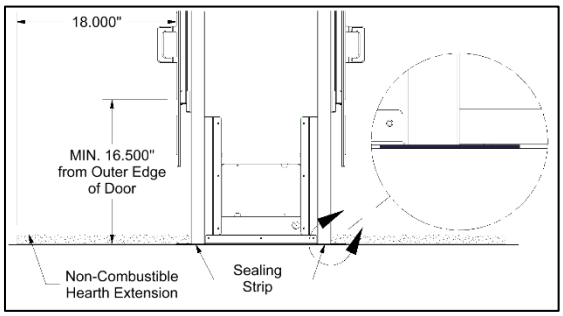


Figure 3-13: Astra Duo Hearth Extension Side View

3.7 Chase Installation

A portion of the front of the chase must be constructed out non-combustible material. Note the chase must be properly fastened onto the framing structure.

WARNING: Do not nail or screw the chase onto the fireplace. For the Contemporary Surround option, two intake openings must be constructed onto the chase, as well as two outtake openings. Refer to the figures and dimensions below.

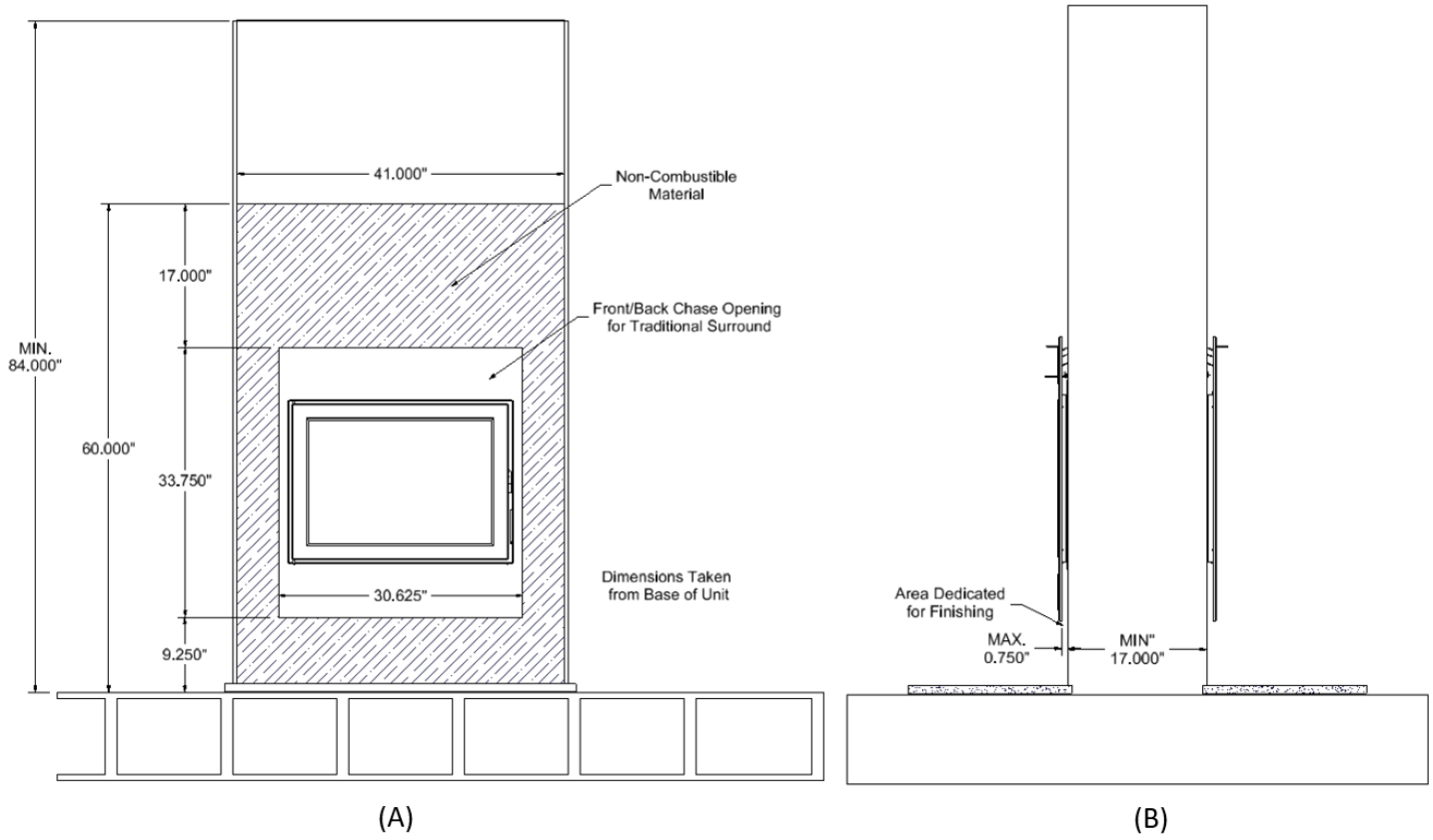


Figure 3-14: Chase Installation for Traditional Surround - (A) Front View and (B) Side View

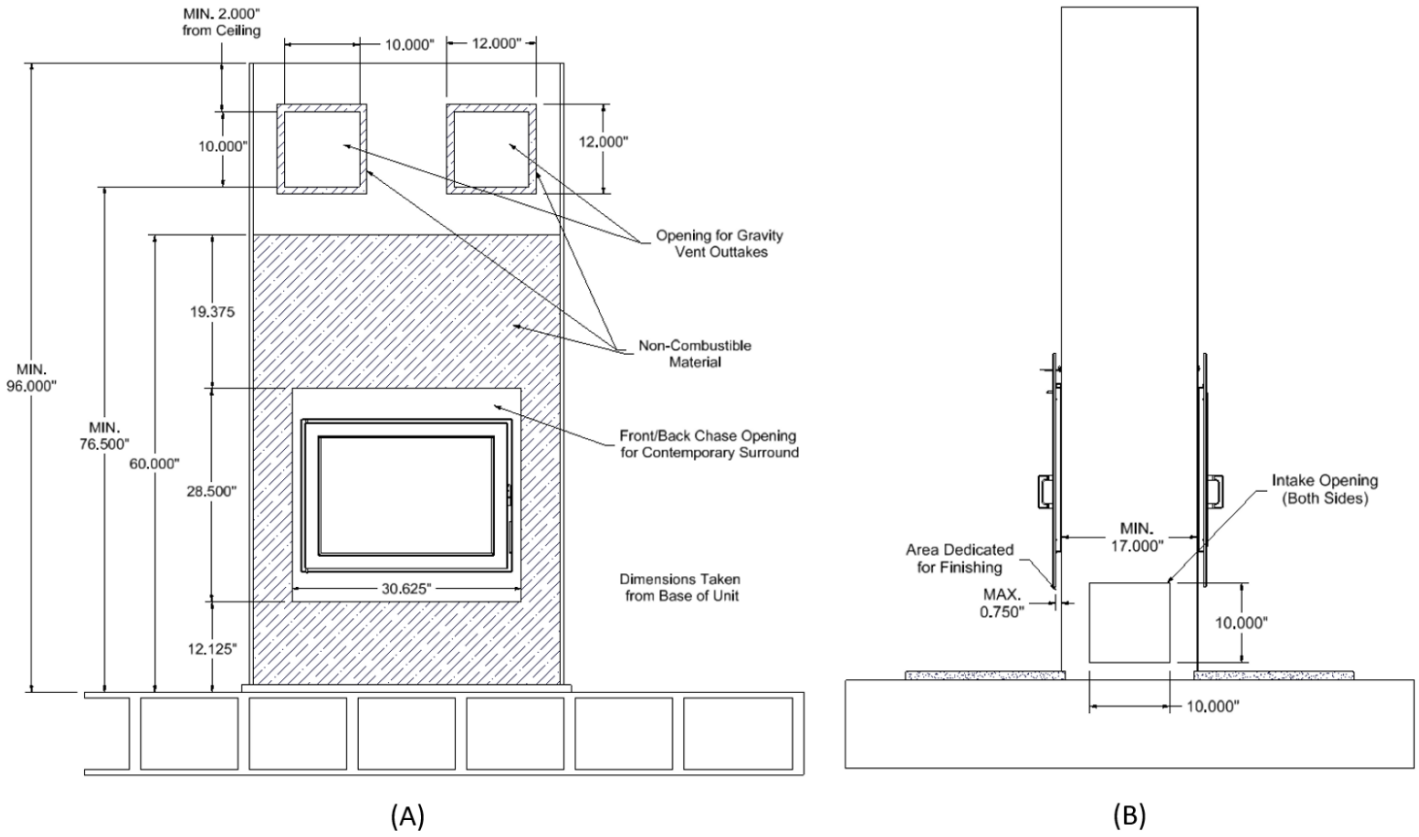


Figure 3-15: Chase Installation for Contemporary Surround with Dual Louver Outtakes at the Front - (A) Front View and (B) Side View

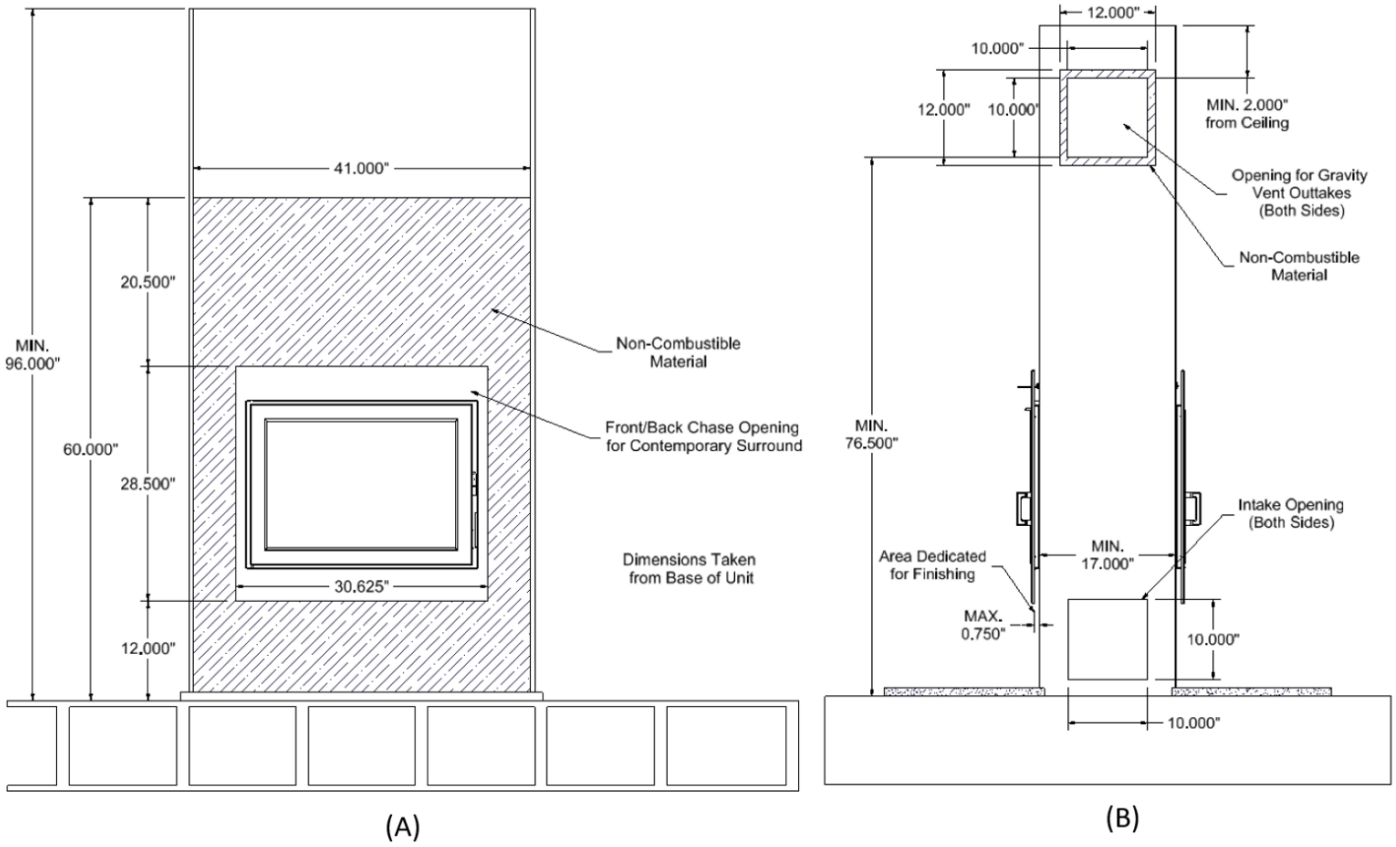


Figure 3-16: Chase Installation for Contemporary Surround with Dual Louver Outtakes at the Side - (A) Front View and (B) Side View

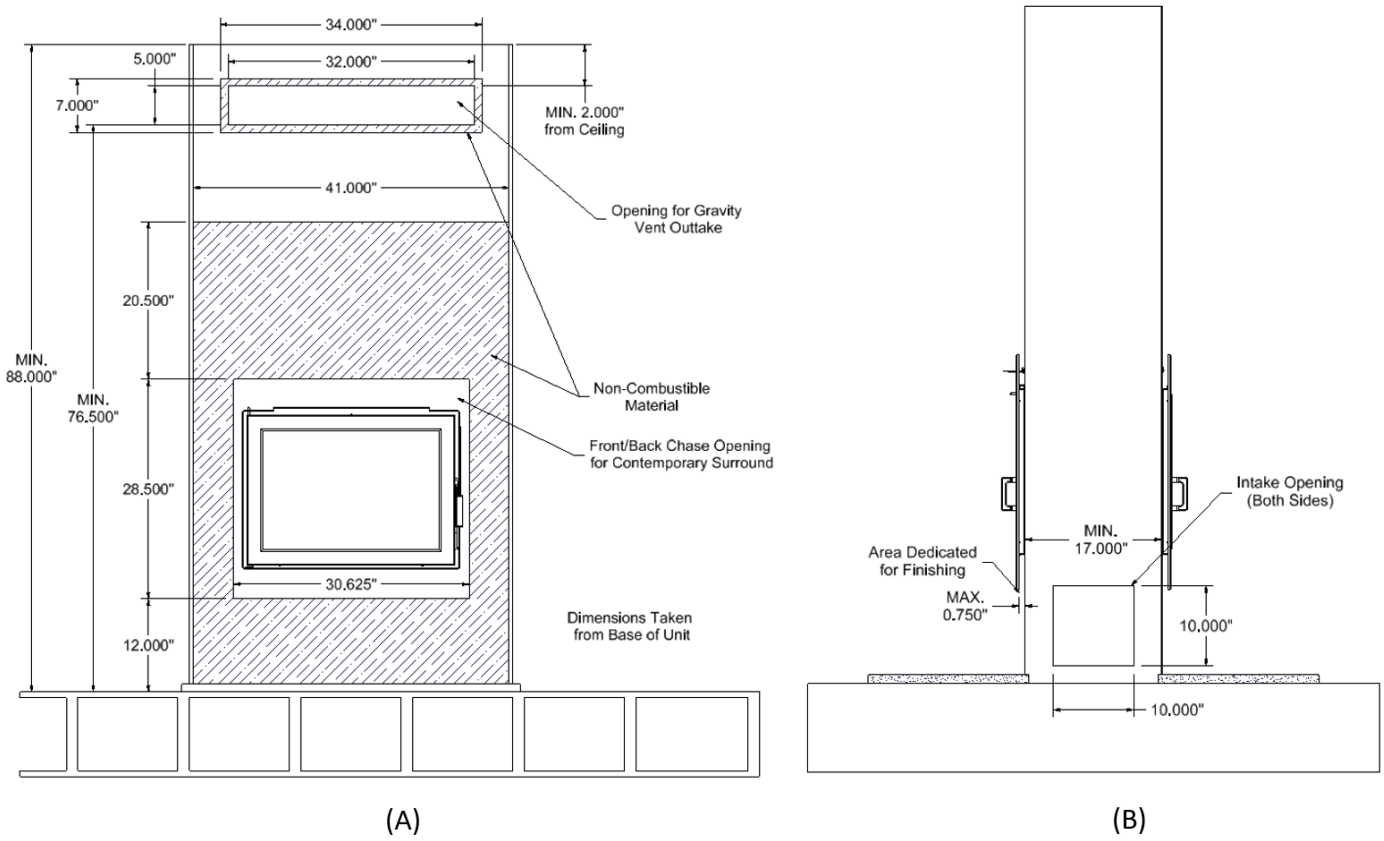


Figure 3-17: Chase Installation for Contemporary Surround with Single Linear Louver Outtake - (A) Front View and (B) Side View

Note that all overlay intakes/outtakes are installed once the chase assembly is completed by fastening the overlay to the wall and the Diffuser Assembly.

3.8 Clearances to Combustibles

The clearances below must be respected to ensure safe operation of the unit under normal and extreme conditions. Failure to follow the information below is a safety hazard and may result in property damage.

Table 3-6: Overall Clearances

Combustible	Clearance	Reference
Side Wall	10” (254 mm)	Outer edge of fuel door
Side Trim	10” (254 mm)	Outer edge of fuel door
Ceiling – Traditional Surround	84” (2134 mm)	Base of unit
Ceiling – Contemporary Surround	96” (2438 mm)	Base of unit

Table 3-7: Combustible Mantel Clearances

Maximum Mantle Depth	Distance from the Base of the Astra Duo 38 II to the Bottom of the Mantle
1.5” (38 mm)	53” (1346 mm)
3.5” (89 mm)	55” (1397 mm)
6.5” (165 mm)	58” (1473 mm)

The depth of the mantle is measured from the face of the fireplace door. When the non-combustible wall is recessed, the depth of the mantle can be increased by the amount of the recess (see Figure 3-18). Note that a combustible mantel cannot be installed below the minimum clearance of 53” (from the bottom of the mantle to the base of the unit). A non-combustible mantle doesn’t require a minimum distance from the fireplace.

WARNING: A minimum clearance of 48” is required between the doors of the Astra Duo and any combustible material not specified in this document.

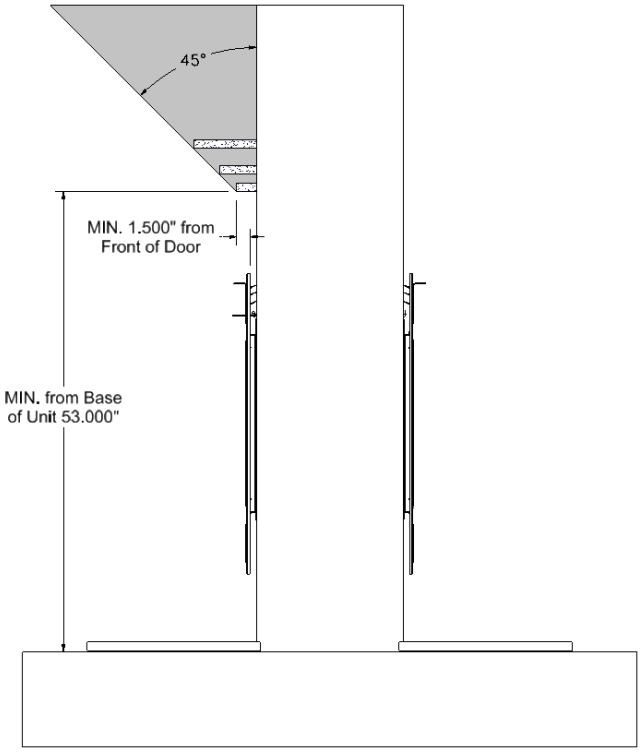


Figure 3-18: Combustible Mantel Clearances

4 OPTIONS

4.1 Fresh Air Kit

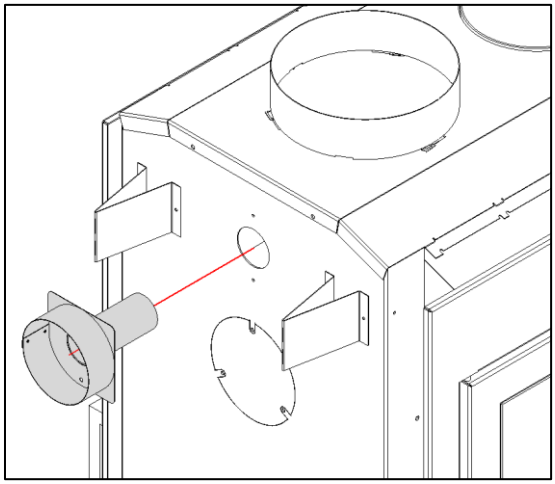


Figure 4-1: Astra Duo ADP4 Installation

Sufficient air exchange is necessary for the fireplace to operate properly and to maintain a good combustion. In an airtight household, the fireplace may not function as designed due to a lack of air; it is therefore recommended to install the fresh air kit in such cases. The fresh air system is an optional kit intended to bring combustion air into the fireplace from an exterior source. Note that a minimum distance of seven inches is required between the side of the unit connecting to the fresh air kit and the framing to allow significant space (refer to Figure 3-2).

Note that the Astra Duo is designed to use a minimum amount of air during operation. Using an air exchanger or simply opening a nearby window/door during the ignition of the unit will achieve a similar result as the fresh air kit. When the fireplace is idle, there is no air escaping from the house through chimney. **Consult a local authority having jurisdiction (such as the fire department, the municipal building department, the fire prevention bureau) to determine if it is mandatory to install a fresh air kit in your area.**

General Notes:

The outside air kit should be installed according to the following guidelines:

- The air duct must be insulated, wrapped with a vapor barrier, and have an inner diameter of 4 inches.
- The air duct must be constructed of non-combustible materials.
- The length of the air duct should not exceed 25 feet.
- The duct should not be elevated more than 10 feet from the base of the unit.
- Fresh air must come from the outside and not from another room or the attic.
- The outside register must be away from automobile exhaust fumes, gas meters, or other vents.
- The outside register must be constructed out of a minimum 20Ga wire mesh with openings not larger than ¼" X ¼" (6.4 X 6.4 mm) with the purpose of preventing any debris and rodents from entering the air duct.
- Avoid installing the air register where it will likely be covered by snow or exposed to strong winds.
- The air register can be installed above or below the level of the fireplace.
- Use the SUPREME FIREPLACES INC. Fresh Air Adapter (ADP4) provided with the unit. Note that the ADP4 is factory installed on the left side facing the unit (PAC control).
- Use the SUPREME FIREPLACES INC. Fresh Air Kit (UPEA4) for installations of 10 feet or less.
- Use the SUPREME FIREPLACES INC. Fresh Air Kit (UPEA4_25) for installations between 10 to 25 feet.

Installation:

1. Cut 4 ½" diameter hole on the exterior wall of an ideal location.
2. Install the air register on the exterior wall.
3. Insert the fresh air adapter (ADP4) into the fireplace from the exterior casing. Make sure that the adapter is properly inserted into the combustion air box on top of the firebox.
4. Secure the fresh air adapter to the side of the fireplace using two screws.
5. Install the air duct and secure it with worm gear clamps.

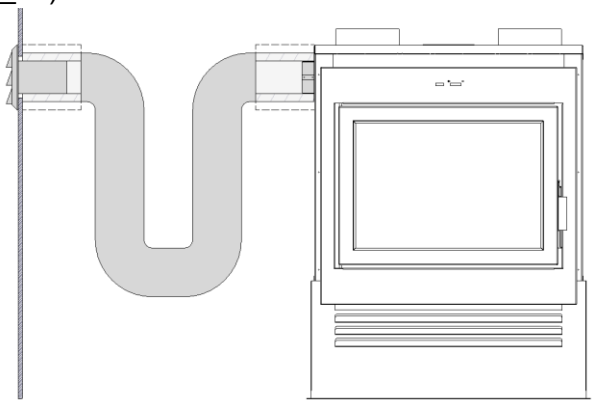


Figure 4-2: Astra Duo UPEA4 Installation

5 OPERATION INSTRUCTIONS

5.1 Fuel

The Astra Duo is designed to burn natural wood only. Higher efficiencies and lower emissions generally result when burning air dried seasoned hardwoods (moisture content below 20%), as compared to softwoods or to green or freshly cut hardwoods. The following are a few signs indicating that firewood is sufficiently dry for use: (a) cracks on the ends and surface of the logs, (b) lighter in weight, and (c) color (yellow/grey). It is recommended to use a moisture meter with pin sensors for determining accurately the moisture content of firewood (read manufacturer's instruction manual before operating). The optimum log length is 18-22 inches, preferably split in halves or quarters and left to dry under a cover or away from external elements for a minimum of one year prior to use. Use good quality dry cordwood only. DO NOT burn garbage, lawn clipping, yard waste, materials containing rubber (including tires), materials containing plastic, waste petroleum products, paints, paint thinners, asphalt products, materials containing asbestos, construction debris, demolition debris, railroad ties, pressure-treated wood, manure, animal remains, coal, salt water driftwood or other previously salt water saturated materials, unseasoned wood, paper products, cardboard, plywood, particle boards, or other foreign materials in this product. The prohibition against burning these materials does not prohibit the use of fire starters made from paper, cardboard, saw dust, wax and similar substances for the purpose of starting a fire in an affected wood heater. Burning these materials may result in release of toxic fumes or render the heater ineffective and cause smoke. Do not over fire the Astra Duo fireplace. Over firing will damage the fireplace, is hazardous and will void the warranty. NOTE: Gas logs cannot be installed in the Astra Duo fireplace.

WARNING: Never use gasoline, gasoline-type lantern fuel, kerosene, charcoal lighter fluid, or similar liquids to start or "freshen up" a fire in this fireplace. Keep all such liquids well away from the fireplace while it is in use.

Ecological or composite logs containing chemical additives are not tested and approved to be used with the Astra Duo. Using them will overheat and damage the fireplace and void the warranty. Use only composite fire logs meeting the requirements of ANSI/CAN/UL/ULC 2115, Processed Solid Fuel Firelogs and Firestarters. Refer to the fire log warnings and caution markings on packaging prior to use. Do not poke or stir the logs while they are burning. Never use more than two of these logs at a time. Using more is not only dangerous, but will damage the fireplace and void the warranty. Follow the ecological log manufacturer's safety guidelines and recommendations and be sure that they are intended for use in fireplaces. Reload only once the previous load of wood has been consumed and only embers remain.

WARNING: Do not keep the door open while the fireplace is in operation.

5.2 First Fires

For the first three fires, burn a maximum of three logs at the medium to low burn rate (refer to Section 5.3) to allow for proper conditioning of the unit. Due to oil residues and the curing of the paint of the fireplace, it is normal to smell an odor for the first fires of the Astra Duo. Open a window or a door near the fireplace to ventilate the house during the first fires. Oil residues may cause light smoking.

5.3 Operating the Combustion Air Control

The burn rate and the heat output are related to the amount of air entering the firebox. The combustion air control of the Astra Duo is a single burn rate mechanism with an Activator lever (see Section 2.3). When starting the fire or when adding a new charge of wood, the fireplace needs additional air to establish a good combustion. When the wood starts to burn properly, the amount of air can be reduced depending on the heating requirements.

When starting a fire or adding a new load of wood, the Activator must be pushed in to allow maximum air to enter the firebox. The combustion air control will automatically and gradually close the primary air source to the factory set position with the presence of heat to maximize the burn time.

NOTE: The Activator must be pushed in when starting a fire or when adding a new load of wood.

WARNING: The combustion air openings should never be obstructed.

WARNING: Never manipulate the Combustion Air Control with bare hands as it gets hot when the Astra Duo is in operation. Use the Cold Hand Key (see Section 2.7) to adjust the Combustion Air Control.

WARNING: This wood heater is designed to burn at a set 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.

5.4 Starting a High Efficiency Fire

The Astra Duo has patented technologies and innovative features that make starting a fire quick and easy. Before starting a fire, assure that all the safety precautions mentioned in the owner's manual are being respected. The following instructions describe starting a fire in Astra Duo fireplace using a "top-down" approach, which results in a cleaner, more efficient, and longer burn:

a) Place two logs in the firebox. The logs should sit directly on the hearth from left to right or east to west (parallel with the door). Do not use a fireplace grate.
b) Place a third and fourth log at a slight angle above the two logs of step a) left to right or east to west.
c) Depending on the size of the logs, a fifth log can be placed above the logs of step a) and step b). For optimal performance of the unit, leave a minimum 1.5" space between the logs and the baffle.
d) Push the left combustion control lever (the Activator) inwards.
e) Place and ignite a firestarter between the logs in step b) or below the log in step c). Make sure that the firestarter is visible from the opening (facing the front).
f) Once the firestarter is well lit, close the door. Do not leave the door open for more than 2 minutes.

NOTE: Install a carbon monoxide (CO) and smoke detector near the location of the unit with respect to the requirements of the authority having jurisdiction in your area.

CAUTION: The wood should be placed away from the door to avoid damage to the glass.

WARNINGS: Over firing the unit may result in overheating and can damage the fireplace and/or result in fire hazards. The maximum firewood load must not exceed four large sized logs (approximately 30 pounds). This fireplace has been designed to burn with the door closed. When the fireplace is being used, the door should remain closed at all times. Failing to do so is a safety hazard, will damage the fireplace and void the warranty.

WARNING: Do not use fire accelerants to rekindle the fire if the first attempt to start the fire failed. Do not open the door. Simply reactivate the Activator by pushing it inwards.

NOTE: Sufficient air exchange is necessary for the fireplace to operate properly. Air is required in order to maintain the combustion of the fireplace. If the house is airtight, the fireplace may not function properly. If the fireplace is deprived of air, it will be necessary to provide a source of fresh air into the dwelling. This may be done by using an air exchanger unit or simply by opening a window or a door near the fireplace partially for a few minutes. Make sure that other equipment such as the kitchen exhaust fans or oil central heating systems does not affect the fireplace functionality. Large return ducts of central heating systems located in the same room as the fireplace may affect the proper functioning of the unit and may cause smoking.

5.5 Adding a New Load of Wood

WARNING: Open the door to reload only when the wood has been reduced to embers, otherwise there is a risk of smoke infiltration into the house.

When the wood has been reduced to embers and there's no visible flame, you may add a new load.

a) Crack the Astra Duo door open and wait a few moments before opening the door completely.
b) Use your fireplace tools to gather the remaining embers at the center of the firebox.
c) Activate the Activator by pushing it in.
d) Once the embers begin to glow red, add the new load of wood in the firebox.
e) Keep the door of the Astra Duo slightly unlatched until you see a flame in the firebox. Never leave the Astra Duo door unlatched without constant supervision.
f) Completely latch the Astra Duo door.

Assure that a flame is maintained. Avoid wood smoldering on top of embers as this will result in a dirty glass, excessive emissions, chimney creosote buildup and poor heat output. If wood is smoldering, ensure the Activator has been activated and unlatch the door slightly with supervision until a flame has been maintained.

6 TROUBLESHOOTING

6.1 Backdraft / Smoking

Draft is the force created by a difference in pressure, which moves air from the appliance up through the chimney. It is important to operate the Astra Duo with proper draft to ensure optimal performance of the unit. Draft is depended on the length of the chimney, local geography, nearby obstructions and other factors. Proper draft results in an upwards flow through chimney, which prevents smoke infiltrating into the house during operation of the unit. As the temperature of the unit and chimney rises during combustion, the draft consequently increases due to a higher difference in pressure.

In contrast, backdraft is air flow from the chimney into the house, which results in smoke infiltration from the appliance and/or the chimney joints during operation. The unit is experiencing backdraft if air is flowing out from the exhaust of the baffle system (within the firebox). Backdraft is most commonly caused by fans around the house (such as in the kitchen and bathrooms) simultaneously in operation, insufficient length of the chimney (less than 15 feet), or a blocked chimney. Refer to the following suggestions to eliminate backdraft:

- Close any fans operating around the house (specifically for the duration of ignition).
- Clean the chimney of any obtrusions (when the unit is cold).
- Open one window or one door near the Astra Duo.
- Heat the chimney by burning a firestarter near the exhaust of the baffle system.

6.2 Over Firing

The appearance of a red glow on the exterior of the firebox (top and sides) and/or on the flue is a sign of over firing. Excess air entering the firebox, over fueling, or an abnormal strong draft causes the unit to reach drastic temperatures from an uncontrollable combustion. Over firing is a safety hazard and may result in permanent damage to the unit. In the occurrence of over firing:

a) Make sure the Astra Duo door is properly closed.
b) Manually close the Combustion Air Control by pulling the Activator (left lever).
c) If possible, turn on the blower to the maximum speed. The red glow on the exterior of the firebox and/or the flue should gradually disappear.

WARNING: Do not touch hot surfaces with bare hands. Always wear heat protecting gloves and use fireplace tools.

Guideline to avoid over firing:

- Always keep the door closed during operation.
- Inspect regularly the door gasket/glass and replace accordingly.
- Always operate the unit with the bypass system cap in the closed position, blocking the hole in the baffle.
- Never load more than 30 lbs of wood at a time.
- Ensure that there is no excess draft.

WARNING: Failure to follow the above guideline will void the warranty. Over firing is a safety hazard, can cause irreversible damages to the Astra Duo and will void the warranty.

7 MAINTENANCE

7.1 Disposal of Ashes

Ashes should be placed in a metal container with a tight fitting lid. The closed container of ashes should be placed on a non-combustible floor or on the ground, well away from all combustible materials, pending final disposal. If the ashes are disposed of by burial on soil or otherwise locally dispersed, they should be retained in the closed container until all cinders have been thoroughly cooled. **CAUTION: Always wear heat resistant gloves when removing the ashes from the firebox.**

a) Let the firebox cool to ambient temperature before removing the ashes. It is recommended to remove the ashes once the bed has exceeded a height of 4 inches.
b) Slowly open the door to prevent ashes from coming into the room.
c) Place an ash bucket (metal container) near the fireplace, onto the non-combustible hearth.
d) Using a shovel and brush, remove the bulk of the ashes from the firebox into the ash bucket. Note that it is not necessary to keep a thin bed of ashes for the next fire.
e) Store the ash bucket (with the tight-fitting lid) on a non-combustible surface, away from any combustible materials, pending final disposal.

7.2 Chimney Maintenance

Creosote – Formation and Need for Removal: When wood is burned slowly, it produces tar and other organic vapors, which combine with expelled moisture to form creosote. The creosote vapor condenses in the relatively cool chimney flue of a slow-burning fire. As a result, creosote residue accumulates on the flue lining. When ignited, this creosote makes an extremely hot fire. The chimney connector and chimney burning wood or coal should be inspected at least once every two months during the heating season to determine if creosote buildup has occurred. The presence in a chimney of soot or creosote in excess of 3 mm thick will indicate the need for immediate cleaning, possible modification of burning procedures, and more frequent inspections. **Never use chemical cleaners for your chimney.**

WARNING: In the case of a chimney fire: 1) close the door of the fireplace; 2) set the burn rate of the Combustion Air Control to minimum (Section 5.3); 3) call the local fire department (if assistance is needed); 4) use a dry chemical fire extinguisher (baking soda or sand) to control the fire.

CAUTION: Never use water to extinguish a fire as it may result to dangerous steam explosions. Do not use the unit until the chimney is inspected and repaired (if needed) by a qualified technician.

NOTE: Do not clean the chimney when the unit is in operation/hot. Follow the instructions below for sweeping the chimney of an Astra Duo fireplace:

a) Open the door of the unit – side of primary air control.
b) Remove the bypass system push rod located at the top center of the door holder by sliding it forward.
c) From within the firebox, remove the baffle by unfastening the bolts.
d) Close the door of the unit.
e) Using the right sized chimney sweeping brush, clean the chimney from any creosote buildup and other residues.
f) Remove all the fallen/loose creosote/residues from the firebox and baffle system (a shop vacuum cleaner can be used for a thorough cleaning).
g) Reinstall the baffle and the bypass system push rod. Assure that the bypass system cap is in the proper position prior to fastening the baffle. Test the bypass system by pressing forward the push rod and observing whether the cap fully closes.

CAUTION: Operating the unit without the bypass system cap in the closed position will result in over firing and void the warranty.

7.3 Cleaning of Glass

It is recommended to clean the glass door with a soft cloth, damped with a non-abrasive solution, such as soap and water.

CAUTION: Cleaning the glass with an abrasive solution will result in surface scratches, reducing glass transparency and resistance to impacts.

The glass of the door may be cleaned with commercial products intended for fireplaces and stoves. After cleaning the glass, remove any remaining solutions with a wet cloth to avoid chemical reactions at elevated temperatures (“cloudiness’’ on the surface of the glass).

CAUTION: Do not apply commercial cleaners onto any painted surfaces as discoloration/peeling may occur.

NOTE: Never clean the glass when the unit is in operation or hot.

7.4 Replacing a Cast Iron Panel

Two panels are assembled along the combustion chamber side walls (left and right) allowing for a longer and a constant heat output. It is recommended to perform a weekly check on the condition of the panels to ensure proper operation of the unit. The panels need to be replaced when it is gravely chipped and/or cracked. Failure to replace the panel under the mentioned conditions will alter the performance of the unit. Refer to the following instructions for replacing a panel:

a) Order the replacement kit for the Astra Duo panel.
b) Remove the door from the firebox and place it face down on a soft surface. NOTE: Rotate the handle to permit proper placing.
c) Remove the bottom plate (hearth) by lifting it out of the firebox.
d) Slide the left/right side wall panel(s) by tilting the bottom and swivelling them out of the top retainer.
e) Replace the damaged panel and position the panels back in place by swiveling them behind the top retainer.
f) Insert the bottom plate (hearth) and door to its original position.

WARNING: Do not operate the unit with any of the cast iron panels missing.

7.5 Replacing the Door Gasket

SUPREME FIREPLACES INC. assembles heat resistant graphite coated gaskets on the doors of all products, allowing for a proper seal of the unit at extreme temperatures (up to 1000^{o}F). It is recommended to perform a weekly visual check on the condition of the ¾” gasket to ensure proper operation of the unit. The ¾” gasket of your door needs to be replaced when 1) the fibers of the gasket are coming loose and 2) the gasket is disintegrating. Failure to replace a gasket under the mentioned conditions can cause irreversible damage to the unit due to over firing. Refer to the following instructions for replacing the ¾” gasket:

a) Order the replacement kit for the Astra Duo ¾” door gasket GSK_75_7.
b) Remove the door from the firebox and place it face down on a soft surface. NOTE: Rotate the handle to permit proper placing.
c) Cover all painted surfaces of the door to avoid damages.
d) Using a wedging tool or flat head screwdriver, gently remove the old ¾” gasket (along with the old silicone) from the door framing.
e) Apply a bead of high temperature silicone along the groove of the metal brackets.
f) Place the new ¾” gasket around the door framing and cut any excess gasket with scissors. NOTE: It is recommended to tape the extremity of the gasket for a cleaner result.

Give significant amount of time to allow the silicone to cure before reinstalling the door onto the firebox. A slight resistance is expected when closing the door with the new ¾" gasket; the door will close normally after the gasket has taken proper shape.

7.6 Replacing the Glass Panel

SUPREME FIREPLACES INC. uses a high quality 5mm thick Pyroceram III / Keralite ceramic glass that can withstand temperatures up to 1300ºF. It is recommended to perform a weekly visual check for any damages or cracks on the glass.

Table 7-1: Parts List of Door Assembly

Item	Code	Description	Qty
1	DR1100	Door Frame Assembly	1
2	PYRO 24.25X17	Pyroceram Glass	1
3	DR 1806	Vertical Metallic Bracket	4
4	DR_2525	Horizontal Metallic Bracket	1
5	GSK_31_7	Thin Gasket	2
6	GSK_75_7	Thick Gasket	1
7	NUT 8-32	8-32 Nut	8

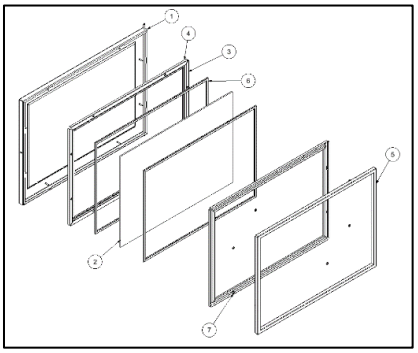


Figure 7-1: Exploded View of Door Assembly

WARNING: Avoid striking the glass and slamming the door shut. Never operate the unit with a broken or damage glass. Wear protective gloves when handling broken glass.

Refer to the following instructions for replacing the glass:

a) Order the replacement kit for the Astra Duo glass.
b) Remove, clean, and dispose any broken glass from the door and the surroundings.
c) Remove the door from the firebox and place it face down on a soft surface. NOTE: Rotate the handle to permit proper placing.
d) Using a wedging tool or flat head screwdriver, gently remove the ¾" gasket (along with the silicone) from the door framing.
e) Using a wrench, remove the 8 nuts fastened around the door framing.
f) Remove the first row of metal brackets (2 small and 2 big) and thin gasket.
g) Remove the damage glass and clean thoroughly the door framing from loose glass fragments.
h) Place the new glass onto the second row of thin gasket, centered with the door framing.
i) Place back the first row of metal brackets (2 small and 2 big) and thin gasket.
j) Using a wrench, fasten the 8 nuts around the door framing (do not over-tighten).
k) Apply a bead of high temperature silicone along the groove of the metal brackets.
l) Place the ¾" gasket back into position.
m) Give significant amount of time to allow the silicone to cure before reinstalling the door onto the firebox.

NOTE: Replacing the glass with a non-conform substitute material may cause irreversible damage to the unit, bodily harm, and void the warranty.

7.7 Door Latch Maintenance

Lightly lubricate the hook of door latch (SFC0031) with graphite grease on a yearly basis to prevent abrasive wear. Occasionally inspect the bushing of the door latch. If required, adjust the tightness of the latch bolt using a 5/32" hex key.

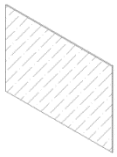
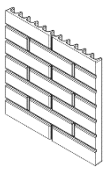
7.8 Paint

Paint touch-ups can be performed on the unit using a high temperature paint (in aerosol spray can format) by Stove Bright®. Refer to your invoice to determine the precise color of your unit. Contact your local hearth shop for further information on purchasing this paint.

NOTE: Apply the paint in a well ventilated area. If applying paint to the door, properly cover/mask the glass of the door using painters tape and cardboard. Wait for paint to dry before operating the unit. Refer to the instructions on the label of the aerosol spray can for proper paint application. **WARNING: Never apply paint to the unit during operation or when it is hot.**

7.9 Replacement Parts

Refer to the codes from the table below for any replacement parts:

Code	Description	Illustration
SFC0032-01	Wood pull handle - metallic black	
PYRO_ 24.25”X17”	Pyroceram III / Keralite 5mm thick glass, 24.25" X 17"	
GSK_31_7 (2X)	Graphite coated square gasket, 0.3125" thick, 7' length	
GSK_75_7	Graphite coated square gasket, 0.75" thick, 7' length	
PA5500-01	Combustion Air Control	
CM0020	Cold Hand Key	
38SFC1175 (2X)	Cast Iron Panel 16” X 12.625” X 1.25”	

8 WARRANTY

SUPREME FIREPLACES INC. warrants that the factory-built fireplaces, fireplace inserts, and stoves will be free from defects in material and workmanship, under normal use and service, for a period of **ten (10) years** from the date of purchase.

This warranty is only intended for the original retail purchaser and is non-transferable, given that the product was purchased from SUPREME FIREPLACES INC. or one of its authorized dealers. This warranty is conditional upon correct installation and intended use of the products and does not cover damages caused by misuse. This warranty shall be void if the fireplace, fireplace insert or wood stove is not installed by an authorized qualified technician in accordance with the installation instructions in the manual provided with this product. The installation must meet local and national building codes.

Description	Coverage	Labour
Patented combustion air control, bypass system cap, door handle (breakage only), door latch assembly, podium structure of wood stove series, legs of wood stove series, circulating chamber of fireplace insert series, bimetallic strip of combustion air control, removable ash lip, surround structure, cold hand key, wall intake and outtake grilles of gravity kit	10 years	2 years
Baffle (excluding bypass mechanism), bottom plate, stainless steel components, cast iron panel, firebox soapstone slab, exterior door frame, liner adaptor of Fusion series	5 years	2 years
Painted and plated parts, door gasket	2 years	1 year
Electrical components	2 years	90 days
Glass panel (thermal breakage only)	90 days	90 days

8.1 Warranty Limitations

Abuse and improper use of the unit may cause irreversible damage and will void the warranty.

Transportation, packaging, and other related costs or expenses arising from the replacement or repair of defective parts will not be covered by this warranty, nor will SUPREME FIREPLACES INC. assume responsibility for them.

Freight related damages of products that are shipped directly from the SUPREME INC. warehouse are covered under warranty if they were indicated on the Bill of Lading from the carrier and SUPREME FIREPLACES INC. is notified within 48 hours.

This warranty is void for any fireplace, wood stove or fireplace insert that wasn’t purchased from an authorized SUPREME FIREPLACES INC. dealer.

The warranty does not cover any physical or esthetic damages that were caused by glass cleaners, soap, or any other cleaning products.

Soapstone is a natural material. Normal wear and tear of the soapstone may result in surface fractures or small hairline cracks. Since these do not affect the functionality nor the integrity of the product, the warranty only covers fractures that are over 3 mm thick and spread across one extremity of the slab to the other.

Deformations, discoloration, corrosion and scratches are not covered under warranty.

All parts are limited to one replacement per warranty term.

This warranty does not cover the labor or other related costs for the removal of a product already installed, the installation of a replacement product and the shipping and handling for the return of a product or for the replacement part.

This warranty applies to normal residential use only. Damages caused by acts nature or natural disasters, accidents, over firing, misuse, abuse, negligence, improper installation, alterations or substitutions of components of the fireplace, abrasives, chemical cleaners, and negligence are not covered by this warranty. Burning anything other than natural wood will damage your fireplace and void the warranty.

This warranty is void for any product that has been moved from its original installation location.

SUPREME FIREPLACES INC. will not be responsible for environmental conditions and drafting issues such as inadequate vents or ventilation, excessive venting configurations or negative air pressures which may or may not be caused by geographic elements, exterior elements and/or mechanical systems such as exhaust fans, furnaces, clothes dryers, etc.

The noise generated by the expansion and contraction of the metallic components is normal as they heat up and cool down and are not covered under the warranty.

Labour covered under the warranty must not exceed the retail price of the part being replaced, are based on a predetermined rate amount found in the dealer program, exclude dealer travel costs and are disbursed to the dealer.

The manufacturer at its discretion may decide to repair or replace any part or unit after inspection and investigation of the defect. The manufacturer may, at its discretion, fully discharge all obligations with respect to this warranty by refunding the wholesale price of the defective part(s).

The manufacturer shall in no event be responsible for any consequential damages of any nature, which are in excess of the original purchase price of the product.

Repairs and/or replacements of parts and labor covered under warranty must be preauthorized by SUPREME FIREPLACES INC.

A proof of purchase (copy of the invoice) is required for all warranty claims, as well as the completed warranty claim form and pictures/videos of the issue.

This **Limited Warranty** is effective on all appliances sold after May 31st, 2022, and supersedes any and all warranties currently in existence.

Please register your SUPREME product online at https://supremem.com/warranty.php to ensure full warranty coverage. Prior to contacting your dealer, have the following information available for warranty claim processing:

- **Customer information (name, telephone number, and address)**
- **Proof of purchase**
- **Model name and serial number (see Section 2.9)**
- **Detailed description of defected component**
- **Pictures (minimum of three)**
- **Videos of the issues**

In the case of a return for repair or replacement, it is the responsibility of the customer to adequately package the component/unit to prevent further damage during transport. Items sent to SUPREME FIREPLACES INC. without an open warranty claim will be returned to the sender.

MODEL NUMBER/NUMERO MODELE: 38SFC_D_II
MAY 2025 / MAI 2025
CERTIFIED TO: CAN/ULC S610-2018-REV1, UL127-9th ed.

ASTRA DUO 38 II ☐
ELEGANCE ST 42 II ☐
MONARCH SEE-THROUGH 38 II ☐
WAYLAND SEE-THROUGH 38 II ☐

U.S. ENVIRONMENTAL PROTECTION AGENCY Certified to comply with 2020 particulate emission standards using crib wood for a single burn rate heater. This single burn rate wood heater is not approved for use with a flue damper.Tested with Method 28R crib wood standard at 1.4 gm/hr of emmission under model name 38ST_D_II. 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. Certification tests were performed by POLYTESTS SERVICES INC. with PFS-TECO as the third-party-certifier.

WH-SFCD

supreme

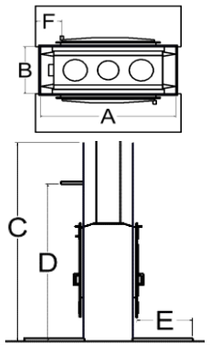
3594 Jarry E., Montreal, QC
H1Z 2G4, Canada

DATE OF FABRICATION / DATE DE FABRICATION

JA	FE	MR	AR	MA	JN	JL	AU	SE	OC	NO	DE

2025	2026	2027	2028	2029	2030

MINIMUM CLEARANCES TO COMBUSTIBLES
DÉGAGEMENTS MINIMUMS AUX COMBUSTIBLES



ADJACENT SIDEWALL / MUR LATERAL	10"
A) CHASE WIDTH / LARGEUR DE L'ENCEINTE	41"
B) CHASE DEPTH / PROFONDEUR DE L'ENCEINTE	16"
C) CEILING / PLAFOND - TRAD	84"
C) CEILING / PLAFOND - CONT	96"
D) MANTEL FROM FLOOR / MANTEAUX DU PLANCHER	53"
E) HEARTH DEPTH / PROFONDEUR DE L'ÂTRE	18"
F) HEARTH FROM SIDE DOOR/ ÂTRE DE LA PORTE	8"

CAUTION



Hot while in operation. Do not touch. Keep children, clothing, and furniture away. Contact may cause skin burns. See nameplate and instructions.
Chaud pendant fonctionnement. Ne pas toucher. Garder les enfants, les vetêments et les meubles hors de portée. Risque de brûlures au contact. Voir la fiche signalétique et instructions

- FOR USE WITH WOOD ONLY, DO NOT USE OTHER FUELS
- USE ONLY IN ACCORDANCE WITH MAUFACTURER'S INSTALLATION AND OPERATING INSTRUCTIONS.
- NOT SUITABLE FOR MANUFACTURED OR MOBILE HOMES.
- A NON-COMBUSTIBLE HEARTH EXTENSION OF MINIMUM THICKNESS 8 MM (5/16 IN.) EXCEEDING 457 MM (18 IN.) FROM THE DOOR FACE AND OF 200 MM (8 IN.) FROM EACH SIDE OF THE DOOR MUST BE INSTALLED.
- USE ONLY WITH 6 IN. (152 MM) DIAMETER CHIMNEY LISTED UL 103/ULC S629
- MINIMUM/MAXIMUM CHIMNEY HEIGHT 15/35 FEET MEASURED FROM THE BASE OF THE FIREPLACE.
- CAN BE CONNECTED TO A MASONRY CHIMNEY. SEE OWNER'S MANUAL FOR INSTALLATION INSTRUCTIONS.
- DO NOT CONNECT THIS UNIT TO A CHIMNEY SERVING ANOTHER APPLIANCE.
- DO NOT INSTALL A FIREPLACE INSERT OR OTHER COMPONENTS NOT LISTED FOR USE WITH THIS PRODUCT.
- FOR CLOSED DOOR OPERATION ONLY
- DO NOT OVERFIRE THE UNIT. IF HEATER OR CHIMNEY CONNECTER GLOWS, YOU ARE OVERFIRING.
- REPLACE GALSS ONLY WITH CERAMIC 5 MM THICK ONLY.
- CAUTION: AIR IS NECESSARY FOR FIREPLACE OPERATION. PRIMARY AND SECONDARY COMBUSTION AIR OPENINGS MUST NOT BE OBSTRUCTED.
- WARNING: THIS FIREPLACE HAS NOT BEEN TESTED WITH AN UNVENTRED GAS LOG SET. TO REDUCE THE RISK OF FIRE OR INJURY, DO NOT INSTALL AN UNVENTED GAS LOG SET INTO THE FIREPLACE.
- CONTACT LOCAL BUILDING CODE OR FIRE OFFICIALS ABOUT RESTRICTIONS AND INSTALLATION INSPECTION IN YOUR AREA.
- THE FIREPLACE AND CHIMNEY MUST BE INSPECTED AND CLEANED REGULARLY.

- POUR UTILISATION AVEC BOIS SEULEMENT, NE PAS UTILISER AVEC D'AUTRES COMBUSTIBLES.
- INSTALLER ET UTILISER CONFORMÉMENT AU MANUEL D'UTILISATION DU FABRIQUANT.
- NE CONVIENT PAS AUX MAISONS MOBILES
- PROLONGEMENT DE L'ÂTRE AYANT UNE ÉPAISSEUR DE 8 MM (5/16 PO.) MINIMUM EXCÉDANT 450 MM (18 PO.) DU DEVANT DE LA PORTE ET DE 200 MM (8 PO.) DE CHAQUE CÔTÉ DE LA PORTE DOIT ÊTRE INSTALLÉ.
- UTILISER SEULEMENT AVEC UNE CHEMINÉE HOMOLOGUÉE SELON UL 103/ULC S629 DE 6 PO. (152 MM) PARMIS LA LISTE DANS LE MANUEL DU PROPRIÉTAIRE.
- PEUT ÊTRE CONNECTÉ À UNE CHEMINÉE DE MAÇONNERIE. VOIR LE MANUEL DU PROPRIÉTAIRE POUR INSTRUCTIONS.
- NE PAS RACCORDER CET APPAREIL À UNE CHEMINÉE DESSERVANT UN AUTRE APPAREIL.
- NE PAS UTILISER UN FOYER ENCASTRABLE OU D'AUTRES COMPOSANTES NON-HOMOLOGUÉES POUR UTILISATION AVEC CE FOYER.
- POUR OPÉRATION AVEC PORTE FERMÉE SEULEMENT.
- NE PAS SURCHAUFFER L'UNITÉ. SI L'APPAREIL OU LE TUYAU ROUGIT, IL Y A UN SURCHAUFFEMENT.
- REMPLACER LA VITRE AVEC UN VERRE CÉRAMIQUE DE 5 MM D'ÉPAISSEUR.
- ATTENTION : L'AIR EST NÉCESSAIRE AU FONCTIONNEMENT DU FOYER. LES ENTRÉES D'AIR DE COMBUSTION PRIMAIRE ET SECONDAIRE NE PEUVENT PAS ÊTRE OBSTRUÉES
- ATTENTION : CE FOYER N'A PAS ÉTÉ TESTÉ AVEC UN BRÛLEUR AU GAZ. POUR RÉDUIRE LES RISQUES D'INCENDIES OU DE BLESSURES, NE PAS INSTALLER UN BRÛLEUR DE GAZ DANS CE FOYER.
- CONTACTER LES AUTORITÉS DE VOTRE LOCALITÉ AYANT JURIDICTION CONCERNANT LES RESTRICTIONS ET INSPECTIONS D'INSTALLATION.
LE FOYER ET LA CHEMINÉE DOIVENT ÊTRE INSPECTÉS ET NETTOYÉS RÉGULIÈREMENT.

MODEL NUMBER/NUMERO MODELE: 38ST_D_II

MAY 2025 / MAI 2025

NOVO DUO 38 II ☐

U.S. ENVIRONMENTAL PROTECTION AGENCY Certified to comply with 2020 particulate emission standards using crib wood for a single burn rate heater. This single burn rate wood heater is not approved for use with a flue damper.Tested with Method 28R crib wood standard at 1.4 gm/hr of emmissions. 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. Certification tests were performed by POLYTESTS SERVICES INC. with PFS-TECO as the third-party-certifier.

WH-NVD

supreme

3594 Jarry E., Montreal, QC
H1Z 2G4, Canada

DATE OF FABRICATION / DATE DE FABRICATION

JA	FE	MR	AR	MA	JN	JL	AU	SE	OC	NO	DE
2025		2026		2027		2028		2029		2030	

MINIMUM CLEARANCES TO COMBUSTIBLES
DÉGAGEMENTS MINIMUMS AUX COMBUSTIBLES

	SINGLE WALL TUYAU SIMPLE NOVO DUO 38	DOUBLE WALL TUYAU DOUBLE NOVO DUO 38
	CANADA	USA
A) FROM STOVE TO SIDE WALL	8"	N/A
B) FROM PIPE TO SIDE WALL	8"	N/A
C) FROM STOVE TO BACK WALL	N/A	8"
D) FROM PIPE TO BACK WALL	18"	16"
E) FROM STOVE TO WALL (CORNER)		
F) FROM PIPE TO STOVE (CORNER)		
J) STOVE TO BACK FLOOR PROTECTOR		
K) STOVE TO SIDE FLOOR PROTECTOR		
L) EDGE OF DOOR TO SIDE FLOOR PROTECTOR		
M) DOOR TO FRONT OF FLOOR PROTECTOR		

CAUTION



Hot while in operation. Do not touch. Keep children, clothing, and furniture away. Contact may cause skin burns. See nameplate and instructions.
Chaud pendant fonctionnement. Ne pas toucher. Garder les enfants, les vetêments et les meubles hors de portée. Risque de brûlures au contact. Voir la fiche signalétique et instructions

- FOR USE WITH WOOD ONLY, DO NOT USE OTHER FUELS.
- USE ONLY IN ACCORDANCE WITH MAUFACTURER'S INSTALLATION AND OPERATING INSTRUCTIONS.
- NOT SUITABLE FOR MOBILE HOMES.
- USE 6 IN. (152 MM) DIAMETER LISTED CONNECTOR WITH LISTED FACTORY-BUILT CHIMNEY SUITABLE FOR ISE WITH SOLID FUELS OR MANSONRY CHIMNEY.
- DO NOT PASS THE CHIMNEY CONNECTOR THROUGH A COMBUSTIBLE CEILING.
- DO NOT CONNECT THIS UNIT TO A CHIMNEY SERVING ANOTHER APPLIANCE.
- FOR CLOSED DOOR OPERATION ONLY.
- DO NOT OVERFIRE THE UNIT. IF HEATER OR CHIMNEY CONNECTOR GLOWS, YOU ARE OVERFIRING.
- REPLACE GLASS ONLY WITH CERAMIC 5 MM THICK.
- CAUTION: AIR IS NECESSARY FOR WOODSTOVE OPERATION. PRIMARY AND SECONDARY COMBUSTION AIR OPENINGS MUST NOT BE OBSTRUCTED.
- COMBUSTIBLE FLOOR MUST BE PROTECTED BY A NON-COMBUSTIBLE MATERIAL EXTENDED TO THE FRONT, SIDES, AND BACK AS INDICATED.
- CONTACT LOCAL BUILDING CODE OR FIRE OFFICIALS ABOUT RESTRICTIONS AND INSTALLATION INSPECTION IN YOUR AREA.
- THE WOODSTOVE AND CHIMNEY NEED TO BE CLEANED AND INSPECTED REGULARLY.
- REFER TO INTERTEK'S DIRECTORY OF BUILDING PRODUCTS FOR DETAILED INFORMATION

- POUR UTILISATION AVEC BOIS SEULEMENT, NE PAS UTILISER AVEC D'AUTRES COMBUSTIBLES.
- INSTALLER ET UTILISER CONFORMÉMENT AU MANUEL D'UTILISATION DU FABRIQUANT.
- NE CONVIENT PAS AUX MAISONS MOBILES.
- UTILISER DU TUYAU DIAM. 6 PO. (152 MM) HOMOLOGUÉ AVEC UNE CHEMINÉE PRÉFABRIQUÉE HOMOLOGUÉE CONVENANT POUR UNE UTILISATION AVEC DES CARBURANTS SOLIDES OU UNE CHEMINÉE DE MAÇONNERIE.
- NE PAS PASSER DE TUYAU À TRAVERS UN PLAFOND COMBUSTIBLE.
- NE PAS RACCORDER CET APPAREIL À UNE CHEMINÉE DESSERVANT UN AUTRE APPAREIL.
- POUR OPÉRATION AVEC PORTE FERMÉE SEULEMENT.
- NE PAS SURCHAUFFER L'UNITÉ. SI LE POÊLE OU LE TUYAU ROUGIT, IL Y A SURCHAUFFÉ.
- REMPLACER UNE VITRE SEULEMENT AVEC DU VERRE PYROCÉRAMIQUE DE 5 MM D'ÉPAISSEUR.
- ATTENTION: L'AIR EST NÉCESSAIRE AU FONCTIONNEMENT DU POÊLE. LES ENTRÉES D'AIR DE COMBUSTION PRIMAIRE ET SECONDAIRE NE DOIVENT PAS ÊTRE OBSTRUÉES.
- CONTACTER LES AUTORITÉS DE VOTRE LOCALITÉ AYANT JURIDICTION CONCERNANT LES RESTRICTIONS ET INSPECTIONS D'INSTALLATION.
- LE POÊLE ET LA CHEMINÉE DOIVENT ÊTRE INSPECTÉS ET NETTOYÉS RÉGULIÈREMENT.
- SE RÉFÉRER AU RÉPERTOIRE DES PRODUITS DE CONSTRUCTION POUR DES INFORMATIONS DÉTAILLÉES

APPENDIX 8: Photographs of test set up

Dilution picture Dia 8 no. EG-029

Polytests Services Inc. 695 B rue Gaudette,St-Jean-sur-Richelieu Québec, Canada, J3B 7S7



Velocity ports at 90 degrees and tunnel temperature sensor location

Particulate sample extraction ports located 48 inches under (requirement 4D=32 inches minimum) velocity ports and 18 inches above downstream Tee. (Requirement 2D=16 inches minimum)

Adjustable damper for flow adjustments

Extraction blower



Total length between hood and sampling port: 23 feet.

POLYTESTS
TESTING THROUGH YOUR REALITY



Two 8 inches elbow with horizontal mixing section.

60 inches horizontal run between two elbows. Mixing section, No mixing baffle. 8 inches diameter pipe

Hood diameter 32 (requirement 4D=32 inches minimum) inches and height of 24 inches (requirement 3D=24 inches minimum)

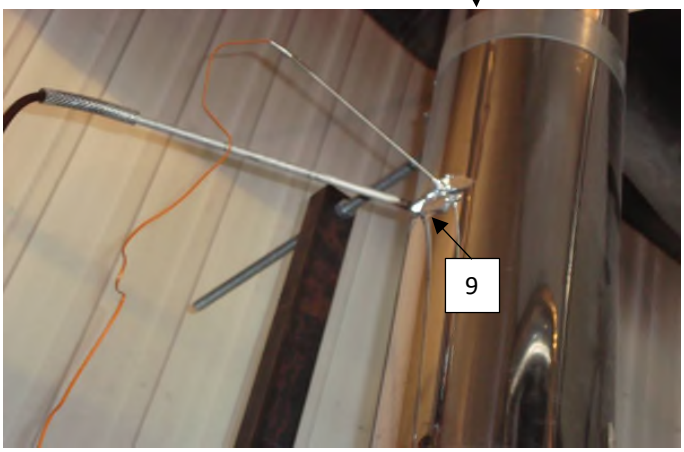
All pipe joints are sealed.

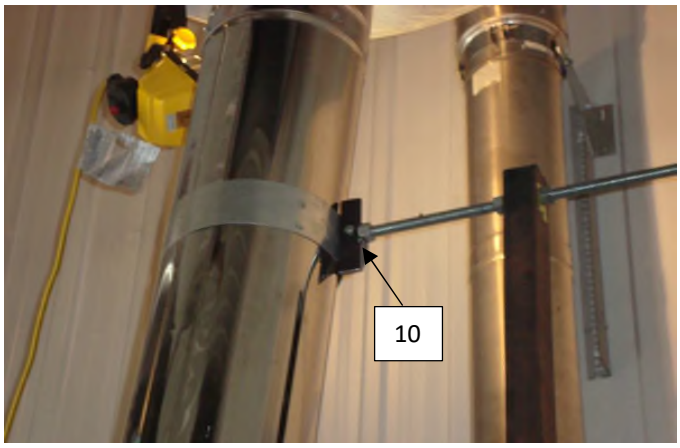
Stack sampling



Gas analysis and temperature probe

chimney support

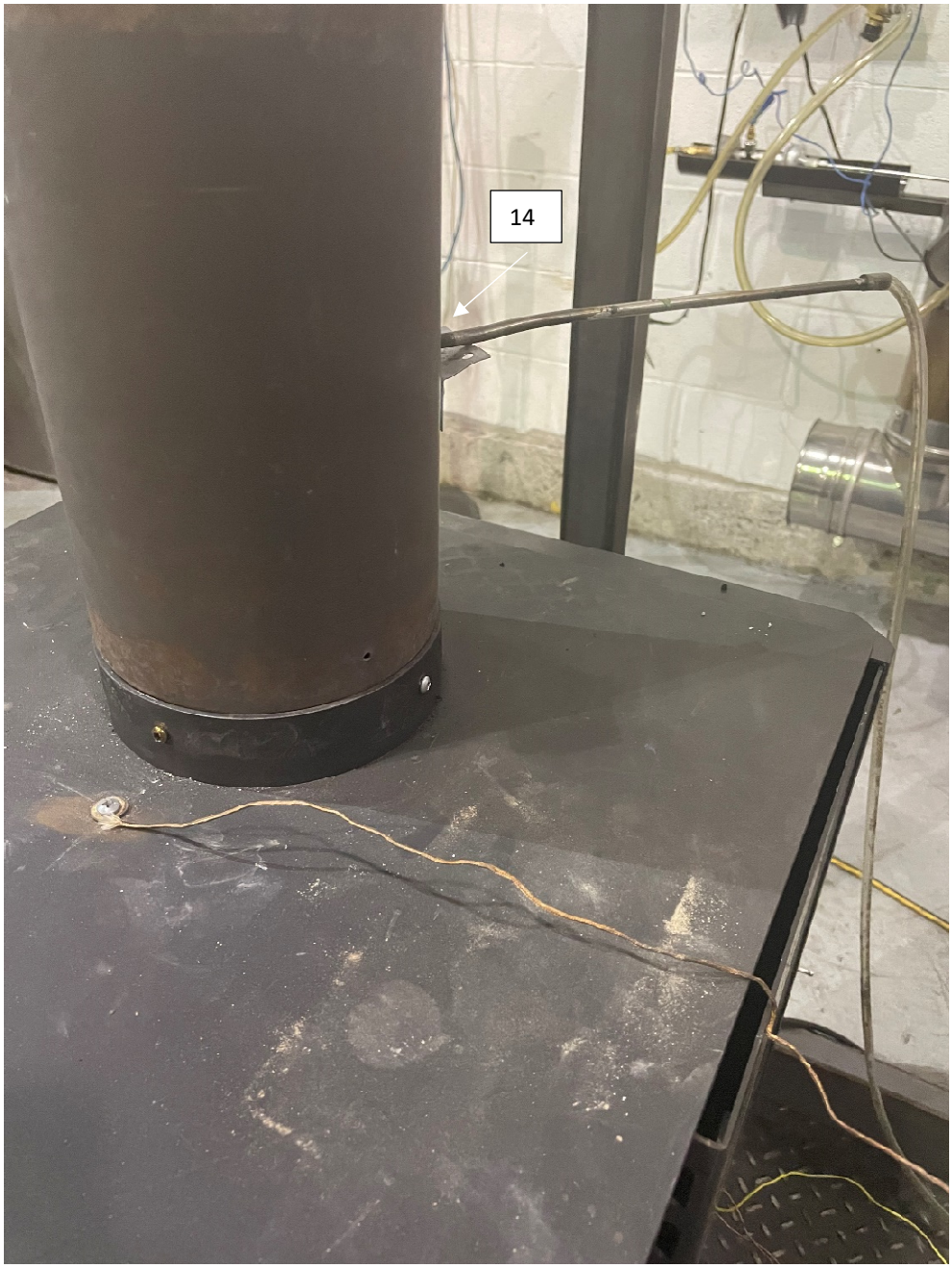




9 : Temperature and gas analyser sampling ports located 9 feet above platform

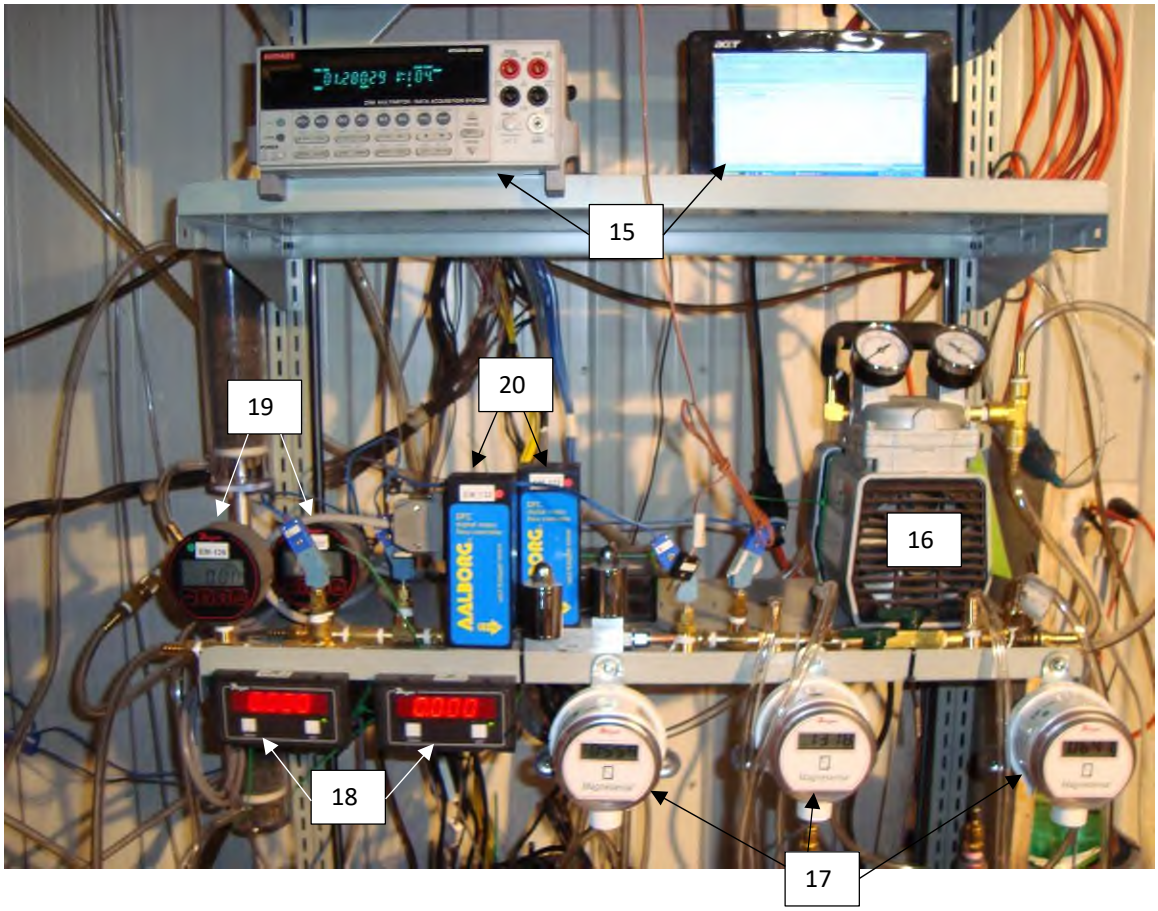
10 : Exhaust system support bracket

Draft sampling



14 : Draft sampling port located 6 in. from the flue outlet

Equipment's



15 : Acquisition system

16 : Vacuum pump

17 : Digital manometer

18 : Digital read out for mass flow meter

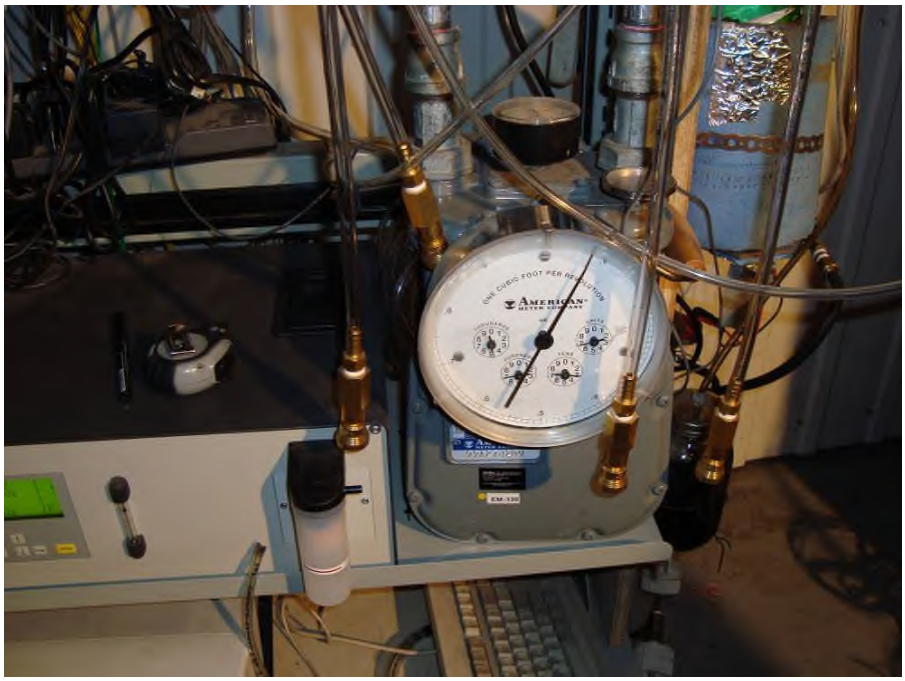
19 : Digital vacuum gage

20 : Mass flow meter

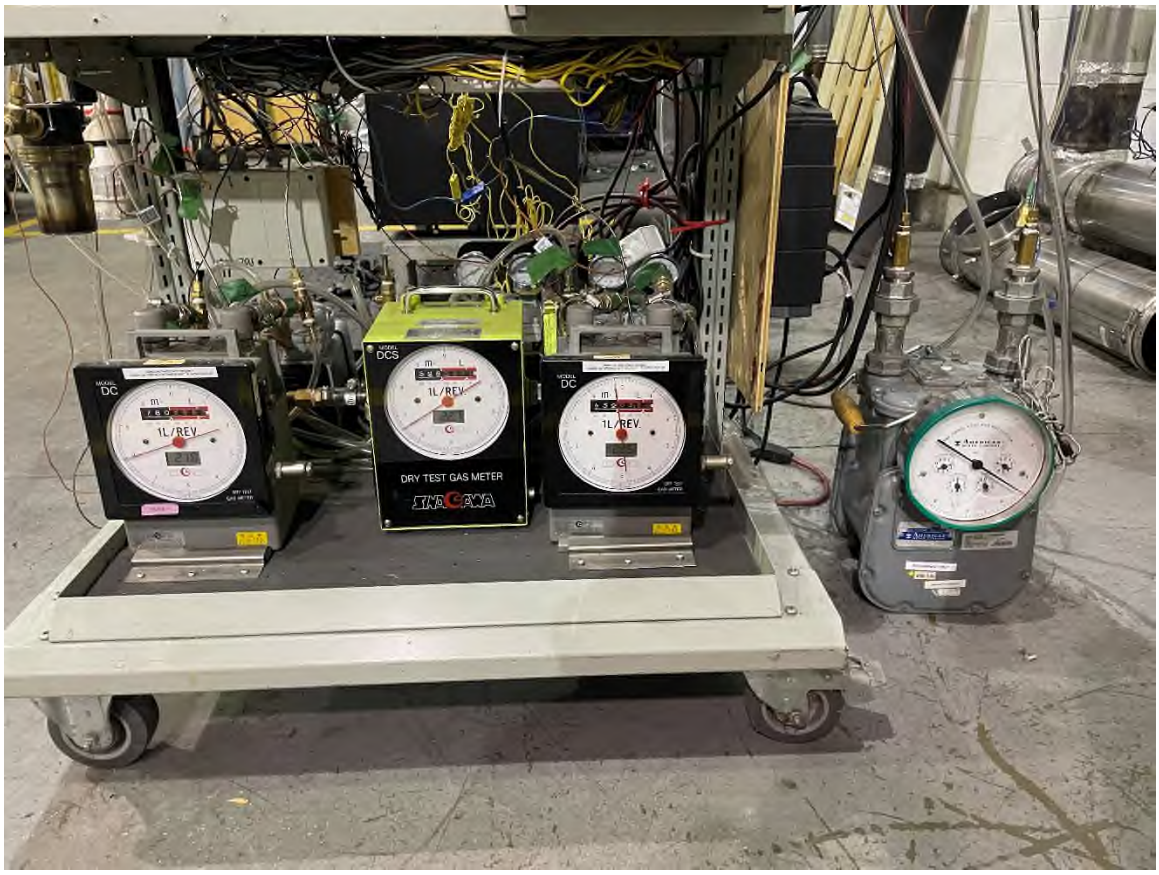
Gaz analyser



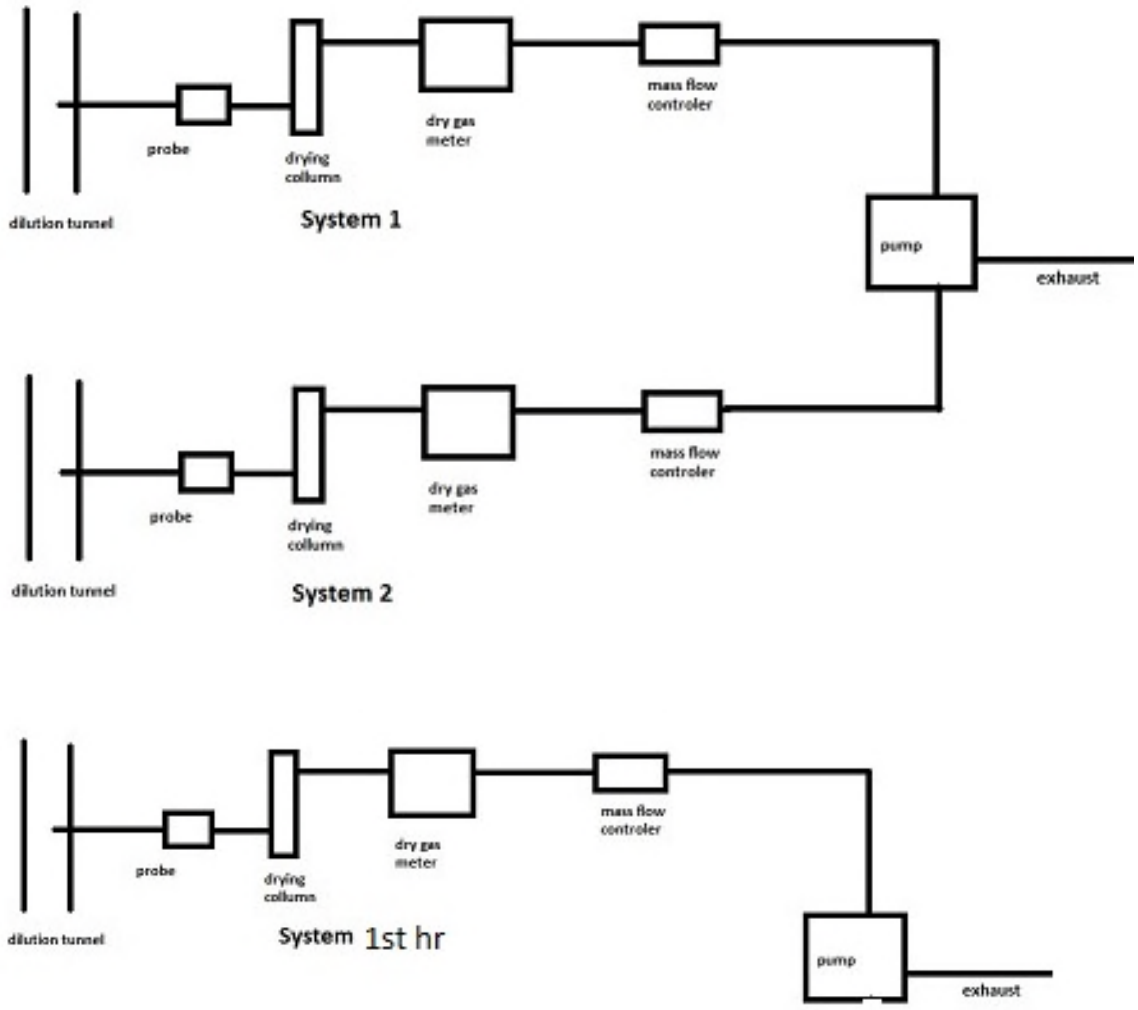
Reference dry gas meter



Dry gas meter for train 1, train 2 and room filter.



Dilution tunnel sample system



Dilution tunnel

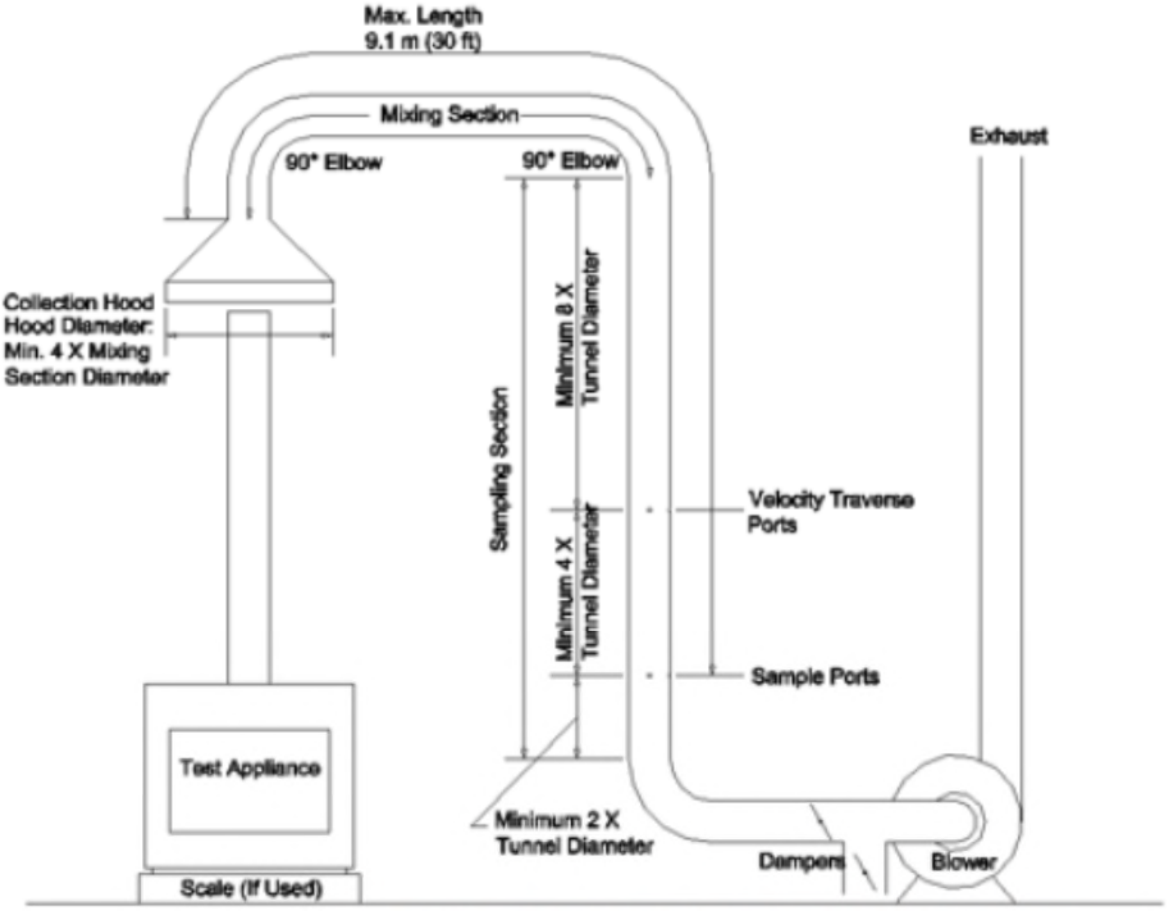


FIG. 3 Steel-Constructed Dilution Tunnel Apparatus

Sampling filter holders	
	Back filer holder The Pall (Gelman) 1119, polycarbonate Thermocouple Front filter holder The Pall (Gelman) 1235 Aluminium Seamless stainless steel probe corrosion resistant, 12in. long, ¼ (O.D.)

The test facility temperature monitor is located on the horizontal plane that includes the primary air intake opening for the test appliance. Locate the temperature monitor 1 to 2 m (3.3 to 6.6 ft) from the front of the test appliance in the 90° sector in front of the test Appliance

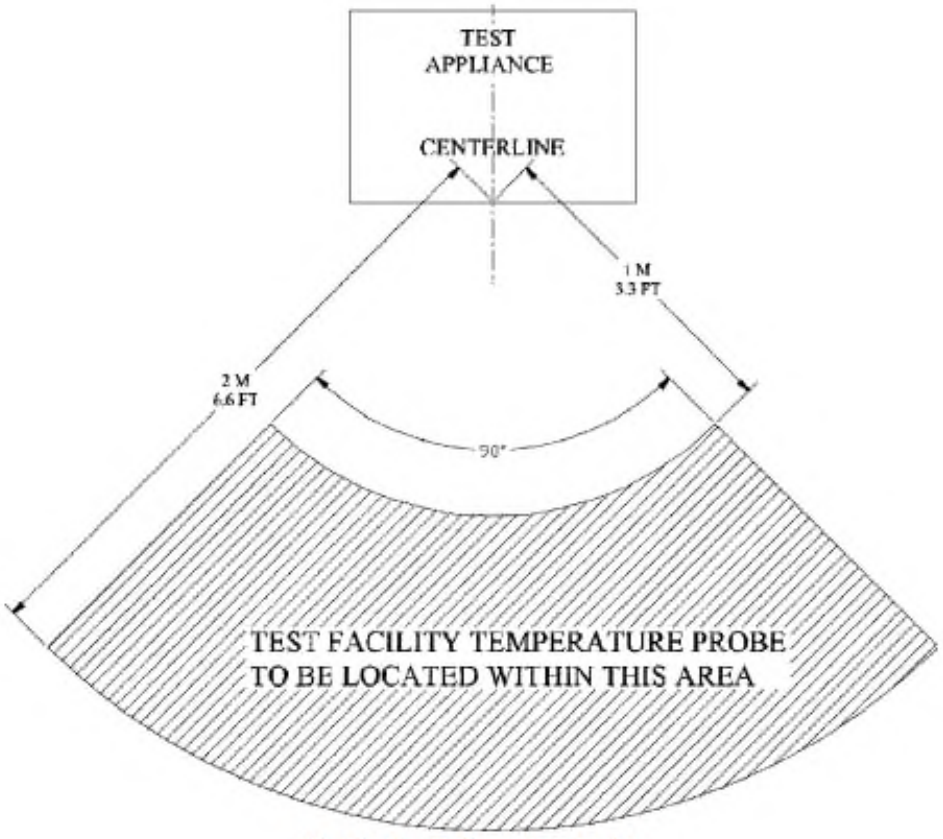
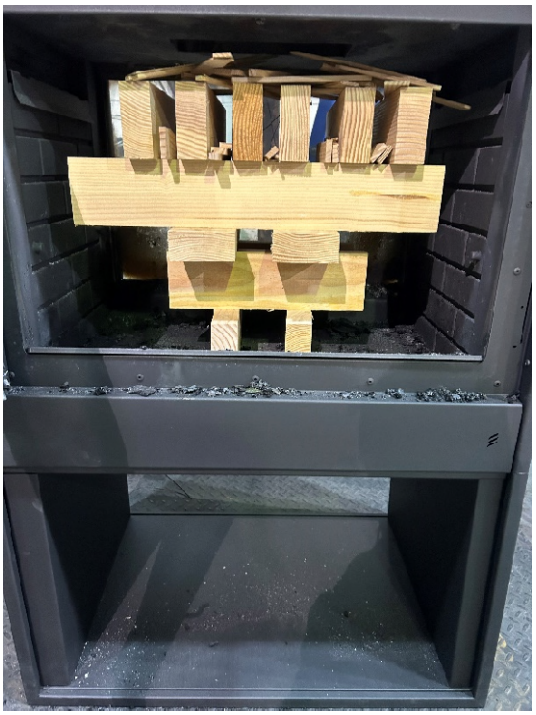


FIG. 8 Test Facility Temperature Monitor

APPENDIX 9: Test load photographs

Front view stove setup	Left side view of the Stove
	
Back side view of the stove	Right side view of the stove
	

Run 1, April 15th 2025	
Testing load	Preburn load
	
Charcoal / coal bed for load	Load in stove
	

Run 2, April 16th 2025	
Testing load	Preburn load
	
Charcoal / coal bed for load	Load in stove
	

Sealed Stove	
	

APPENDIX 10: Laboratory Operating Procedures

POLYTESTS Services inc.

SFBA EMISSIONS AND EFFICIENCY TESTING LABORATORY OPERATING PROCEDURE

INTRODUCTION

This document provides a step-by-step guide for the technician conducting tests to EPA standard requirements. Procedures outlined here, when followed, will result in tests in conformance with EPA Methods 28R, ASTME2780, ASTME2515, ASTM E2618, Method 28WHH, Method 28 PTS, Method ALT-125, ASMTE 3053, ALT-134, ASTME2779

The primary measurements to be made are particulate emissions rates. The technician's duties include the following steps.

1. Incoming inspection of test units.
2. Set-up of test units.
3. Preliminary testing to establish unit operating procedures and familiarity with operating controls.
4. Calibration of test equipment.
5. Set-up, checking and operation of sampling apparatus.
6. Conduct of tests including complete record keeping and data recording for non-automated functions.
7. Operation of hardware and software included in automatic data acquisition system.
8. Review and analysis of data at test completion to ensure test validity.

The technician running this test must be familiar with the following documents, which are to be kept in the laboratory at all, times.

EPA METHODS

1. EPA METHODS 28R
2. ASTME2780
3. ASTME2515
4. ASTM E2618
5. METHOD 28WHH
6. METHOD 28 PTS
7. ALT-125
8. ASMTE 3053
9. ALT-134
10. ASTME2779

I. APPLIANCE INSPECTION AND SET-UP

A. INCOMING INSPECTION

1. Check for completeness of unit including parts, accessories, installation and operating instructions, drawings and specifications etc. Note any discrepancies or missing parts or information.
2. Check for shipping damage. If damage has occurred, notify the laboratory manager. In some cases, repairs may be made, provided the manufacturer and laboratory manager concur that repairs will not affect the unit's performance. If damage is irrepairable, a new unit will need to be obtained.
3. Note whether unit is catalytic of non-catalytic.
4. Mark unit with manufacturer's name, model number, work order number and date received.
5. If unit is safety listed, note label data including listing agency and serial number. If unit is not listed, mark all data sheets "UNLISTED". Test results will not be released until unit passes safety tests without modification unless authorized by laboratory manager.

B. UNIT SET-UP

1. All new units must be operated for a breaking in period as follows.

    a) Fifty (50) hours at medium burn rate with Douglas Fir scrap or cordwood. Between 18% and 25% MC.

During these break-in runs the unit may be connected to a lab chimney and fuel additions noted into the corresponding data acquisition file. For catalytic units, a thermocouple must be installed in the catalyst.

Record catalyst temperature at 1-hour intervals or on chart recorder. Operating should continue until data shows at least fifty (50) hours of operation with catalyst temperature in excess of 500 degrees Fahrenheit (active range).

For non-catalytic units a stack thermocouple should be installed and stack temperature recorded at 1-hour intervals. 50 hours minimum burn time with a stack temperature of at least 250 degrees Fahrenheit is required.

Once break-in is completed, allow unit to cool. Clean unit thoroughly.

2. Unit is to be placed on scale for testing. Prior to proceeding with verification process, scale should be turned on and allowed to warm up for one (1) hour minimum. Zero scale and check calibration with standard weights. One (1) 1 kg weight and one (1) 2 kg weight are provided for this purpose. Use scale verification test form no. EPA-7-TP to record results. If scale fails to reproduce weights within tolerance, check with laboratory manager before proceeding.
3. If scale checks out, place unit on scale and align so chimney will be centered in hood.
4. Attach chimney connector and chimney. Be sure all joints are sealed below sampling points. Chimney and connector should be cleaned with a wire brush. Be sure chimney connector terminates and chimney starts at proper level above scale platform. Chimney must be supported from scale so that it does not touch test enclosure or hood walls.
5. Thermocouples should be attached to surfaces of unit prior to testing. EPA requires a thermocouple on the bottom of the firebox. This must be installed prior to putting the unit on the scale. In some cases, the required thermocouple locations will be inaccessible on finished units. These units should have thermocouples installed by the manufacturer during construction. Check with the laboratory manager if problems are encountered in proper thermocouple attachment.
6. Measure firebox dimensions and record on data forms nos. EPA-2-TP. Make a three-dimensional sketch of the firebox including firebrick, baffles and obstructions. Calculate firebox volume in cubic feet with both addition and subtraction methods using forms nos. EPA-3-TP and EPA-4-TP. See Section 6.2.4 of EPA Method 28 for details of firebox volume determination.
7. If unit is catalytically equipped, additional thermocouples must be installed upstream and downstream of catalyst. Thermocouples should also be placed in the primary and secondary combustion chambers of all units.
8. Plug thermocouples into data acquisition system jacks making a check of locations and jack numbers for each test on data form no. EPA-5-TP.
9. Note that inserts are tested as if they are freestanding stoves.
10. Dilution tunnel should be cleaned prior to each certification test series and at anytime a higher burn rate follows a lower test burn rate.

II. SAMPLING SYSTEM – SET-UP

A. GAS ANALYSIS

1. Instruments should be turned on and allowed to warm up for one (1) hour minimum.

2. Calibrate analyzers as follows:

   NOTE: Prior to proceeding with calibration, make sure to use NIST traceable calibration gas bottles. Adjust flow meter, if necessary, at each instrument to required flow value.

   a) Using span gas, adjust span control to values specified on calibration gas label.
   b) Using nitrogene, adjust zero controls to provide a 0.00 analyzer readout.
   c) Repeat a) and b) until no further adjustment is required.
   d) Check readout vs. calibration gases (2) labels.

   The CO_2 and CO analyzers are "ZEROED" on nitrogen. The O_2 analyzer is spanned on air and set for 20.9%. It is zeroed on nitrogen as well.

3. Check for response time synchronization.

   a) With no fire in unit, allow reading to stabilize (O_2 should be 20.93, CO and CO_2 should equal O).
   b) Flow the calibration gas in the unit and start stop watch. Note the time required for each unit to reach .90 of the calibration gas bottle value. If all three analyzers reach this value within 15 seconds of each other, synchronization is adequate. If not, contact the laboratory manager. Synchronization is adjusted by internal instrument setting.

4. Set-up sample clean-up and water collection train as follows.

   a) Load impingers as follows:
   Impinger #1: 100 ml distilled water and 5 ml H_2SO_4
   Impinger #2: 100 ml distilled water and 5 ml H_2SO_4
   Impinger #3: Empty
   Impinger #4: 200 – 300 grams silica gel (dry)

   b) Place impingers in container and connect with "U TUBES". Grease carefully on bottom half of ball joint so that grease will not get into tubes.

c) Connect filter to first impinger and sample line to last impinger.

e. Leak check system as follows.

1) Plug probe.
2) Turn on sample system.
3) Observe sample flow rotometer and vacuum gauge. If necessary, use vacuum; adjust valve to set vacuum to the maximum inches Hg.
4) If the float in rotometer does not stabilize below 10 on scale, system must be resealed.
5) Repeat leak check procedure until satisfactory results are obtained.

f) Just prior to starting test, fill impinger container with water and ice and record ambiant conditions on data form no. EPA-8-TP.

B. DILUTION TUNNEL SAMPLE TRAIN SET-UP

1. Filters and holders.

a) Clean probes and filter holder front housings carefully and desiccate for at least 48 hours prior to use.
b) Filters should be numbered and filter and probe combinations labeled prior to use.
c) Weigh desiccated filters and probe-filter units on analytical balance. Record weights data form no. EPA-10-TP. Note that probe and front half of front filter are to be weighed as a unit.
d) Carefully assemble filter holder units and connect to sampling systems. Check "DRIERITE" columns for adequate dry absorbent (blue).

2. Leak checking.

a) Each sample system is to be checked for leakage prior to inserting probes in tunnel.
b) Plug probes and start samplers, adjust pump bypass valve to produce a vacuum reading of 10 inches Hg. (NOTE: During test, vacuum must not exceed 10 inches unless posttest leak check shows acceptable results.)
c) Allow vacuum indication to stabilize for two (2) minutes, then record time and dry gas (DGM_1) and (DGM_2) meter readings. Wait ten (10) minutes and record dry gas meter readings again (DGM_3, DGM_4).

NOTE: If mark, system is leaking too much and all seals should be checked.

d) Calculate leakage rate as follows.

1) System 1: $\frac{(DGM_3 - DGM_1)}{10} = CFM_1$

2) System 2: $\frac{(DGM_4 - DGM_2)}{10} = CFM_2$

If CFM_1 or CFM_2 is greater than .02 CFM, leakage is unacceptable and system must be resealed.

If CFM_1 or CFM_2 is greater than 0.04 X sample rate, leakage is unacceptable. For most tests, the sample rate will be about 0.15 CFM, thus leakage rates in excess of 0.04 X 0.15 = 0.006 CFM are not acceptable. Record leakage rates on form no. EPA-5-TP

e) Once leakage check is satisfactory, unplug probe and set flow to appropriate rate for test. This should be done in the minimum amount of time necessary and with the probes in ambient air. Do not insert probes in tunnel until the start of the test run. When flow is established, replug probes to prevent contamination.

III. TEST CONDUCT

A. FUEL LOAD

1. Determine optimum load weight by multiplying firebox volume in cubic feet by 7 or (10 and 12 for cordwood method). This is the load weight on an as-fired basis.
2. Determine piece size to obtain the requested load configuration and meet the test load weight criteria. The load should consist of the following: **TO BE DETERMINED**
3. Weigh out test load and adjust weight by shortening all pieces equally if necessary. Record individual piece load on form no. EPA-11-TP.

4. Measure and record moisture content of each fuel piece using Delmhorst moisture meter. Determine if fuel load moisture content is in required range. If not, construct new load using wood with required moisture content. All wood in the humidity chamber should be within range. Contact project manager if you cannot find suitable pieces. Record moisture of each individual piece load on form no. EPA-11-TP.

B. UNIT START-UP

1. Before lighting a fire, turn on dilution tunnel and set tunnel velocity to 500ft/min Record readings on data form no. EPA-9-TP.
2. Check draft imposed on cold stove with all inlets closed and a draft gauge in the chimney. If draft is greater than 0.005 inches water column, adjust tunnel to stack gap until draft is less than 0.005.
3. Check for ambient airflow around unit with hot wire anomometer. Must be less than 50 ft/min.
4. Check all equipment for proper operation. Analyzers should be on and in sample mode. Computer should be loaded with test program and awaiting test start command.
5. Zero scale and start fire with uncolored newspaper and kindling representing 10 % of test load with the same type of fuel.
6. Once kindling is burning well after 5 minutes, add splitted pieces having a bottom surface around 4 sq. inches and representing 25% of test load weight. Operate at high fire for 15 minutes. Then adjust settings to intended test run levels as per the manufacturers.
7. Following addition of pretest fuel load (splitted pieces), start computer for data logging.
8. All fuel additions, air intake settings and operational characteristics shall be noted with associated time stamp on form no. EPA-1-TP.

C. TEST RUN

1. Once the targeted test fuel bed weight is obtained, the test is to be started as follows:

   a) Insert the sample probes into the tunnel being careful not to hit sides of tunnel with probe tip.
   b) Check tunnel pitot tube for proper position. (Pitot should be carefully cleaned prior to each test.)
   c) Turn on probe sample systems and stack sampler.
   d) Open stove door, rake coals and load stove as follows: **TO BE DETERMINED**
   e) Close door or follow manufacturer's start-up procedures. (Five (5) minutes maximum time before all doors and controls must be set to final positions for duration of test. 15 minutes or 15% of lad burned allowed for ALT-125 method))
   f) An alarm will sound an audible signal at the (10) minutes intervals. This signals a reading interval. You must verify at each interval that the following readings are correctly logged by the data acquisition system and make observations of any unusual or non-routine events that could occur.

      1) Rotometer readings.
      2) Tunnel pitot tube reading.

(Zero regularly between readings)

      3) Gas meter readings.
      4) Temperature readings.
      5) Draft reading
      6) Test laod weight
      7) CO, CO_2 and O_2 readings
      8) Observations of any unusual or non-routine events.

   g) During the test, any condition approaching unacceptable limits will be noted. The filter probes and housings are installed in small holders just outside the tunnel. If the filter temperature gets too high, you will have to increase the water flow through the cooling unit until acceptable temperatures are obtained. In between readings, check on other equipment. Be sure dryers and filters are working and monitor impinger train for proper water and ice levels etc.

   h) When the fuel charge is consumed, it will signal end of test and shut down the sampling systems. When this occurs,

remove filter holder and probes from tunnel and impingers from sample line.

IV. POST TEST PROCEDURES

A. SAMPLE RECOVERY – FILTER TRAINS

1. Carefully clean outside of probes and filter housings with alcohol.
2. Disassemble filter holder and transfer filters to clean petri dish. Scrape gasket with scalpel and collect any loose material on filters.
3. Place probe and front half of first filter holders (still assembled) and filters in desiccator. Allow 48-hour desiccation before weighing.
4. Weigh probe filter holder units and filters at six (6) hour intervals minimum until weight change between weightings is less than 0.2 mg. Record all weights taken on data form no. EPA-10-TP.

B. CALCULATION OF RESULTS

The computer program carries out all final calculations. When run, it will ask for data from forms used during the test. Enter data as called for.

GENERAL

This guide cannot cover every possible contingency, which may develop during a particular test program. Many questions, which may arise, can be answered by a complete understanding of the test standards and their intent. When in doubt on any detail, check with the laboratory manager and be sure you understand the procedures involved.

It is critical that all spaces on the data forms be properly filled in. Each test must be represented by a complete record of what was done and when.

APPENDIX 11: Sample calculations

Validation du fichier de calcul avec les équations provenant des normes:
ASTM E2515-11
ASTME2618

Dry burn rate (BR)

Equation used

B415.1, 13.4

$$BR = \left[\frac{60W_{WD}}{\theta}\right]\left[\frac{100 - \%M_W}{100}\right]$$

Nomenclature

BR	Dry wood burn rate, kg/hr (lb/hr)
W_{WD}	Total mass of wood burned (wet basis) during the test run, kg (lb)
θ	Total time of test run, minutes
$\%M_W$	Average moisture in test fuel charge, wet basis, %
	To convert from dry basis to wet basis: % moisture wet basis =

Sample calculation

Data

W_{WD}	22,828	lbs
θ	272	min
$\%M_W$	16,42	%

Calculation

BR	1,910	Dry kg/hr

Volume of gas sample corrected to dry standard conditions ($V_{m(std)}$)

Equation used

ASTM 2515, equation 6

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

Nomenclature

$V_{m\,(std)}$	Volume of gas sample , corrected to standard conditions, $dscm^3$ (dscf)
K_1	17.64 R/in Hg
V_m	Volume of gas sample
Y	DGM calibration factor
P_{bar}	Barometric pressure mmHg (in Hg)
ΔH	Average pressure at the outlet of the dry gas meter mm water (in. Water)
T_m	Absolute average dry gas meter temperature K (R)

Sample calculation

Data

V_m	54,00	dcf
Y	1,01	
P_{bar}	29,10	in Hg
ΔH	-0,9750	in Hg
T_m	538,9	R

Calculation

$V_{m(std)}$	50,22	dscf

Total amount of particulate matter collected (m_n)

Equation used

ASTM 2515, equation 12 $$m_n = F_1 + F_2 + \Delta PF$$

Nomenclature

m_n	Total amount of particulate matter collected, mg
F_{1+F2}	Particulate matter collected on filters, mg
ΔPF	Post-test weight gain of probe and filter holder assembly, mg

Sample calculation

Data

F_{1+F2}	0,0024 g
ΔPF	0,001 g

Calculation

m_n	3,300 mg

Calculation based of train 2 data

Particulate concentration (C_S)

Equation used

ASTM 2515, equation 13

$$C_S = (0{,}001\ g/mg) \times \left(\frac{m_n}{V_{m\,(std)}}\right)$$

Nomenclature

C_S	Concentration of particulate matter in stack gas or dilution tunnel, dry basis, corrected to standard conditions, g/dsm^3 (g/dscf)
m_n	Total amount of particulate matter collected in the sampling train, mg
$V_{m(std)}$	Volume of gas sample measured corrected to dry standard conditions, dsm^3 (dscf)

Sample calculation

Data

m_n	3,300	mg
$V_{m(std)}$	50,22	dscf

Calculation

C_s	0,000066	g/dscf

Calculation based of train 2 data

Particulate concentration for room air (C_r)

Equation used

ASTM 2515, equation 14

$$C_r = (0{,}001\ g/mg) \times \left(\frac{m_r}{V_{mr\,(std)}}\right)$$

Nomenclature

C_r	Concentration of particulate matter in room air, dry basis, corrected to standard conditions, g/dsm^3 (g/dscf)
m_r	Total amount of particulate matter collected in the sampling train, mg
$V_{mr(std)}$	Volume of room air sample measured corrected to dry standard conditions, dsm^3 (dsc

Sample calculation

Data

m_r	0,100	mg
$V_{mr(std)}$	47,45	dscf

Calculation

C_r	0,000002	g/dscf

Calculation based of train 2 data

Adjustment factor for alternative pitot tube placement (FP)

Equation used

ASTM 2515, equation 1

$$F_P = \frac{V_{strav}}{V_{scent}}$$

Nomenclature

V_{strav}	Average gas velocity caclulated after the Pitot tube traverse
V_{scent}	Average gas velocity at the center of the dilution tunnel cacluated after the multi-point Pitot traverse
F_P	Adjustment factor for center of tunnel pitot tube placement

Sample calculation

Data

V_{strav}	0,261918668
V_{scent}	0,27838677

Calculation

F_P	0,940845

Average dilution tunnel gas velocity (V_S)

Equation used

ASTM 2515, equation 9

$$V_S = F_p K_P C_P (\sqrt{\Delta P})_{avg} \sqrt{\frac{T_S}{P_S M_S}}$$

Nomenclature

V_S	Average dilution tunnel gas velocity, m/s (ft/s)
K_P	Pitot tube constant For the metric units: $34.97\ m/sec \left[\frac{\left(\frac{g}{g-mole}\right)(mm\ Hg)}{(°K)(mm\ H_2O)}\right]^{1/2}$ For English units: $85.49\ ft/sec \left[\frac{\left(\frac{lb}{lb-mole}\right)(in\ Hg)}{(°R)(in\ H_2O)}\right]^{1/2}$
C_P	Pitot tube coefficient (use 0.99 for standard pitot tube, 0.84 may be used for S-type tubes constructed according to Method 2 specifications)
F_P	Pitot tube correction factor
$(\sqrt{\Delta P})_{avg}$	Average square root of each individual velocity head (ΔP)
P_{bar}	Barometric pressure at measurement site, mm H_2O (in. H_2O)
P_g	Stack static pressure, mm Hg (in. Hg)
P_S	Absolute dilution tunnel static gas pressure, mm Hg (in. Hg), or $P_{bar} + P_g$
M_S	Molecular weight of dilution tunnel gas, wet basis, g/g-mole (lb/lb-mol) may be assumed to be 28.78 or 29 for CSA B415
t_S	Dilution tunnel temperature, °C (°F)
T_S	Absolute dilution tunnel temperature, °K (°R), or 273 + t_s for metric units, 460 + t_s for English units

Sample calculation

Data

K_P	85,49	
C_P	0,99	
F_P	0,941	
$(\sqrt{\Delta P})_{avg}$	0,2830	in $H_20^{1/2}$
P_{bar}	29,10	in Hg
P_g	0,28	in H_20
P_S	29,12	in Hg
M_S	29	lb/lb-mol
t_S	103,49	F
T_S	563,49	R

Calculation

V_S	18,4049	ft/s

Average dilution tunnel gas flow rate (Qstd)

Equation used

ASTM 2515, equation 3

$$Q_{std} = 60(1 - B_{WS})V_S A\left(\frac{T_{std}}{T_S}\right)\left(\frac{P_S}{P_{std}}\right)$$

Nomenclature

Q_{std}	Total gas flow rate corrected to dry standard conditions, dsm^3/min (dscf/min)
60	Conversion factor minutes per hour
B_{WS}	Water vapour in the dilution tunnel stream, proportion by volume (may be assumed to be 2%)
V_S	Average dilution tunnel gas velocity, m/s (ft/s)
A	Cross-sectional area of dilution tunnel, m^2 (ft^2)
T_{std}	Standard absolute temperature, 293 °K (528°R)
T_S	Absolute average dilution tunnel temperature, °K (°R), or 273 + t_s for metric units, 460 + t_s for English units
t_S	Dilution tunnel temperature, °C (°F)
P_S	Absolute dilution tunnel static gas pressure, mm Hg (in. Hg), or P_{bar} + P_g
P_{bar}	Barometric pressure at measurement site, mm Hg (in. Hg)
P_g	Dilution tunnel static pressure, mm Hg (in. Hg)
P_{std}	Standard absolute pressure, 760 mm Hg (29.92 in. Hg)

Sample calculation

Data

B_{WS}	0,02	
V_S	18,405	
A	0,349	ft^2
T_{std}	528	R
T_S	563,49	R
P_S	29,123	in Hg
P_{std}	29,92	in Hg

Calculation

Q_{std}	344,53	dscf/min

Particulate emission rate (E)

Equation used

$$E = (C_S - C_r)Q_{std}$$

Nomenclature

E	Particulate emission rate, g/hr
C_S	Concentration of particulate matter in stack gas or dilution tunnel gas, dry basis corrected to standard conditions, g/dscm^3 (g/dscf)
C_r	Concentration of particulate matter in room air, g/dscm^3 (g/dscf)
Q_{std}	Total gas flow rate, dry basis corrected to standard conditions, dsm^3/min (dscf/min)

Sample calculation

Data

C_S	0,000066	g/dscf
C_r	0,000002	g/dscf
Q_{std}	344,53	dscf/min

Calculation

E	0,02	g/min
E	1,31	g/h

Calculation based on train 2 data.

Total particulate emission rate (E_T)

Equation used

ASTM 2515, equation 15

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

Nomenclature

E_T	Total particulate emission, g
C_S	Concentration of particulate matter in stack gas or dilution tunnel gas, dry basis corrected to standard conditions, g/dscm^3 (g/dscf)
C_r	Concentration of particulate matter in room air, g/dscm^3 (g/dscf)
Q_{std}	Total gas flow rate, dry basis corrected to standard conditions, dsm^3/min (dscf/min)
θ	Total sampling time, min

Sample calculation

Data

C_S	0,000066	g/dscf
C_r	0,000002	g/dscf
Q_{std}	344,53	dscf/min
θ	272	min

Calculation

E	5,96	g

Calculation based on train 2 data.

Average gas velocity in dilution tunnel during each min interval, i, of the test run

Equation used

ASTM 2515, equation 10

$$v_{si} = F_p K_p C_p \sqrt{\Delta p_i} \sqrt{\frac{T_{si}}{P_s M_s}}$$

Nomenclature

v_{si}	Average gas velocity in dilution tunnel during each min interval, i of the test run m/sec (ft/sec)
F_P	Pitot tube correction factor
K_P	Pitot tube constant For the metric units: $34.97\ m/sec \left[\frac{\left(\frac{g}{g-mole}\right)(mm\ Hg)}{(°K)(mm\ H_2O)}\right]^{1/2}$ For English units: $85.49\ ft/sec \left[\frac{\left(\frac{lb}{lb-mole}\right)(in\ Hg)}{(°R)(in\ H_2O)}\right]^{1/2}$
C_P	Pitot tube coefficient (use 0.99 for standard pitot tube, 0.84 may be used for S-type tubes constructed according to Method 2 specifications)
Δp_i	interval, i, of the test run
T_{Si}	Absolute average gas temperature in the dilution tunnel during the i^{th} minutes
P_S	Absolute dilution tunnel static gas pressure, mm Hg (in. Hg), or $P_{bar} + P_g$
M_S	Molecular weight of dilution tunnel gas, wet basis, g/g-mole (lb/lb-mol) may be assumed to be 28.78

Sample calculation

Data

i=1			**i=2**		
F_P	0,941		F_P	0,941	
K_P	85,49		K_P	85,49	
C_P	0,99		C_P	0,99	
Δp_i	0,077	in H_20	Δp_i	0,080	in H_20
T_{Si}	583,8	R	T_{Si}	564,8	R
P_S	29,12	in Hg	P_S	29,12	in Hg
M_S	29	lb/lb-mol	M_S	29	lb/lb-mol

Calculation

i=1			**i=2**		
v_{si}	18,41	ft/sec	v_{si}	18,47	ft/sec

Percent of proportional sampling rate (PR)

Equation used

B415, equation 13.1

$$PR = \left(\frac{\theta V_{mi(std)} V_S T_m T_{Si}}{\theta_i V_m V_{Si} T_{mi} T_S}\right) \times 100$$

Nomenclature

PR	Percent of proportional sampling rate (%)
θ	Total sampling time, min
θ_i	Time of interval, 1 min
V_m	Volume of gas sample measured by the DGM, dsm^3 (dscf)
$V_{mi(std)}$	Volume of gas sample measured by the digital mass flow controller during the i^{th} 1 minutes interval, dsm^3 (dscf)
V_S	Average gas velocity in the dilution tunnel, ft/min
V_{Si}	Average gas velocity in the dilution tunnel during the i^{th} 10 minutes interval, ft/min
T_m	Absolute average digital mass flow controller temperature, K (R)
T_{mi}	Absolute average digital mass flow controller temperature during the i^{th} 1 minutes
T_S	Absolute average gas temperature in the dilution tunnel, K (R)
T_{Si}	Absolute average gas temperature in the dilution tunnel during the i^{th} 1 minutes

Sample calculation

Data

train =1			train =2		
θ	272	min	θ	272	min
θ_i	1	min	θ_i	1	min
V_m	50,03	dcf	V_m	50,24	dcf
$V_{mi(std)}$	0,181	cuft	$V_{mi(std)}$	0,1808	cuft
V_S	18,41	ft/sec	V_S	18,41	ft/sec
V_{Si}	18,413	ft/sec	V_{Si}	18,413	ft/sec
T_m	535,0	R	T_m	538,9	R
T_{mi}	533,50	R	T_{mi}	533,30	R
T_S	563,49	R	T_S	563,49	R
T_{Si}	583,8	R	T_{Si}	583,8	R

Calculation

train=1		**train=2**	
PR	102,4 %	PR	102,5 %

Filter face velocity check

Equation used

$$FV_{max} = \frac{V_{mL}}{1} \times \frac{1}{F_A}$$

Nomenclature

FV_{max}	Maximum filter face velocity during the test run, m/min (ft/min)
V_{mL}	Largest 1 minute interval metered gas volume value recorded during the test run, dm^3 (dcf)
F_A	Filter area exposed to gas sample during train operation, m2 (ft^2)

Sample calculation

Data

V_{mL}	0,176	dcf
F_A	0,0116	ft^2

Calculation

FV_{max}	15,18	ft/min

Dual train precision

Equation used

$$\frac{Train\ 1 - average\ train\ 1\ and\ train\ 2}{average\ train\ 1\ and\ train\ 2} \times 100 \leq 7.5\%$$

Nomenclature

Dual train precision	Deviation between emission's train 1 and 2
Train 1	Total emission for train 1
Train 2	Total emission for train 2

Sample calculation

Data

Train 1	6,54 g
Train 2	5,95 g

Calculation

Dual train precision	4,69 %

Analyzer drift checks

Equation used

$$Drift = \frac{\Delta R}{span} \times 100$$

Nomenclature

Drift	The change in analyzer response to calibration gas over the duration of the test run
ΔR	The difference between the analyzer response at the end of the test run and the
Span	The upper limit of the instrument range, ppmv or %

Sample calculation

Data

ΔR	0,015 %
Span	5 %

Calculation

Drift	0,30 %

Calculated with CO concentration values.

Validation du fichier de calcul avec les équations provenant des normes:
ASTM E2515-11
ASTME2618

Dry burn rate (BR)

Equation used

B415.1, 13.4

$$BR = \left[\frac{60W_{WD}}{\theta}\right]\left[\frac{100 - \%M_W}{100}\right]$$

Nomenclature

BR	Dry wood burn rate, kg/hr (lb/hr)
W_{WD}	Total mass of wood burned (wet basis) during the test run, kg (lb)
θ	Total time of test run, minutes
$\%M_W$	Average moisture in test fuel charge, wet basis, %
	To convert from dry basis to wet basis: % moisture wet basis =

Sample calculation

Data

W_{WD}	22,184	lbs
θ	257	min
$\%M_W$	16,55	%

Calculation

BR	1,961	Dry kg/hr

Volume of gas sample corrected to dry standard conditions ($V_{m(std)}$)

Equation used

ASTM 2515, equation 6

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

Nomenclature

$V_{m\,(std)}$	Volume of gas sample , corrected to standard conditions, $dscm^3$ (dscf)
K_1	17.64 R/in Hg
V_m	Volume of gas sample
Y	DGM calibration factor
P_{bar}	Barometric pressure mmHg (in Hg)
ΔH	Average pressure at the outlet of the dry gas meter mm water (in. Water)
T_m	Absolute average dry gas meter temperature K (R)

Sample calculation

Data

V_m	50,20	dcf
Y	1,01	
P_{bar}	29,28	in Hg
ΔH	-1,0208	in Hg
T_m	534,2	R

Calculation

$V_{m(std)}$	47,32	dscf

Total amount of particulate matter collected (m_n)

Equation used

ASTM 2515, equation 12 $$m_n = F_1 + F_2 + \Delta PF$$

Nomenclature

m_n	Total amount of particulate matter collected, mg
F_{1+F2}	Particulate matter collected on filters, mg
ΔPF	Post-test weight gain of probe and filter holder assembly, mg

Sample calculation

Data

F_{1+F2}	0,0019	g
ΔPF	0,001	g

Calculation

m_n	3,000	mg

Calculation based of train 2 data

Particulate concentration (C_S)

Equation used

ASTM 2515, equation 13

$$C_S = (0{,}001\ g/mg) \times \left(\frac{m_n}{V_{m\,(std)}}\right)$$

Nomenclature

C_S	Concentration of particulate matter in stack gas or dilution tunnel, dry basis, corrected to standard conditions, g/dsm^3 (g/dscf)
m_n	Total amount of particulate matter collected in the sampling train, mg
$V_{m(std)}$	Volume of gas sample measured corrected to dry standard conditions, dsm^3 (dscf)

Sample calculation

Data

m_n	3,000 mg
$V_{m(std)}$	47,32 dscf

Calculation

C_s	0,000063 g/dscf

Calculation based of train 2 data

Particulate concentration for room air (C_r)

Equation used

ASTM 2515, equation 14

$$C_r = (0{,}001\ g/mg) \times \left(\frac{m_r}{V_{mr\,(std)}}\right)$$

Nomenclature

C_r	Concentration of particulate matter in room air, dry basis, corrected to standard conditions, g/dsm^3 (g/dscf)
m_r	Total amount of particulate matter collected in the sampling train, mg
$V_{mr(std)}$	Volume of room air sample measured corrected to dry standard conditions, dsm^3 (dsc

Sample calculation

Data

m_r	0,000	mg
$V_{mr(std)}$	55,93	dscf

Calculation

C_r	0,000000	g/dscf

Calculation based of train 2 data

Adjustment factor for alternative pitot tube placement (FP)

Equation used

ASTM 2515, equation 1

$$F_P = \frac{V_{strav}}{V_{scent}}$$

Nomenclature

V_{strav}	Average gas velocity caclulated after the Pitot tube traverse
V_{scent}	Average gas velocity at the center of the dilution tunnel cacluated after the multi-point Pitot traverse
F_P	Adjustment factor for center of tunnel pitot tube placement

Sample calculation

Data

V_{strav}	0,261912639
V_{scent}	0,27838677

Calculation

F_P	0,940823

Average dilution tunnel gas velocity (V_S)

Equation used

ASTM 2515, equation 9

$$V_S = F_p K_P C_P (\sqrt{\Delta P})_{avg} \sqrt{\frac{T_S}{P_S M_S}}$$

Nomenclature

V_S	Average dilution tunnel gas velocity, m/s (ft/s)
K_P	Pitot tube constant For the metric units: $34.97\ m/sec \left[\frac{\left(\frac{g}{g-mole}\right)(mm\ Hg)}{(°K)(mm\ H_2O)}\right]^{1/2}$ For English units: $85.49\ ft/sec \left[\frac{\left(\frac{lb}{lb-mole}\right)(in\ Hg)}{(°R)(in\ H_2O)}\right]^{1/2}$
C_P	Pitot tube coefficient (use 0.99 for standard pitot tube, 0.84 may be used for S-type tubes constructed according to Method 2 specifications)
F_P	Pitot tube correction factor
$(\sqrt{\Delta P})_{avg}$	Average square root of each individual velocity head (ΔP)
P_{bar}	Barometric pressure at measurement site, mm H_2O (in. H_2O)
P_g	Stack static pressure, mm Hg (in. Hg)
P_S	Absolute dilution tunnel static gas pressure, mm Hg (in. Hg), or $P_{bar} + P_g$
M_S	Molecular weight of dilution tunnel gas, wet basis, g/g-mole (lb/lb-mol) may be assumed to be 28.78 or 29 for CSA B415
t_S	Dilution tunnel temperature, °C (°F)
T_S	Absolute dilution tunnel temperature, °K (°R), or 273 + t_s for metric units, 460 + t_s for English units

Sample calculation

Data

K_P	85,49	
C_P	0,99	
F_P	0,941	
$(\sqrt{\Delta P})_{avg}$	0,2840	in $H_20^{1/2}$
P_{bar}	29,28	in Hg
P_g	0,28	in H_20
P_S	29,30	in Hg
M_S	29	lb/lb-mol
t_S	97,86	F
T_S	557,86	R

Calculation

V_S	18,3264	ft/s

Average dilution tunnel gas flow rate (Qstd)

Equation used

ASTM 2515, equation 3

$$Q_{std} = 60(1 - B_{WS})V_S A\left(\frac{T_{std}}{T_S}\right)\left(\frac{P_S}{P_{std}}\right)$$

Nomenclature

Q_{std}	Total gas flow rate corrected to dry standard conditions, dsm^3/min (dscf/min)
60	Conversion factor minutes per hour
B_{WS}	Water vapour in the dilution tunnel stream, proportion by volume (may be assumed to be 2%)
V_S	Average dilution tunnel gas velocity, m/s (ft/s)
A	Cross-sectional area of dilution tunnel, m^2 (ft^2)
T_{std}	Standard absolute temperature, 293 °K (528°R)
T_S	Absolute average dilution tunnel temperature, °K (°R), or 273 + t_s for metric units, 460 + t_s for English units
t_S	Dilution tunnel temperature, °C (°F)
P_S	Absolute dilution tunnel static gas pressure, mm Hg (in. Hg), or P_{bar} + P_g
P_{bar}	Barometric pressure at measurement site, mm Hg (in. Hg)
P_g	Dilution tunnel static pressure, mm Hg (in. Hg)
P_{std}	Standard absolute pressure, 760 mm Hg (29.92 in. Hg)

Sample calculation

Data

B_{WS}	0,02	
V_S	18,326	
A	0,349	ft^2
T_{std}	528	R
T_S	557,86	R
P_S	29,300	in Hg
P_{std}	29,92	in Hg

Calculation

Q_{std}	348,64	dscf/min

Particulate emission rate (E)

Equation used

$$E = (C_S - C_r)Q_{std}$$

Nomenclature

E	Particulate emission rate, g/hr
C_S	Concentration of particulate matter in stack gas or dilution tunnel gas, dry basis corrected to standard conditions, g/dscm^3 (g/dscf)
C_r	Concentration of particulate matter in room air, g/dscm^3 (g/dscf)
Q_{std}	Total gas flow rate, dry basis corrected to standard conditions, dsm^3/min (dscf/min)

Sample calculation

Data

C_S	0,000063	g/dscf
C_r	0,000000	g/dscf
Q_{std}	348,64	dscf/min

Calculation

E	0,02	g/min
E	1,33	g/h

Calculation based on train 2 data.

Total particulate emission rate (E_T)

Equation used

ASTM 2515, equation 15

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

Nomenclature

E_T	Total particulate emission, g
C_S	Concentration of particulate matter in stack gas or dilution tunnel gas, dry basis corrected to standard conditions, g/dscm^3 (g/dscf)
C_r	Concentration of particulate matter in room air, g/dscm^3 (g/dscf)
Q_{std}	Total gas flow rate, dry basis corrected to standard conditions, dsm^3/min (dscf/min)
θ	Total sampling time, min

Sample calculation

Data

C_S	0,000063	g/dscf
C_r	0,000000	g/dscf
Q_{std}	348,64	dscf/min
θ	257	min

Calculation

E	5,68	g

Calculation based on train 2 data.

Average gas velocity in dilution tunnel during each min interval, i, of the test run

Equation used

ASTM 2515, equation 10

$$v_{si} = F_p K_p C_p \sqrt{\Delta p_i} \sqrt{\frac{T_{si}}{P_s M_s}}$$

Nomenclature

v_{si}	Average gas velocity in dilution tunnel during each min interval, i of the test run m/sec (ft/sec)
F_P	Pitot tube correction factor
K_P	Pitot tube constant For the metric units: $34.97\ m/sec \left[\frac{\left(\frac{g}{g-mole}\right)(mm\ Hg)}{(°K)(mm\ H_2O)}\right]^{1/2}$ For English units: $85.49\ ft/sec \left[\frac{\left(\frac{lb}{lb-mole}\right)(in\ Hg)}{(°R)(in\ H_2O)}\right]^{1/2}$
C_P	Pitot tube coefficient (use 0.99 for standard pitot tube, 0.84 may be used for S-type tubes constructed according to Method 2 specifications)
Δp_i	interval, i, of the test run
T_{Si}	Absolute average gas temperature in the dilution tunnel during the i^{th} minutes
P_S	Absolute dilution tunnel static gas pressure, mm Hg (in. Hg), or $P_{bar} + P_g$
M_S	Molecular weight of dilution tunnel gas, wet basis, g/g-mole (lb/lb-mol) may be assumed to be 28.78

Sample calculation

Data

i=1			**i=2**		
F_P	0,941		F_P	0,941	
K_P	85,49		K_P	85,49	
C_P	0,99		C_P	0,99	
Δp_i	0,076	in H_20	Δp_i	0,080	in H_20
T_{Si}	574,1	R	T_{Si}	559,5	R
P_S	29,30	in Hg	P_S	29,30	in Hg
M_S	29	lb/lb-mol	M_S	29	lb/lb-mol

Calculation

i=1			**i=2**		
v_{si}	18,01	ft/sec	v_{si}	18,31	ft/sec

Percent of proportional sampling rate (PR)

Equation used

B415, equation 13.1

$$PR = \left(\frac{\theta V_{mi(std)} V_S T_m T_{Si}}{\theta_i V_m V_{Si} T_{mi} T_S}\right) \times 100$$

Nomenclature

PR	Percent of proportional sampling rate (%)
θ	Total sampling time, min
θ_i	Time of interval, 1 min
V_m	Volume of gas sample measured by the DGM, dsm^3 (dscf)
$V_{mi(std)}$	Volume of gas sample measured by the digital mass flow controller during the i^{th} 1 minutes interval, dsm^3 (dscf)
V_S	Average gas velocity in the dilution tunnel, ft/min
V_{Si}	Average gas velocity in the dilution tunnel during the i^{th} 10 minutes interval, ft/min
T_m	Absolute average digital mass flow controller temperature, K (R)
T_{mi}	Absolute average digital mass flow controller temperature during the i^{th} 1 minutes
T_S	Absolute average gas temperature in the dilution tunnel, K (R)
T_{Si}	Absolute average gas temperature in the dilution tunnel during the i^{th} 1 minutes

Sample calculation

Data

train =1			train =2		
θ	257	min	θ	257	min
θ_i	1	min	θ_i	1	min
V_m	46,97	dcf	V_m	47,33	dcf
$V_{mi(std)}$	0,181	cuft	$V_{mi(std)}$	0,1808	cuft
V_S	18,33	ft/sec	V_S	18,33	ft/sec
V_{Si}	18,015	ft/sec	V_{Si}	18,015	ft/sec
T_m	530,4	R	T_m	534,2	R
T_{mi}	529,50	R	T_{mi}	529,36	R
T_S	557,86	R	T_S	557,86	R
T_{Si}	574,1	R	T_{Si}	574,1	R

Calculation

train=1		**train=2**	
PR	104,0 %	PR	103,7 %

Filter face velocity check

Equation used

$$FV_{max} = \frac{V_{mL}}{1} \times \frac{1}{F_A}$$

Nomenclature

FV_{max}	Maximum filter face velocity during the test run, m/min (ft/min)
V_{mL}	Largest 1 minute interval metered gas volume value recorded during the test run, dm^3 (dcf)
F_A	Filter area exposed to gas sample during train operation, m2 (ft^2)

Sample calculation

Data

V_{mL}	0,178	dcf
F_A	0,0116	ft^2

Calculation

FV_{max}	15,38	ft/min

Dual train precision

Equation used

$$\frac{Train\ 1 - average\ train\ 1\ and\ train\ 2}{average\ train\ 1\ and\ train\ 2} \times 100 \leq 7.5\%$$

Nomenclature

Dual train precision	Deviation between emission's train 1 and 2
Train 1	Total emission for train 1
Train 2	Total emission for train 2

Sample calculation

Data

Train 1	5,91 g
Train 2	5,67 g

Calculation

Dual train precision	2,03 %

Analyzer drift checks

Equation used

$$Drift = \frac{\Delta R}{span} \times 100$$

Nomenclature

Drift	The change in analyzer response to calibration gas over the duration of the test run
∆R	The difference between the analyzer response at the end of the test run and the
Span	The upper limit of the instrument range, ppmv or %

Sample calculation

Data

∆R	0,015 %
Span	5 %

Calculation

Drift	0,30 %

Calculated with CO concentration values.

APPENDIX 12: Volume calculations

4 Volume Calculations

The usable firebox of the 38SFC_D_II & 38ST_D_II (V_U) consists of a rectangular prism with a width of 24.000 in (W_U), a depth (D_U) of 13.500 in, and a height (H_U) of 18.625 in, making a 3.492 ft^3 combustion chamber (refer to Figure 4-1).

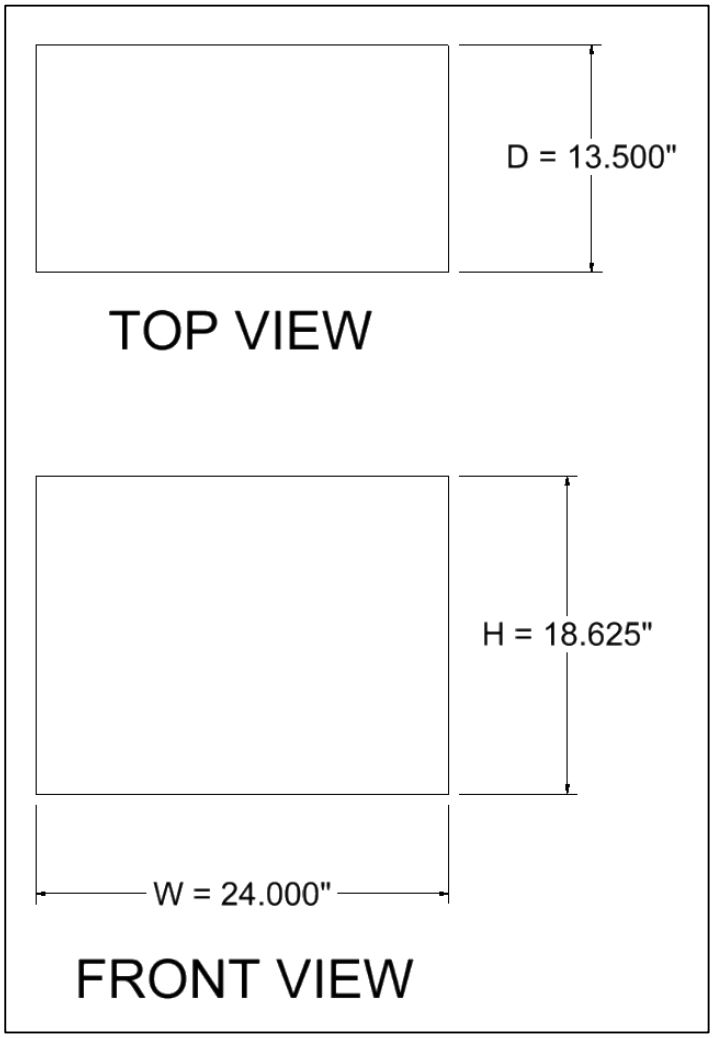


Figure 4-1: 38SFC_D_II and 38ST_D_II Usable Firebox

$$V_U = [\, W_U * D_U * H_U]$$

$$V_U = [24.000 * 13.500 * 18.625] in^3$$

$$V_U = 6{,}034.500\ in^3 = \ 3.492\ ft^3$$

The non-usable section of the firebox consists of the front portion facing the door, where the load cannot be placed due to the angled flanges of the ¼" hearth plate. This portion of the firebox (V_{NU}) consists of a rectangular prism with a width (W_{NU}) of 24.000 in, a depth of (D_{NU}) 2.250 in, and a height of (H_{NU}) 15.750 in, making a 0.492 ft^3 combustion chamber (refer to Figure 4-2). As this wood heater consists of 2 functional doors (front and back), the non-usable firebox illustrated in Figure 4-2 needs to be multiplied by 2, making a total of 0.984 ft^3.

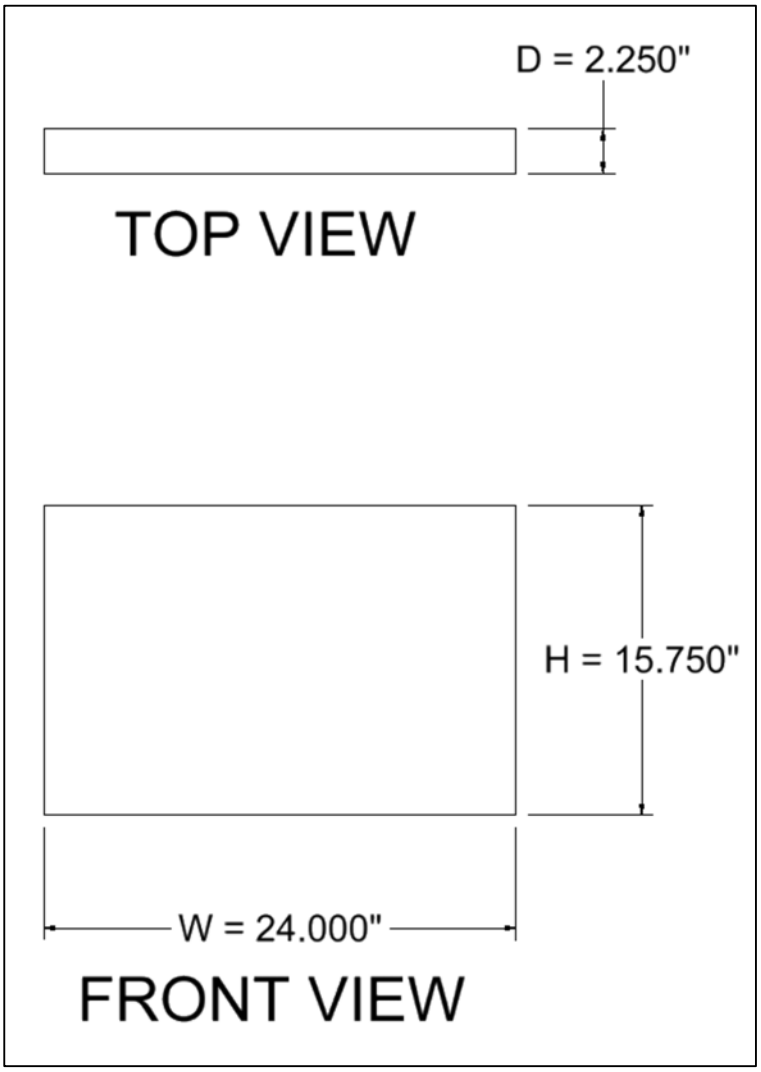


Figure 4-2: 38SFC_D_II and 38ST_D_II Non-Usable Firebox

$$V_{NU} = 2 * (W_{NU} * D_{NU} * H_{NU}) = 2 * (24.000 * 2.250 * 15.750)\ in^3 = 1{,}701.000\ in^3 = 0.984\ ft^3$$

The total firebox volume (V_T)is therefore calculated by adding the usable portion (V_U) with the non-usable portion (V_{NU}) which result to 4.476 ft^3.

$$V_T = V_U + V_{NU} = 3.492\ ft^3 + 0.984\ ft^3 = 4.476\ ft^3$$

APPENDIX 13: Operating instruction

EPA Test Procedures

Model Number: **38STD_II**

This product is proudly manufactured in North America by **SUPREME FIREPLACES INC.**

3594 Jarry East, Montreal, QC H1Z 2G4
T: 877-593-4722, F: 514-593-4424
www.supremem.com

Revised: March 2025 - Revised

IMPORTANT: Keep the owner's manual for future use.

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2.2 Load Configuration 6
2.3 General Information 6

1 Unit Pre-Burn

1.1 Load



- 2” X 4” X 12” – 12 pc
- 2” X 4” X 20” – 6 pc

1.2 Load Configuration

- 1st Row – 12” (2 pc) Upright – North-South Center



- 2nd Row – 12” (2 pc) Upright – East-West Center



- 3rd Row – 12” (2 pc) Downright – North-South Center



- 4th Row – 20” (6 pc) – East-West Center



- 5th Row – 12” (6 pc) Upright – North-South Center



The total weigh of the preload should be between 28.0 to 29.0 lbs

1.3 Procedures

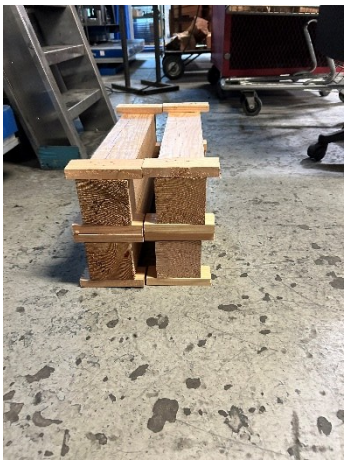
1. Once the load is place as displayed in *Section 1.2 Load Configuration*, push the activator lever all the way back.
2. Place the kindling between the center, right, and left column of the top row.



3. Ignite kindling with a torch and keep door open until proper combustion has been achieved on the top row (between 5 to 10 minutes).
4. At 7.0 lbs, prepare the coal bed by leveling all burnt pieces. Place any unburnt pieces, compacted onto the surface of the coal bed.

2 Test

2.1 Load


- 4” X 4” X 20” – 4 pc (4 spacers) – Humidity 19 to 20 %
- Weight: 22.0 to 22.5 lbs

2.2 Load Configuration

1. Place two 4” X 4” (spacers up-down) at the center of the hearth. East-West.
2. Place the two remaining 4” X 4” on top of the pieces from step 1. East-West.

Refer to above figures as a reference.

2.3 General Information

1. The 38STDz_II is a single burn wood heater, therefore the primary air control does not have the burn rate selector level (swivel).
2. The pretest lasts approximately 3 hours and the test lasts approximately 4 hours.

APPENDIX 14: Drawing Air flow pattern

3 Air Flow Patterns

The primary air enters the unit from three channels: the front air wash, the back air wash, and the booster. The opening of the front air wash and booster channel is regulated by a single burn rate automatic bi-metal control (refer to Section 13). The back air wash is not regulated by a control and remains open throughout the operation of the unit. The secondary air enters the combustion chamber from the top and through the baffle system. Please refer to the following illustrations:

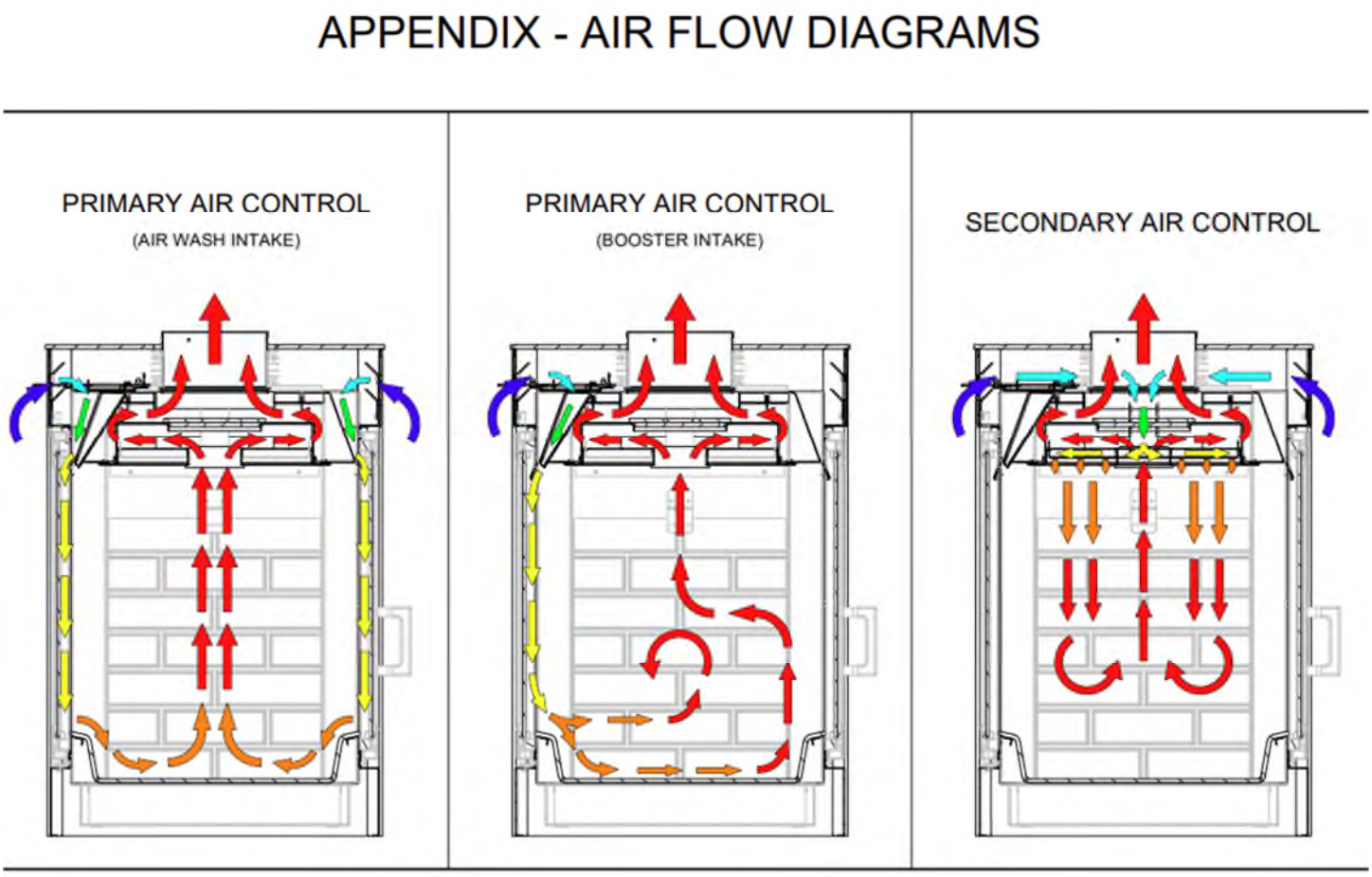


Figure 3-1: (Left) Primary Air Control - Air Wash Intake, (Middle) Primary Air Control - Booster Intake, (Right) Secondary Air Control Intake

APPENDIX 15: WHA, CoC, 30 Day notice, Other

U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA)
30-DAY NOTIFICATION FORM
PURSUANT TO 40 CFR PART 60 SUBPARTS AAA AND QQQQ
2015 STANDARDS OF PERFORMANCE FOR NEW RESIDENTIAL WOOD HEATERS, NEW RESIDENTIAL HYDRONIC HEATERS AND FORCED-AIR FURNACES

Disclaimer: The statutory provisions and the EPA regulations described in this document contain legally binding requirements. This document is not a substitute for those provisions or regulations, nor is it a regulation itself. In the event of a discrepancy, please refer to 40 CFR PART 60 Subparts AAA AND QQQQ, Sections 60.533 and 60.5475. This document may be revised periodically without public notice. If you have additional questions, please contact Rafael Sanchez at 202-564-7028 or via email at sanchez.rafael@epa.gov.

- **The manufacturer of an affected wood/pellet heater/central heater model line must notify the Administrator of the date that certification testing is scheduled to begin by email to WoodHeaterReports@epa.gov.**
- **This notice must be received by the EPA at least 30 days before the start of testing.**

Alexander Marcakis, Engineering Department

Print Name and Title of Authorized Official

Signature

Thursday the 6th of March, 2025

Date

Remarks:

v1

U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA)
30-DAY NOTIFICATION FORM
PURSUANT TO 40 CFR PART 60 SUBPARTS AAA AND QQQQ
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- **The manufacturer of an affected wood/pellet heater/central heater model line must notify the Administrator of the date that certification testing is scheduled to begin by email to WoodHeaterReports@epa.gov.**
- **This notice must be received by the EPA at least 30 days before the start of testing.**

Phone: (450) 741-3636	**E-mail: dpower@polytests.com**	**Fax: N/A**
City: St-Jean-sur-Richelieu	**State: Quebec (Canada)**	**ZIP Code: J3B 7S7**
EPA APPROVED THIRD-PARTY CERTIFIER		
Name and Title of Authorized Representative: John Steinert, General Manager – Portland Laboratory		
Company: PFS-TECO		
Phone: (503) 650-0088	**E-mail: jsteinert@pfsteco.com**	**Fax: N/A**
City: Clackamas	**State: OR**	**ZIP Code: 97015**
COMPLIANCE TEST INFORMATION		
Test Method(s): EPA Method 28R		
Date(s) of Proposed Test: Week of the ~~7th~~ of April 2025 Week of the 14th of April 2025		
Testing Location: **Polytests Services Inc.** **695 B rue Gaudette,** **St-Jean-sur-Richelieu** **QC, Canada, J3B 7S7** -A.M 10th April 2025		

U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA)
30-DAY NOTIFICATION FORM
PURSUANT TO 40 CFR PART 60 SUBPARTS AAA AND QQQQ
2015 STANDARDS OF PERFORMANCE FOR NEW RESIDENTIAL WOOD HEATERS, NEW RESIDENTIAL HYDRONIC HEATERS AND FORCED-AIR FURNACES

Disclaimer: The statutory provisions and the EPA regulations described in this document contain legally binding requirements. This document is not a substitute for those provisions or regulations, nor is it a regulation itself. In the event of a discrepancy, please refer to 40 CFR PART 60 Subparts AAA AND QQQQ, Sections 60.533 and 60.5475. This document may be revised periodically without public notice. If you have additional questions, please contact Rafael Sanchez at 202-564-7028 or via email at sanchez.rafael@epa.gov.

- **The manufacturer of an affected wood/pellet heater/central heater model line must notify the Administrator of the date that certification testing is scheduled to begin by email to WoodHeaterReports@epa.gov.**
- **This notice must be received by the EPA at least 30 days before the start of testing.**

GENERAL INFORMATION

Manufacturer's Name:
Foyers Supreme Incorporated

Appliance Type (Circle One):	Adjustable Burn Rate Wood Heater	Pellet Stove	**Single Burn Rate Heater**	Hydronic Heater	Forced Air Furnace	Other:
Hydronic Heater Type (Circle One):	Traditional	Full Storage	Partial Storage	Indoor/Outdoor	Other:	
Forced-Air Furnace Type (Circle One):	Small (less than 65,000 BTU/hr heat output)		Large (greater than 65,000 BTU/hr heat output)		Other:	
Fuel Type:	**Crib**	Pellet	Cordwood	Other:		

Model Number: 38ST_D
Model Name: Elegance ST 42, Astra Duo 38, Monarch See-Through 38, Wayland See-Through 38, Novo Duo 38 – Cast Iron, Novo Duo 38 - Soapstone

Catalyst: No

Mailing Address:
3594 Jarry East, Montreal, QC, H1Z 2G4, Canada

Street Address:
3594 Jarry East, Montreal, QC, H1Z 2G4, Canada

City: Montreal	**State: Quebec (Canada)**	**ZIP Code: H1Z 2G4**
Phone: (514) 593-4722	**Fax: (514) 593-4424**	**Web Site: www.supremem.com**

Address of Manufacturing Facility:
3594 Jarry East, Montreal, QC, H1Z 2G4, Canada

City: Montreal	**State: Quebec (Canada)**	**ZIP Code: H1Z 2G4**

EPA APPROVED TEST LABORATORY

Name and Title of Authorized Representative: Danick Power, VP of Operations

Company: Polytests Services Inc.

U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA)
2015 Standards of Performance for New Residential Wood Heaters, New Residential Hydronic Heaters and Forced-Air Furnaces Application
40 CFR PART 60 SUBPARTS AAA AND QQQQ

Disclaimer: The statutory provisions and the EPA regulations described in this document contain legally binding requirements. This document is not a substitute for those provisions or regulations, nor is it a regulation itself. In the event of a discrepancy, please refer to 40 CFR PART 60 Subparts AAA AND QQQQ, Sections 60.533(b), 60.5475(b), and Appendix A–8. This document may be revised periodically without public notice. If you have additional questions, please contact Rafael Sanchez at 202-564-7028 or via email at sanchez.rafael@epa.gov.

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Application for us epa wood heater certification pursuant to 40 cfr PART 60 Subparts AAA and QQQQ 1

Application for A Certificate of Compliance pursuant to 40 cfr PART 60 Subparts AAA and QQQQ 2

2015 Standards of PerfoRmance for New Residential Wood Heaters, new residential hydronic heaters and forced-air furnaces 2

General Information 2

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Compliance Statements and Acknowledgements – Sections 60.533(b) and 60.5475(b) 4

Instructions: Please read the below statements and affirmations and address accordingly 4

For emissions data summary tables see attachments 4

Wood Burning Heaters 6

I. Test Method 28R for Certification and Auditing of Wood Heaters 6

A. *Summary Results – Adjustable Wood Burning Heaters* 6

APPLICATION FOR A CERTIFICATE OF COMPLIANCE PURSUANT TO 40 CFR PART 60 SUBPARTS AAA AND QQQQ
2015 STANDARDS OF PERFORMANCE FOR NEW RESIDENTIAL WOOD HEATERS, NEW RESIDENTIAL HYDRONIC HEATERS AND FORCED-AIR FURNACES

GENERAL INFORMATION

Manufacturer's Name: Foyers Supreme Inc.

Heater Type (Circle One):	Single Burn Rate Wood Heater					
Hydronic Heater Type (Circle One):						
Forced-Air Furnace Type (Circle One):						
Fuel Tested:	Crib					

Test Method(s) Method 28R, ASTME2870 & ASMTE2515 | **Catalyst: No**

Model Number: 38ST_D_II, 38SFC_D_II
Model Name: Elegance ST 42 II, Astra Duo 38 II, Monarch See-Through 38 II, Wayland See-Through 38 II, Novo Duo 38 II – Cast Iron, Novo Duo 38 II - Soapstone

Physical Address (Street number and Address, not P.O. Box): 3594 Jarry, East | **Mailing Address: 3594 Jarry, East, Montreal, QC, H1Z 2G4, Canada**

City: Montreal	**State: QC, Canada**	**ZIP Code: H1Z 2G4**
Phone: (514) 593-4722	**Email: alexander@supremem.com**	**Website: www.supremem.com**

EPA Submission Date of 30 day Notice: 6th of March 2025

MANUFACTURER'S AUTHORIZED REPRESENTATIVE INFORMATION

Name: Alexander Marcakis

Position/Title: President

Address: 3594 Jarry, East

City: Montreal	**State: QC, Canada**	**ZIP Code: H1Z 2G4**
Phone: (514) 593-4722	**E-mail: alexander@supremem.com**	**Website: www.supremem.com**

Remarks:

EPA-APPROVED TEST LABORATORY

APPLICATION FOR A CERTIFICATE OF COMPLIANCE PURSUANT TO 40 CFR PART 60 SUBPARTS AAA AND QQQQ
2015 STANDARDS OF PERFORMANCE FOR NEW RESIDENTIAL WOOD HEATERS, NEW RESIDENTIAL HYDRONIC HEATERS AND FORCED-AIR FURNACES

Name of Test Laboratory: **Polytests Services inc.**		
Name of Person Authorized or Responsible for Conducting Compliance Test: Danick Power		
Position/Title: VP operation		
Address: 695-B Gaudette,		
City: St-Jean-sur-Richelieu	**State: Quebec, Canada**	**ZIP Code: J3B 7S7**
Phone: 450 741-3636	**Email: dpower@polytests.com**	**Website: www.polytests.com**
Remarks:		
EPA-Approved Third Party Certifier		
Name of Certifier Entity: PFS-TECO, Inc.		
Name of Person Authorized or Responsible for Reviewing Test Report and/or Issuing Certification of Conformity: **John Steinert**		
Position/Title: General Manager – Portland Laboratory		
Address: 11785 SE Hwy. 212 Suite 305		
City: Clackamas	**State: OR**	**ZIP Code: 97015**
Phone: (503) 650-0088	**Email:** **john.steinert@pfsteco.com**	**Website: www.pfsteco.com**
Remarks:		

COMPLIANCE STATEMENTS AND ACKNOWLEDGEMENTS – SECTIONS 60.533(B) AND 60.5475(B) INSTRUCTIONS: PLEASE READ THE BELOW STATEMENTS AND AFFIRMATIONS AND ADDRESS ACCORDINGLY.
FOR EMISSIONS DATA SUMMARY TABLES SEE ATTACHMENTS
1. Engineering Drawings Statement Foyers Supreme Incorporated has provided engineering drawings and specifications of components that may affect emissions (including specifications for each component listed in paragraphs (k)(2), (3) and (4) of 60.533(b) and 60.5475(b)). Foyers Supreme Incorporated may use assembly or design drawings that have been prepared for other purposes, but must designate on the drawings the dimensions of each component listed in paragraph (k) of this section. Foyers Supreme Incorporated must identify tolerances of components listed in paragraph (k)(2) of 60.533(b) and 60.5475(b) that are different from those specified in that paragraph, and show that such tolerances cannot reasonably be anticipated to cause wood heaters in the model line to exceed the applicable emission limits. The drawings must identify how the emission-critical parts, such as baffle and air control, can be readily inspected and replaced.
2. Firebox Statement Requirement Foyers Supreme Incorporated will manufacture the firebox or any firebox component (including the materials listed in paragraph (k)(3) of 60.533(b) and 60.5475(b)) with the same materials from the material used for the firebox or firebox component in the wood heater on which certification testing was performed. In the case that the firebox or any firebox component (including the materials listed in paragraph (k)(3) of 60.533(b) and 60.5475(b)) will be composed of material different from the material used for the firebox or firebox component in the wood heater on which certification testing was performed, Foyers Supreme Incorporated will provide a description of any such differences and demonstration that any such differences may not reasonably be anticipated to adversely affect emissions or efficiency.
3. CBI Foyers Supreme Incorporated has identified any claimed confidential business information (CBI). Foyers Supreme Incorporated will submit such information under separate cover to the EPA CBI Office; Attn: Residential Wood Heater Compliance Program Lead, 1200 Pennsylvania Ave., NW, Room 7138, MS:2227A, Washington, DC 20460. **Note that all emissions data, including all information necessary to determine emission rates in the format of the standard, cannot be claimed as CBI.**
4. Valid Certification Statement Foyers Supreme Incorporated has submitted all documentation pertaining to a valid certification test, including the complete test report and, for all test runs: Raw data sheets, laboratory technician notes, calculations and test results. Foyers Supreme Incorporated has included the items specified in the applicable test methods. Foyers Supreme Incorporated has included discussion of each test run and its appropriateness and validity, and must include detailed discussion of all anomalies, whether all burn rate categories were achieved, any data not used in the calculations and, for any test runs not completed, the data collected during the test run and the reason(s) that the test run was not completed and why. The burn rate for the low burn rate category of the tested unit [Elegance ST 42 II, Astra Duo 38 II, Monarch See-Through 38 II, Wayland See-Through 38 II, Novo Duo 38 II – Cast Iron, Novo Duo 38 II – Soapstone] is not greater than the rate that an operator can achieve in home use and no greater than is advertised by the manufacturer or retailer. Foyers Supreme Incorporated has included in the test report a summary table that clearly presents the individual and overall emission rates, efficiencies and heat outputs. Foyers Supreme Incorporated has submitted the test report and all associated required information, according to the procedures for electronic reporting specified in § 60.537(f) and 60.5475(f).
5. Warranties Foyers Supreme Incorporated has provided a copy of the warranties for the Elegance ST 42 II, Astra Duo 38 II, Monarch See-Through 38 II, Wayland See-Through 38 II, Novo Duo 38 II – Cast Iron, Novo Duo 38 II - Soapstone, which includes a statement that the warranties are void if the unit is used to burn materials for which the unit is not certified by the EPA and void if not operated according to the owner's manual.
6. Q/A Statement Foyers Supreme Incorporated will conduct a quality assurance program for the model line that satisfies the requirements of paragraph (m) of this section.
7. Laboratory Sealing of Unit Services Polytests Inc. (laboratory) has sealed the tested unit [Elegance ST 42 II, Astra Duo 38 II, Monarch See-Through 38 II, Wayland See-Through 38 II, Novo Duo 38 II – Cast Iron, Novo Duo 38 II - Soapstone] after completion of the test series and the unit will be stored at Foyers Supreme Incorporated facility for a minimum of 5 years from the completion of the certification test.

8. Statements that the wood heaters manufactured under this certificate will be—

(i) The unit tested [Elegance ST 42 II, Astra Duo 38 II, Monarch See-Through 38 II, Wayland See-Through 38 II, Novo Duo 38 II – Cast Iron, Novo Duo 38 II - Soapstone] is similar in all material respects that would affect emissions as defined in §60.531 to the wood heater submitted for certification testing, and labeled as prescribed in §60.536 and 60.5478.

(ii) Foyer Supremes Incorporated has provided an owner's manual that meets the requirements in § 60.536 and 60.5478. In addition, a copy of the owner's manual will be submitted to the Administrator and be available to the public on the Foyers Supreme Incorporated's web site.

9. Third Party Certification Statement

Foyers Supreme Incorporated has contracted an approved laboratory (Services Polytests Inc.) and an approved third-party certifier (PFS-TECO) whom satisfies the requirements of paragraph (f) of this section.

10. Approved laboratory/third party Statement

The test laboratory (Services Polytests Inc.) and approved third-party certifier (PFS-TECO) are authorized to submit information on behalf of the Foyers Supreme Incorporated, including any claimed to be CBI.

11. Manufacturer's Website Certification Test Reports Availability Statement

Foyers Supreme Incorporated agrees to place a copy of the certification test report and summary on its web site available to the public within 30 days after the Administrator issues a certificate of compliance.

12. Transferability Acknowledgement Statement

Foyers Supreme Incorporated acknowledges that the certificate of compliance cannot be transferred to another manufacturer or model line without written approval by the Administrator.

13. Statement about Selling Wood Heaters without an EPA Certificate

Foyers Supreme Incorporated acknowledges that it is unlawful to sell, distribute or offer to sell or distribute an affected wood heater without a valid certificate of compliance.

Print Name and Title:	**Date:**
Alexander Marcakis, President	~~**6th of May, 2025**~~ ~~**25th of November 2025**~~ **3rd of December 2025** (*)

Signature of responsible representative of the manufacturer certifying the accuracy of the above statements:

The authorized person whose signature is above certifies that the appliance [Elegance ST 42 II, Astra Duo 38 II, Monarch See-Through 38 II, Wayland See-Through 38 II, Novo Duo 38 II – Cast Iron, Novo Duo 38 II - Soapstone] as tested is in compliance with all certification requirements of the 2015 NSPS. Foyers Supreme Incorporated (manufacturer) also acknowledges that we remain responsible for compliance regardless of any error by the test laboratory (Services Polytests Inc.) or third-party certifier (PFS-TECO).

(*) Model names & Model numbers has been revised for consistency purposes.

AM 03/DEC/2025

Attachments

Instructions: Please complete the section applicable to your certification request. You may substitute your own data tables in lieu of the ones shown below provided that all the information is captured.

WOOD BURNING HEATERS

I. Test Method 28R for Certification and Auditing of Wood Heaters

A. *SUMMARY RESULTS – ADJUSTABLE WOOD BURNING HEATERS*

Test No.	Burn Rate (Kg/hr)	(E) Ave. Emission Rate g/hr	(OHE) %	Heat Output (BTU/HR)	CSA B415.1 CO emission g/min	CSA B415.1 CO emission g/Mj
1	1,909	1,38	70,8%	25 403	1,5	0,05
2	1,960	1,35	68,3%	25 174	2,8	0,05
Weighted particulate emission average of 2 test runs: 1,4 grams per hour.						
Weighted average HHV efficiency of 2 test runs: 70 %.						
Average Co 2,15 gr/min						

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
RESEARCH TRIANGLE PARK, NC 27711

OFFICE OF
AIR QUALITY PLANNING
AND STANDARDS

Mr. Ken Morgan
Technical Services Director
OMNI-Test Laboratories, INC
Post Office Box 301367
Portland, Oregon, 97294

01/21/2025

Dear Mr. Morgan,

This letter is a modification of my original response letter dated December 13, 2024. This modification is made to include approval to use this alternative 40 CFR part 60, Subpart QQQQ - Standards of Performance for New Residential Hydronic Heaters and Forced-Air Furnaces (Subpart QQQQ). The approval to also use this alternative on central heaters under Subpart QQQQ should have been included in the original response letter. These letters are written in response to your emails and letter dated November 20, 2023, requesting that the Environmental Protection Agency approve for use an alternative test method (ATM) for demonstrating compliance with New Source Performance Standard (NSPS) Subpart AAA, Standards of Performance for New Residential Wood Heaters (Subpart AAA). Specifically, the filter weighing procedures as outlined in ASTM E2515-11 to determine compliance for wood heaters under 40 CFR Part 60. The Office of Air Quality Planning and Standards, as the delegated authority, must make the determination on any major alternatives to test methods and procedures required under 40 CFR parts 59, 60, 61, 63, and 65. Your proposed alternative test method and our approval decisions are discussed below.

Your letter outlines concerns with the gravimetric analysis of the pair of filters used to capture particulate during each compliance test. Specifically, you state that the method suggests that weighing filters and filter assemblies in pairs will reduce measurement error, but that the method provides direction inconsistent with achieving error reduction.

As detailed in your letter ASTM E2515-11 section 9.4.4 states:

> *"9.4.4 Desiccate the filters, filter gaskets, and the probe assemblies at 20 +/- 5.6°C (68 +/- 10°F) and ambient pressure for at least 24 h. Weigh each component at intervals of not less than 6 h until a constant weight is achieved. Record results to the nearest 0.1 mg. During each weighing, the period for which the components are exposed to the laboratory environment shall be less than 2 min. The filter gaskets can be weighed in sets to be used in each filter holder and kept in an identified container at all times except during sampling and weighing. The filter holder assembly after the front filter need not*

be desiccated or weighed."

As shown above, section 9.4.4 states that "…the filter gaskets may be weighed in pairs", however it does not say that you may do so for the filter tares.

In contrast, section 10.2.1 of ASTM E2515-11 states:

> *"10.2.1 Desiccate the filters and filter gaskets at 20 +/- 5.6°C (68 +/-10°F) and ambient pressure for at least 24 h. Weigh each component at intervals of at least 6 h until a constant weight is achieved. Report the results to the nearest 0.1 mg. Filters and filter gaskets may be weighed directly without a Petri dish. They may be weighed in pairs (front and back filters and front and back filter gaskets from same filter train) to reduce handling and weighing errors. During each weighing, the components shall not be exposed to the laboratory atmosphere for longer than 2 min. For the room air background sample filter and filter gasket, treat negative particulate catch weights as "zero" when determining total room air particulate weight in accordance with 10.2."*

Additionally, you point out that section 10.2.1 allows, during post-test analysis, the filters to be weighed in pairs. You also assert that not only does this section state that filters may be weighed in pairs, but it also expresses that it is advantageous to do in order to reduce handling and weighing errors.

Furthermore, during our recent discussions of this issue, you pointed out that since ASTM E2515-11 does not specify that filters may be weighed in pairs during pre-test processing, doing so would likely lead to concerns regarding whether proper procedures were being followed. Also,in response to our inquiry of whether ASTM E2515-11 could be followed as written, where one would weigh both filters independently during pre-test processing (clause 9.4.4) and in pairs during post-test processing (section 10.2.1), you point out that this defeats the intent of section 10.2.1 in that more measurements are being performed than necessary and this goes against the stated intent of reducing handling and weighing errors.

It is your opinion, given the language in ASTM E2515-11 discussed above, that the authors originally intended that both filter gaskets and filters should be weighed in pairs during both pre-test and post-test procedures in order to reduce such errors (as evidenced by the language in section 10.2.1). Based on this, you are asking for consideration and approval of an alternative test method that would allow pre-test processing (taring) of filters in pairs as is currently allowed for filter gaskets in section 9.4.4. As you state, you seek this alternative because the errors imposed by the extra weighing of independent filters can account for a very high degree of error on today's cleaner stoves where a ±0.1 mg of measured catch can mean ± 0.2 grams of emissions under ordinary conditions. In light of these circumstances, we agree that appropriate paired weighings must be done during both pre and post test weighings.

We have reviewed your request to perform the pre-test processing (taring) of filters in pairs as is currently allowed for filter gaskets in section 9.4.4 when conducting testing testing of wood heaters under Subpart AAA. Because of the similarities in the requirements, we are also approving this alternative for use on central heaters under Subpart QQQQ. This approval is contingent on the following conditions:

- All of the pieces of the filter and filter assemblies that are tared together during pre-test assessment must also be weighed together when the post-test gravimetric assessment is made and the results of these assessments must be recorded to the nearest 0.1 mg. Please note that this alternative method approval is valid until such time that Subpart AAA and QQQQ are revised or replaced to require a different certification method, and at such time, this alternative will be reconsidered and possibly withdrawn. A copy of this letter must be included in each certification test report where this alternative test method is utilized.

Since this alternative test method may be of interest to others performing testing as described in ASTM2515-11 on wood heaters subject to 40 CFR 60, Subpart AAA or central heaters subject to Subpart QQQQ, we believe it is reasonable to make it broadly applicable. Therefore, we will post this letter as ALT-154 on the EPA website at *https://www.epa.gov/emc/broadly-applicable-approved-alternative-test-methods* for use by other interested parties.

If you have additional questions regarding this approval, please contact Michael Toney of my staff at 919-541-5247 or toney.mike@epa.gov.

Sincerely,

STEFFAN JOHNSON

Digitally signed by STEFFAN JOHNSON
Date: 2025.01.21 07:20:30 -05'00'

Steffan M. Johnson, Group Leader
Measurement Technology Group

cc: Shannon Banner, EPA/OAQPS/SPPD
Lessard, Patrick, EPA/OAQPS/SPPD
Rafael Sanchez, EPA/OECA
Robert Scinta, EPA/OECA
Michael Toney, EPA/OAQPS/AQAD
Mark Turner, EPA/OAQPS/SPPD
Richard Wayland, EPA/OAQPS/AQAD

Quality Assurance and Quality Control Program

PER 40 CFR PART 60 STANDARD OF PERFORMANCE FOR NEW RESIDENTIAL WOOD HEATERS, NEW RESIDENTIAL HYDRONIC HEATERS AND FORCED-AIR FURNACES

FOR MODEL NUMBER 38SFC_D_II:

- Astra Duo 38 II

3594 Jarry East, Montreal, QC H1Z 2G4
T: 877-593-4722, F: 514-593-4424
www.supremem.com
Revised: May 2025